Volume 4 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

TEHACHAPI RENEWABLE TRANSMISSION PROJECT

Final Environmental Impact Report/Statement

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Tehachapi Renewable Transmission Project EIR/EIS

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Lead Agencies:
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USDA Forest Service, Angeles National Forest

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June 2008
(Revised August 2009)

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1. Introduction

1.1 Purpose of Report

On June 29, 2007, Southern California Edison (SCE) submitted Application A.07-06-031 seeking authorization by the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity (CPCN) for the Tehachapi Renewable Transmission Project (TRTP or proposed Project/Action). On August 10, 2007, SCE submitted a Special Use Application (SF 299) to the USDA Forest Service because the proposed Project/Action would cross approximately 43 miles (~26 miles in Segment 6 and ~17 miles in Segment 11) of National Forest System (NFS) lands in the Angeles National Forest (ANF). This document describes the alternatives screening analysis that has been conducted for the proposed Project/Action.

Alternatives to the proposed Project/Action were suggested by SCE in its Proponent's Environmental Assessment (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 Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Project/Action. Alternatives were also suggested by public agencies and the public during the scoping period for the EIR/EIS (August-October 2007). This Alternatives Screening Report is intended to document: (1) the range of alternatives that have been considered and evaluated; (2) the approach and methods used in screening the feasibility of these alternatives according to guidelines established under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA); and (3) the results of the alternatives screening analysis.

This Alternatives Screening Report provides the basis and rationale for whether or not an alternative will be carried forward for analysis in the EIR/EIS. For each alternative that was eliminated from further consideration, this screening report explains in detail the rationale for elimination. Since full consideration of the No Project/Action Alternative is required by CEQA and NEPA, and must automatically be considered in the EIR/EIS, this report does not address that alternative.

1.2 Background

Under 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, SCE is obligated to interconnect and integrate power generation facilities into its electric system. In addition, the 2001 National Energy Policy goals are to increase domestic energy supplies, modernize and improve our nation's energy infrastructure, and improve the reliability of the delivery of energy from its sources to points of use. Executive Order 13212 encourages increased production and transmission of energy in a safe and environmentally sound manner. According to Executive Order 13212, for energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects. The agencies shall take such actions to the extent permitted by law and regulations and where appropriate.

Based on SCE's obligation to integrate planned generation projects into its electrical system, SCE determined that certain transmission lines (T/Ls) and substation facilities are required to be constructed between the Tehachapi Wind Resources Area (TWRA), located in southern Kern County, California, and the Mira Loma Substation located in Ontario, San Bernardino County, California.

1.3 Summary of SCE's Proposed Project

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 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 facilities, while Segment 9 addresses the addition and upgrade of substation facilities. For descriptive purposes, the discussion throughout this report is organized 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 1.3-1, below, and in Figure 1.3-1. 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 1.3-1. Summary of Alternative 2 (SCE's Proposed Project) Components
Overall Project Construction
• Proposed construction duration of 55 months (estimated to begin in April 2009 and end in November 2013) • Transmission facility construction generally scheduled for Monday through Friday, 7:00 a.m. to 5:00 p.m.; when extended hours would require a variance, it would be acquired • Substation construction generally scheduled for Monday through Friday, 7:00 a.m. to 5:00 p.m.; when extended hours would require a variance, it would be acquired • Workforce ranging in size from 10 to 300 persons, with daily average workforce of approximately 75 persons • Disturbance of approximately 1,518 acres with a ±15% range of 1,290-1,746 acres, with restoration of approximately 1,292 acres with a ±15% range of 1,098-1,486 acres, resulting in permanent land disturbance of approximately 215 acres with a ±15% range of 183-247 acres
Segment 10: New Whirlwind – Windhub 500-kV T/L
• Initiates at the Windhub Substation and ends at the new Whirlwind Substation • Construct new approximately 17-mile single-circuit Whirlwind – Windhub 500-kV T/L • All construction within new 330-foot-wide ROW (~17 miles) • Erect approximately 96 new single-circuit 500-kV lattice steel towers (LSTs) (94-172 feet tall) • Would require approximately 16 new pulling locations, 16 tensioner locations, and 7 new splicing locations
Segment 4: Whirlwind 500/220 kV T/L Elements

• Initiates at the Cottonwind Substation and ends at the existing Antelope Substation
• Construct two new parallel 4-mile single-circuit 220-kV T/Ls (Cottonwind – Whirlwind 220-kV No. 1 & No. 2)
• Construct new approximately 16-mile single-circuit Antelope – Whirlwind 500-kV T/L
• All construction within new 200-foot-wide ROW (20 miles total)
• Erect approximately 165 new transmission structures, including:
  ▪ 88 single-circuit 220-kV LSTs (90-120 feet tall)
  ▪ 77 single-circuit 500-kV LSTs (113-188 feet tall)

Table 1.3-1. Summary of Alternative 2 (SCE's Proposed Project) Components
• Would require approximately 34 new pulling locations, 34 tensioner locations, and 19 new splicing locations
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 18-mile single-circuit Antelope – Vincent No. 2 500-kV T/L • All construction in existing ROW (18 miles) • Erect approximately 67 new single-circuit 500-kV LSTs (113-188 feet tall) • Would require approximately 14 new pulling locations, 16 tensioner locations, and 7 new splicing locations
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 19-mile 500-kV single-circuit T/L between Vincent and Gould Substations (initially energized at 220 kV)
• String approximately 18 miles of new 220-kV conductor on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L
• Most construction within existing ROW, except for approximately 3 miles north of Gould Substation where existing ROW would be expanded by approximately 250 feet on the west side to accommodate swing of proposed T/Ls
• Erect approximately 76 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)
• Would require approximately 12 new pulling locations, 15 tensioner locations, and 5 new splicing locations
• Several portions along 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-Forest properties 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 27 miles of the existing Antelope – Mesa 220 kV T/L from Vincent Substation to the southern boundary of the ANF
• Construct new approximately 27-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 construction within existing ROW (~32 miles)
• Erect approximately 140 new transmission structures (104 on NFS lands), including:
  ▪ 2 single-circuit 220-kV LSTs (90-120 feet tall)
  ▪ 30 single-circuit 500-kV tubular steel poles (TSPs) (75-200 feet tall)
  ▪ 104 single-circuit 500-kV LSTs (85-193 feet tall)
  ▪ 4 three-pole dead-end 500-kV structures (75-80 feet tall)
• Would require approximately 16 new pulling locations, 16 tensioner locations, and 16 new splicing locations
• 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-Forest properties are located between the mileposts listed)

Table 1.3-1. Summary of Alternative 2 (SCE's Proposed Project) Components
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 16 miles of the existing Antelope – Mesa 220-kV T/L between the southern boundary of the ANF and the Mesa Substation • Construct new approximately 16-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 construction within existing ROW (~16 miles) • Erect approximately 82 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) ▪ 76 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 new pulling locations, 16 tensioner locations, and 16 new splicing locations
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 construction in existing ROW, except for the following: ▪ Rose Hills Memorial Park ROW relocation (existing: 1.1-mile, 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 • Would require approximately 33 new pulling locations, 33 tensioner locations, and 33 new splicing locations
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 18 acres for Antelope upgrade and approximately 0.2 acre for Vincent upgrade; Vincent expansion would disturb approximately 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

2. Overview of Alternatives Evaluation Process

The alternatives evaluated in this report were identified through the EIR/EIS scoping process, and through supplemental studies and consultations that were conducted during the course of this analysis. The range of alternatives considered in the screening analysis encompasses:

- Alternatives identified by SCE, including refinements to the proposed route;
- Alternatives identified by the EIR/EIS team in response to issues identified as a result of independent examination of the Project and meetings with affected agencies and interested parties;
- Alternatives suggested by interested and affected public agencies during the EIR/EIS scoping period; and
- Alternatives identified by members of the public during the EIR/EIS scoping period.

2.1 Alternatives Considered

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 transmission line routes for some segments of the proposed alignment; and (3) alternate system voltages and system configurations. Each category of alternative is presented below in Sections 2.1.1 through 2.1.3. Section 3 provides full descriptions of each alternative and detailed explanations of why each was either selected for full analysis in the EIR/EIS or eliminated from further consideration.

In addition to the alternatives that have been evaluated in this 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 did not lead to the development of viable alternatives and, therefore, could not be included in the screening process. These suggested ideas for alternatives and the reasons for their elimination are discussed in Section 2.1.4.

2.1.1 Design Variations to the Proposed Project/Action

The following alternatives are design variations to the proposed Project/Action, 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.
- **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.
- **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.
- **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.

- **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/Action.
- **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.
- **Reduced Number of 220-kV T/Ls in the ANF Alternative:** This alternative would provide similar upgrades to the proposed Project/Action, 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.
- **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.
- **Segments 6 and 11 Double-Circuit Structures Alternative:** This alternative would remove the two existing 220-kV T/Ls located north of the crossover span in Segment 6, and an existing 220-kV T/L and 500-kV T/L south of the crossover span in Segment 6, and replace them with a new double-circuit 500-kV T/L (between the Vincent Substation and the southern boundary of the ANF). In addition, within Segment 11, this alternative would remove two existing 220-kV T/Ls and replace them with a new double-circuit 500-kV T/L (initially operated at 220 kV) between the Vincent Substation and La Cañada Flintridge (Gould Substation).
- **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/Action would use double-circuit 500-kV structures.
- **Partial Underground Alternative:** This alternative would utilize underground construction in place of the proposed overhead line construction. Of the available technologies, Solid Dielectric Transmission Cables (XLPE) and Gas-Insulated Lines (GIL) are the two primary technologies being evaluated. Locations where underground construction would be considered to reduce significant visual and fire safety impacts, as requested by the public and agencies during the scoping period, include the ANF, Peaceful Valley (area north of Vincent Substation), Puente Hills, and Chino Hills.
- **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.

2.1.2 Alternate Corridors

The following 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, mostly parallel to the Los Angeles Aqueduct and associated access roads. This would connect the new Windhub Substation with the proposed Whirlwind Substation.
- **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.
- **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.
- **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.
- **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.
- **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.
- **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.
- **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.
- **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.

- **West Lancaster Alternative:** This alternative was suggested by members of the public prior to the scoping period. It would re-route the new ROW in Segment 4, which is currently proposed along 110th Street West, 0.5 miles farther west along 115th Street West.
- **Chino Hills Route A Alternative:** This alternative was suggested by the City of Chino Hills during the scoping period. This represents a substantial refinement on the Chino Hills State Park alternatives considered by SCE in its PEA (RA Eliminated 6, Options 1 and 2). It would route the new double-circuit 500-kV T/L (Segment 8A) through Chino Hills State Park (CHSP) parallel to an existing double-circuit 220-kV T/L. This alternative would require construction of a new 500-kV switching station in CHSP, which would allow the new 500-kV T/L to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Chino Hills Route B Alternative:** This alternative was suggested by the City of Chino Hills. This represents a refinement to the Chino Hills Route A Alternative. It would route the new double-circuit 500-kV T/L (Segment 8A) completely through CHSP parallel to an existing double-circuit 220-kV T/L. This alternative would require construction of a new 500-kV switching station, which would be located east of and outside of the CHSP, which would allow the new 500-kV T/L to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Chino Hills Route C Alternative:** This alternative was suggested by the City of Chino Hills based on discussions between Chino Hills, CHSP, SCE, and the CPUC. This represents a refinement to the Chino Hills Route A Alternative. It would route the new double-circuit 500-kV T/L (Segment 8A) parallel to an existing double-circuit 220-kV T/L up to CHSP. At this point, the 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 500-kV T/Ls within CHSP would be re-routed to tie into the new switching station, which would allow the new 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/Ls within CHSP would be re-routed outside of CHSP, paralleling the new 500-kV T/L from just west of the CHSP boundary to the new switching station. Upon leaving the new switching station, the re-routed 500-kV and 220-kV T/Ls would re-enter CHSP traversing around Raptor Ridge, and then reconnecting to the existing T/Ls that currently traverse the park.
- **Chino Hills Route D Alternative:** This alternative was suggested by the City of Chino Hills. This represents a refinement on the Chino Hills Route A Alternative. It would route a new double-circuit 500-kV T/L (Segment 8A) parallel to 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 and cut across CHSP for approximately 1.3 miles, and then turn northeast for approximately 0.4 mile to a new 500-kV switching station located east of the boundary of CHSP. This switching station would allow the new 500-kV T/L to connect to existing 500-kV T/Ls located in this area to provide connections to the Mira Loma Substation.
- **San Gabriel Valley New Corridor Alternative:** This alternative would differ from the proposed Project/Action 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.

2.1.3 System Alternatives

The following alternatives are system-wide variations to the proposed Project/Action. 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.
- **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.

2.1.4 Scoping Suggestions

During the scoping period (August-October 2007), members of the public and various agencies submitted requests and suggestions for potential alternatives. 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. Below is a list of concepts for alternatives brought up during the scoping period that did not result in the formulation of potential alternatives, along with explanations of why these concepts were not included in the alternatives screening process.

- **Avoid Impacts to Habitat Authority Properties.** The Puente Hills Landfill Native Habitat Authority requested that all possible alternatives be explored that would avoid any impacts to the Habitat Authority properties, including the No Project Alternative. A mapping exercise followed by field reconnaissance was conducted to determine if potential areas for re-routing the proposed Project/Action alignment north of the Habitat Authority Jurisdictional Boundary were available. Possible routes were considered north of the Pomona Freeway (State Route 60) through the San Gabriel Valley, including existing freeway, rail, transmission, and flood control corridors. No specific re-route was identified that could avoid Habitat Authority properties without displacing numerous existing homes and businesses. A broader look at routing possibilities within existing transportation and commercial corridors south of the ANF is further discussed below under the bullet entitled "Use Existing Corridors."
- **Avoid Parklands, Public Open Space, and Recreation Areas.** It was requested that the EIR/EIS consider alternative alignments that would avoid existing parkland and other public open space and recreation areas; however, no specific alignments were suggested. Significant impacts to parklands, open space, and recreation areas will be addressed in the EIR/EIS and mitigation measures will be applied to reduce impacts to the extent feasible, which may include minor re-routes of the proposed alignment. These will be determined based on a review and analysis of each park, open space, and recreational facility affected. As such, a specific alternative was not developed to address this issue.
- **Reduce Impacts to the River Commons Project.** The Watershed Conservation Authority (WCA), which is Joint Powers Authority operated by the Los Angeles County Flood Control District and the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC), has an approved project called the River Commons Project adjacent to the San Gabriel River. The River Commons Project is located along Segment 7 between approximately MP 8.9 (Valley Blvd.) and MP 10.55 (San Jose Creek Diversion Channel). The WCA requested that the EIR/EIS consider

alternatives to going through their project area as it would affect the plan for the River Commons Project. Alternate corridors to Segment 7 were investigated, as discussed below under the bullet entitled "Use Existing Corridors." Furthermore, members of the TRTP EIR/EIS Team met with the RMC on December 6, 2007, to discuss the proposed Project and learn about the issues and concerns of the RMC.

Phase 1A of the River Commons Project (Valley Blvd. to Avocado Creek, north of I-605) is planned to begin construction in June 2008, which would be prior to TRTP construction. As such, the RMC stated that they would like SCE to mitigate for any construction damage resulting from the TRTP, and would like to coordinate with SCE on the TRTP construction staging areas, construction schedule, and any transmission tower location changes, in order to minimize impacts to Phase 1A. RMC stated that they are willing to adjust the planned development of the River Commons Project to minimize impacts to their project. RMC also expressed concerns regarding the radius buffer required at each tower site during construction of the TRTP as well as once the TRTP is operational. They stated that 200-foot radius buffers would conflict with planned riparian habitat; however, 100-foot radius buffers would not.

Initial investigations by SCE determined that Segment 7 would not appear to prevent the River Commons Project from moving forward, although additional coordination between SCE and the WCA on design and construction issues would be necessary to minimize impacts to the River Commons Project. While all components of the proposed Project/Action (construction and operations) would remain within the existing SCE easement along Segment 7, the ROW would be disturbed during construction beyond the tower sites, including use of the existing access roads and additional areas for pulling sites. As these activities could impact the current Phase 1A of the River Commons Project, the WCA should work closely with SCE to adjust the planned development of the River Commons Project based on the TRTP design and construction schedule to minimize impacts to their project. The need for mitigation measures to address significant environmental impacts at the River Commons Project site will be evaluated in the EIR/EIS.

- **Reduce New ROW Width West of Mira Loma Substation.** The City of Ontario noted that the 500-kV and 220-kV T/Ls, which have been proposed along a new 150-foot ROW located west of Haven Avenue and south of Chino Avenue, just west of the Mira Loma Substation, would affect existing entitled projects and proposed developments in this area. The City of Ontario requested that the EIR/EIS consider reducing the ROW width from 150 to 100 feet to minimize potential impacts to the development. According to SCE, the 150-foot ROW width is a minimum requirement for the new T/Ls in this area and cannot be reduced. As such, no new alternative resulted from this request; however, mitigation measures may be recommended in the EIR/EIS to address any significant impacts identified in this area.
- **Use Existing Corridors.** It was requested that the proposed alignment, specifically along Segment 8A between the San Gabriel Junction (S8A MP 2.2) and Chino Substation, be re-routed to follow existing transportation and commercial corridors, including freeways, railroad tracks, flood control channels, etc. A detailed examination of maps and aerial photographs verified by field reconnaissance was conducted to determine if any existing corridors within the project area would be viable candidates for an alternative route for Segment 8A. To be considered a viable route, a corridor of adequate minimum width (180 to 200 feet) would need to be established between the southern boundary of the ANF and Mira Loma Substation. The following corridors were considered:

- Interstate 210 (Foothill Freeway) beginning in Duarte, just east of the intersection with Interstate 605 (San Gabriel River Freeway), and ending at the Lugo-Serrano transmission corridor (parallel to Day Creek) in Rancho Cucamonga
- Interstate 10 (San Bernardino Freeway) beginning in Baldwin Park, at the intersection with Interstate 605, and ending at the Lugo-Serrano transmission corridor in Ontario
- State Route 60 (Pomona Freeway) beginning in the City of Industry, at the intersection with Interstate 605, and ending at the Lugo-Serrano transmission corridor, just north of the Mira Loma Substation in Ontario
- State Highway 57 (Orange Freeway) considered as a north-south connector between two or more east-west routes (i.e., between Interstate 210 and State Route 60)
- Valley Boulevard beginning at the City of Bassett/City of Industry border, at the intersection with Interstate 605, and ending at State Highway 57 in Pomona
- Union Pacific rail corridor beginning just north of the Santa Fe Flood Control Basin (just east of the intersection of Interstate 210 and Interstate 605) in Irwindale, and ending at the Lugo-Serrano transmission corridor in Rancho Cucamonga
- Union Pacific rail corridor considered as a north-south connector between two east-west rail corridors, beginning at the Orange Avenue Junction in Irwindale and running north-south between Irwindale Avenue and the Santa Fe Flood Control Basin
- Union Pacific rail corridor beginning in the City of Industry just east of Interstate 605, then heading northeast parallel to Feather Avenue in Baldwin Park, then turning east at the Orange Avenue Junction in Irwindale and ending at the Lugo-Serrano transmission corridor in Rancho Cucamonga
- Union Pacific rail corridor beginning in the City of Industry just east of Interstate 605, then heading southeast parallel to and just north of Valley Boulevard in the City of Industry, and ending at the Lugo-Serrano transmission corridor in Ontario
- Union Pacific rail corridor beginning in the City of Industry just east of Interstate 605, then heading southeast parallel to and just south of Valley Boulevard in the City of Industry, and ending at the Lugo-Serrano transmission corridor in Ontario
- Big Dalton Wash flood control channel beginning at its confluence with Walnut Creek just east of the intersection of Interstate 10 and Interstate 605 in Baldwin Park, and ending at the 210 in Glendora
- Walnut Creek flood control channel beginning at its confluence with the San Gabriel River and ending at State Highway 57
- San Jose Creek flood control channel beginning at its confluence with the San Gabriel River and ending at State Highway 57
- LADWP 287-kV transmission corridor beginning just south of the Santa Fe Flood Control Basin and just east of the Rio Hondo Substation in Irwindale, and ending at the Lugo-Serrano transmission corridor north of Rancho Cucamonga
- SCE Lugo-Serrano 500-kV transmission corridor beginning at Blanchard Street just north of Rancho Cucamonga, then running north-south along Day Creek, and ending just west of the Mira Loma Substation in Ontario
- Based on field reconnaissance, no available re-route was identified that had adequate width and provided a re-route for Segment 8A. The only way to establish such a route, even with maximum use of existing transportation and utility corridors, would require extensive acquisition and relocation of residences and businesses. Therefore, no such alternative route was evaluated in the screening analysis.

- **Rowland Heights Water District Detour.** To accommodate a new 500-kV T/L, the proposed Project/Action re-routes the existing 220-kV T/Ls near Fullerton Road to the west and south of their current location due to the narrow ROW in this area. A member of the public suggested the use of tubular steel poles (TSPs) for the new 500-kV T/L, and also the replacement of the existing 220-kV LSTs with TSPs, with the intent of enabling the upgrades to remain in the existing ROW and avoid the need for new ROW in this area. SCE reviewed the feasibility of this suggestion and determined that replacing all the structures within the ROW with TSPs would not avoid the need for new ROW (SCE, 2007b). A ROW width of 330 feet would be required to accommodate the new structures; however, the existing ROW in this area is only 230 feet wide. Therefore, to accommodate the use of TSPs would require the acquisition of 100 feet of additional ROW in this area, which would affect several developed parcels, including a church, several water tanks, and private residences (SCE, 2007b). Additional ROW in this area may also impact the intersection of Fullerton Road and Pathfinder Road and require the relocation of existing lines. Consequently, no alternative was developed.

- **Chino Hills 500-kV Split.** In response to community concerns in the City of Chino Hills, Hills for Everyone represented by Shute, Mihaly & Weinberger LLP suggested that the 500-kV T/L within Segment 8A be split. As proposed, this alternative would involve constructing a new substation at the point that the existing Mira Loma-Serrano corridor branches off from the proposed Project route, in or near the Firestone Boy Scout Reservation. At this substation, the power would be stepped down into two 220-kV T/Ls. One of the 220-kV T/Ls would follow the existing Mira Loma-Serrano corridor through Chino Hills State Park (CHSP), using the existing towers. The other 220-kV T/L would follow the proposed Segment 8A route, with the additional potential to underground the T/L at this lower voltage. This proposed alternative would not meet two of the main project objectives, which are to provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW and address the South of Lugo transmission constraints (SCE, 2008c – DR#5-09). Generally speaking, power flow on an interconnected transmission system follows a path of least resistance. The 500-kV portion of the Project has been configured to deliver bulk power into a 500-kV substation that has substantial other transmission interconnections which will provide a low resistance path. By placing a substation in the 500-kV line and stepping it down to just two 220-kV T/Ls, a choke point or higher resistance path would be created on the transmission network. The use of 220-kV infrastructure would not allow for the transmission of the necessary capacity to Chino and Mira Loma Substations. The desired power flow would most likely not be accomplished over the two new 220-kV T/Ls, due to the choke point, and the power may flow over other parts of the transmission network which could lead to overloading on other T/Ls and reduced system reliability, or the need to build additional 220-kV T/Ls between the new substation and Mira Loma Substation. Furthermore, use of existing structures through CHSP would not be possible as they are not sufficiently strong enough to accommodate the new larger conductor needed to provide the higher capacity required to meet the Project objectives. Therefore, this potential alternative would not meet most of the project objectives and would not reduce environmental impacts. Consequently, this alternative was not further developed and evaluated in the screening process.
- **Use Tubular Steel Poles.** It was requested that TSPs be used to reduce visual impacts created by the proposed Project/Action. The visual resources analysis in the EIR/EIS will assess appropriate locations for use of TSPs. Issues of symmetry with existing structures, land use, construction constraints, and terrain will be considered. Where determined to be feasible and where significant visual impacts would need to be addressed, the use of TSPs will be considered as a possible mitigation measure. As such, the use of TSPs has not been addressed as an alternative.
- **Match Existing Structure Heights.** It was requested that the height of the new T/L structures be reduced to match existing structure heights. The majority of the existing T/L structures located along the proposed route are 220-kV and 66-kV lines. The new 500-kV T/Ls would be placed on larger, taller structures that are required to maintain a minimum separation between the 500-kV conductor and the ground. Higher voltage lines require a greater separation between the conductor

and ground, which does not allow higher voltage T/Ls to be constructed at the same height as lower voltage lines. Therefore, it is not feasible to match the existing structure heights.

- **Solar Power.** The Wildlife Corridor Conservation Authority suggested that the amount of money needed to implement the proposed Project/Action could be allocated to building a large number of solar panels on public land and private rooftops in the immediate area that needs to be serviced, and stated that solar power has the advantage of having immediate effects. This idea, while commendable, does not accomplish one of the primary objectives of the TRTP, which is to interconnect and integrate wind energy projects in the Tehachapi area. SCE is obligated under federal rules to interconnect these energy generators to its transmission system, if feasible. However, the use of solar power as an alternative to the proposed Project/Action will be considered as part of the No Project/Action Alternative in the EIR/EIS as an alternate method for generating renewable energy in response to California's Renewables Portfolio Standard.

2.2 Alternatives Screening Methodology

The evaluation of the alternatives identified above was completed using a screening process that consisted of three steps:

Step 1: Clarify the description of each alternative to allow comparative evaluation

Step 2: Evaluate each alternative using CEQA/NEPA criteria (defined below)

Step 3: Based on the results of Step 2, determine the suitability of the each alternative for full analysis in the EIR/EIS. If the alternative is unsuitable, eliminate it from further consideration.

As noted above for Step 2, the advantages and disadvantages of the remaining alternatives were carefully weighed with respect to CEQA and NEPA criteria for consideration of alternatives. These criteria are discussed in the following section.

2.3 CEQA and NEPA Requirements for Alternatives

Both CEQA and NEPA provide guidance on selecting a reasonable range of alternatives for evaluation in an EIR and EIS. The CEQA and NEPA requirements for selection and analysis of alternatives are similar, thereby allowing the use of an alternatives screening and evaluation process that satisfies both State and federal requirements. The CEQA and NEPA requirements for selection of alternatives are described below.

2.3.1 CEQA

An important aspect of EIR preparation is the identification and assessment of feasible alternatives that have the potential for avoiding or minimizing the significant effects of a proposed project. In addition to mandating consideration of the No Project Alternative, the State CEQA Guidelines (§15126.6[e]) emphasize the selection of a reasonable range of feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers. The State CEQA Guidelines (§15126.6[a]) state that:

> *An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project.*

Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation.

In order to comply with CEQA's requirements, each alternative that has been suggested or developed for this Project has been evaluated in three ways:

- Does the alternative accomplish all or most of the basic project objectives?
- Is the alternative feasible (from economic, environmental, legal, social, technological standpoints)?
- Does the alternative avoid or substantially lessen any significant effects of the proposed Project (including consideration of whether the alternative itself could create significant effects potentially greater than those of the proposed Project)?

2.3.1.1 Consistency with Project Objectives/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. The purpose and need statement is used to identify a range of reasonable alternatives to be analyzed in the EIR/EIS. In the PEA submitted as part of SCE's application to the CPUC for the TRTP, SCE states that "the purpose of the proposed Tehachapi Renewable Transmission Project (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".

In addition, SCE identified the following nine objectives as part of its PEA (Section 1.3):

- 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 in an expedited manner.
- Comply with all applicable reliability planning criteria required by the California Independent System Operator (CAISO), Western Electricity Coordinating Council (WECC), and the North American Electric Reliability Council (NERC).
- 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 ROW 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 ROW is not available, select the shortest feasible route that minimizes environmental impacts.
- Meet project needs in a cost-effective and timely manner.

For the purposes of CEQA/NEPA compliance, the Lead Agencies have identified the following objectives, based on SCE's stated purpose and objectives, for meeting the purpose and need of the TRTP and to allow the development of a reasonable range of potential alternatives.

(1) Provide the electrical facilities necessary to reliably interconnect and integrate up to approximately 4,500 megawatts (MW) of new wind generation in the Tehachapi Wind Resource Area 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).

(2) Address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley.

(3) Address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.

The above objectives as identified by the Lead Agencies are described in greater detail below, including background information on the planning, legislation, and transmission criteria used to develop the TRTP.

Accommodate Potential Renewable Power Generation

As noted above, a primary objective of the proposed TRTP is to 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 Renewables Portfolio Standard (RPS). To allow for a better understanding of this primary objective of the TRTP, the following discussion provides additional information regarding the TWRA, SCE's obligation to provide transmission capacity to the TWRA and other sources of generation, and the RPS requirements which are currently driving renewable energy development.

Tehachapi Wind Resource Area (TWRA). The TWRA is situated in southeastern Kern County and includes parts of the San Joaquin Valley, the Tehachapi Mountains, and the Mojave Desert. The unique geography of this area makes it one of the world's leading wind energy centers. Prevailing northwesterly winds blow through the passes in the Tehachapi Mountains that connect the San Joaquin Valley with the Mojave Desert. As a result of the regional geography and the high potential for wind power, this area has become the focus for current and future wind generation facilities. Wind power is increasingly encouraged by the State of California, beginning with tax incentives and favorable legislation in the wake of the 1970s energy crisis. In the early 1980s, California became the first state to develop large-scale wind farms.

The TWRA is widely considered the largest resource for wind energy in California. As a result, both federally-regulated and State-regulated utilities have focused on the development of wind projects in this area. Wind energy development in the TWRA, as well as in other areas of Kern County and northern Los Angeles County, could meet a significant portion of the State's goals for provision of renewable energy in California. However, a current lack of transmission capacity is a severely limiting factor to new wind installations. Large-scale transmission upgrades, such as the TRTP, are needed to cost-effectively utilize the TWRA's potential for generation of renewable energy.

A variety of wind generation projects currently have applications pending before the Counties of Kern and Los Angeles, or are expected to submit applications in the near future. The CAISO currently estimates that a total of 5,949 MW of wind energy generation facilities are in the planning stages for the Tehachapi and Mojave areas of Kern County (CAISO, 2007). Consequently, the TRTP is needed to increase the capacity of the SCE system to a level that would accommodate proposed or planned wind energy projects in the TWRA.

Requirement for SCE to Provide Transmission. 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, SCE is obligated to interconnect and integrate power generation facilities into its electric system. As described above, wind power generation facilities are currently being developed and planned in Kern County. In addition to wind farms, other sources of power generation within SCE's service region include gas-fired thermal power plants and hydroelectric plants to the north, east, and south of the Los Angeles metropolitan area. As a variety of power sources continue to develop and become operational in the Antelope Valley and Tehachapi areas, transmission capacity beyond that which is currently available will be required in order to supply customers in SCE's service region.

The SCE power grid is made up of a complex and dynamic network of infrastructure which includes generation, transmission, and distribution facilities. In order for power to be reliably delivered from generation sites to areas of demand, it is essential that all aspects of the SCE power grid develop in conjunction with each other. System upgrades such as the proposed TRTP are necessary for SCE to maintain a reliable transmission network with adequate capacity to transmit electrical power from new and developing generation sources to areas of electrical load or demand. As such, TRTP is needed to expand the SCE transmission grid and deliver power from current and future renewable power sources in the Antelope Valley and Tehachapi areas to SCE's high electrical demand areas further south.

As part of the development of the TRTP, SCE identified the "weak links" or "choke points" within the existing SCE system, which would limit transmission capacity and the ability to provide additional transmission to new wind generation sources. Specifically, within Segment 6 between Vincent Substation and the City of Duarte, the Antelope-Mesa 220-kV T/L was identified as the transmission facility that limits south of Vincent capability (SCE, 2007a). Consequently, removal and replacement of existing T/Ls in any other transmission corridor would not result in increased transmission capability south of Vincent unless the limiting component (i.e., the Antelope-Mesa 220-kV T/L) is upgraded. Alternatively, if new T/Ls are constructed in a new ROW without upgrading the limiting component, the amount of transmission capability increase would continue to be severely limited by the limiting element and would therefore result in substantial underutilization of the new transmission infrastructure. Therefore, in order to maximize the use of south of Vincent capability to allow up to 2,200 MW of new wind generation to be integrated into the grid, the Antelope-Mesa 220-kV T/L must be upgraded as part of the TRTP (SCE, 2007a).

Additional upgrades to the next limiting element would also be needed to accommodate the additional megawatts necessary to meet the TRTP purpose and need to integrate 4,500 MW of new wind generation. The Segment 11 corridor would be used as an alternative corridor to provide for new T/Ls south of Vincent through the ANF towards La Cañada Flintridge. Similar to Segment 6, unless the limiting transmission element in this corridor is upgraded, the amount of incremental transmission capability that can be realized by the addition of new T/Ls would be severely limited. With the Segment 6 upgrades in place, the next limiting transmission element south of Vincent is identified to be the Eagle Rock-Pardee 220-kV T/L in Segment 11 (SCE, 2007a). For the same reasons as discussed above, upgrades to accommodate more than 2,200 MW of new wind generation that do not include upgrading the next limiting transmission element south of Vincent (i.e., Eagle Rock-Pardee 220-kV T/L) would result in underutilization of the upgrades. Such underutilization would not satisfy the TRTP purpose and need to accommodate up to 4,500 MW of new generation resources. Therefore, as part of the TRTP, the Eagle Rock-Pardee 220-kV T/L would be upgraded in Segment 11.

Renewable Portfolio Standard (RPS) Requirements. The California Renewables Portfolio Standard (RPS) was established in 2002 by Senate Bill 1078. The RPS 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 (at the latest). 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). This RPS target of 20 percent renewable energy by 2010 is required by the Public Utilities Code (PUC) §399.14. 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, which are otherwise known as load centers. In order for SCE and other investor-owned utilities to satisfy the target goal of 20 percent 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 metropolitan area which are within the SCE service area.

While the most recent RPS target of 20 percent renewable energy by 2010 is required by the PUC §399.14, as described above, additional RPS goals have been proposed by the State. Currently, the CEC is conducting feasibility studies for a new RPS goal of 33 percent renewable energy by the year 2020, as mandated by Assembly Bill 1585 (CEC, 2007). The CEC's 2007 Integrated Energy Policy Report (IEPR) states the following: "Meeting the 33 percent goal in 2020 is feasible, but it will require significant changes in infrastructure and significant changes in program structure. Specifically, meeting the 33 percent goal will require...investments in the state's transmission infrastructure to adequately access renewable-rich resource areas...[and] the ability to integrate large quantities of intermittent resources..." (CEC, 2007).

Upgrades to the SCE transmission grid are necessary in order to maximize benefits from continued regional development of renewable wind power. The CEC's 2007 IEPR further states: "The proposed transmission development for the Tehachapi Wind Resource Area would capture much of the estimated economic potential for renewable energy development in that region...An Energy Commission report identifies potential renewable energy in Tehachapi by 2020 as about 8,000 megawatts of wind, with 4,500 megawatts included in a scenario achieving 33 percent by 2020." (CEC, 2007). As such, Tehachapi-area transmission projects are essential to facilitate the development of renewable energy resources required by existing and proposed RPS goals. The TRTP will enable SCE as well as other California utilities to comply with the State-mandated RPS.

Improve System Reliability to Address Projected Load Growth

Upgrades to existing Antelope Valley transmission facilities are needed to reliably serve growing area load within the Antelope Valley as well as regions farther south. 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 are used to mitigate reliability problems on the existing 220-kV system that occur during heavy load conditions. These operating procedures typically call for dropping of area load during overload conditions. SCE transmission studies indicate that continued use of such operating procedures will be insufficient to mitigate thermal overload problems on both the existing Antelope-Mesa and Antelope-Vincent 220-kV T/Ls.

The inclusion of the Antelope-Pardee 500-kV T/L (initially energized at 220 kV), referred to as Segment 1 of the Antelope Transmission Project (CPCN filing A.04-12-007), and the Antelope-Vincent 500-kV T/L (initially energized at 220 kV), referred to as Segment 2 of the Antelope Transmission Project (CPCN filing A.04-12-008), will provide sufficient transmission capacity to reliably serve the forecast load growth beyond the ten-year planning window in the Antelope Valley. The subsequent north of Vincent Substation transmission upgrades (Segments 3, 4,5,and 10) needed to interconnect and transmit the electrical power from the new potential generation resources were developed to both reliably serve the load requirements for the Antelope Valley and deliver power to Vincent Substation.

Mitigate Existing Transmission Constraints South of Lugo Substation

As part of the CAISO Controlled SCE Transmission Expansion Plan, SCE identified the need to increase transmission transfer capability from the northern portion of the SCE service territory, where substantial renewable resources are located north of SCE's Vincent and Lugo Substations, into SCE's load centers in the Los Angeles Basin. One existing transmission path between the northern portion of SCE's service territory and the Los Angeles Basin is referred to as the "South of Lugo transmission corridor," which currently contains three 500-kV T/Ls beginning at the Lugo Substation in Hesperia, traversing through the Cajon Pass along the I-15 freeway, and terminating at the Mira Loma Substation in Ontario.

Given continued load growth in Southern California, SCE forecasts that the South of Lugo transmission corridor will exceed its current transfer capability limitation of 6,100 MW prior to, as well as after, the addition of the new Rancho Vista 500-kV Substation (not part of TRTP), located in the city of Fontana. Furthermore, within the Cajon Pass, history has demonstrated that forest fires are a serious risk factor affecting multiple T/Ls in a common corridor on an annual basis, as exemplified in 2002 when all three of the existing 500-kV T/Ls located in the Cajon Pass were lost due to a forest fire during the heavy load demand period. To manage power flow under these circumstances, SCE has a special protection system (SPS) currently in place, which measures voltages at key substations within SCE's network. When the T/Ls within the Cajon Pass are lost (common mode failure), power is transmitted through other T/Ls within SCE's network to the load centers in the Los Angeles Basin. As a result of the substantial and rapid increase in current flowing over the remaining facilities, the voltage on these T/Ls rapidly decays over the length of the line. As a result, the voltage at the receiving end, or the "load center," can drop below acceptable levels, resulting in these facilities being removed from the grid, thus further perpetuating the voltage decay. This is referred to as "voltage collapse." Under these circumstances, the SPS requires that SCE shed a significant amount of SCE system load, resulting in power outages. Addition of power from the new wind generation facilities north of Vincent Substation adds further to the loading on these key transmission lines, thus compounding the existing system problems (voltage collapse) during outages of two or more of the lines located south of Lugo Substation.

The TRTP is expected to increase the total import capability of power into the Mira Loma area from 6,400 MW to 7,400 MW by providing additional transmission paths within the SCE system which would help alleviate the load on the Lugo-Mira Loma T/Ls. As a result, the overall reliability of the SCE system would be increased.

Discussion on Consistency with Project Objectives/Purpose, and Need

As noted above, CEQA §15126.6(a) requires that alternatives "feasibly attain most of the basic objectives of the project." Similar to CEQA, NEPA allows consideration of alternatives that meet "most" of the project purpose. As noted in the findings for *Natural Resources Defense Council v. Morton (458 F.2d 827 [D.C. Cir. 1972])*, "Nor is it appropriate to disregard alternatives merely because they do not offer a complete solution to the problem." While the concept of meeting *most* of the basic project objectives allows for some flexibility within the alternatives screening process to allow for alternatives that do not meet *all* of the project objectives, the reality is that some project objectives must be met, while others are weighted with respect to their importance. Of the three main objectives identified by the Lead Agencies, the hierarchy and reasoning is discussed below.

One of the primary objectives of the Project would be to provide the electrical facilities to reliably interconnect and integrate new wind generation in the TWRA to comply with the California Renewables Portfolio Standard (RPS). This is one of the driving forces for SCE applying for a CPCN for the TRTP. While there could be some flexibility with respect to meeting the target capacity of 4,500 MW, any alternative considered *must* provide at least some reasonable percentage of the target capacity and *must* provide for a reliable system (see Section 2.3.1.4 for a discussion on reliability). Furthermore, the design of any alternative should allow SCE to reach the RPS target by 2010 as required by Public Utilities Code (PUC) §399.14 (State law). An equally important objective of the Project is to alleviate the South of Lugo transmission constraints. As noted, this has been an ongoing issue for the Los Angeles Basin and is represented by the majority of the proposed infrastructure upgrades south of Vincent Substation.

Addressing projected load growth in Antelope Valley is almost a secondary outcome of reliability interconnecting and integrating new wind generation in the TWRA, as the infrastructure that would meet this objective would invariably meet the projected load growth of the Antelope Valley. The other objectives stated by SCE, which are not covered by the three objectives identified by the Lead Agencies to meet the purpose and need for the TRTP, represent planning and management guidance. While these objectives help to facilitate the design of the Project, strict adherence to these objectives would potentially result in inappropriately limiting the range of alternatives. Therefore, these objectives have been presented, but were not considered by the Lead Agencies. For example, an alternative that requires new ROW and does not provide for the shortest feasible route, may in fact be a better route for other environmental reasons, and therefore would not be eliminated based on this criteria alone.

2.3.1.2 Feasibility

The State CEQA Guidelines (§15364) define feasibility as:

> *. . . capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.*

The alternatives screening analysis is largely governed by what CEQA terms the "rule of reason," meaning that the analysis should remain focused, not on every possible eventuality, but rather on the alternatives necessary to permit a reasoned choice. Furthermore, of the alternatives identified, the EIR is expected to fully analyze those alternatives that are feasible, while still meeting most of the project objectives.

According to the State CEQA Guidelines (§15126.6[f][1]), among the factors that may be taken into account when addressing the feasibility of alternatives to determine the range of alternatives to be evaluated in the EIR include: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or other regulatory limitations; jurisdictional boundaries; and whether the proponent can reasonably acquire, control or otherwise have access to alternative sites in determining the range of alternatives to be evaluated in the EIR. For the screening analysis, the feasibility of potential alternatives was assessed taking the following factors into consideration:

- **Economic Feasibility.** Is the alternative so costly that implementation would be prohibitive?
- **Environmental Feasibility.** Would implementation of the alternative cause substantially greater environmental damage than the proposed Project, thereby making the alternative clearly inferior from an environmental standpoint?

- **Legal Feasibility.** Do legal protections on lands preclude or substantially limit the feasibility of permitting a high-voltage transmission line? Do regulatory restrictions substantially limit the feasibility or successful permitting of a high-voltage transmission line? Is the alternative consistent with regulatory standards for transmission system design, operation, and maintenance?
- **Social Feasibility.** Would the alternative cause significant damage to the socioeconomic structure of the community and be inconsistent with important community values and needs?
- **Technical Feasibility.** Is the alternative feasible from a technological perspective, considering available technology? Are there any construction, operation, or maintenance constraints that cannot be overcome?

For the screening analysis, the economic, environmental, legal, social, and technological feasibility of potential alternatives was assessed. The assessment was directed towards reverse reason; that is, a determination was made as to whether there was anything about the alternative that would be infeasible on economic, environmental, legal, social, and technological grounds.

2.3.1.3 Potential to Eliminate Significant Environmental Effects

The State CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly" (§15126.6[b]). At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the proposed Project/Action with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of the proposed Project/Action that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area to determine whether or not an alternative may reduce such impacts.

Table 2.3-1 presents a summary of the potential significant effects of the proposed Project/Action. This impact summary was prepared prior to completion of the EIR/EIS analysis, so it may not be complete in comparison to the detailed analysis that will be included in the EIR/EIS. The impacts stated below are based on a preliminary assessment of potential impacts and were used to determine whether an alternative met the CEQA requirement to reduce or avoid potentially significant effects of the proposed Project/Action.

Table 2.3-1. Summary of Preliminary Impacts of the Proposed Project/Action

Environmental Issue Area	Potential Issues or Impacts
Aesthetics/Visual Resources	• Permanent impacts related to visual contrast, alterations in existing scenic integrity, blocked or partially blocked views and the introduction of industrial-like facilities and new sources of light and glare due to the placement of towers, new or expanded substations, and new access and spur roads in all project segments, including scenic vistas and other designated scenic resources. • Construction-related activities would result in the temporary degradation of existing visual character and quality in all project segments, including scenic vistas and other designated scenic resources. • Possible conflicts with federal, State and local plans, regulations or standards applicable to the protection of visual resources.
Agricultural Resources	• Project's potential to impact Prime Farmland, Farmland of Statewide Importance, and lands under Williamson Act Contracts.
Air Quality	• Impacts during construction would occur when heavy equipment, support vehicles, and other internal combustion engines creates fugitive dust and/or generates exhaust containing: carbon monoxide (CO), reactive organic compounds (ROC), nitrogen oxide (NOx), sulfur oxides (SOx), and particulate matter (PM10). • Impacts would result from fugitive dust generated from ground clearing, grading, vehicle traffic on the access roads, and vehicle traffic at the construction sites. • Potential ongoing impacts from emissions and fugitive dust produced during operation and maintenance of proposed transmission line. • Potential temporary and long-term impacts from toxic air contaminants including diesel particulate matter that have localized effects.

Table 2.3-1. Summary of Preliminary Impacts of the Proposed Project/Action

Biological Resources	• Construction activities and project facilities would result in temporary and permanent loss of native wildlife and habitat. • Loss of habitat for sensitive species designated by State and federal resource agencies. • Construction and operation could disturb wildlife and cause changes in wildlife behavior. • Construction activities may conflict with local policies or ordinances protecting biological resources.
Cultural & Paleontological Resources	• Construction of new towers and access roads could damage or destroy historic and archaeological sites, traditional cultural properties, or areas containing paleontological resources. • Temporary use of staging areas and conductor pull sites could damage or destroy historic and archaeological sites, traditional cultural properties, or areas containing paleontological resources.
Geology and Soils	• Soil erosion on low fill slopes and steeply graded areas could result in sedimentation of water bodies. • Ground surface rupture could occur where the proposed transmission line would cross active fault lines. • Landslides, mudslides, or other related ground failures from seismic activity, could occur and damage facilities, particularly where the proposed transmission line would cross active fault lines.
Hazards and Hazardous Materials	• Temporary relocation of residents along parts of the project might be required where helicopter construction is required (FAA safety regulations of helicopter flight paths). • Improper storage or handling of hazardous materials and/or hazardous wastes during project construction, operations, or maintenance could present hazards to construction workers or the public. • Leaking or spilling of petroleum or hydraulic fluids from construction equipment or other vehicles during project construction, operation, or maintenance could contaminate soils, surface waters, or groundwater. • The inadvertent uncovering of hazardous materials during excavation activities could cause toxic releases to the environment.
Fire Prevention and Suppression	• Wildfires could be caused by construction or operation of the transmission lines. • Facilities and activities could interfere with wildfire suppression.
Hydrology and Water Quality	• Increased surface water runoff, erosion, siltation, and sedimentation could diminish water quality. • Water quality of streams or washes could be diminished from violation of water quality standards or waste discharge requirements.
Land Use	• Possible conflicts with applicable local agency land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. • Possible conflict with the Forest Land Management Plan, Puente Hills Landfill Native Habitat Authority Resource Management Plan, and other resource management plans that protect resources along project route. • Construction would temporarily disturb the land uses it traverses or adjacent land uses. • Operation would result in permanent preclusion of, or substantial conflict with, land uses it traverses, or adjacent land uses.
Noise	• During construction, noise generated by construction equipment could create nuisance to nearby residents, park users, or other sensitive receptors. Volume range could be 80 to 100 dBA at a range of 50 feet from the active construction site. • Corona noise generated during the operation of the proposed transmission line would increase ambient noise levels surrounding the corridor. • Construction or corona noise in residential areas along the proposed transmission corridor could violate local noise ordinances (for volume and hours of operation).
Socioeconomics	• Employment of construction personnel could be beneficial to regional economy. • Remote areas of Los Angeles, San Bernardino and Kern Counties could lose access to temporary housing due to the possible influx of construction labor, if housing is required during construction of the proposed transmission line. • Additional property-taxes could be provided to local jurisdictions. • Construction activities could temporarily impact local business revenues due to limited access or disruptions of operations. • Operation would have the potential to decrease property values traversed by or adjacent to the transmission line. • Potential for project impacts to disproportionately affect low-income or minority populations (environmental justice).
Public Services and Utilities	• Construction activities could cause increased demand on public resources, services, and utilities. • Construction activities could result in increased generation of waste and disposal needs.
Recreational Resources and Wilderness Areas	• Construction or operation could cause conflicts with established or pending resource management or conservation plans. • Recreational land users would be disturbed by construction and operation where the proposed transmission line crosses the Angeles National Forest and other designated recreational areas. • Road closures and increased traffic during construction activities may impede or prevent access to recreational and wilderness areas.

Table 2.3-1. Summary of Preliminary Impacts of the Proposed Project/Action	
Transportation and Traffic	• Construction could result in a temporary disruption of traffic flow, transit services, emergency services, or rail services.
Cumulative and Growth-Inducing Impacts	• Cumulative impacts could occur (considering other projects that are proposed or under construction in the project area). • Growth-inducing effects could occur.

2.3.1.4 Reliability

In addition to the feasibility considerations discussed above, the reliability of the transmission system must also be considered to meet one of the primary objectives of the Project, which is to reliably interconnect and integrate up to approximately 4,500 MW of new wind generation in the TWRA into the CAISO-controlled grid. Planning criteria developed by the California Independent System Operator (CAISO), Western Electricity Coordinating Council (WECC), and the North American Electric Reliability Council (NERC), requires the loss of a single transmission line to be analyzed (N-1). For this case, the reliability criteria do not allow unplanned load interruption following the loss of a single transmission line. Further, for the case where multiple lines of the same voltage originating from the same source are placed in a common ROW, the reliability criteria require the loss of up to two transmission lines be analyzed (N-2). For the situation where two lines are lost, the CAISO criteria limit the amount of generation drop or reduction to no more than 1,400 MW. All reasonable alternatives must meet CAISO/WECC/NERC planning criteria.

2.3.2 NEPA

According to the Council on Environmental Quality's (CEQ) NEPA Regulations (40 CFR. 1502.14), an EIS must present the environmental impacts of the proposed action and alternatives in comparative form, defining the issues and providing a clear basis for choice by decision makers and the public. The alternatives discussion shall:

a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

c) Include reasonable alternatives not within the jurisdiction of the lead agency.

d) Include the alternative of no action.

e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.

f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

The CEQ has stated that "[r]easonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant" (CEQ, 1983). In addition, as stated in 40 CFR §1502.1, Purpose, an Environmental Impact Statement "shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

In order to comply with NEPA's requirements, each alternative that has been suggested or developed for this project has been evaluated using the following:

- Does the alternative meet the statement of purpose and need?
- Is the alternative feasible?
- Does the alternative avoid or minimize adverse impacts or enhance the quality of the human environment?

2.3.2.1 Consistency with Purpose and Need

CEQA (State CEQA Guidelines §15124[b]) and NEPA (CFR Title 40 §1502.13) both explain that an agency's statement of objectives or purpose and need should describe the underlying purpose of the proposed project and reasons to which an agency is responding. For the proposed Project/Action, the objectives or purpose and need, are described in Section 2.3.1.1, above. Similar to CEQA, NEPA allows consideration of alternatives that meet "most" of the project purpose. As noted in the findings for *Natural Resources Defense Council v. Morton (458 F.2d 827 [D.C. Cir. 1972])*, "Nor is it appropriate to disregard alternatives merely because they do no offer a complete solution to the problem."

2.3.2.2 Feasibility

The environmental consequences of the alternatives, including the proposed action, are to be discussed in the EIR/EIS per CEQ NEPA Regulations (40 CFR 1502.16). The discussion shall include "Possible conflicts between the proposed action and the objectives of federal, regional, State, and local land use plans, policies and controls for the area concerned." Other feasibility factors to be considered may include cost, logistics, technology, and social, environmental, and legal factors (Bass et. al., 2001). The feasibility factors are substantially the same as described for CEQA in Section 2.3.1.2, above.

2.3.3 Summary of CEQA and NEPA Screening Methodology

Unlike CEQA's requirements, NEPA does not screen out alternatives based on avoiding or lessening significant environmental effects. However, CEQ NEPA Regulations (40 CFR 1500.2[e]) state that "Federal agencies shall to the fullest extent possible: Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." Therefore, to ensure that the alternatives considered for the EIR/EIS would meet the requirements of both CEQA and NEPA, a reasonable range of alternatives has been considered and evaluated as to whether or not the alternatives meet (1) most of the project objectives/purpose and need, (2) are considered feasible, (3) meet CAISO/WECC/NERC reliability planning criteria, and (4) would avoid or lessen adverse effects of the proposed Project/Action.

3. Alternative Descriptions and Determinations

3.1 Introduction

The alternatives presented in this section range from minor routing adjustments to SCE's proposed route, to entirely different transmission line routes for some segments of the proposed alignment, to alternate system voltages and system designs. Section 3.2 addresses design variations to the proposed Project/Action. Section 3.3 discusses alternatives that would be routed along a new corridor or an existing corridor, other than the proposed corridors. Finally, transmission system alternatives are evaluated in Section 3.3. The No Project/Action Alternative, because it must be considered in an EIR/EIS, is not discussed herein. All figures referenced in the discussion below are provided at the end of this report.

After initial screening, a potential alternative was eliminated from full evaluation if it: (1) was unable to meet the primary project purpose and fulfill the project need; (2) proved to be infeasible or would not meet reliability criteria; or (3) did not have the ability to reduce or avoid impacts of the proposed Project/Action without creating other impacts of its own. The alternatives that have been determined to meet the CEQA/NEPA alternatives screening criteria have been retained for full analysis in the EIR/EIS.

A summary table is provided at the end of the analysis of each alternative considered in the alternatives screening process. This table provides an "at a glance" summary of the CEQA/NEPA criteria considered, as discussed above. The first three boxes along the top of the table answer the question of whether or not the proposed alternative: (1) meets the Project purpose; (2) is feasible; and (3) meets CAISO/NERC/WECC reliability requirements. If the alternative does NOT meet the Project purpose, is NOT feasible, and/or does NOT meet reliability requirements, the appropriate box will have a designation of "No" and the alternative is immediately eliminated from further consideration, as these are fundamental criteria to meet for an alternative to be considered "reasonable". Explanations and supporting information for these determinations are provided in the second row of the summary table. The third row of the summary table provides a side-by-side summary comparison of the environmental advantages and disadvantages of the proposed alternative. The last row of the table provides the conclusion of whether or not to retain the alternative for further analysis in the EIR/EIS or to eliminate from further analysis.

3.2 Design Variations to the Proposed Project/Action

Each of the following alternatives is located within or along the proposed alignment which traverses from the Windhub Substation in southern Kern County to the Mira Loma Substation in San Bernardino County. The discussions below explain the reasons for elimination or retention for full analysis for each potential alternative.

3.2.1 Whirlwind Substation Site A Alternative

Alternative Description

The Whirlwind Substation would be a new 500/220-kV facility located in Kern County, approximately 4.5 miles south of the proposed Cottonwind Substation. The facility would include a 500-kV switchyard and a 220-kV switchyard in order to connect T/Ls in Segments 4 and 10. Alternative Site A for the Whirlwind Substation was considered by SCE in its PEA (RA Retained 6), and would be located on the east side of Segment 4, south of Rosamond Boulevard and east of 170th Street West, as shown in Figure

3.2-1. The site for this alternative consists of approximately 113 acres of previously disturbed land. Grading to prepare the site for the new substation is estimated to result in 15,000 cubic yards of soil mixed with small stones and organic matter. The permanent land disturbance associated with Whirlwind Substation Site A would be approximately 66 acres. It should also be noted that this site has been proposed for an aquifer recharge facility.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints. Therefore, this alternative would accomplish the Project purpose.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This alternative substation site would be located on previously disturbed land, which would reduce potential biological impacts, and near proposed wind generation projects, thereby minimizing routing distances.

Environmental Disadvantages

This alternative substation would be located on 113 acres and would result in an additional 7 acres of permanent disturbance in comparison to the proposed Project/Action. Soil stability issues could be a concern considering an aquifer recharge facility has been proposed for this site.

Alternative Conclusion

ELIMINATED. This alternative would meet the purpose and need of the TRTP, would be feasible, and would meet CAISO/NERC/WECC reliability requirements. However, the alternative substation site would require additional land over 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. Overall, this alternative offers no environmental advantage over the proposed Project/Action without creating greater impacts of its own, and is substantially similar to the proposed Project/Action. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

Whirlwind Substation Site A Alternative	Meets Project Purpose? Yes[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would be designed to meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints. [2] This alternative would be feasible. [3] Meets CAISO/NERC/WECC requirements. Requires crossing of existing 220-kV T/Ls, decreasing overall reliability.			
Environmental Advantages • Located on 113 acres of previously disturbed land, which would reduce potential biological impacts • Located between Cottonwind and Antelope Substations near proposed wind generation projects, thereby minimizing routing distances		Environmental Disadvantages • Soil stability issues could be a concern as an aquifer recharge facility is proposed for this site • Greater permanent land disturbance than the proposed Whirlwind Substation site	
Conclusion: Eliminate from further analysis. This alternative offers no environmental advantage over the proposed Project/Action and is substantially similar to the proposed Project/Action.			

3.2.2 Whirlwind Substation Site B Alternative

Alternative Description

The Whirlwind Substation would be a new 500/220-kV facility located in Kern County, approximately 4.5 miles south of the proposed Cottonwind Substation. The facility would include a 500-kV switchyard and a 220-kV switchyard in order to connect T/Ls in Segments 4 and 10. Alternative Site B for the Whirlwind Substation was considered by SCE in its PEA (RA Retained 6), and would be located west of 170th Street West, on the west side of Segment 4, south of Rosamond Boulevard, as shown in Figure 3.2-1. The site for this alternative consists of approximately 102 acres of previously undisturbed land. Grading to prepare the site for the new substation is estimated to result in 24,000 cubic yards of soil mixed with small stones and organic matter. The permanent land disturbance associated with Whirlwind Substation Site B would be approximately 67 acres.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This alternative substation site would be located nearby proposed wind generation projects, minimizing routing distances.

Environmental Disadvantages

This alternative substation site would be located on previously undisturbed land, thereby increasing potential biological impacts, and would require grading of an additional 9,000 cubic yards of soil in comparison to the proposed Project/Action, which would increase air quality impacts during construction.

Alternative Conclusion

ELIMINATED. This alternative would meet the purpose and need of the TRTP, would be feasible, and would meet CAISO/NERC/WECC reliability requirements. However, the alternative 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. Overall, this alternative offers no environmental advantage over the proposed Project/Action without creating greater impacts of its own, and is substantially similar to the proposed Project/Action. Therefore, the Whirlwind Substation Site B Alternative has been eliminated from further consideration.

SUMMARY

Whirlwind Substation Site B Alternative	Meets Project Purpose? Yes[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would be designed to meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints. [2] This alternative would be feasible. [3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.			
Environmental Advantages • Located between Cottonwind and Antelope Substations near proposed wind generation projects, thereby minimizing routing distances		Environmental Disadvantages • Located on 102 acres of previously undisturbed land, increasing potential for biological impacts • Grading of the site would result in an estimated quantity of 24,000 cubic yards of soil mixed with small stones and organic matter versus 15,000 cubic yards for the proposed Project/Action	
Conclusion: Eliminate from Further Analysis. This alternative offers no environmental advantage over the proposed Project/Action, and is substantially similar to the proposed Project/Action.			

3.2.3 Upgrade Transmission through the ANF in Segment 6 Only Alternative

Alternative Description

This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11A). as shown in Figure 3.2-2, the proposed improvements within Segment 6 for this alternative would include replacing one existing 220-kV T/L with a 500-kV T/L and constructing a new 500-kV T/L either to the east or west of the existing T/Ls in the designated utility corridor through the ANF between the Vincent Substation and the City of Duarte, and widening of the existing ROW to accommodate the new T/Ls. A new approximately 8-mile, 200-foot-wide east-west corridor along the southern boundary of the ANF would need to be established to allow one of the new 500-kV T/Ls (Mesa-Vincent No. 2 500/220-kV T/L) to connect into the southern portion of Segment 11 near Gould Substation. As proposed for Segment 11, this circuit would be completed by stringing an existing vacant tower position from the Gould Substation area to the Mesa Substation. This alternative would be approximately 9 miles longer than the proposed Segment 11 between Antelope Substation and Gould Substation.

Implementation of this alternative would result in a total of four T/Ls from the Vincent Substation to the southern boundary of the ANF in the City of Duarte along Segment 6. This would include three 500-kV

T/Ls (Rio Hondo-Vincent No. 2, Mesa-Vincent No. 2, and Mira Loma-Vincent) and one existing 220-kV T/L (Rio Hondo-Vincent No. 1). The two existing 220-kV T/Ls within Segment 11 (Mesa-Vincent and Eagle Rock-Pardee) would remain and continue to operate as under current conditions.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would meet the purpose and need of the TRTP by allowing for the interconnection of new wind generation resources in the TWRA, meeting projected load growth in the Antelope Valley, and addressing the South of Lugo transmission constraints, although not necessarily to the extent to which the proposed Project/Action would meet these objectives and only when operated reliably. Incorporating the proposed upgrades, which under the proposed Project/Action would be split between Segments 6 and 11, into only Segment 6, would compromise system reliability (see "Feasibility" discussion below). As such, this alternative would only partially fulfill the Project objectives/purpose and need.

Feasibility

No feasibility issues have been identified.

Reliability

This alternative would locate four lines (three 500-kV and one 220-kV) in Segment 6 while maintaining the existing 220-kV lines in Segment 11. The increased number of T/Ls in Segment 6 would likely subject the lines to common mode failure. Under such a condition, power flow studies determined that a total of 3,800 MW would flow on the four T/Ls in Segment 6, as summarized in Table 3.2-1 below. This amount of power flow would need to be carried by the remaining T/Ls under outage conditions within Segment 6. Of this total flow, approximately 60 percent would be transmitted toward the Rio Hondo and Mesa load centers while the remaining 40 percent would be transmitted to the Mira Loma area.

Table 3.2-1. Heavy Summer Power Flow on T/Ls Located in Segment 6 and 11 Under the "Upgrade Transmission Through the ANF in Segment 6 Only" Alternative

Transmission Line	Segment	Amp Rating	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	6	2480	2088	802	84.2%
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	6	3230	2053	784	63.6%
Mesa-Vincent No. 2 500-kV partially built to 500-kV	6	3230	1563	598	48.4%
Mira Loma-Vincent 500-kV	6	3950	1807	1616	45.7%
Existing Mesa-Vincent 220-kV	11	2480	2127	816	85.8%
Existing Eagle Rock-Pardee220-kV	11	1240	633	246	51.0%

A simultaneous outage condition of the three lines in Segment 6 that would connect the Vincent Substation to the Rio Hondo and Mesa Substations would result in loading the remaining T/L that connect the Vincent Substation to the Mesa Substation, located in Segment 11, beyond the available thermal capacity. Under such an outage condition, the existing Mesa-Vincent 220-kV T/L would load up to 150 percent of its maximum normal conductor rating which is well over the maximum 115 percent long-term emergency and 133 percent short-term emergency capabilities. If, in addition to the loss of these three lines in Segment 6, the Mira Loma-Vincent 500-kV T/L were subjected to the same outage condition associated with the same common mode failure risk factor, loading on the existing Mesa-Vincent 220-kV T/L would exceed 170 percent of its maximum normal conductor rating. A summary of the power flow study results is provided below in Table 3.2-2.

Implementing a Special Protection System (SPS) which trips TWRA generation would not provide for an adequate solution to mitigate the identified thermal overload problem. The amount of generation tripping required to reduce the thermal overload to within limits would exceed the maximum 1,400 MW tripping limits associated with the use of a SPS. Under such a condition, tripping 1,417 MW resulted in reducing the identified thermal overload by 17 percent from 170 percent to 153 percent. Extrapolating the overload reduction indicates that over 3,100 MW of generation tripping would be required to reduce the identified thermal overload to within SCE's short-term emergency limits. To further reduce the overload to within SCE's long-term emergency rating, over 3,750 MW of generation tripping would be required.

Consequently, routing both proposed upgrades (Segment 6 and 11) within Segment 6 would compromise system reliability and would not meet the required CAISO/NERC/WECC Planning Standards.

Table 3.2-2. Summary of Power Flow on Transmission Located in Segment 6 and Segment 11 Under Outage of Facilities Located in Segment 11

Transmission Line	Amp Rating	Loss of Three Transmission Lines			Loss of Four Transmission Lines		
		Amp	MW	Percent	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	2480	0	0	0	0	0	0
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	3230	0	0	0	0	0	0
Mesa-Vincent No. 2 500-kV partially built to 500-kV	3230	0	0	0	0	0	0
Mira Loma-Vincent 500-kV	3950	2217	1933	56.1%	0	0	0
Existing Mesa-Vincent 220-kV	2480	3726	1370	150.2%	4223	1483	170.3%
Existing Eagle Rock-Pardee 220-kV	1240	911	345	73.5%	1012	372	81.6%

Environmental Advantages

For this alternative, construction activities within the ANF along Segment 11 under the proposed Project/Action would not occur. As a result, air quality, noise, traffic, and visual impacts (among others) in the ANF along Segment 11 would be reduced; however, most of these impacts would be shifted to Segment 6.

Environmental Disadvantages

The need to establish a new 200-foot-wide east-west corridor between the Cities of Duarte and Altadena (south of Gould Substation) would result in additional impacts to air quality, biology, noise, traffic, and visual resources, and would create the need to traverse through densely populated urban areas resulting in greater land use impacts than the proposed Project/Action. In addition, the new corridor would parallel the Sierra Madre Fault presenting potential geotechnical issues that could compromise system reliability. Although this alternative would reduce the construction-related impacts associated with the upgrades to Segment 11, as discussed above, it would be 9 miles longer than the proposed route, and would require new access roads and spur roads along the new east-west corridor. Therefore, impacts would not be expected to be substantially reduced in comparison to the proposed Project/Action.

Alternative Conclusion

ELIMINATED. While this alternative would partially meet the project purpose and need, and would be technically feasible, system reliability would be compromised and would not meet the required

CAISO/NERC/WECC Planning Standards resulting in a legally infeasible alternative. 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. Overall, this alternative would not substantially lessen any significant impacts of the proposed Project/Action without creating greater impacts of its own. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Upgrade Transmission through ANF in Segment 6 Only Alternative</td><td>Meets Project Purpose?
Partially[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
No[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, reliability would be a concern (see #3 below). This alternative would be designed to meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints when operating reliably.
[2] This alternative would be feasible.
[3] Does not meet CAISO/NERC/WECC requirements. Collocates multiple transmission lines in a common corridor (three 500-kV T/Ls and one 220-kV T/L), which compromises overall system reliability. A simultaneous outage condition of the T/Ls in Segment 6 would result in loading the T/Ls in Segment 11 beyond the available thermal capability. Implementing a Special Protection System (SPS) which trips TWRA generation would not provide for an adequate solution to mitigate the identified thermal overload problem, as it would exceed the maximum 1,400 MW tripping limits of the SPS.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Avoids any upgrades and associated environmental impacts in Segment 11 within the ANF</td><td colspan="2">Environmental Disadvantages
• Need to establish a new east-west T/L corridor between Duarte and Altadena (south of Gould Substation) resulting in additional environmental impacts (air quality, biological resources, land use, noise, traffic, visual)
• East-west corridor would parallel the Sierra Madre Fault (geotechnical issues)
• Potential land use conflict in establishing new east-west corridor outside of the ANF
• Longer alignment (35 versus 26 miles for proposed route)</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.2.4 Upgrade Transmission through ANF in Segment 11 Only Alternative

Alternative Description

This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11B). As shown in Figure 3.2-3, the proposed improvements within Segment 11 for this alternative would include replacing one existing 220-kV T/L with a 500-kV T/L and constructing a new 500-kV T/L either to the east or west of the existing T/Ls in the utility corridor through the ANF between the Vincent Substation and La Cañada Flintridge (Gould Substation), and widening of the existing ROW to accommodate the new T/Ls. A new 200-foot-wide east-west corridor along the southern boundary of the ANF would need to be established between the cities of La Cañada Flintridge (Gould Substation) and Duarte to allow one of the new 500-kV T/Ls (Mira Loma-Vincent 500-kV T/L) to connect to the northern end of Segment 7. This alternative would be approximately 7 miles longer than the proposed route for Segment 6.

As part of this alternative, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed as this line segment would be disconnected. Upgrades between the City of Duarte and Mesa Substation (Segment 7), between the Mesa Substation and Mira Loma Substation (Segment 8), and between the Gould Substation area and Mesa Substation (southern portion of Segment 11) would continue to occur as proposed under this alternative.

Implementation of this alternative would result in a total of three T/Ls from the Vincent Substation to the southern boundary of the ANF in La Cañada Flintridge along Segment 11; this would include two new 500-kV T/Ls (Mesa-Vincent No. 2 and Mira Loma-Vincent) and one existing 220-kV T/L (Eagle Rock-Pardee). The remaining T/Ls within Segment 6 (Rio Hondo-Vincent No. 1 220-kV and Rio Hondo-Vincent No. 2 220/500-kV) would remain and continue to operate as under current conditions.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints; however, this alternative would be slightly less effective than the proposed Project/Action in addressing the South of Lugo transmission constraints due to the longer route.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

For this alternative, construction activities within the ANF along Segment 6 under the proposed Project/Action would not occur, with the exception of the removal of the Antelope-Mesa 220-kV T/L. As a result, air quality, noise, traffic, and visual impacts in the ANF along Segment 6 would be reduced; however, most of these impacts would simply shift to Segment 11.

Environmental Disadvantages

The need to establish a new 200-foot-wide east-west corridor between La Cañada Flintridge (Gould Substation) and the City of Duarte would result in additional impacts to air quality, biology, noise, traffic, and visual resources, as well as traverse through densely populated urban areas resulting in greater land use impacts than the proposed Project/Action. In addition, the new corridor would parallel the Sierra Madre Fault presenting potential geotechnical issues. Although this alternative would reduce the construction-related impacts associated with the upgrades to Segment 6, as discussed above, it would require the removal of the Antelope-Mesa 220-kV T/L, as this T/L segment would be disconnected, would be seven miles longer than the proposed route, and would require new access roads and spur roads along the new east-west corridor. Therefore, impacts would not be expected to be substantially reduced in comparison to the proposed Project/Action.

Alternative Conclusion

ELIMINATED. While this alternative would meet the project purpose and need, and would be feasible, this alternative would require establishment of a new east-west corridor. 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/Action without creating greater impacts of its own. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Upgrade Transmission through ANF in Segment 11 Only Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would be designed to meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints.
[2] This alternative would be feasible.
[3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Avoids upgrades and associated environmental impacts in Segment 6 within the ANF, although the Antelope-Mesa 220-kV T/L would be removed, as this T/L segment would be disconnected</td><td colspan="2">Environmental Disadvantages
• Need to establish a new east-west T/L corridor between La Cañada Flintridge and Duarte resulting in additional environmental impacts (air quality, biological resources, land use, noise, traffic, visual)
• East-west corridor would parallel the Sierra Madre Fault (geotechnical issues)
• Potential land use conflict in establishing new east-west corridor outside of the ANF
• Longer alignment (34 vs. 27 miles for proposed route)</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.2.5 Reduced Upgrades in Segment 6 Alternative

Alternative Description

This alternative was developed by the EIR/EIS team 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. These alternatives are discussed in Section 3.2.3 and 3.2.4. As shown in Figure 3.2-4, north of the crossover span (S6 MP 4.8) in Segment 6, this alternative would maintain the existing Rio-Hondo No. 2 220-kV T/L without any upgrades, and rebuild the existing Antelope-Mesa 220-kV T/L as the new Mira Loma-Vincent 500-kV T/L. At the crossover span, the Vincent- Rio Hondo No. 2 220-kV T/L would connect into the Antelope-Mesa 220-kV T/L, and the new Mira Loma-Vincent 500-kV T/L would connect into the existing Rio Hondo-Vincent No. 2 T/L, which is already built to 500-kV standards.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

South of the crossover span this alternative would leave the Antelope-Mesa 220-kV T/L in place. This T/L represents a weak link or choke point within the existing transmission system, as under normal operating conditions this T/L overloads. 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. As such, this alternative does not meet the objectives/purpose or need of the TRTP.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would not comply with CAISO, NERC, and WECC requirements, as it would leave the Antelope-Mesa 220-kV T/L in place, which represents a choke point within the existing transmission system and would therefore not provide for a reliable system.

Environmental Advantages

In comparison to the proposed Project/Action, this alternative would eliminate the addition of one new 500-kV T/L in Segment 6. As such, the environmental impacts associated with the removal of the existing 220-kV T/L and the construction of a new 500-kV T/L would not occur. Furthermore, long-term visual impacts would be reduced as fewer T/Ls would traverse the ANF along Segment 6.

Environmental Disadvantages

Not upgrading the Antelope-Mesa 220-kV T/L along the entire length of Segment 6 would immediately limit the ability of the system to accommodate the additional generation from the TWRA. As such, new infrastructure would be required, which may include re-building the existing 220-kV T/L to 500-kV as currently proposed or building future upgrades in parallel, requiring additional ROW width, or elsewhere, requiring entirely new ROW. These additional upgrades to the system would result in additional environmental impacts.

Alternative Conclusion

ELIMINATED. This alternative would reduce the number of new 500-kV T/Ls within the ANF along Segment 6 from two to one, thereby reducing construction impacts (air quality, noise, traffic) and long-term visual impacts within the ANF. 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. As such, this alternative does not meet the objectives/purpose or need of the TRTP and has been eliminated from further consideration.

SUMMARY

Reduced Upgrades in Segment 6 Alternative	Meets Project Purpose? Partially[1]	Feasible? Yes[2]	Meets Reliability Criteria? No[3]
Explanations: [1] This alternative would not provide for the reliable transmission of up to 4,500 MW from the TWRA and would not address South of Lugo transmission constraints. It would meet projected load growth in the Antelope Valley. [2] This alternative would be feasible. [3] This alternative would leave a choke point in the transmission system which would result in overloading of the existing Antelope-Mesa 220-kV T/L under normal operations. As such, the reliability of the system would be in jeopardy.			
Environmental Advantages • Limits upgrades in Segment 6 to the first approximately 4.8 miles between Vincent Substation and the crossover span • Impacts associated with the removal of the existing 220-kV T/L and the construction of a new 500-kV T/Ls would not occur. • Long-term visual impacts would be reduced as fewer T/Ls would traverse the ANF along Segment 6.		Environmental Disadvantages • 220-kV lines would need to be rebuilt to 500-kV standards at some point in the future • Not upgrading the Antelope-Mesa 220-kV T/L along the entire length of Segment 6 would immediately limit the ability of the system to accommodate the additional generation from the TWRA. • New infrastructure would be required resulting in additional environmental impacts	
Conclusion: Eliminate from Further Analysis			

3.2.6 Co-Locate All SCE T/Ls in Either Segment 6 or 11 Across the ANF Alternative

Alternative Description

This alternative considered by SCE in its PEA (RA Eliminated 3, Option 6/11C). It would include removing all existing transmission facilities within Segment 6 and rebuilding them in Segment 11, or vice versa. For the case where the transmission facilities would all be located in Segment 11 (Option A), one 220-kV T/L in Segment 11 would be replaced with one 500-kV T/L; one 220-kV T/L in Segment 6 would be removed and replaced with one 500-kV T/L located in Segment 11; and the two remaining 220-kV T/Ls in Segment 6 would be relocated to Segment 11 either east or west of the existing T/Ls. To accommodate the new transmission facilities in Segment 11, the ROW through the ANF would need to be expanded. Additionally, a new 200- to 420-foot-wide east-west corridor paralleling the southern boundary of the ANF would need to be established between the cities of La Cañada Flintridge (Gould Substation) and Duarte to allow one of the new 500-kV T/Ls (Mira Loma-Vincent 500-kV T/L) and the two existing 220-kV T/Ls to connect to the northern end of Segment 7. The alignment for Option A would be similar to that shown in Figure 3.2-3.

For the case where the transmission facilities would all be located in Segment 6 (Option B), one 220-kV T/L in Segment 6 would be replaced with one 500-kV T/L; one 220-kV T/L in Segment 11 would be removed and replaced with one 500-kV T/L located in Segment 6; and the one remaining 220-kV T/L in Segment 11 would be relocated to Segment 6 either east or west of the existing T/Ls. To accommodate the new transmission facilities in Segment 6, the ROW through the ANF would need to be expanded. Additionally, a new 200- to 420-foot-wide east-west corridor along the southern boundary of the ANF would need to be established between the cities of Duarte and La Cañada Flintridge (Gould Substation) to allow one of the new 500-kV T/Ls (Mesa-Vincent 500-kV T/L) and the one existing 220-kV T/L to connect to Segment 11. The alignment for Option B would be similar to that shown in Figure 3.2-2.

Implementation of this alternative would result in a total of five T/Ls (two 220-kV lines and three 500-kV lines) being located in a single corridor through the ANF, either in Segment 6 or 11. Assuming all transmission facilities are within Segment 11, the alternative would be approximately 34 miles longer than the proposed route for Segments 6 and 11. Assuming all transmission facilities are within Segment 6, this alternative would be approximately 27 miles longer than the proposed route for Segments 6 and 11.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would meet the purpose and need of the TRTP by allowing for the interconnection of new wind generation resources in the TWRA, meeting projected load growth in the Antelope Valley, and addressing the South of Lugo transmission constraints, when operated reliably. However, routing proposed upgrades within the same corridor would seriously compromise system reliability (see “Feasibility” discussion below). Therefore, this alternative would only partially fulfill the project purpose and need.

Feasibility

No feasibility issues have been identified.

Reliability

Co-locating multiple T/Ls currently located in different designated utility corridors through the ANF eliminates the geographic diversity which allows SCE's transmission system to meet the required CAISO/NERC/WECC Planning Standards. By locating all facilities into one corridor, the risk exposure for simultaneous loss of multiple transmission facilities is substantially increased. Such a system design would be inconsistent with the CAISO/NERC/WECC Planning Standards requiring SCE to plan, design, and construct the interconnected transmission system in a manner that maintains the ability of the electric systems to supply the aggregate electrical demand and energy requirements of their customers at all times taking into account scheduled and reasonably expected unscheduled outages of system elements.

Environmental Advantages

Under this alternative, the proposed transmission upgrades within either Segment 6 or 11 would not occur, which would eliminate impacts associated with the construction, operation and maintenance of the proposed Project/Action within one of these corridors. Furthermore, depending on which corridor is chosen, the existing T/Ls located in the other corridor would be removed, which while this would result in impacts during construction, would provide for a long-term reduction in visual impacts within the ANF.

Environmental Disadvantages

Implementation of this alternative would require approximately 34 or more additional miles of T/L than required for the proposed Project/Action and require a new 200- to 420-foot-wide east-west corridor paralleling the southern boundary of the ANF between the cities of Duarte and La Cañada Flintridge (Gould Substation), which would result in greater impacts to air quality, biology, land use, noise, traffic, and visual resources than the proposed Project/Action. The east-west corridor would also parallel the Sierra Madre Fault resulting in potential geotechnical issues. This alternative would also require deconstruction of approximately 27 miles of existing T/Ls in Segment 6 if the T/Ls are moved to Segment 11, and approximately 18 miles in Segment 11 if the T/Ls are moved to Segment 6. These activities would result in greater construction impacts than the proposed Project/Action.

Alternative Conclusion

ELIMINATED. While this alternative would partially meet the project purpose and need, and would be feasible, 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/Action, resulting in greater air quality, biology, land use, noise, traffic, and visual resource impacts. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

Co-Locate All SCE T/Ls in Either Segment 6 or 11 Across the ANF Alternative	Meets Project Purpose? Partially[1]	Feasible? Yes[2]	Meets Reliability Criteria? No[3]
Explanations: [1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however reliability would be a concern (see #3 below). This alternative would be designed to meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints when operating reliably. [2] This alternative would be feasible. [3] Does not meet CAISO/NERC/WECC requirements. Collocates multiple transmission lines in a common corridor (three 500-kV T/Ls and two 220-kV T/L), which compromises overall system reliability.			
Environmental Advantages • Avoids any upgrades and associated environmental impacts in either Segment 6 or 11 within the ANF • Reduces long-term visual impacts in Segment 6 or 11, with the removal of existing infrastructure		Environmental Disadvantages • Requires deconstruction of approximately 27 miles of existing T/Ls in Segment 6 or 18 miles in Segment 11 • Need to establish a new east-west T/L corridor between Duarte and La Cañada Flintridge (Gould Substation) resulting in additional environmental impacts (air quality, biological resources, land use, noise, traffic, visual) • East-west corridor would parallel the Sierra Madre Fault (geotechnical issues) • Longer alignment than proposed route – 34 miles (All T/Ls in Segment 6) or 27 miles (All T/Ls in Segment 11)	
Conclusion: Eliminate from Further Analysis			

3.2.7 Reduced Number of 220-kV T/Ls in the ANF Alternative

Alternative Description

This alternative would provide similar upgrades to the proposed Project/Action, but would reduce the number of 220-kV T/Ls through the ANF along Segment 6 and 11 as a means to reduce the visual "clutter" within the ANF. Figure 3.2-5 provides a sketch of the components of this alternative, which are described below.

In Segment 6, north of the crossover span (S6 MP 4.8), this alternative rebuild the Antelope-Mesa 220-kV T/L and the Rio Hondo-Vincent No. 2 220-kV T/L with 500-kV single-circuit structures, same as the proposed Project/Action. South of the crossover span, this alternative would rebuild the Antelope-Mesa 220-kV T/L as the upgraded Rio Hondo-Vincent No. 2 500-kV T/L and the new Mira Loma-Vincent 500-kV T/L would connect into and use the existing 500-kV single-circuit towers of the existing Rio Hondo-Vincent No. 2 T/L (same as the proposed Project/Action). Unlike the proposed Project/Action, the existing Rio Hondo-Vincent No.1 220-kV T/L, which would otherwise be untouched, would be removed.

In Segment 11, this alternative would build the new Mesa-Vincent No. 1 500-kV T/L in place of the Vincent-Pardee No. 1 220-kV T/L (for first ~4 miles) and the Eagle Rock-Pardee 220-kV T/L (for the remaining ~15 miles), same as the proposed Project/Action. In addition, the existing Mesa-Vincent No. 1 220-kV T/L would be removed along the entire length of Segment 11 (from Vincent Substation to Mesa Substation), which would otherwise be untouched under the proposed Project/Action.

For the southern portion of Segment 11 (south of Gould Substation), this alternative would design the system for 500 kV, where the proposed Project/Action would string the new Mesa-Vincent 220-kV T/L on the currently empty position of the existing 220-kV double-circuit towers. For this alternative, the ROW south of the ANF would be reconfigured to accommodate a new 500-kV T/L. Currently, the ROW south of Gould Substation has two double-circuit 220-kV towers accommodating three 220-kV T/Ls

(Mesa-Vincent No. 1, Eagle Rock-Mesa and Gould-Goodrich). For this alternative, one set of existing double-circuit 220-kV towers would be removed and the second set would be reconfigured to accommodate the existing Eagle Rock-Mesa and Gould-Goodrich 220-kV T/Ls (Mesa-Vincent No. 1 would be removed as noted above). New 500-kV single-circuit structures would be added (in place of the double-circuit 220-kV towers) to accommodate the new Mesa-Vincent 500-kV T/L.

The three 500-kV T/Ls (Mira Loma-Vincent, Rio Hondo-Vincent No. 2, and Mesa-Vincent No. 1) under this alternative would be operated at 500-kV, which would allow for additional capacity in the system to respond to the loss the Rio Hondo-Vincent No.1 220-kV T/L (in Segment 6) and the Mesa-Vincent No.1 220-kV T/L (in Segment 11). As such, substation upgrades to accommodate 500-kV buses and transformers would be required at both the Rio Hondo Substation and the Mesa Substation.

South of Rio Hondo Substation (Segment 7) and east of Mesa Substation (Segment 8), upgrades would be the same as the proposed Project/Action.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would require upgrades at both the Rio Hondo Substation and the Mesa Substation in order to allow for operation of the new T/Ls at 500 kV. The estimated time frame for completion of the upgrades at these substations, which would occur within the existing substation boundaries, is a minimum of 4 to 5 years. As such, the integration of new wind generation in the TWRA would be delayed well beyond the California Renewables Portfolio Standard deadline of 2010. If this alternative were to consider initial operation of the new Rio Hondo-Vincent No. 2 and Mesa-Vincent No. 1 500-kV T/Ls at 220 kV, which would eliminate the need to upgrade the Rio Hondo and Mesa Substations, the alternative would not provide the intended capacity (up to 4,500 MW), due to the loss of the 220-kV T/Ls in Segments 6 and 11. In addition, the overall reduction of 220-kV lines within the system 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 fully address the South of Lugo transmission constraints. This alternative, however, would meet the projected load growth in the Antelope Valley, as upgrades north of Vincent Substation would be identical to the proposed Project/Action.

Feasibility

Without further evaluation, it is difficult to determine the feasibility issues associated with this alternative, both from a construction standpoint as well as power flow/reliability standpoint (see "Reliability" discussion below). Specifically, south of Gould Substation along Segment 11, the reconfiguration of the T/Ls to accommodate new 500-kV single-circuit structures, considering the limited space available within the current ROW and that expansion of the ROW is not possible without condemnation (houses are built right up to the edge of the ROW), would need to be assessed.

Reliability

For the case where the two 500-kV T/Ls within Segment 6 (Mira Loma-Vincent and Rio Hondo-Vincent No. 2) experience a common outage condition, according to SCE the transmission system would likely experience problems (failures) elsewhere, as there would no longer be 220-kV T/Ls through the ANF to use to redirect the power flow. A complete power flow analysis would need to be conducted by SCE to verify the reliability issues associated with this alternative.

Environmental Advantages

The reduction of 220-kV T/Ls within Segments 6 and 11 would reduce the visual "clutter" within the ANF as well as provide the potential to reduce the width of these T/L corridors in the ANF, thereby decreasing potential biology and land use impacts.

Environmental Disadvantages

This alternative would result in greater construction impacts (air quality, noise, and traffic) as a result of additional activities to remove the Rio Hondo-Vincent No. 1 220-kV T/L in Segment 6 and the Mesa-Vincent No. 1 220-kV T/L in Segment 11. South of Gould Substation along Segment 11, upgrading the system to accommodate new single-circuit 500-kV structures would result in substantially greater impacts (air quality, noise, traffic, and visual) than the stringing activities that would occur under the proposed Project/Action. Upgrades at the existing Rio Hondo and Mesa Substations to accommodate 500-kV buses and transformers would also result in greater construction impacts than the proposed Project/Action, which would require limited work at these substations.

Alternative Conclusion

ELIMINATED. While this alternative would have the potential to reduce long-term visual impacts within Segments 6 and 11 in the ANF, it 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. As such, this alternative does not substantially meet the objectives/purpose and need of the TRTP. In addition, this alternative would result in greater construction impacts in the ANF (Segments 6 and 11), along Segment 11 (south of Gould Substation), as well as at the Rio Hondo and Mesa Substations. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Reduced Number of 220-kV T/Ls in the ANF Alternative</td><td>Meets Project Purpose?
Partially[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
No[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] Upgrades at Rio Hondo Substation and Mesa Substation would take a minimum of 4 to 5 years, which would prevent compliance with the Renewables Portfolio Standard deadline of 2010. In addition, a reduction of 220-kV lines through the ANF would decrease capacity and potentially overload the system, which would interfere with the objective of reliably transmitting 4,500 MW from the TWRA and would not fully address the South of Lugo transmission constraints. This alternative, however, would meet the projected load growth in the Antelope Valley, as upgrades north of Vincent Substation would be identical to the proposed Project/Action.
[2] This alternative appears to be technically feasible; however additional analysis is needed to ensure the feasibility of construction, specifically south of Gould Substation along Segment 11.
[3] Elimination of 220-kV lines in Segments 6 and 11 would reduce capacity and potentially overload the system. A power flow analysis would need to be conducted to further understand the effect of this alternative on overall system power flow to ensure compliance with CAISO/NERC/WECC requirements.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Reduces the amount of visual "clutter" within the ANF along both Segments 6 and 11 by reducing the number of 220-kV T/Ls by one in each corridor
• Provides the potential to reduce the width of the T/L corridors in the ANF, thereby decreasing potential biology and land use impacts</td><td colspan="2">Environmental Disadvantages
• Greater construction impacts (air quality, noise, and traffic) as a result of additional activities to remove 220-kV T/Ls in Segment 6 and 11 that would otherwise be untouched under the proposed Project/Action
• Upgrading Segment 11 south of Gould Substation to accommodate new single-circuit 500-kV structures would result in substantially greater impacts (air quality, noise,</td></tr>
</table>

	traffic, and visual) than the stringing activities that would occur under the proposed Project/Action • Upgrades at Rio Hondo and Mesa Substations would result in greater construction impacts than the proposed Project/Action, which would require limited upgrades
Conclusion: Eliminate from Further Analysis	

3.2.8 Minimize 500-kV Upgrades Alternative

Alternative Description

As part to SCE's proposed Project/Action, Segments 6, 7 and 11 would initially be energized to 220 kV for an undetermined length of time; however, the T/Ls would be designed and built to 500-kV standards in order to prepare for the future need of transferring power beyond the initial ~~up to~~ 4,500 MW from the TWRA. This alternative would construct these portions of the TRTP to 220-kV standards, thereby minimizing the number of 500-kV upgrades required, as shown in Figure 3.2-6.

Under this alternative, the following changes to the proposed Project/Action would occur:

- Segment 6: The proposed new Rio Hondo-Vincent No. 2 500-kV T/L would not be built and instead the existing Rio Hondo-Vincent No. 2 220-kV T/L, north of the crossover span, and the existing Antelope-Mesa 220-kV T/L, south of the crossover span, would be removed and rebuilt with new higher capacity conductor. Use of the existing 220-kV towers would not be possible as they are not sufficiently strong enough to accommodate the new conductor. Upgrades to create the new Mira Loma-Vincent 500-kV T/L and the elimination of the crossover span would be the same as the proposed Project/Action.
- Segment 7: From the southern boundary of the ANF to Rio Hondo Substation, the Rio Hondo-Vincent No. 2 T/L would be re-conductored on the existing 220-kV double-circuit towers. South of Rio Hondo Substation, upgrades would be the same as the proposed Project/Action.
- Segment 11: The existing 220-kV structures of the Vincent-Pardee No. 1 220-kV T/L (first approximately 4 miles south of Vincent Substation) and the Eagle Rock-Pardee 220-kV T/L (last approximately 15 miles through the ANF) would be removed and rebuilt as a new 220-kV T/L with new higher capacity conductor, rather than as a new 500-kV T/L. Use of the existing 220-kV towers would not be possible as they are not sufficiently strong enough to accommodate the new conductor.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

While this alternative would allow for the reliable interconnection and integration of new wind generation in the TWRA, not all planned or expected projects (up to 4,500 MW) would be accommodated within the transmission system. Furthermore, ~~as final~~future operation at 500 kV~~, which would allow for the full capacity,~~ would not be achievable without additional, extensive upgrades involving the tear down and removal of 220-kV structures or the placement of new 500-kV structures elsewhere. As a result of the reduce capacity within the system associated with this alternative, it would not fully meet projected load growth in the Antelope Valley, or address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO/NERC/WECC requirements; however, reliability would become as issue as power generation within the TWRA increases to meet the expected 4,500 MW.

Environmental Advantages

Construction of 220-kV structures rather than 500-kV structures would result in a slight reduction in visual impacts, as 220-kV structures are shorter and less bulky than 500-kV structures. Additionally, as a result of using lower voltage towers, for those areas where the ROW may need to be widened or new ROW obtained, the width would be reduced thereby reducing potential land use impacts. Smaller pads would also be constructed for the 220-kV structures compared to 500-kV tower pads, resulting in slightly reduced construction air quality and biology impacts.

Within Segment 6 and the portion of Segment 11 through the ANF, removing and rebuilding of the existing 220-kV structures would result in basically the same environmental impacts as rebuilding with 500-kV structures, except for the reduction in long-term visual impacts. Within Segment 7, between the southern boundary of the ANF and Rio Hondo Substation, construction activities would include re-conductoring of the Rio Hondo-Vincent No. 2 220-kV T/L and replacing the existing Antelope-Mesa 220-kV T/L (on single-circuit 220-kV LSTs) with 500-kV single-circuit structures, unlike the proposed Project/Action which would require double-circuit 500-kV structures. As such, long-term visual impacts along this portion of Segment 7 would be reduced in comparison to the proposed Project/Action.

Environmental Disadvantages

Installation of infrastructure at 220 kV would not accommodate the full generation potential of 4,500 MW in the TWRA. As such, new infrastructure would be required in the future, which may mean re-building the T/Ls to 500 kV as load increases; however the CAISO may not allow the 220-kV T/Ls to be taken out of service at a later date due to system loading, which would require the future upgrades to be built in parallel, requiring additional ROW width, or built elsewhere, requiring entirely new ROW. These additional upgrades to the system would result in additional environmental impacts, which would exceed those associated with the proposed Project/Action. Furthermore, upgrading the system with new 220-kV conductor would not necessarily reduce the environmental impacts associated with construction, as the structures in Segments 6 and 11, would still need to be removed and replaced with new structures due to the design limitations (mechanical strength, conductor clearances, etc.) of the existing structures.

Alternative Conclusion

ELIMINATED. 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/Action. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Minimize 500-kV Upgrades Alternative</td><td>Meets Project Purpose?
Partially[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of new wind generation resources in the TWRA; however, it would not allow for the integration of the full 4,500 MW. ~~as~~ Furthermore, the majority of the system would not be designed to allow for future increases in voltage operation from 220 kV to 500 kV. ~~Furthermore~~Therefore, this alternative would not fully meet projected load growth in the Antelope Valley, or address South of Lugo transmission constraints.
[2] This alternative would be feasible.
[3] Meets CAISO/NERC/WECC requirements; however, reliability would become as issue as power generation within the TWRA increases to meet the expected 4,500 MW.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Constructs a new 220-kV line rather than a 500-kV line in Segment 5 thereby reducing visual impacts that would result from installation of larger, taller 500-kV structures
• Replaces 220-kV structures in Segments 6 and 11 with new structures and conductor, thereby reducing visual impacts that would result from installation of larger, taller 500-kV structures</td><td colspan="2">Environmental Disadvantages
• 220-kV lines would need to be rebuilt to 500-kV standards at some point in the future
• CAISO may not allow the 220-kV T/Ls to be taken out of service at a later date, which would require the future upgrades to be built in parallel or elsewhere, requiring new ROW
• Existing 220-kV structures in Segments 6 and 11 through the ANF would still need to be replaced to allow for the use of new conductor resulting in similar environmental impacts as identified for the proposed Project/Action</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.2.9 Segments 6 and 11 Double-Circuit Structures Alternative

Alternative Description

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, as shown in Figure 3.2-7. 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.

Approximately 40 additional double-circuit structures would be required within Segment 6, and approximately 20 additional double-circuit structures would be required within Segment 11 at intermediate locations generally due to the severe topography and weather conditions within the ANF (SCE, 2008d – Q03). The route may also need to be moved outside of the existing ROW as the double-circuit towers would not be able to span the same valleys, which currently range from 2,000 to 3,900 feet, due to structure capacity limitations (SCE, 2008d – Q03). Furthermore, due to the heavy weight of the double-circuit towers (120,000 to 200,000 lbs) helicopter construction is not feasible (SCE, 2008d – Q03).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to interconnect and integrate up to 4,500 MW of new wind generation in the TWRA; however, due to the need to create a new non-standard design for the double-circuit towers (see "Feasibility" and "Reliability" discussions below), which would take approximately 30 to 40 months to complete (SCE, 2008c – DR#5-01), SCE would not have the upgrades in Segments 6 and 11 completed in time to meet the California Renewables Portfolio Standard of 20 percent renewable energy by 2010. Once in place, this alternative would meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

Use of double-circuit structures at elevations above 3,000 feet, where ice loading and wind loading is a concern, would require the use of a non-standard SCE structure design, as described in the "Reliability" discussion below. Development of a new structure design and full-scale testing to ensure reliability is expected to take up to 27 months (SCE, 2008a). The breakdown of design and testing activities that would need to take place include: 1) Design including, but not limited to development of a) loading criteria for weather and ice conditions, b) crossarm configurations, c) tower testing requirements (5 to 7 moths); 2) Tower Test Preparation including, but not limited to solicitation and awarding of bids for tower supply and testing, fabricator design, SCE review and approval of design (9 to 11 months); and 3) Full Scale Tower Testing assuming three different tower types to be tested, plus one tower failure requiring re-test (6 to 9 months) (SCE, 2008a). The overall time frame from start of development to start of delivery would be 30 to 40 months (SCE, 2008c – DR#5-01). Completion of the design and testing activities described above does not guarantee a feasible design. If at any point the tower testing results in the designs failing, SCE would have to re-design the structures or modify the initial designs and once again complete the tower testing activities. This process would repeat until a reliable structure design meeting all loading criteria endures full scale testing without failure.

Reliability

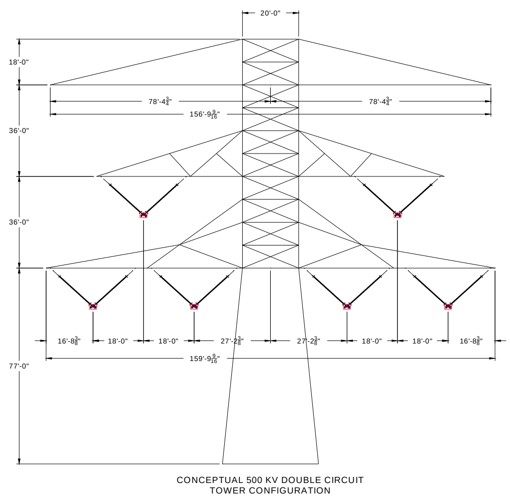
CPUC General Order No. 95 (GO95) prescribes transmission line design requirements for heavy loading conditions (i.e., where the elevation exceeds 3,000 feet where ice is likely to form), such as the ANF (Segments 6 and 11). In particular, GO95 requires that such design assume a minimum of one-half inch radial ice load on all conductors, weighing 57 pounds per cubic foot, in combination with a horizontal wind load assumption of a minimum 6 pounds per square foot. In addition to the ice loading design assumptions, a non-ice loading analysis is required that assumes a horizontal wind load of a minimum 8 pounds per square foot wind (SCE, 2008c – DR#5-01). GO95 also allows for more stringent requirements to be utilized if necessary.

Utilities based outside of California utilize the National Electric Safety Code (NESC) as the basis of their transmission design criteria, rather than the GO95 criteria used in California; therefore, the T/L and tower design practices of other utilities are not directly applicable to the site conditions and electrical requirements for the TRTP (SCE, 2008c – DR#5-01). In addition, each utility has company-specific operating and maintenance requirements, transmission design criteria, weather conditions, and reliability criteria that influence details of specific tower designs. Utilities across the United States also utilize a variety of conductor types and configurations. These items have a great influence on the tower designs with respect to conductor clearances and tower loading capacity. Finally, some NESC criteria may be less stringent than that required by GO95 and vice-versa. In either case, NESC and GO95 are minimum design criteria. In addition to these minimum requirements, SCE has adopted criteria that are specifically applicable to the SCE system and SCE's operating practices.

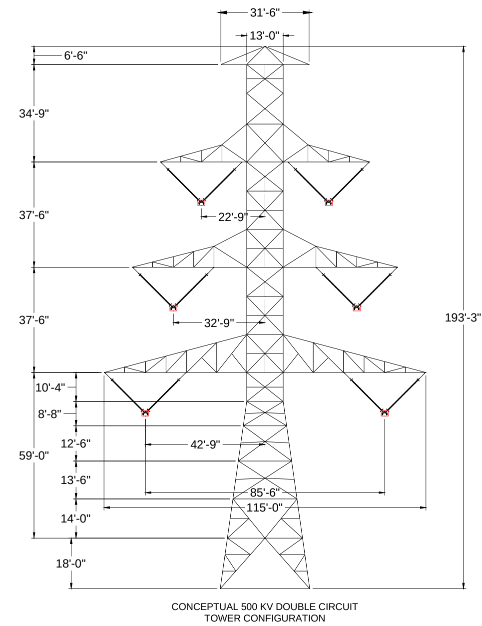
SCE's existing double-circuit 500-kV tower design, which places the three conductor phases of each circuit into a vertical configuration, would negatively affect reliability when used at high elevations or in ice prone areas, such as the ANF (Segments 6 and 11), as the vertical conductor configuration places the phases in a position whereby vertical displacement of one phase may bring it into unacceptably close proximity to the phases above or below it (SCE, 2008c – DR#5-01). This displacement can be caused by two processes: (1) more ice may form on a phase relative to the phases below it, causing it to sag down into a lower phase; or (2) ice may accumulate on all phases equally, where as the ice sheds off each phase independently, the phases are prone to "jumping" vertically and could lead to a flashover caused by an electrical contact with the phase above it (SCE, 2008c – DR#5-01). While both processes are possible, the second is more likely to occur and lead to circuit outages which would affect reliability (SCE, 2008c – DR#5-01). To address this concern, a new double-circuit structure family (likely consisting of three different tower types) would need to be developed for this alternative for use at high elevations (SCE, 2008c – DR#5-01). The design would need to provide for offsetting the vertical conductor phases. Two possible double-circuit tower configurations are provided below (Tower A and B – Hypothetical). The overall time frame for designing a new double-circuit family of structures for TRTP would be approximately 30 to 40 months, including 8 months for transmission design and weather studies, and 26 to 36 months to develop the tower concept, bid, design, test, and start delivering the towers (SCE, 2008c – DR#5-01).

As noted above, a weather study would be required to formulate the basis for the new double-circuit towers. SCE has not conducted a recent weather study for the specific design of Segments 6 and 11. This would normally occur prior to final design. The amount of ice loading would be identified in the weather study. This would determine what ice loading above the code minimum of one-half inch radial ice should be considered in the design. In addition, the potential ice densities would be identified. The weather studies would take approximately 3 months to perform (SCE, 2008c – DR#5-01).

While specific/current weather data pertaining to the lines in Segments 6 and 11 has not been obtained, an initial review of potential ice formation associated with TRTP Segments 6 and 11 was conducted by Joseph Catalano, a senior consulting scientist (meteorologist) to SCE. Mr. Catalano estimated that under certain weather conditions, the amount of ice formation that can be expected in the forest areas of Segments 6 and 11 could reach one and one-half (1.5) inches of radial ice on the conductors and ground wires with an ice density of 56 pounds per cubic foot of ice (SCE, 2008c – DR#5-01). This estimated ice loading is substantially greater than the assumed GO95 minimum of one-half (0.5) inches of radial ice formation (SCE, 2008c – DR#5-01). As such, the design of the new double-circuit 500-kV towers would need to sustain ice loadings that far exceed the minimum requirements, further increasing the difficulty of creating a tower design that would be reliable under such conditions.



Tower A (Hypothetical)
This is an alternate double-circuit tower that spreads the circuit in a manner that eliminates the vertical aligned conductor concern in ice areas. Additional ROW width would be required to accommodate the wide spread of the bottom phase, as well as avoid interference with adjacent transmission lines.
Source: SCE, 2008c – DR#5-01



Tower B (Hypothetical)
This is an alternate double-circuit tower that spreads the circuits in a manner that eliminates the vertical aligned conductor concern in ice areas. Following acceptable design, fabrication, and testing, this type of structure could be utilized in ice areas.
Source: SCE, 2008c – DR#5-01

Placement of two 500-kV T/Ls on a double-circuit structure would result in a less reliable design than the proposed Project/Action, where the 500-kV T/Ls would be placed on separate single-circuit structures, as the failure of a structure would end up taking out two T/Ls rather than only one. Such a failure is potentially greater within the ANF due to the extreme weather conditions that occur at elevations above 3,000 feet, as well as conditions such as fires followed by rains which increases the potential for landslides. A statistical determination was completed by SCE which estimated that an outage would involve both circuits on a double-circuit structure approximately 80 percent of the time, whereas for two or more single-circuit lines located in the same ROW the chance that another circuit would also be involved in an outage was estimated to be approximately 15 to 30 percent of the time (SCE, 2008d – Q02).

Environmental Advantages

Implementation of this alternative in Segment 6 would result in one existing 220-kV T/L (on single-circuit structures) and two 500-kV T/Ls (on double-circuit structures), thereby reducing the overall number of parallel structures from three to two. In Segment 11, this alternative would result in two 500-kV T/Ls (on double-circuit structures), thereby reducing the overall number of parallel structures from two to one. By reducing the number of structures within the ANF, the visual "clutter" would be reduced as would the long-term footprint of the transmission infrastructure within the ANF. In addition, the amount of permanent land disturbance and associated biological impacts would be reduced compared to the proposed Project/Action.

Environmental Disadvantages

Installation of double-circuit 500-kV structures within the ANF along Segments 6 and 11 would result in the placement of bulkier, taller (depending on terrain) structures, which would result in potentially greater visual impacts. For example, within Segment 6, having two 500-kV single-circuit structures placed in parallel, per the proposed Project/Action design, would provide for some symmetry in the design along the Segment 6 corridor, whereas this alternative would place bulkier, taller double-circuit 500-kV structures next to an existing single-circuit 220-kV T/L. Furthermore, taller structures would increase the potential for skylined conditions, which presents the greatest visual contrast to viewers, as well as results in greater potential for fire safety issues, as helicopters used during wildland fire fighting would need to avoid these structures.

Greater visual, biological, and cultural impacts may result due to the need for approximately 60 additional double-circuit structures within Segments 6 and 11 at intermediate locations and the potential need to place towers outside of the existing ROW, as the double-circuit towers would not be able to span the valleys. In addition, fire safety issues may increase as it may be necessary to locate the new towers along ridge tops to circumvent the large valleys that occur in the project area along Segments 6 and 11, which currently result in long spans ranging from 2,000 to 3,900 feet (SCE, 2008d – Q03).

The new double-circuit transmission towers would need to be designed with a strength capacity that allows the towers to be placed adjacent to or in close proximity to existing towers in the ROW (SCE, 2008c – DR#5-01). If such a tower cannot be designed (i.e., the new towers are not strong enough to have equivalent spans), potential line design problems would result. First, the resultant shorter conductor span lengths would require the placement of additional new towers in locations somewhere near the mid-span of the adjacent lines. This could cause clearance problems with the adjacent existing lines during high wind conditions that may be only be mitigated by adding additional new towers to the existing adjacent lines, which would increase the potential for environmental impacts including air quality, biology, and cultural resources. Second, if the new tower locations are not near existing towers, additional access roads may need to be built to provide access to the new towers, again increasing the potential for impacts within the ANF.

Furthermore, while the proposed Project/Action allows for the erection of T/L structures utilizing helicopter construction erection of double-circuit towers by helicopter is not feasible (SCE, 2008d – Q03). The weight of double-circuit 500-kV suspension towers could range from 120,000 to 200,000 (SCE, 2008d – Q03). The estimated weight that would be possible to be lifted by a helicopter is limited to approximately 8,000 to 12,000 pounds in high elevation areas (SCE, 2008c – DR#5-01). Consequently, since helicopter construction is not viable, this alternative would result in greater biology, visual, and cultural impacts, due to the need for additional access roads, for those structures that would otherwise be constructed by helicopter under the proposed Project/Action. Removing the existing single-circuit 500-kV structures in Segment 6 from the crossover span to the southern boundary of the ANF, as well as an additional single-circuit 220-kV T/L in Segment 11, which would otherwise be untouched under the proposed Project/Action, would also result in increased air quality, biology, noise, and traffic impacts during construction.

Alternative Conclusion

ELIMINATED. While this alternative would generally meet the objectives/purpose and need of the TRTP, with the exception of meeting the deadline imposed by the California Renewables Portfolio Standard (2010), and would have the potential to reduce the visual “clutter” and long-term footprint of the transmission infrastructure within the ANF along Segments 6 and 11, a new double-circuit structure family would need to be developed that is designed for use at high elevations (above 3,000 feet) and in ice prone areas. These new towers would be bulkier and taller (depending on terrain) than the proposed single-circuit 500-kV towers, and would result in a greater potential for skylined conditions; would require additional towers, as the double-circuit towers would not be able to span the existing valleys along the current alignment, and in fact may require the placement of towers outside of the existing ROW to circumvent the large valleys that occur along Segments 6 and 11; fire safety issues may increase as it may be necessary to locate the new towers along ridge tops to circumvent the large valleys; may result in the need for even more additional towers along the existing adjacent lines for clearance purposes; are not feasible to construct by helicopter, resulting in the need for additional access roads which may result in greater biology, visual, and cultural impacts; and would result in increased air quality, biology, noise and traffic impacts associated with the removal of the existing 220-kV structures that would otherwise be untouched under the proposed Project/Action. Furthermore, placement of two 500-kV T/Ls on a double-circuit structure would result in a less reliable design than the proposed Project/Action, where the 500-kV T/Ls would be placed on separate single-circuit structures, as the failure of a structure would end up taking out two T/Ls rather than only one. Such a failure is potentially greater within the ANF due to the extreme weather conditions that occur at elevations above 3,000 feet, as well as conditions such as fires followed by rains which increases the potential for landslides. 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 has been eliminated from further consideration.

SUMMARY

Segments 6 and 11 Double-Circuit Structures Alternative	Meets Project Purpose? Partially[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints; however, due to the need for non-standard structures at elevations above 3,000 feet within Segments 6 and 11, the Project schedule would not be met and as a result the California Renewables Portfolio Standard of 20 percent renewable energy by 2010 would not be met. [2] This alternative appears to be feasible. A non-standard design for double-circuit 500-kV structures would need to be developed and tested. [3] Meets CAISO/NERC/WECC requirements. Standard SCE double-circuit structures are impacted by ice loading and wind loading at high elevations (>3,000 feet), which would occur within Segments 6 and 11. The reliability of a non-standard design for double-circuit 500-kV structures is unknown. The potential to lose two T/Ls resulting from the failure of a single tower in an area prone to extreme weather conditions, as well as conditions such as fires followed by rains which increases the potential for landslides, would substantially degrade the preconceived reliability of the system.			
Environmental Advantages • ROW width through the ANF along Segments 6 and 11 would potentially be reduced, thereby allowing for revegetation of those portions of the ROW which would no longer be in use • Visual "clutter" and long-term footprint of transmission infrastructure within the ANF would be reduced	Environmental Disadvantages • Larger, taller (over 200-feet) double-circuit 500-kV structures would result in potentially greater visual impacts in Segment 6 than having two single-circuit 500-kV structures placed in parallel due to the lack of symmetry and increased potential for skylined conditions • Requires approximately 60 additional towers due to severe topography and weather conditions in the ANF • May require additional towers along existing adjacent lines for clearance • May require re-routing outside of the existing ROW to circumvent large valleys which currently have long spans resulting in potentially greater visual, biological, and cultural impacts • May result in the placement of towers at ridge top locations resulting in greater fire safety impacts • Not feasible to construct double-circuit towers by helicopter thereby requiring additional access roads and the associated environmental		

	impacts • Additional environmental impacts (AQ, noise, biological resources) associated with removing another 500-kV T/L from Segment 6 and an additional 220-kV T/L in Segment 11, which would otherwise be unaffected by the proposed Project/Action
Conclusion: Eliminated from Further Analysis	

3.2.10 Segments 7/8A Single-Circuit 500-kV Structures Alternative

Alternative Description

This alternative was considered by SCE in its PEA (Technology Alternative 5). The proposed Project/Action would replace the existing 220-kV structures with 500-kV double-circuit structures through Segments 7 and 8A, which would allow the Mira Loma-Vincent 500-kV T/L to be configured as a split-phase for EMF reduction purposes. The double-circuit configuration would also allow for the potential to add another 500-kV T/L to these structures at some point in the future, thereby avoiding the future need to tear down and rebuild these structures (assuming the ISO would allow them to be taken out of service) or build new structures placed in parallel or in new ROW. This alternative would instead replace the 220-kV structures with single-circuit 500-kV structures between Rio Hondo Substation and Chino Substation in Segments 7 and 8A.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. However, as designed, it would not provide for the same amount of transmission capacity as the proposed Project and therefore is not comparable. This alternative would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

The existing ROW within Segments 7 and 8A varies between 200 and 250 feet, and is currently occupied by multiple 66-kV and 220-kV T/Ls. The minimum ROW width required for single-circuit 500-kV LST structures is typically 200 feet, while double-circuit 500-kV LST structures only require a width of 150 to 180 feet (SCE, 2008b – DR#4: Q4-49). This is a result of the fact that the electrical conductors in SCE's single-circuit 500-kV LSTs are configured horizontally, whereas on the double-circuit 500-kV LSTs the conductors are stacked vertically. Consequently, the installation of single-circuit instead of double-circuit 500-kV LST structures would require a greater ROW width, which in combination with the existing T/Ls could not be accommodated within the existing ROW (SCE, 2008b – DR#4: Q4-49). As such, use of single-circuit 500-kV structures would require expansion of the existing ROW; however this is not a viable option along most of Segment 7 as the existing ROW is bounded by the San Gabriel Rivers to the west and the 605 Freeway to the east (SCE, 2008b – DR#4: Q4-49). Therefore, this alternative would not be feasible.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

Use of 500-kV single-circuit rather than double-circuit structures would substantially reduce the structure heights and associated visual impacts. For example, in Segment 7 the 500-kV double-circuit LSTs would be 147 to 262 feet tall, whereas the 500-kV single-circuit LSTs would be 113 to 175 feet tall (difference of 34 to 87 feet). Similarly, the 500-kV double-circuit TSPs would be 195 to 200 feet tall, whereas the 500-kV single-circuit TSPs would be 120 to 170 feet tall (difference of 30 to 75 feet). In Segment 8, the 500-kV double-circuit LSTs would be 147 to 255 feet tall, whereas the 500-kV single-circuit LSTs would be 128 to 149 feet tall (difference of 19 to 106 feet). Similarly, the 500-kV double-circuit TSPs would be 150-195 feet tall, whereas the 500-kV single-circuit TSPs would be 120 to 170 feet tall (difference of 25 to 30 feet).

Environmental Disadvantages

This alternative would not allow for a split-phase configuration of the new T/L between Rio Hondo Substation and Chino Substation for EMF reduction, or provide space for the future addition of a second 500-kV T/L on these structures if and when one is determined to be required (e.g., when generation in the TWRA exceeds 4,500 MW). At that time, the 500-kV single-circuit structures may need to be removed and replaced with 500-kV double-circuit structures (assuming the ISO will allow these structures to be taken out of service), or new structures placed in parallel or in new ROW, which would result in increased air quality, biology, noise, traffic, and visual impacts.

Alternative Conclusion

ELIMINATED. While this alternative would meet the objectives/purpose and need of the TRTP, 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. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Segments 7/8A Single-Circuit 500-kV Structures Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Nos[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA; however, the overall capacity provided would not be comparable to the proposed Project. It would meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.
[2] This alternative would require expansion of the ROW, which is not viable within Segment 7 due to existing infrastructure. Therefore, this alternative would not be feasible.
[3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Placement of single-circuit 500-kV structures within Segment 7, south of Rio Hondo Substation, and Segment 8A, to Chino Substation would reduce visual impacts associated with the proposed double-circuit 500-kV structures.</td><td colspan="2">Environmental Disadvantages
• Would not facilitate the possibility of adding a second 500-kV T/L if and when one is determined to be required (e.g., when generation in the TWRA exceeds 4,500 MW), which would result in tearing down and rebuilding double-circuit structures sometime in the future and the associated environmental impacts (air quality, biology, noise, traffic, visual)
• Would not allow for a split-phased configuration</td></tr>
<tr><td colspan="4">Conclusion: Eliminated from Further Analysis</td></tr>
</table>

3.2.11 Partial Underground Alternative

For this alternative, a portion of the proposed Project would be installed underground. Below is a discussion of the various underground technologies available. The most detailed information is provided the technologies and construction methods that are best suited for the proposed TRTP T/L segments. A description of underground construction methods for both cut/cover trenching and boring techniques is also provided. Locations where underground construction has been considered are discussed and assessed per the alternatives screening methodology described in Section 2.2.

Underground Transmission Technologies – Feasibility/Reliability

Similar to overhead transmission lines, underground transmission can utilize either High Voltage Alternating Current (HVAC) or High Voltage Direct Current (HVDC) technology. The primary differences in the construction of these two technologies are that HVDC would consist of two DC conductor positions, referred to as "Poles," instead of three AC conductor positions, referred to as "Phases", and as such an HVDC underground transmission line would utilize two-thirds the number of cables necessary for an HVAC system. However, HVDC would require AC to DC converter stations at each end of an underground transmission segment for use on the Project (TRTP).

Technological developments within the last decade have made HVDC transmission more economically feasible and advantageous. Conventional HVDC utilizes Current-Source Converters (CSC) to rectify or invert the power from AC to DC and back to AC. New technology uses what is known as Voltage-Source Converters (VSC). Typically using the VSC technology results in a much reduced converter station size when compared to conventional CSC systems. This generation of technology is referred to as "HVDC Light" or "HVDC Plus."

To date this HVDC "Light or Plus" technology has seen limited application for power transfer levels up to about 1,000 MW and 150 kV DC. Therefore, for the power transfer levels and voltage required for the TRTP, the Project would need to utilize conventional CSC converters. The conventional CSC stations required at each end of the HVDC line would house the HVDC equipment in large buildings with open air AC line terminal equipment. The converter stations are estimated to encompass an area approximately 2,000 feet by 1,200 feet with structures and buildings 75 to 90 feet tall. A typical HVDC line and conventional CSC stations are depicted in Figures 3.2-8 through 3.2-10. Due to the greater long-term impacts associated with these large converter stations (i.e., visually more obtrusive and greater permanent land disturbance), which far exceed the area needed for the transition stations required with use of underground HVAC technology (130 to 150 feet high and approximately 75 feet by 150 feet for a single-circuit 500-kV T/L and 75 feet by 250 feet for a double-circuit 500-kV T/L), HVAC would be the preferred technology for TRTP. Applicable HVAC cable technologies are discussed below.

The cable technologies currently available for 500-kV underground T/Ls (HVAC) include the following: high-pressure fluid-filled cables (HPFF); self-contained fluid-filled cables (SCFF); solid dielectric (XLPE) cables; and gas-insulated lines (GIL). The application of the SCFF cable type within the United States has largely been limited to the 115/138-kV range, with only a few miles at 220 kV installed commercially. As such, SCFF has been eliminated as a potential technology for this alternative. HPFF cable systems range from 69 to 345 kV and have been in commercial operation for over 35 years. HPFF cable systems with rated system voltages up to and including 765 kV are commercially available and have passed long-term qualification tests; however, due to its potential to release of dielectric insulating fluid into the environment it has also been eliminated as a potential technology for this alternative. The remaining technologies under consideration include solid dielectric (XLPE) transmission cables and gas-insulated lines (GIL), which are discussed further below.

XLPE. Underground transmission XLPE cable has been available for system voltages up to 138 kV since the early 1970s; however, there was a lack of widespread acceptance in the United States because of reliability problems associated with the first generation of cable and accessories for some of the initial installations. Today, XLPE systems have begun to have installations with long enough service life to increase utility confidence in their reliability. Recent years have seen substantial improvement in XLPE systems and acceptance and adoption for higher transmission voltages. Currently, the number of 220-kV solid dielectric cable installations in the United States is increasing with approximately 50 circuit miles in service.

Utility acceptance in the United States for XLPE has grown relatively rapidly (over the about the last 5 years) for use at 220 kV and 345 kV. For example, a California utility proposed a project using over 12 miles of 220-kV XLPE underground transmission in September 2002 and a New England utility is presently constructing a 345-kV line which includes 2.1 miles of XLPE underground transmission cable with a second phase of the project proposed with a 5.5-mile XLPE alternative segment. Internationally, a number of XLPE systems up to 420 kV have been installed including a 13.75-mile and 6.25-mile direct buried loop in Copenhagen, Denmark, which was completed in 1997. The first long-distance 500-kV XLPE lines were installed in Tokyo, Japan, in 2000. This XLPE system is two circuits (with a third planned) and was installed in a cable tunnel and in ducts beneath bridges for 25 miles. As only one 500-kV XLPE system has been installed in the world, and was specially installed in a cable tunnel (and ducts), XLPE technology has scant operating history that can serve as a basis for demonstrating reliability at this voltage. However, XLPE cable has been successfully installed and operated for long lengths at lower voltages and has been shown to be technically feasible for a 500-kV installation since the fundamental technology is the same. Use of XLPE cable would require superior quality control during manufacturing, as a key reliability factor for the cables is the purity of the XLPE insulating material. In addition, during installation of the XLPE cable, special skills and proprietary equipment associated with the cable supplier may be required for cable splicing (joining of two segments in a splicing vault).

GIL. GIL underground transmission system technology has primarily been used in applications where high power transfer is required over short distances, such as short dips in overhead lines, relatively short connections within substations, or for get-aways to overhead lines. Relatively short lengths (i.e., less than 1,000 feet) of the 100 percent SF6 compressed-gas underground transmission lines have been installed in the United States, Japan, and European countries for several decades. The system voltages for these installations have been up to 765 kV.

The initial use of GIL technology for a long length of transmission line was placed into service in 1975 and consists of approximately 2,300 feet of 420-kV line in a tunnel. In 1998, a 275-kV GIL system was installed in a tunnel with other utilities in Nagoya, Japan for two miles and is the longest GIL installation to date. The first commercial application of second generation GIL technology, using a lower SF6 gas percentage due to greenhouse gas concerns, was the construction of a “dip” in an existing 400-kV overhead transmission line in Geneva, Switzerland in 2000. A short single-phase segment of GIL was constructed as a direct-buried line as a test section to evaluate construction methods and issues related to expansion and contraction. There are a number of concerns related to the susceptibility of direct-buried lines to “dig-ins” by other construction in the area of the line and the difficulty of locating, excavating and repairing a direct-buried GIL. Another particularly challenging issue for assembly of a direct-buried GIL would be creating a dust-controlled environment to avoid particle pollution of the insulating gas. Because

GIL has not been installed for long lengths as a direct-buried line, utilities remain hesitant to accept the feasibility of this technology. As such, construction of GIL technology within tunnels would be the preferred methodology.

Other Considerations Associated with Underground Transmission Technologies

In addition to the reliability issues associated with the use of newer underground technologies, such as XLPE and GIL, where operating histories are limited, as discussed above, the following are other potential issues that may impact reliability and must be taken into consideration when designing an underground transmission line.

Seismic Considerations. Underground transmission lines are more at risk for damage from earthquakes and landslides than overhead lines. A seismic event or landslide could expose the underground line to potential fault rupture, local ground cracking, and groundshaking, which could damage the underground line and result in it not being able to transmit power. As such, serious reliability concerns would exist, which would challenge the feasibility of underground construction near an active fault zone and in areas with known landslides and unstable slopes. The occurrence of one of these events after construction could substantially increase the required operation and maintenance activities associated with the underground lines.

Slope Considerations. Placing underground cables (XLPE) in a duct bank with a slope for any significant distance is of concern as there is a risk of movement of the cable down slope due to either gravity or contraction and expansion effects. While there are no hard and fast specific guidelines on slope limitations, and free-laying cables have been placed on slopes that range from five to eight percent for relatively short distances (less than 500 feet), cable grappling or retention systems would need to be considered if the cable slope is in excess of five percent for distances greater than 500 feet. Significant cable slopes with cable retention systems are rarely used due to the potential for the attachments to introduce physical, electrical, and thermal stress points that can result in cable failures. There are no slope limitations for underground GIL since it can be fabricated to accommodate bends in the line. Furthermore, due to the rigid nature of the bus conductor and enclosure tube, GIL can be installed in vertical runs.

Construction Disturbance. At 500 kV, matching the current carrying capacity of overhead conductors with XLPE cables often requires multiple underground cables for each phase of the transmission line. This can mean that multiple underground ductbanks need to be constructed for a single 500-kV line. This would require an 85-foot-wide continuous construction zone for a single-circuit 500-kV system with overhead to underground transition stations at each end on a 2 to 3 acre graded and fenced site. GIL can achieve a much higher capacity through use of a solid bus conductor meaning that at 500 kV each phase requires a single 2.5 foot diameter enclosure. The GIL enclosures are placed in an underground tunnel that is approximately 12 feet wide and 15 feet tall or a 16-foot-diameter circular tunnel. Constructing a GIL tunnel using cut and cover techniques requires a 55-foot-wide continuous construction zone for a single-circuit 500-kV system with overhead to underground transition stations at each end on an approximate 0.25-acre graded and fenced site.

Cost. As a result of the considerable construction activities associated with undergrounding T/Ls, the associated costs are substantially greater than the cost of installing overhead transmission lines. For XLPE the cost is approximately 10 times more expensive, and for GIL the cost is approximately 10 to 15 times more expensive than overhead construction. In 2008 dollars, the direct cost to SCE to install double-circuit overhead transmission lines has been estimated at $7.3 million per mile, whereas the cost of undergrounding a double-circuit transmission line utilizing GIL technology is on the order of $77 to $102 million per mile (assumes GIL is $16 million per mile per circuit, life support systems are $5 to $10 million per mile, and tunnel work is approximately $40 to $60 million per mile) (SCE, 2008c – DR#5: Q5-12). The cost of undergrounding the transmission line could be a major consideration for decision makers and may result in a socioeconomic impact as these costs would be passed on to the rate payers.

Underground Transmission Technology Feasibility/Reliability Conclusion

Underground transmission using XLPE, while technically feasible, is not suitable in areas of moderate to steep terrain. Underground transmission using GIL is also feasible but, unlike XLPE, can be installed in areas of moderate to steep terrain. Both XLPE and GIL technologies would not be appropriate in areas where soil conditions would not be conducive to excavation activities, such as bedrock, in areas that are constrained (too narrow) to accommodate a construction spread, or where adequate access is not available to accommodate the large construction equipment needed for excavation, installation and transport of materials (helicopter construction is not possible). Considering the scant operating history for XLPE at 500 kV that can serve as a basis for demonstrating reliability at this voltage, the greater limitations associated with how and where XLPE cable systems can be constructed, and the lesser construction disturbance for GIL, the most appropriate underground technology identified for the Partial Underground Alternative would be GIL.

Components of Underground Gas-Insulated Systems

The main components of high-voltage underground gas-insulated systems are transition stations at each end of the underground line (see Figures 3.2-11 through 3.2-13), where the overhead line is connected to the underground bus; the underground rigid bus; the bus enclosure tube; insulating gas within the enclosure tubes and a tunnel to hold the enclosure tubes. The transition stations, which allow for the transfer of the T/Ls from overhead to underground and vice versa, would be approximately 130 to 150 feet high and require a footprint of approximately 75 feet by 150 feet (~0.25 acre) for a single-circuit 500-kV T/L and 75 feet by 250 feet (~0.5 acre) for a double-circuit 500-kV T/L.

The components of a typical high-voltage gas-insulated line (GIL) are discussed below and are shown in Figures 3.2-14 and 3.2-15.

Bus. The bus acts as the conductor and is a rigid metallic tube which is energized at the circuit voltage and which carries the load current. Typically, the bus conductors for GIL are aluminum. For a 500-kV line, the bus is estimated to be approximately 8-inches in diameter. Due to the high current carrying capacity of a GIL for a 500-kV underground T/L, a GIL system would use a single bus and enclosure tube for each phase.

Insulation. Insulation isolates the energized bus from the enclosure tube which is at electrical ground. For GIL, the insulation has two components. First, the bus conductor is supported within the enclosure tube on solid dielectric insulators. Second, the air is removed from the enclosure tube and replaced with a mixture of insulating gases. New generation GIL uses a mixture of insulating gases and for a 500-kV line this mixture would consist of 40 percent Nitrogen (N_2) and 60 percent Sulfur Hexafluoride (SF6).

Enclosure Pipe. The enclosure pipe consists of a 30-inch diameter grounded aluminum pipe that can be installed above ground on periodic supports or below grade in a tunnel. The enclosure pipe for a GIL is separated into gas compartments approximately 4,000 feet long and the insulating gas is pressurized to 50 to 60 pounds per square inch (psi).

Disconnecting Units. Disconnecting units are used to separate the GIL enclosure pipes into gas compartments and to connect high-voltage testing equipment for commissioning the GIL. Disconnecting units would be required approximately every 4,000 feet and would be installed in the line in the underground tunnel. If necessary, compensation units to accommodate for thermal expansion of the enclosure pipe would also be located as bellow sections of the GIL enclosure.

Underground Tunnel. The GIL would be housed in an underground tunnel which would be constructed of precast concrete sections. Either a rectangular or circular tunnel cross-section can be utilized. The tunnel would include a rack support system to support the GIL enclosures. Once completed, access to the underground tunnel would be from each end. Since the tunnel would be considered a confined work space the tunnel would need to include a positive ventilation system for worker safety and lighting. The ventilation system is typically mounted at the top of the tunnel and requires periodic air intake or exhaust shafts that are visible above grade.

GIL Operating Principles. A GIL has electrical behavior similar to an overhead line. Because of the large cross-section of the conductor, GILs have low electrical losses. GILs also have low capacitive load, thereby avoiding the cable charging and reactive VAR (volt-amperes reactive or reactive power) issues associated with underground cables, such as XLPE.

Construction Methods for Gas-Insulated Systems

A GIL can be installed in underground tunnels constructed by cut/cover trenching methods, with pipe jacking at intersections to avoid existing infrastructure, and/or tunnel boring methods. The GIL can be installed in concrete-covered trenches, tunnels, or directly buried. Each construction method is discussed further below.

Cut/Cover Tunnel Method

In order to build an underground 12-foot wide by 15-foot tall tunnel (rectangular configuration), as shown in Fig 3.2-12, using cut/cover methods, a continuous trench approximately 15-feet wide and 18-feet deep would need to be excavated. The tunnel would be constructed in the trench and backfill placed to cover the tunnel. The active work area for installation of a single- or double-circuit 500-kV T/L would be approximately 55-feet wide (Figure 3.2-16), including a 15-foot wide all-weather access road, a 15-foot wide equipment work area, 15-foot wide trench and an approximately 10-foot wide area where excavated spoils would be stored before use as backfill. Superfluous spoils would be hauled offsite to an appropriate waste facility. These dimensions have been approximated based on information provided by GIL manufacturers and extrapolated by transmission engineers to determine the installation requirements for application at 500 kV. To avoid disruption of existing infrastructure, pipe jacking methods would be completed at major street crossings, flood control channels, or to avoid existing utilities (see discussion on "Jacking Method" below). In areas of steep/hilly terrain where trenching and access issues would generally render installation by cut/cover methods impractical or infeasible, tunnel boring would be applicable (see discussion on "Tunnel Boring Method" below).

In general, the process for the cut/cover construction method consists of site preparation, excavation and shoring, concrete tunnel construction, trench backfilling, site restoration and GIL installation. Work would be phased in work areas, typically between 800 and 1,000 feet in length. Construction usually progresses along the alignment with the maximum length of open trench at one time being approximately 500 feet. The following is a description of the phases of construction for cut/cover construction.

Site Preparation. For work occurring within roadways, traffic control plans would be prepared to detour and delineate the traffic lanes around the work areas. The existing pavement along the alignment would be cut with a concrete saw and then removed using jackhammers, pavement breakers, and loaders. Other similar equipment may be used. The pavement would then be removed from the project site and recycled, processed and reused as a backfill material, or disposed of at an appropriate facility. For undeveloped lands, vegetation would be removed prior to excavation.

Trench Excavation and Shoring. A trench is excavated along the alignment using backhoes, excavators, or other types of excavation equipment. The excavated soil may be temporarily stockpiled in single rows adjacent to the trenches with excess material hauled off-site. As the trench is excavated, the trench walls are supported, or shored, typically with hydraulic jacks or trench boxes. Steel or wood sheeting between H-beams (e.g., beam and plate) may also be used for shoring. Other similar shoring methods may be utilized to support the excavation as the final tunnel box is constructed. If construction occurs in areas with high groundwater, the groundwater would be removed prior to and during the excavation of trenches, usually by pumping it from dewatering wells that have been drilled along the alignment to maintain the local water table below the base of the excavation. The extracted groundwater would first be treated for sediment and any contaminant removal, before being hauled from the site or discharged to the storm drain system under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Regional Water Quality Control Board.

Concrete Tunnel Construction and Backfilling. Once the trench has been excavated and shored, tunnel construction begins. Pre-cast tunnel sections would be placed into the trench, joined together and backfill placed to totally cover the tunnel. The rate at which tunnel may be installed in a single day varies, but is estimated to be approximately 200 feet per day for the proposed Project. Not more than 500 feet of trench, or the amount of the trench that can be backfilled in one day, may be under construction at any given time.

GIL Installation. After the tunnel is complete the GIL is installed in segments. Each GIL segment would be moved into the tunnel with cranes or other loading equipment, mechanically pushed, carried, or hauled into the proper position within the tunnel, and placed on supports. The joints of adjoining segments are welded as placement occurs. The air is then pumped out of the enclosure sections and replaced with insulating gases.

Site Restoration. Any portion of the roadway damaged as a result of construction activities would be repaved and restored in accordance with all applicable standards. Once the pavement has been restored, traffic delineation (restriping) would also be restored. For natural areas restoration would include re-establishing vegetation.

Pipe Jacking Method

Pipe-jacking is utilized for relatively short distances to avoid the disruption of other facilities such as flood control channels and major roadways. Although installation using pipe jacking techniques avoids the continuous surface disruption common to open-trench construction, some surface disruption is unavoidable because jacking and receiving pits are required. The pit sizes for jacking would be 25 to 30 feet wide by 30 to 40 feet long and 30 or more feet deep depending upon the obstacle being crossed.

Pipe-jacking is an operation in which a steel casing/pipe is pushed into undisturbed soil by a horizontal, hydraulic jacking system while at the same time the soil ahead of the steel casing is being excavated and brought out through the steel casing. A vertical excavation or pit is made at each end of the section where pipe-jacking is to be used with the jacking equipment utilized for this operation placed in one of these pits (jacking pit). As excavation occurs, the pits are shored utilizing a beam and plate (steel I-beam and wood planks), or a braced shoring system The casing and excavation is advanced until the casing emerges in the receiving pit where the leading edge is then removed with the remainder of the casing remaining in place to hold open the excavated area. The GIL tunnel section is then placed inside the casing. See Figure 3.2-17.

The five primary phases for pipe-jacking are site preparation, excavation and shoring of the jacking and receiving pits, casing/tunnel installation, GIL installation, and site restoration.

Site Preparation. For the pit areas the site preparation would be the same as for the cut/cover method.

Casing/Tunnel Installation. Once the jacking and receiving pits are constructed and shored, a horizontal hydraulic jack is placed at the bottom of the jacking pit. The steel casing is lowered into the pit with a crane and placed on the jack. A simple cutting shield is placed in front of the pipe segment to cut through the soil more easily. As the jack pushes the steel casing and cutting shield into the soil, soil is removed from within the lead casing with an auger or boring machine, either by hand or on a conveyor. Once the segment has been pushed into the soil, a new segment is lowered, set in place, and welded to the casing that has been pushed. Installation of the steel casing is expected to progress at approximately 40 feet per day for auger-bored jacked casing. Once the casing has been installed, the concrete tunnel section is constructed within the space created by the steel casing.

GIL Installation. After the tunnel is complete the GIL installation would proceed and is the same as for a tunnel constructed by cut/cover methods.

Site Restoration. After completion of the tunnel installation along the jacking location, the shoring system is disassembled as the pits are backfilled, the soil compacted and the ground surface is restored.

Tunnel Boring Method

For tunneling applications involving a double-circuit 500-kV T/L, an approximately 16-foot diameter circular tunnel would be constructed to contain the GIL enclosure pipes, disconnecting units, etc., requiring a boring of approximately 18 to 20 feet in diameter. Installation of the GIL system utilizing the tunnel boring method would require the establishment of a large laydown and construction area (~2 to 3 acres) at the initial access point or portal. A tunnel boring machine (TBM) would be utilized to create the tunnel, with portals on either end, which would be maintained (with access) for the life of the Project. Other equipment associated with tunneling would include cranes, loaders, tunnel locomotives, muck and material cars. Access roads would need to be established to allow for transport of large equipment and materials to the construction laydown and portal sites. These access roads would need to be wide, have limited gradient (10 to 15 percent maximum grade), and have gradual turns such that transportation of equipment and materials would not become hazardous.

Tunnel boring within flat terrain and within urban areas is often completed utilizing vertical shafts for access at each end of a straight tunnel section. Tunnel boring involves underground boring through the ground between two or more shafts with a tunnel boring machine. Tunneling consists of the excavation of vertical shafts, horizontal or inclined straight-line boring to remove the soil between shafts, installation of the concrete tunnel lining, and site restoration (Figure 3.2-18).

Shaft Excavation and Shoring. Two or more shafts are constructed as described previously for pipe-jacking. However, for tunnel boring the shaft excavation may be longer and deeper than for pipe jacking.

Tunnel Excavation. Large diameter tunnels are excavated using a tunnel boring machine (TBM). For tunneling below the groundwater level without dewatering, pressurized-face TBMs are used to stabilize the tunnel face and prevent water from entering the tunnel. One of two basic types of TBMs may be used: (1) Slurry Pressure Balance (SPB) TBM or (2) Earth Pressure Balance (EPB) TBM.

Excavation by 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.

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. The tunnel sections would consist of 16-foot diameter precast concrete sections. 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.

Site Restoration. After completion of the boring along the tunneling alignment the TBM is removed, the shoring system is disassembled as the shafts are backfilled, the soil compacted and the ground surface restored.

GIL Installation. The GIL system installation would be the same for a bored tunnel as for a cut and cover tunnel.

A recent example of tunnel boring utilizing the shaft approach that is of similar diameter to the proposed Project is a large water pipeline project currently being proposed by the Los Angeles Department of Water and Power (LADWP) as part of the River Supply Conduit Improvement – Upper Reach Project. This project involves the installation of approximately 31,300 linear feet (approximately 6 miles) of 78-inch (6.5-foot) diameter welded steel underground pipeline. As currently proposed, installation of the Upper Reach pipeline would be accomplished by a combination of open-trench excavations, jacking, and tunneling. In general for the Upper Reach pipeline, deep sections of pipe would be tunneled (Segment UR1 – 24 to 40 feet below ground surface (bgs); Segment UR2 – 30 to 33 feet bgs; Segment UR3 – 40 feet to 60 feet bgs) and street intersections would be jacked or tunneled. The shaft sizes for tunneling would be about 45 feet in diameter. The pit sizes for jacking would be 12 to 18 feet wide by 20 to 60 feet long and 15 to 55 feet deep. The longest single segment of tunneling for the Upper Reach pipeline would occur within the City of Burbank beginning at Burbank Blvd. and Clybourn Avenue and proceeding southeast to Johnny Carson Park, just north of the Los Angeles River (approximately 2.4 miles).To provide an example of the types of construction impacts, activities, and equipment needed to construct a tunnel utilizing the portal approach, photos from a tunnel boring construction project of similar diameter to what would be required for the Partial Underground Alternative are provided below (see Photos 1 through 6). These photos are from the Metropolitan Water District's Inland Feeder Project, which consists of two 19-foot diameter tunnels (Arrowhead East and West) through the San Bernardino Mountains (MWD, 2005). The Arrowhead East Tunnel stretches from the Strawberry Creek Portal (west of Waterman Canyon) to the City Creek Portal (near Highland) (Neufeld, 2007). The Arrowhead West

Tunnel starts at Waterman Canyon Portal and emerges at the Devil Canyon Portal (Neufeld, 2007). Lasers were used to navigate the two custom-built, 400-foot long TBMs along their routes through the two tunnels totaling 11 miles (MWD, 2005). Tunneling is expected to be completed in 2008, with the tunnel lining and other work to be completed in 2009. The Inland Feeder Project has been ongoing since 2002 (crews arrived on site in August 2002) (Neufeld, 2007).

As discussed above, the tunnel project displayed in Photos 1 through 6 is occurring within the San Bernardino National Forest, where steep/hilly terrain and the need to reduce environmental impacts associated with the installation of a water pipeline through the forest ultimately resulted in the decision to place the new water pipelines within a tunnel.

Photo 1: Assembly of the tunnel boring machine at the Strawberry Creek Portal.
Source: Neufeld, 2007

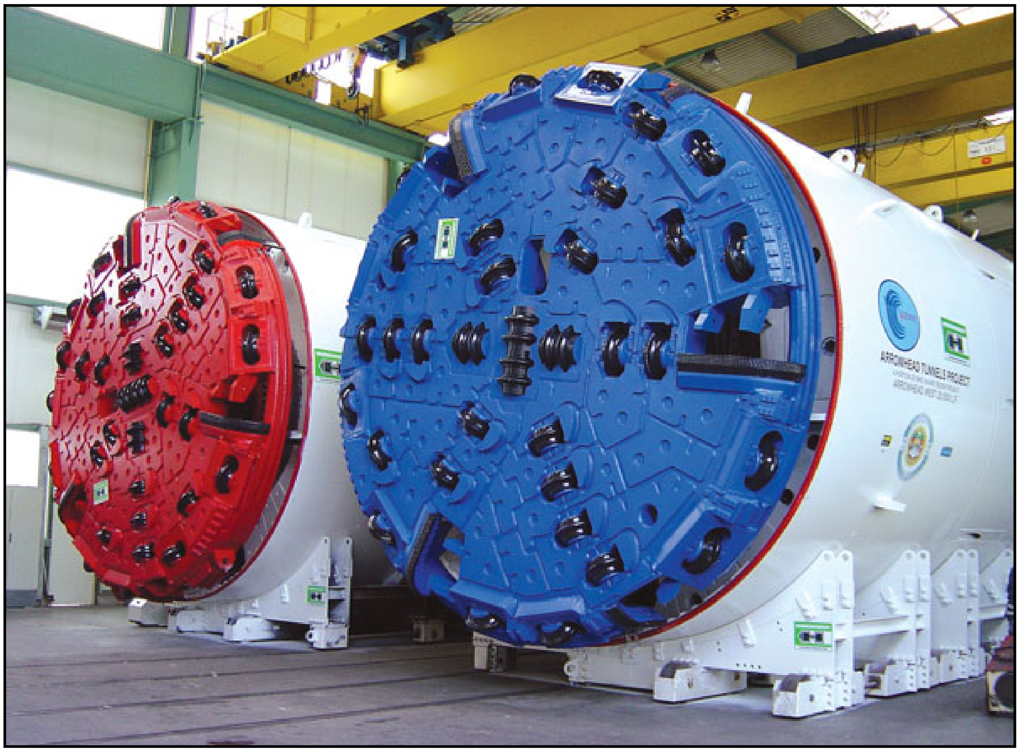


Photo 2: The two 8-million dollar, 19-foot 1-inch tunnel boring machines (TBMs) (manufactured in Germany). Source: Neufeld, 2007.

Photo 3 (Left): A 3900 Manitowoc Crane and a 300-ton Hydraulic Liebherr Crane were used to lift the front section of the tunnel boring machine.

Photo 4 (Right): One section of the tunnel boring machine being transported to the Strawberry Creek Portal on the newly constructed project-specific access road.
Source: Neufeld, 2007.

Photo 5: Strawberry Tunnel exit (City Creek Portal). Source: LetsGetNuts.com, 2008.

Photo 6: Rail car engine at Strawberry Portal. Source: LetsGetNuts.com, 2008.

Alternative Description

This alternative would utilize underground construction in place of the proposed overhead line construction following generally the same routes as the proposed Project/Action. New underground facilities would replace existing aboveground facilities, and transition stations would be required at each end of an underground segment to transfer the T/Ls from overheard to underground and vice versa.

Locations where underground construction was considered to reduce potentially significant visual and fire suppression impacts, as requested by the public and agencies during the scoping period, included the ANF, Segment 5 (north of State Route 14), and portions of Puente Hills and Chino Hills. Field surveys of these areas were conducted on December 13-14, 2007, to determine the suitability of these various locations for underground installation. Certain necessary aspects of underground construction would reduce the viability and/or environmental advantages of particular locations, such as the need for upgraded access roads for large construction equipment and materials delivery, sufficient ROW width, slope and seismic considerations, extent of installation due to technical and feasibility issues, availability of land for transition stations, etc.

Angeles National Forest

Within the ANF, particular locations of high visibility to the public, particularly from local roadways, were identified as possible locations for underground construction to reduce visual impacts. Two areas were identified within the ANF as candidate locations. The first location is where the T/L (Segment 6) crosses the Angeles Crest Highway (Highway 2), which is a Forest Service Scenic Byway and State Scenic Highway. The other location is also within Segment 6, where the T/L would traverse along the ridgeline and result in a skylined condition.

Segment 6 – Near Highway 2

For the area along Highway 2 in Segment 6, under-ground construction was considered beginning somewhere near S6 MP 17.0 and the Shortcut Picnic Grounds and along Upper Big Tujunga Canyon Road north of Highway 2 to approximately S6 MP 14.0. South of Highway 2 (S6 MP 16.8) the topography was found to be very hilly with steep, jagged valleys between hilltops and dense forest vegetation (see Photo 7). A suitable location for a transition station (assuming cut/cover trenching), which would need to occupy a level area of approximately 0.25 acres (75-feet by 150-feet) for a single-circuit 500-kV transition station, or a tunnel boring laydown and construction area (assuming the use of tunnel boring), which would need to occupy a level area of approximately 2 to 3 acres, south of the Highway 2 was difficult to identify due to the lack of accessibility and rugged terrain. Based on site reconnaissance, a review of aerial photography, and topographic information for the area south of Highway 2, a potential location for a transition station and/or tunnel boring laydown/construction area would be near S6 MP 17.7 (see Photo 8). This location was chosen because the topography of the area would block views from Highway 2, and existing roads would be available for access to the site; although these roads would need to be upgraded and additional roads created to reach the proposed transition station and/or boring laydown/construction area.

Underground construction within this type of terrain would require upgrading existing narrow access

Photo 7: Looking south from Angeles Crest Highway along Segment 6 (S6 MP 16.8).

roads, creating new roads to allow for large construction equipment and vehicles to access the construction zones, as well as cut and fill to create a level pad for the transition station, construction lay-down areas, and portals. Construction zones for cut/cover trenching as opposed to tunneling boring would differ greatly; however, in either case large areas of existing vegetation would need to be cleared during construction to provide the necessary work areas.

For installations using a cut/cover tunneling methodology, placement of the T/Ls underground would increase the potential for erosion both during construction and after, which would likely result in very difficult restoration and recovery of the vegetation in the area leading to long-term scarring of the landscape. Furthermore, vegetation which results in deeply rooted systems, such as would be the case with the forest vegetation in this area (i.e., trees), would not be allowed above the underground infrastructure. Consequently, the area would remain altered and scarred for the lifetime of the Project.

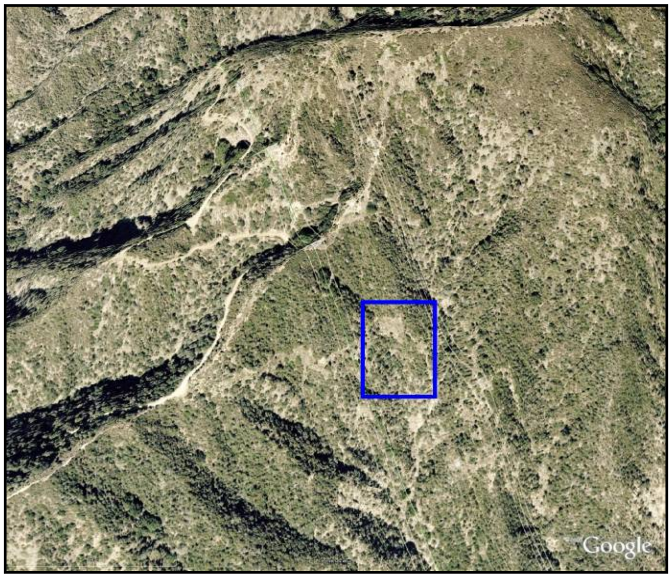


Photo 8: Aerial (oriented north) of potential tunnel boring construction laydown and portal location (near S6 MP 17.7). Source: Google Earth.

Alternatively, tunnel boring could be completed in this area, which would reduce the overall scaring along the T/L alignment; however, in the area of the entrance/exit portals, large areas (~2 to 3 acres) would need to be cleared and graded to provide a level area for construction laydown and staging (see Photo 1) and roadways would need to be created and maintained for construction vehicle and equipment access (see Photo 4), which would remain for the lifetime of the Project to allow access to the tunnel portal. Some revegetation would be possible; however, it would be limited so as to not prevent access for operations and maintenance activities.

Another issue to consider with tunneling would be potential impacts to groundwater resources, and areas of fractured igneous and metamorphic bedrock. Historic tunnel construction in this same setting throughout southern California has had significant impacts on local groundwater resources. As with the Arrowhead Tunnels Project, limits would be placed on groundwater inflows into the tunnels prior to the start of construction. The maximum permissible groundwater inflow would be determined through an assessment of the local hydrogeologic setting and identified groundwater resources in the area such as springs, stream base flow, riparian areas, water rights, and lowering of water levels in local supply wells. If the local conditions are determined to be sensitive to groundwater loss during and after construction, the actual types or methods used to control groundwater inflow would be specified in the construction documents. The contractor would be responsible to implement one or more of the measures to maintain inflow below the specified maximum and may be required to stop work and implement additional measures to reduce the inflow to acceptable levels. Groundwater control measures include grouting in highly fractured areas prior to construction, probing and high-pressure grouting ahead of the tunnel face, and installation of temporary and permanent water-tight liners. In addition, groundwater inflow to the tunnel would require a water treatment and disposal program in accordance with a project-specific NPDES permit.

Immediately north of Highway 2 along Upper Big Tujunga Canyon Road the topography is less severe and potentially would provide for a more suitable location for underground construction; however, dense forest vegetation occurs along the Project T/L alignment (see Photo 9), which would result in noticeable long-term scarring of the landscape as a result of underground construction utilizing cut/cover trenching construction techniques and the need to limit deeply rooted vegetation (i.e., trees) above the trenches. In addition, the proposed T/L would cross Big Tujunga Creek at approximately S6 MP 16.3, as well as several other ephemeral drainages, which would be an obstacle to underground trenching along this portion of the alignment which could result in a hydrology issue. Pipe jacking construction methods could be employed for such crossings, although a tunnel crossing of Big Tujunga Creek would require a vertical separation to achieve minimum cover above the tunnel crown and likely encounter significant groundwater inflows.

Photo 9: Looking south from Upper Big Tujunga Canyon Road towards Angeles Crest Highway (S6 MP 16.3).

To minimize impacts to the existing vegetation, the potential exists to place the underground T/L within Upper Big Tujunga Canyon Road north of Highway 2 utilizing cut/cover traditional trenching techniques. As described above under "Cut/Cover Tunnel Method", placement of the T/L within the existing road would require a work area width of approximately 55 feet for installation of a single-circuit 500-kV T/L. Upper Big Tujunga Canyon Road in this area is a two-lane road approximately 20 to 30 feet wide. As such, widening of this existing road would be required to accommodate the new underground 500-kV T/L. Widening of the existing road would require extensive engineering and construction work, which may include cutting into existing hillsides or filling in areas that would otherwise result in a drop-off down a hillside. Figure 3.2-19 depicts the area and construction method considered within Segment 6 in the vicinity of Highway 2 for this alternative.

Utilizing a combination of tunnel boring and cut/cover traditional trenching would result the following surface disruption:

- An initial tunnel portal (Photo 1) and transition station near S6 MP 17.7 (Photo 8), which would require a level area of approximately 2 to 3 acres;
- A tunnel shaft/portal outlet near S6 MP 16.0 (Photo 10), which would have an approximate diameter of 75 feet (based on a 45 foot diameter shaft for a 12-foot diameter pipe casing);

Photo 10: Aerial (oriented north) of potential shaft location where construction would switch from tunnel boring to cut/cover trench tunneling within Upper Big Tujunga Canyon Road (near S6 MP 16.0). Source: Google Earth.

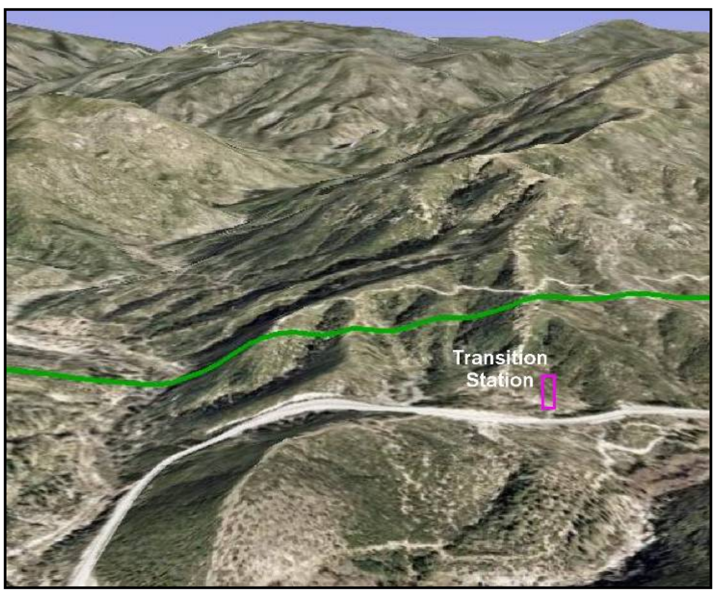


Photo 11: Aerial (oriented northeast) of potential northern transition station location near S6 MP 14.0. Source: Google Earth.

- Widening of Upper Big Tujunga Canyon Road to 55 feet (Photo 4 and Figure 3.2-16), as it is currently only 20 to 30 feet wide; and
- A transition station near S6 MP 14 (Photo 11), which would require an area of approximately 75 feet by 150 feet (~0.25 acres) to accommodate the single-circuit 500-kV T/L.

Based on the above surface disruption, undergrounding with the ANF would not meet the Forest Service objective of minimizing impacts within the Forest.

After consideration of (1) the extensive area required for constructing tunnel portals, shafts, and transition stations, (2) the need to substantially upgrade existing access roads and construct new access roads, (3) substantial traffic impacts that would result from the closure of Upper Big Tujunga Canyon Road during construction, (4) potential groundwater issues, and (5) considering that two of the existing three T/Ls (one single-circuit 220 kV and one single-circuit 500 kV) within the area would remain aboveground resulting in limited visual benefits, underground construction within the ANF near Highway 2 was eliminated from further consideration.

Segments 6 and 7 – Along the Ridgeline

Underground construction was also considered along the end of Segment 6 and the beginning of Segment 7 where the T/L would traverse a ridgeline as it exits the ANF and enters the City of Duarte, resulting in a skylined condition. Underground construction along this portion of the TRTP would result in a transition from overhead to underground at approximately S6 MP 25.6, continuing underground through the end of Segment 6 (S6 MP 27.0) and transitioning back to overhead along Segment 7 at approximately S7 MP 0.8, in the foothills bordering the City of Duarte. The total underground length would be approximately 2.2 miles. This alternative would remove the proposed T/L from skyline views, particularly in the City of Duarte and Van Tassel Canyon along the Angeles Forest Highway, which provides access to the ANF from the Los Angeles basin. As proposed by SCE, this portion of the Project would involve replacing the existing Antelope – Mesa 220-kV T/L with the new Rio Hondo – Vincent No. 2 500-kV T/L on LSTs, adjacent to the new Mira Loma – Vincent 500-kV T/L. As such, there are existing transmission structures in the corridor that are currently skylined and would continue to be skylined following construction of the Project; undergrounding this portion of the T/L would not remove existing T/L infrastructure from skylined conditions.

Under this alternative, the T/L would transition to underground on the north side of the ridge which runs in an east-west direction along the southern border of the ANF (see Photo 12), and would transition back to overhead on the south side of this ridge (see Photo 13), in the foothills bordering the City of Duarte. A permanent transition station and boring portal would be required in each of these locations, in addition to construction laydown areas of approximately 2 to 3 acres, which would be cut into the hills on either side of the ridge.

In addition, paved access roads would be required to provide permanent access to each of the boring portals and transition stations. In the ANF, access to the transition station at S6 MP 25.6 would require the cutting of an access road into the hillsides between the Angeles Forest Highway and the transition station. Due to the mountainous topography of this area and the size of vehicles and equipment involved with underground construction, it is expected that switchback roads would be necessary and would include cutting, filling, grading, and paving activities. In Duarte, the transition station would be located near existing roadways along residential streets, and although it is not expected that extensive road construction would be required, some new roads and improvements to existing roads would be necessary to ensure access to the transition station site. Permanent visual scarring would occur at each transition station site, resulting from the installation of the construction laydown/portal area (~2 to 3 acres), transition stations, and the cutting of new roadways, which is expected to be particularly extensive in the ANF.

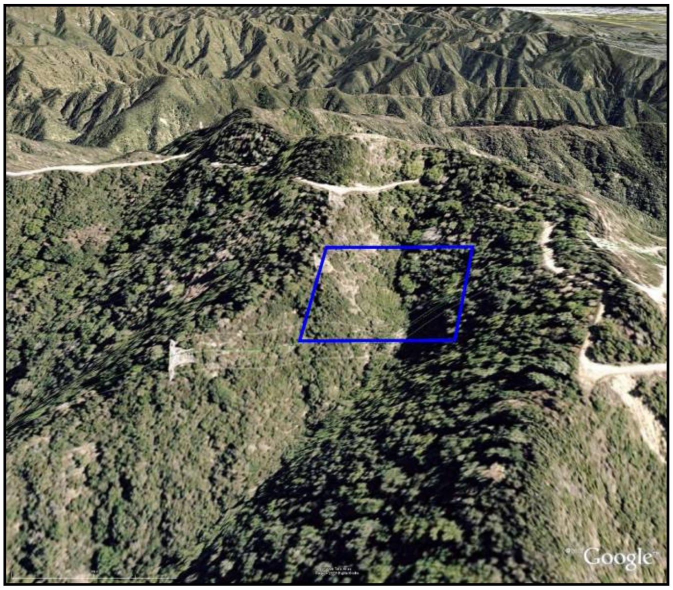


Photo 12: Aerial (oriented west) of potential northern portal and transition station location (near S6 MP 25.6).
Source: Google Earth.

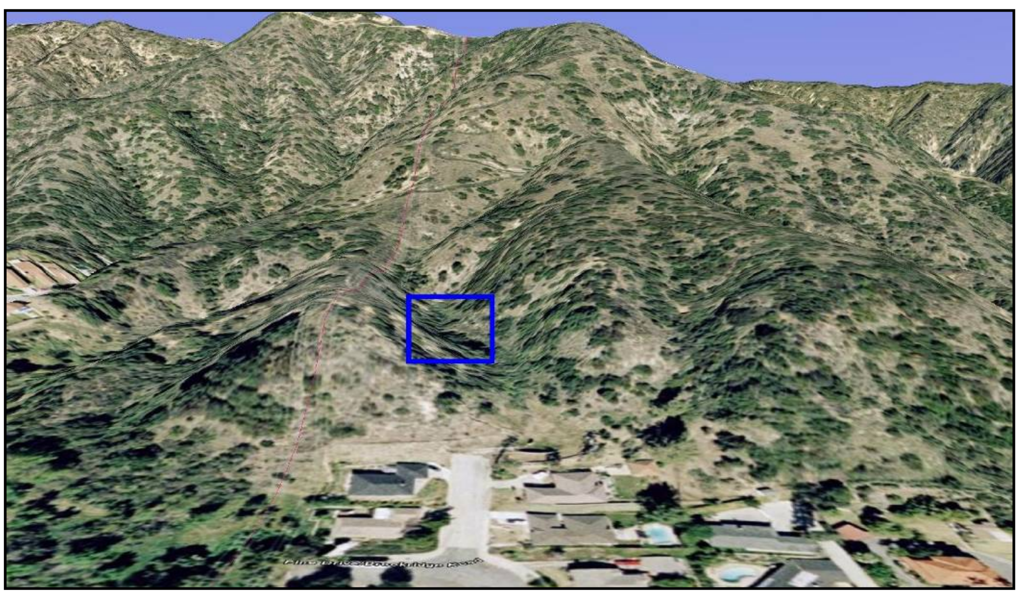


Photo 13: Aerial looking north at potential southern portal and transition station location in Duarte (near S7 MP 0.8). Source: Google Earth.

As previously described, one of the primary purposes of underground alternatives is to remove visual impacts associated with T/L infrastructure. Although this alternative would remove just over two miles of the proposed T/L from skylined conditions, it would not remove existing T/L infrastructure from the skyline and it would further introduce substantial visual impacts through hillside cutting and grading activities associated with underground infrastructure requirements. Therefore, after consideration of (1) the extensive area required for constructing portals (boring) and transition stations, (2) the need to construct new hillside access roads, and (3) undergrounding this portion of the T/L would not remove existing infrastructure from skylined conditions, underground construction of this portion of Segment 6 (S6 MP 25.6 – 27.0) and Segment 7 (S7 MP 0.0 – 0.8) was eliminated from further consideration.

Segment 5 – Pleasant Valley

The area north of Vincent Substation (Pleasant Valley) along Segment 5 was identified by the public as another potential location for underground construction. The terrain within this area is moderately hilly with a mild grade, whereby cut/cover trenching would be an appropriate method for underground construction. A new 500-kV T/L is proposed along this segment. Within this area there are currently two 500-kV T/L on LSTs, two 220-kV T/Ls on LSTs, and one 220-kV T/L on TSPs (see Photo 14). In addition, the new Antelope–Vincent 500-kV T/L (Segment 2) has been approved for construction within this corridor. While the topography of the area would allow for transition stations and the placement of the new T/L underground, the visual improvement would be very limited due to the existing and already approved aboveground infrastructure in this area that would remain aboveground (three 500-kV T/Ls and one 220-kV T/L). As a result, undergrounding in this area would provide very little benefit compared to existing conditions. Therefore, underground construction in this area was not pursued further.

Photo 14: Looking northwest from Soledad Pass along Segment 5 (S5 MP 16.8) at Pleasant Valley.

Segment 8 – Puente Hills

Within Puente Hills, underground construction was considered along Powder Canyon beginning near Fullerton Road (S8A MP 13.5) and proceeding west approximately two miles toward Hacienda Heights. This area was identified because it traverses the Puente Hills Landfill Native Habitat Preservation Authority lands where there is high desirability to keep the landscape in as natural a condition as possible. Within this area, cut/cover trenching was initially considered; however, due to the terrain, tunnel boring may be a more appropriate method and would limit the surface disruption associated with cut/cover trenching. Potential locations for the eastern transition station and portal (assuming tunnel boring method) would include an undeveloped area west of Fullerton Road, behind the existing water tanks (see Photo

15), although it would be highly visible from Fullerton Road, or the first knob west of the existing water tanks (see Photo 16), which again would be highly visible. The western transition station, assuming cut/cover trenching, would likely need to be placed somewhere west of Punta Del Este Drive (S8A MP 11.3), as the terrain results in a sheer drop-off on either side of the knoll in this area (see Photo 17). If the tunnel boring method is applied, a potential portal, based on the topography of the area, would be just east of Colima Road (~S8A MP 9.8) where there is undeveloped land that is generally flat (see Photo 18).

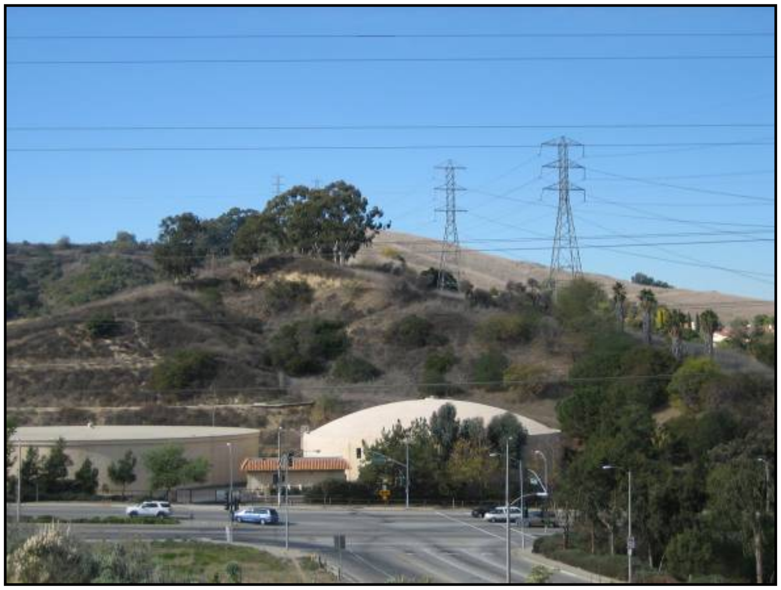


Photo 15: Looking west from Pathfinder County Park (S8A MP 13.7) towards Fullerton Road and Powder Canyon.

Photo 16: Looking north towards Powder Canyon at first knob west of the water tanks and Fullerton Road.

Photo 17: Looking east from Punta del Este Drive in Hacienda Heights (S8A MP 11.3).

Photo 18: Aerial (oriented north) of potential portal exit location east of Colima Road in Hacienda Heights, accessible from Skyline Drive (~S8A MP 9.8). The blue line indicates the proposed T/L route paralleling existing 220-kV T/Ls. Source: Google Earth

Through Powder Canyon, the terrain is fairly hilly and several valleys would need to be traversed by the underground T/L, which assuming cut/cover trenching would likely result in very difficult restoration and recovery of the vegetation in the area. The existing narrow dirt roads would also limit the ability of construction equipment to access the site. Application of tunnel boring would reduce the surface disruption associated with cut/cover trenching; however, large construction laydown and portal areas would be required, which would be highly visible from Fullerton Road on the east end and Colima Road on the west end and the neighborhoods which surround these areas. In either case (cut/cover trenching or tunnel boring), the placement of the new T/L underground would result in limited visual improvement due to the existing aboveground infrastructure in this area, which consists of two existing 220-kV T/Ls. Therefore, under-ground construction in this area was not further pursued.

Segment 8 – Chino Hills

Chino Hills was another area identified for underground construction, as requested by the community, and due to the high visibility of the proposed T/L which would be placed adjacent to a large concentration of existing and proposed homes. Potential locations for transition stations are identified in Figure 3.2-20. The westernmost transition station would be located in an area just west of the dead-end of Eucalyptus Avenue (~S8A MP 21.9). A new housing development, Pine Valley Estates, is currently under construction in this area; however, the residential lots are planned to be on the east-facing slope overlooking the golf course and Carbon Canyon Road. The remainder of the property would remain largely in open space. The open space area to the west, generally within the existing ROW or potentially offset from the existing ROW due to topography, is recommended as a possible location for a transition station (see Photo 19).

Photo 19: Looking southwest from the west end of Eucalyptus Avenue (S8A MP 22.0) at potential western-most transition station location.

Proceeding east from this westernmost point, the terrain consists generally of rolling hills and flatter terrain. Another potential transition station (see Photo 20 – Transition Station Alt. 1) for the west side of the underground segment is located approximately one mile east on Eucalyptus Avenue just west of Coral Ridge Park (near the intersection of Eucalyptus Avenue and Avenida Cabrillo). A transition station in this location would be highly visible from both the street and by the residences overlooking this site, far more so than west of the dead-end of Eucalyptus Avenue; therefore, this site was not carried forward for further analysis.

Two possible locations were identified for an eastern transition station, one located west of Highway 71 along Pipeline Avenue and the other east of Highway 71. The first is an undeveloped area under the existing transmission lines situated between the Chino Hills Car Wash and the Little Chino Creek flood control channel (see Photo 21). Only the 150-foot wide ROW is available in this area and may even require encroaching upon or utilizing the existing parking lot or the adjacent car wash, which may actually be within SCE's existing ROW. It is possible that an area slightly farther to the east (approximately 0.3 mile) on the east side of State Highway 71, within the existing ROW paralleling Corporate Center Avenue west of Ramona Avenue, may provide for a larger area in which to place a transition station (Transition Station Alt. 2 – Photo 22). However, based on preliminary geologic information, several inactive earthquake faults and one potentially active earthquake fault (Chino-Central Avenue) have been identified in the project area. Available documents show that general location of the Chino Fault as being generally west of the 71 Freeway, with the northerly most extension ending south of Chino Hills Parkway, near Bird Farm Road. A graphical extension of the known fault trace appears to pass between the two potential easterly transition station locations, where the existing ROW crosses the 71 Freeway. Because Transition Station Alt. 2 is east of the assumed extension of the Chino Fault, it is not considered a viable location for transitioning the 500-kV T/L underground considering that a 500-kV circuit should not be placed underground in a tunnel crossed by an earthquake fault; therefore, this site was not carried forward for further analysis (SCE, 2008c – DR#5: Q5-11).

Photo 20: Aerial of alternate western transition station location next to Coral Ridge Park (S8A MP 22.9). Source: Google Earth.

Assuming that the areas identified for the eastern and western transition stations would be feasible, underground construction along this portion of Segment 8A through Chino Hills would reduce potentially significant and unavoidable visual impacts in this area. The existing aboveground infrastructure, which consists of a single-circuit 220-kV T/L on LST structures, would be removed and the new double-circuit 500-kV T/L would be placed underground within SCE's existing T/L corridor utilizing a combination of cut/cover trenching and jacking. Therefore, based on the above discussion, the Partial Underground Alternative would consist of (and be limited to) an approximately 4-mile underground segment between approximately S8A MP 21.9 and 25.8 utilizing GIL technology.

Photo 21: Looking west along alignment at Pipeline Avenue at potential eastern transition station location (S8A MP 25.5).

Photo 22: Aerial (oriented north) of alternate eastern transition station location on the east side of State Highway 71 (S8A MP 25.8). Source: Google Earth.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA; however, the timeframe for construction of the underground portions would be considerably longer than overhead construction, which may extend construction activities beyond the California Renewables Portfolio Standard initial deadline of 2010. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

As discussed above under "Underground Technology Feasibility/Reliability Conclusion", the most appropriate underground technology for the Partial Underground Alternative would be GIL. GIL is considered feasible at 500 kV.

Environmental Advantages

Under the proposed Project/Action, overhead T/Ls would be built from Windhub Substation in southern Kern County to the Mira Loma Substation in Ontario, San Bernardino County, creating potentially significant visual impacts along the T/L alignment. For the Partial Underground Alternative, the new T/Ls would be constructed underground through Chino Hills, which would reduce significant visual impacts.

Environmental Disadvantages

Construction of the Partial Underground Alternative through Chino Hills would require substantially more construction activity than overhead construction, and greater ground disturbance than overhead construction. For GIL installation utilizing cut/cover trenching, an approximately 55-foot-wide construction zone would be required, as well as an area approximately 75 feet by 250 feet (~0.5 acres) on either end for the double-circuit 500-kV T/L transition stations.

Overhead T/L construction would result in construction disturbance primarily at individual structure sites along the alignment, whereas underground construction and trenching would involve much greater ground disturbance and construction-related impacts (traffic, air quality and dust, and noise). There is also a greater potential to encounter contaminated soils and buried cultural resources, and to impact biological resources due to the greater amount of ground disturbance. Furthermore, the proposed underground alignment through Chino Hills crosses and runs parallel to Little Chino Creek for a distance of approximately 1,400 feet and 2,700 feet depending on the termination point west or east of State Highway 71, respectively. The unlined channel likely supports a local shallow groundwater regime recharged by constant urban runoff. Underground construction in this area would require a dewatering program and compliance with a project-specific NPDES permit for disposal of the treated groundwater. Quality of the groundwater is unknown but may contain residual pesticides and herbicides related to the historic agricultural activities. A long jack and bore crossing of State Highway 71 would also likely encounter groundwater and require dewatering of the jacking and receiving pits.

Before the trench for underground T/Ls may be installed, vegetation must be cleared and terrain must be leveled by grading and filling, in order to accommodate the required construction equipment, along the entire length of the corridor (i.e., similar to pipeline construction). Such construction is much more difficult and results in much more land disturbance than overhead lines, where the land that needs to be kept free of vegetation for overhead lines is usually limited to the area around each tower (plus vegetation management below each tower).

Whenever possible, existing roads would be utilized to minimize new access road construction. In undisturbed areas, vegetation must be cleared prior to beginning underground construction. Access roads must be created or improved to handle large construction vehicles and trucks hauling precast tunnel sections. Due to the size of the equipment and the extent of construction activities, helicopter construction is not viable for underground construction.

The installation of an underground T/L would likely require more time and/or resources than construction of an equivalent length of overhead line because of the work required for excavating trenches and/or tunneling, constructing the tunnel, and welding the enclosure pipes. Construction could also be substantially extended due to restrictions on the times of the year available for construction, which are required to limit the impacts on the environment or due to winter weather.

While in operation, the land above the underground T/Ls must remain free from secondary surface development, including overhead T/Ls, in order to accommodate operation and maintenance activities. Only restricted vegetation would be permitted above the underground route throughout the life of the Project/Action. Scarring along the alignment would result from the installation of underground infrastructure resulting in potential visual impacts, especially in areas where vegetation is forested and/or dense.

It should also be noted that the maintenance of underground T/Ls is more difficult than overhead lines because when a problem occurs underground the process to repair or replace a GIL segment would cause circuit restoration to take much longer than with overhead transmission lines.

The primary disadvantages of GIL systems are:

- Relatively high cost;
- Environmental concerns about releases of SF6 gas to the environment;
- A very high amount of field assembly work is required;
- Less flexibility in avoiding other underground obstacles;
- System reliability is sensitive to contaminants introduced during field assembly; and
- Large construction work zones (55-feet wide) and transition stations (75 feet by 150 feet for single-circuit 500-kV system and 75 feet by 250 feet for a double-circuit 500-kV system).

Alternative Conclusion

RETAIN FOR FURTHER ANALYSIS. While the Partial Underground Alternative would generally meet the objectives/purpose and need of the TRTP, with the exception of not meeting the California Renewables Portfolio target of 2010, construction activities would cause substantially more environmental impacts than the proposed Project/Action, specifically to biological resources, buried cultural resources, air quality, and geology and soils (erosion). However, these impacts would be short-term in nature and would be offset by the long-term benefits of reduced visual impacts through Chino Hills. The GIL underground technology is considered feasible and would allow for underground installations within steep terrain, would require less buried infrastructure, and would require substantially smaller transition stations than XLPE, thereby reducing both land disturbance and visual impacts compared to XLPE. As such, GIL technology is the preferred technology for this alternative. Because the Partial Underground Alternative meets the objectives/purpose and need of the TRTP, is feasible, and has the potential to reduce potentially significant visual impacts of the proposed Project/Action in Chino Hills, it has been retained for further consideration in the EIR/EIS.

SUMMARY

Partial Underground Alternative – Chino Hills	Meets Project Purpose? Partially[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints; however, the additional construction activities associated with underground construction would prevent compliance with the Renewables Portfolio Standard deadline of 2010. [2] This alternative would be feasible. [3] Meets CAISO/NERC/WECC requirements. The reliability of GIL technology at the distances and voltages considered for this alternative is unknown as no data exists.			
Environmental Advantages • Placement of the T/Ls underground along Segment 8A through Chino Hills would reduce potentially significant visual impacts associated with the proposed Project		Environmental Disadvantages • Greater impacts to air quality, biological resources (removal of vegetation), traffic, noise, and geology/soils (erosion) would result from the substantially increased construction activity and ground disturbance required for continuous trenching to install underground T/Ls • Increased potential to encounter contaminated soils and buried cultural resources due to the increased excavation and ground disturbance for underground construction • Restricted vegetation on lands above underground tunnels resulting in permanent impacts to biological resources	
Conclusion: Retain for Further Analysis			

3.2.12 Partial Composite Core Conductor Alternative

Alternative Description

This alternative was considered by SCE in its PEA (Technology Alternative 1). It would replace existing conductors with lightweight composite core wrapped with high-performance, trapezoid-shaped aluminum alloy wires (i.e., composite core conductor) for the purpose of increasing capacity (up to 50 percent). The conductor would be replaced on existing 220-kV single-circuit structures between the Vincent Substation and the Mesa Substation, and between the Mesa Substation and the Chino Substation, adding new structures as necessary along the proposed routes in Segments 6, 7, 8, and 11.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, the amount of generation would be restricted as this new technology can only provide an increase in capacity of up to 50 percent over conventional conductors with similar mechanical properties. Furthermore, use of composite core conductor would not support the identified 4,500 MW of new wind generation anticipated from the TWRA, and would only partially address South of Lugo transmission constraints. While the use of composite core conductor would not allow for the full integration of the expected wind generation resources in the TWRA, it is anticipated that use of composite core conductor would generally meet the projected load growth in the Antelope Valley.

Feasibility

The U.S. Department of Energy Technical Review Committee on Composite Core Conductors has deemed several composite core conductors as a “commercial product”. As such, this alternative would be feasible.

Reliability

Implementation of this alternative would comply with CAISO/NERC/WECC requirements; however, reliability would become as issue as power generation within the TWRA increases to meet the expected 4,500 MW. Furthermore, composite core conductor is a new technology, which is not supported by sufficient field experience and, therefore, the long-term reliability is unknown

Environmental Advantages

Installation of composite core conductor on existing 220-kV single-circuit structures between Vincent Substation and Mesa Substation (Segments 11, 6, and 7) and between Mesa Substation and Chino Substation (Segment 8), and only constructing new structures as necessary, would reduce air quality, biology, noise, and visual impacts associated with the removal of existing 220-kV structures and installation of new bulkier, taller 500-kV structures as required for the proposed Project/Action. For those areas where existing structures would need to be replaced, the new 220-kV structures would be shorter and of less mass than the 500-kV structures. Therefore, visual impacts associated with this alternative would be reduced; however, air quality, biology, and noise impacts would essentially be the same as the proposed Project/Action.

Environmental Disadvantages

To provide the greatest system capacity (and capability) using composite core conductor, the system would need to be designed for ultimate operation at 500 kV, as the amount of increased system transmission capability on a 220 kV voltage level would be limited by other existing 220 kV transmission elements between the Vincent and Pardee Substations and the L.A. Basin. Existing structures south of the Vincent Substation within the ANF (Segments 6 and 11) and between the Mesa and Chino Substations (Segments 7 and 8), however, would not be able to support the weight of the composite core conductor that would be needed to provide for the required capacity increase.

This determination was made by SCE by evaluating the use of composite core conductors utilizing design wind criteria and applying the resulting design requirements for mechanical loads and composite conductor weights to the existing structures. SCE’s evaluation determined that the existing structures would fail under the new weight and certain wind conditions. It was also determined that resulting conductor sag would not meet the minimum CPUC General Order-95 line clearance requirements (vertical clearance from ground). In addition, the existing structures would not allow SCE to operate the T/Ls between the Vincent Substation and the Mira Loma Substation (Segments 6, 7, 8, and 11) at 500 kV because the existing structures, as designed, do not provide adequate spacing for operation at 500 kV (horizontal clearance between phases). Consequently, the existing structures within Segments 6, 7, 8, and 11 would need to be replaced to provide sufficient mechanical strength and adequate clearances for ultimate operation at 500 kV. Therefore, the environmental advantages of using composite core conductor associated with the use of existing structures would be eliminated. As such, construction impacts to air quality, biology, and noise would essentially be the same as the proposed Project/Action.

Alternative Conclusion

ELIMINATED. While this alternative at face value would provide an opportunity to increase the system capacity between Vincent Substation and Mira Loma Substation with minimal upgrades to existing infrastructure, upon further inspection not only would it limit the overall system capacity, such that the objectives/purpose and need of the TRTP are not fully met, but would in fact require upgrades of the existing transmission structures resulting in environmental impacts that are substantially the same as the proposed Project/Action, with the exception of reduced visual impacts associated with the installation of 220-kV structures versus 500-kV structures. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

Partial Composite Core Conductor Alternative	Meets Project Purpose? Partially[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, the amount of generation would be limited and would not support the identified 4,500 MW anticipated from the TWRA. Furthermore, use of existing structures would not allow for future increase in voltage operation from 220 kV to 500 kV. This alternative would only partially address South of Lugo transmission constraints, as the upgrades south of Vincent Substation would limit the capacity of the system. Projected load growth in the Antelope Valley would generally be met. [2] This alternative would be feasible. [3] Meets CAISO/NERC/WECC requirements; however, reliability would become as issue as power generation within the TWRA increases to meet the expected 4,500 MW. Composite core conductor is a new, unproven technology with unknown life-cycle performance; therefore, its reliability in long-term use is unknown.			
Environmental Advantages • Reduces visual impacts as a result of not installing bulkier, taller 500-kV structures between Vincent Substation and Mesa Substation, and between Mesa Substation and Chino Substations		Environmental Disadvantages • Existing structures would not be able to support the composite core conductor to provide the required capacity increase and would need to be replaced resulting in similar environmental impacts similar to the proposed Project/Action	
Conclusion: Eliminate from Further Analysis			

3.3 Alternate Corridors

3.3.1 Segment 10A Route Alternative

Alternative Description

This alternative route was considered by SCE in its PEA (RA Retained 7). It would provide for an alternate alignment for siting a new 500-kV T/L between the Windhub Substation and the proposed new Whirlwind Substation in Segment 10. The route for this alternative would initially follow the proposed route for Segment 10 which would begin from the south side of Windhub Substation heading southwest for approximately 3.4 miles, then turn south for approximately 3.6 miles. As shown in Figure 3.3-1, Segment 10A would deviate from the proposed route beginning at S10 MP 7.0 (Alternative Segment 10A MP 0.0), and would proceed within a new 330-foot-wide ROW and travel in a southwest direction paralleling the Los Angeles Aqueduct for approximately 6.3 miles before turning south-southwest paralleling an existing transmission corridor for approximately 1.3 miles (S10A MP 6.3 to 7.6). At this point, the alignment would turn south along 170th Street West for the remaining 2.0 miles. At Alternative Segment 10A MP 9.6, the alternative route would realign with the proposed route (S10 MP 15.8). The overall Segment 10A route from Windhub Substation to Whirlwind Substation would be 17.6 miles long, as opposed to the proposed route which would be 16.8 miles long (additional 0.8 mile).

Approximately 101 500-kV single-circuit LSTs would be constructed along Segment 10A between the Windhub and Whirlwind Substations, as opposed to 96 LSTs for the proposed Project/Action. The height of the 500-kV single-circuit LSTs would range from 94 feet to 172 feet. The Segment 10A 500-kV T/L would be strung with 2B-2156 kcmil ACSR with nonspecular finish, and include the installation of approximately 551,000 feet of conductor, whereas the proposed Segment 10 would require 525,000 feet of conductor (additional 26,000 feet).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

The re-routed portion of the ROW mostly parallels the Los Angeles Aqueduct thereby allowing use of existing access roads, which would reduce associated construction impacts such as air quality, noise, and visual impacts.

Environmental Disadvantages

The proposed alternative route is slightly longer (18 versus 16.8 miles) and would therefore result in increased impacts to air quality, biology, noise, and visual impacts compared to the proposed Project/Action.

Alternative Conclusion

ELIMINATED. This alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would 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/Action and has therefore been eliminated from further consideration.

SUMMARY

Segment 10A Route Alternative	Meets Project Purpose? Yes[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints. [2] This alternative would be feasible. [3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.			
Environmental Advantages • Parallels Los Angeles Aqueduct for a short distance allowing for use of existing access roads thereby reducing construction impacts (air quality, noise, visual)		Environmental Disadvantages • Longer route (18 vs. 16.8 miles for proposed Segment 10) resulting in potentially greater air quality, biology, noise, and visual impacts	
Conclusion: Eliminate from Further Analysis. This alternative offers no environmental advantage over the proposed Project/Action without introducing equivalent disadvantages, and is substantially similar to the proposed Project/Action.			

3.3.2 Segment 10B Route Alternative

Alternative Description

This alternative route was considered by SCE in its PEA (RA Retained 7). It would provide for an alternate alignment for siting a new 500-kV T/L between the Windhub Substation and the proposed new Whirlwind Substation in Segment 10. The route for this alternative would initially follow the proposed route for Segment 10 which would begin from the south side of the Windhub Substation heading southwest for approximately 3.4 miles, then turn south for approximately 3.6 miles. As shown in Figure 3.3-1, Segment 10B would deviate from the proposed route beginning at S10 MP 7.0 (Alternative Segment 10B MP 0.0), and would proceed within a new 330-foot-wide ROW and travel in a southwest direction paralleling the Los Angeles Aqueduct for approximately 2.3 miles. This portion of the alignment is the same as the Segment 10A Route Alternative described above. At this point, Segment 10B would turn west for approximately 3.4 miles, crossing over the Los Angeles Aqueduct, and then turn south for 1.6 miles along the assumed 160th Street West, which is not yet a designated street, again crossing the Los Angeles Aqueduct. The route would continue southwest for approximately 1.6 miles, paralleling an existing transmission corridor, then turn south along 170th Street West for the remaining 2.0 miles. At Alternative Segment 10B MP 10.9, the alternative route would realign with the proposed route (S10 MP 15.8). The overall Segment 10B route from Windhub Substation to Whirlwind Substation would be 18.9 miles long, as opposed to the proposed route which would be 16.8 miles long (additional 2.1 miles).

Approximately 109 500-kV single-circuit LSTs would be constructed along Segment 10B between Windhub and Whirlwind Substations, as opposed to 96 LSTs for the proposed Project/Action. The height of the 500-kV single-circuit LSTs would range from 94 feet to 172 feet. The proposed Segment 10A 500-kV T/L would be strung with 2B-2156 kcmil ACSR with nonspecular finish, and include the installation of approximately 593,000 feet of conductor, whereas the proposed Segment 10 would require 525,000 feet of conductor (additional 65,000 feet).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

The re-routed portion of the ROW would parallel the Los Angeles Aqueduct for a short distance (approximately 2.3 miles), thereby allowing use of existing access roads and reducing associated construction impacts such as air quality, noise, and visual impacts. In addition, this alternative route would place the new T/L behind existing homesteads, unlike the proposed Project/Action where the T/L would traverse in front of the homesteads, which would reduce potential visual impacts.

Environmental Disadvantages

The proposed alternative route is slightly longer (18.9 versus 16.8 miles) and would therefore result in increased impacts to air quality, biology, noise, and visual impacts compared to the proposed Project/Action.

Alternative Conclusion

ELIMINATED. This alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and 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/Action and has therefore been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Segment 10B Route Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints.
[2] This alternative would be feasible.
[3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Parallels Los Angeles Aqueduct for a short distance allowing for use of existing access roads thereby reducing construction impacts (air quality, noise, visual)
• Re-routed portion of ROW would go behind homesteads located along the proposed Project/Action route</td><td colspan="2">Environmental Disadvantages
• Longer route (18.9 vs. 16.8 miles for proposed Seg. 10) resulting in potentially greater air quality, biology, noise, and visual impacts</td></tr>
<tr><td colspan="4">Conclusion: Eliminate From Further Analysis. This alternative offers no environmental advantage over the proposed Project/Action without introducing equivalent disadvantages, and is substantially similar to the proposed Project/Action.</td></tr>
</table>

3.3.3 Windhub Substation to Cottonwind Substation to Whirlwind Station Alternative

Alternative Description

This alternative was considered by SCE in its PEA (RA Eliminated 7). As shown in Figure 3.3-2, it would route a new 500-kV T/L from the Windhub Substation southwest along the foothills of the Tehachapi Mountain Range to the Cottonwind Substation, rather than directly to the Whirlwind Substation. A new approximately 25-mile, 200-foot-wide corridor along the southern margin of the foothills of the Tehachapi Mountain Range, including access and spur roads, would be required to accommodate the new 500-kV T/L. From the Cottonwind Substation, the new 500-kV T/L would continue southeast to the Whirlwind Substation adjacent to existing ROW. A 150-foot expansion of the existing ROW, as well as new spur roads, would be required along this portion of the alignment to accommodate the new 500-kV T/L. This alternative would be approximately 12 miles longer than the proposed Segment 10.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, due to the routing of the new T/L alignment along the foothills of the Tehachapi Mountain Range between the Windhub Substation and the Cottonwind Substation, it could potentially interfere with wind generation projects planned in the area. As such, the 4,500 MW of identified wind generation within the TWRA may not be fully realized. While the full capacity of the TWRA may not be achieved, implementation of this alternative would accommodate the projected load growth in the Antelope Valley and address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

The proposed Project/Action would establish a new approximately 16.8-mile T/L corridor between the Windhub Substation and the Whirlwind Substation. As part of this alternative, the new 500-kV T/L would be placed adjacent to existing ROW between the Cottonwind Substation and the Whirlwind Substation, which would reduce access road requirements and associated impacts. However, a new approximately 25-mile T/L corridor would be required between the Windhub Substation and the Cottonwind Substation (see “Environmental Disadvantages” below).

Environmental Disadvantages

While this alternative would place a portion of the new 500-kV T/L adjacent to existing ROW between the Cottonwind Substation and the Whirlwind Substation, a new approximately 25-mile, 200-foot-wide T/L corridor would need to be established along the foothills of the Tehachapi Mountain Range between the Windhub Substation and the Cottonwind Substation. New access roads and spur roads would need to be established along this corridor, resulting in greater environmental impacts (air quality, noise, and visual resources) than the proposed Segment 10. Furthermore, construction along the foothills as opposed to the valley floor would be more difficult and potentially increase water quality impacts (there are many arroyos in this area) and erosion potential during construction.

Alternative Conclusion

ELIMINATED. 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/Action. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

Windhub Substation to Cottonwind Substation to Whirlwind Substation Alternative	Meets Project Purpose? Partially[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, due to its location it could potentially interfere with wind generation projects planned in the area such that the full 4,500 MW may not be realized. It would accommodate the projected load growth in the Antelope Valley and address South of Lugo transmission constraints. [2] This alternative would be feasible. [3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.			
Environmental Advantages • Would place the new T/L adjacent to existing ROW for a short distance, which would reduce access road requirements and associated impacts		Environmental Disadvantages • New ROW and access roads would be needed to establish the east-west portion of this alternative, crossing the foothills of the Tehachapi Range resulting in greater environmental impacts (air quality, noise, visual) • Construction along the foothills versus the valley floor would be more difficult and have the potential to interfere with arroyos in the area	
Conclusion: Eliminate from Further Analysis			

3.3.4 Whirlwind Substation to Antelope Substation Alternative

Alternative Description

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 as shown in Figure 3.3-3. The new utility corridor would be at a distance of at least 2,000 feet from either the east or west side of the existing utility corridor. The width of the new corridor would be at least 200 feet, and the establishment of new access and spur roads would be required.

The west side route would result in locating the new 500-kV T/L closer to or through the Antelope Valley California Poppy Reserve and/or the Arthur B. Ripley Desert Woodland State Park than the proposed Segment 4. The east side route would result in placement of the new 500-kV T/L through existing or planned development areas. The western alignment would be approximately 15 miles long and the eastern alignment would be approximately 17 miles long, whereas the proposed Segment 4 between Whirlwind Substation and Antelope Substation would be approximately 16 miles long.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints. Furthermore, it would improve system reliability beyond that of the proposed Project/Action by eliminating the risk of simultaneous outage of T/Ls contained within a common corridor, specifically within Segment 4.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This alternative does not result in any substantial environmental advantage as compared to the proposed Project/Action.

Environmental Disadvantages

Not only would this alternative be slightly longer than the proposed Segment 4, but it would require a new 200-foot-wide corridor between the existing Antelope Substation and the proposed Whirlwind Substation. Furthermore, placing the new T/L at least 2,000 feet to the west of the existing T/L corridor would move the line closer to the Antelope Valley California Poppy Reserve, a California State Park, which would have the potential to result in greater biology and visual impacts. Placing the new T/L at least 2,000 feet to the east of the existing T/L corridor would potentially interfere with existing and planned development in the Antelope Valley resulting in additional land use impacts. Establishment of a new T/L corridor with new access roads and spur roads would result in greater air quality, biology, land use, noise, and visual impacts compared to the proposed Project/Action.

Alternative Conclusion

ELIMINATED. While this alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would improve the system reliability beyond that of the proposed Project/Action, it 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/Action without creating greater impacts of its own. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

Whirlwind Substation to Antelope Substation Alternative	Meets Project Purpose? Yes[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA. In fact, it would improve the system reliability by eliminating the risk of simultaneous outage of T/Ls contained within a common corridor. It would also accommodate the projected load growth in the Antelope Valley and address South of Lugo transmission constraints. [2] This alternative would be feasible. [3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.			
Environmental Advantages • None identified		Environmental Disadvantages • Would require the establishment of a separate new corridor (200-feet wide) with access roads and spur roads, resulting in greater environmental impacts (air quality, biology, land use, noise, visual) • Placing the new T/L at least 2,000 feet to the west of the existing T/L corridor would move the line closer to the Antelope Valley California Poppy Reserve, a California State Park, which would have the potential to result in greater biology and visual impacts • Placing the new T/L at least 2,000 feet to the east of the existing T/L corridor would potentially interfere with existing and planned development in the Antelope Valley	
Conclusion: Eliminate from Further Analysis			

3.3.5 Antelope Substation to Vincent Substation Alternative

Alternative Description

This alternative was considered by SCE in its PEA (RA Eliminated 2). It would establish a new corridor between the Antelope Substation and the Vincent Substation in Segment 5, as shown in Figure 3.3-4. The new utility corridor would be at a distance of at least 2,000 feet from either the east or west side of the existing utility corridor. The width of the new corridor would be at least 200 feet, and the establishment of new access and spur roads would be required.

The west side route would result in the construction of approximately 19 miles of new 500-kV T/L, while the east side route would result in construction of approximately 18 miles of new 500-kV T/L. Either route would result in placement of the new 500-kV T/L through existing or planned development areas.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints. Furthermore, it would improve system reliability beyond that of the proposed Project/Action by eliminating the risk of simultaneous outage of T/Ls contained within a common corridor, specifically within Segment 5.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This alternative does not result in any substantial environmental advantage as compared to the proposed Project/Action.

Environmental Disadvantages

Not only would this alternative be slightly longer than the proposed Segment 5, but it would require a new 200-foot-wide corridor between Antelope Substation and Vincent Substation. Furthermore, placing the new T/L at least 2,000 feet to the west or east of the existing T/L corridor would potentially interfere with existing and planned development in the Antelope Valley resulting in additional land use impacts. Establishment of a new T/L corridor with new access roads and spur roads would result in greater air quality, biology, land use, noise, and visual impacts compared to the proposed Project/Action.

Alternative Conclusion

ELIMINATED. While this alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would improve the system reliability beyond that of the proposed Project/Action, it 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/Action without creating greater impacts of its own. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Antelope Substation to Vincent Substation Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of up to 4,500 MW of new wind generation resources in the TWRA. In fact, it would improve the system reliability by eliminating the risk of simultaneous outage of T/Ls contained within a common corridor. It would also accommodate the projected load growth in the Antelope Valley and address South of Lugo transmission constraints.
[2] This alternative would be feasible.
[3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• None identified</td><td colspan="2">Environmental Disadvantages
• Would require the establishment of a separate new corridor (200-feet wide) with access roads and spur roads, resulting in greater environmental impacts (air quality, noise, visual)
• Placing the new T/L at least 2,000 feet to the west or east of the existing T/L corridor would potentially interfere with existing and planned development in the Antelope Valley</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.3.6 Use of the LADWP Transmission Corridor through the ANF Alternative

Alternative Description

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, as shown in Figure 3.3-5. The two new 500-kV transmission lines could be located east or west or both east and west of the existing utility corridor. The northern LADWP corridor currently contains two 500-kV T/Ls, whereas the southern LADWP corridor contains one 500-kV T/L.

For the northern corridor (Option A), the two new 500-kV T/Ls would be installed within the existing LADWP utility corridor beginning at the Antelope Substation and continuing southwest through the ANF, Santa Clarita, unincorporated areas, and continue to SCE's Sylmar Substation located near the intersection of State Highway 14 and Interstate 5. A new 300-foot-wide east-west corridor paralleling the southern boundary of the ANF would need to be established to allow for one of the new 500-kV T/Ls to connect into the southern portion of Segment 11 near Gould Substation and for the other 500-kV T/L to connect into Segment 7 in the City of Duarte. This route would be approximately 62 miles longer than the proposed Segments 6 and 11.

For the southern corridor (Option B), the two new 500-kV T/Ls would be installed within the existing LADWP utility corridor beginning at the Vincent Substation and continuing southwest through the ANF, exiting the ANF in the Tujunga Valley near the Hansen Flood Control Basin. A new 300-foot-wide east-west corridor paralleling the southern boundary of the ANF would need to be established to allow for one of the new 500-kV T/Ls to connect into the southern portion of Segment 11 near Gould Substation and for the other 500-kV T/L to connect into Segment 7 in the City of Duarte. This route would be approximately 45 miles longer than the proposed Segments 6 and 11.

As part of this alternative (Option A or B), the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed as this line segment would be disconnected. Upgrades between the City of Duarte and Mesa Substation (Segment 7), between the Mesa Substation and Mira Loma Substation (Segment 8), and between the Gould Substation area and Mesa Substation (southern portion of Segment 11) would continue to occur, same as the proposed Project/Action.

Implementation of this alternative would result in two existing T/Ls in the ANF in Segment 6 (one 500-kV and one 220-kV) and two existing 220-kV T/Ls in the ANF in Segment 11, in addition to two new 500-kV T/Ls being added in one of two existing designated corridors through the ANF with existing LADWP transmission infrastructure.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, the longer routes identified under this alternative would compromise system reliability (see "Feasibility" discussion below). Consequently, this alternative would not allow for the interconnection of the full 4,500 MWs of wind generation, which is one of the primary objectives of the TRTP, and may not adequately improve the South of Lugo transmission constraints. It would, however, be expected to accommodate the projected load growth in the Antelope Valley.

Feasibility

No feasibility issues have been identified.

Reliability

Option A or B of this alternative would increase the distance of the two new 500-kV T/Ls by approximately 62 and 45 miles, respectively. The increased distance of these two T/Ls would increase the corresponding electrical impedance or resistance and thus would result in a less efficient use of the new transmission facilities. Consequently, the additional power flow would be carried by the existing T/Ls south of Vincent Substation as summarized in Table 3.3-1.

Table 3.3-1. Proposed Project/Action versus Use of LADWP Corridor through the ANF Alternative – Summary of Power Flow on Transmission South of Vincent

Transmission Line	Amp Rating	Proposed Project/Action			Use of LADWP Corridor through the ANF		
		Amp	MW	Percent	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	2480	2055	789	82.9%	2259	865	91.1%
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	3230	2030	776	62.8%	2221	845	68.8%
Mira Loma-Vincent 500-kV	3950	1800	1610	45.6%	1519	1359	38.5%
Mesa-Vincent No. 2 500-kV partially built to 500-kV	3230	1985	759	61.5%	1162	443	36.0%
Existing Mesa-Vincent 220-kV	2480	2103	807	84.8%	2377	910	95.8%

As shown in Table 3.3-1, loading on the existing Rio Hondo-Vincent No. 1 220-kV and Mesa-Vincent 220-kV T/Ls in increased by approximately 10 and 11 percent respectively when compared to the proposed transmission routing. This increase in power flow under base case conditions would result in a corresponding increase under outage conditions.

Evaluation of single outage conditions, as shown in Table 3.3-2, reveals that the existing Rio Hondo-Vincent No. 1 220-kV T/L loads in excess of its maximum long-term emergency limit of 2850 amps, the maximum overload capability for single outage conditions, under loss of the Rio Hondo-Vincent No. 2 500-kV T/L (energized at 220 kV). Consequently, this alternative would compromise system reliability and would not meet required CAISO/NERC/WECC Planning Standards.

Table 3.3-2. Proposed Project/Action versus Use of LADWP Corridor through the ANF Alternative – Summary of Power Flow on Transmission South of Vincent Under Outage Condition

Transmission Line	Amp Rating	Proposed Project/Action			Use of LADWP Corridor through the ANF		
		Amp	MW	Percent	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	2850	2705	1024	94.9%	3014	1139	105.8%
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	3710	0	0	0	0	0	0
Mira Loma-Vincent 500-kV	4540	1884	1673	41.5%	1599	1423	35.2%
Mesa-Vincent No. 2 500-kV partially built to 500-kV	3710	2275	859	61.3%	1282	485	34.6%
Existing Mesa-Vincent 220-kV	2850	2410	915	84.6%	2766	1049	97.1%

Environmental Advantages

Placement of the new 500-kV T/Ls one of the two existing LADWP corridors would eliminate the need to construct new T/Ls within Segments 6 and 11 through the ANF. In addition, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed, which would reduce the long-term visual “clutter” within the ANF.

Environmental Disadvantages

While this alternative would reduce the environmental impacts within Segments 6 and 11 through the ANF, which as proposed would occur within existing T/L corridors (no widening required), this alternative would require the widening of an existing LADWP corridor to accommodate the new 500-kV T/Ls, and depending on which one is used, may also be located within the ANF. This alternative would also require the establishment of a new 300-foot-wide corridor between the exit point of the LADWP corridor and Gould Substation and the City of Duarte, which would traverse through densely populated urban areas resulting in greater land use impacts than the proposed route. Furthermore, the longer routes identified under this alternative would result in potentially greater air quality, biology, noise, and visual impacts.

Alternative Conclusion

ELIMINATED. While this alternative would have the potential to reduce impacts within Segments 6 and 11 through the ANF, it 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. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Use LADWP Transmission Corridor Through the ANF Alternative</td><td>Meets Project Purpose?
Partially[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
No[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, it could inhibit full integration of up to 4,500 MW (see #3 below). Furthermore, this alternative may not adequately improve the South of Lugo transmission constraints. It would be expected to generally accommodate the projected load growth in the Antelope Valley.
[2] This alternative would be feasible.
[3] The increased distance of the T/Ls would increase the corresponding electrical impedance and thus result in additional power flow being carried by the existing T/Ls south of Vincent Substation. This increase in power flow under base case conditions results in a corresponding increase under outage conditions. Evaluation of single outage conditions (i.e., loss of Rio Hondo-Vincent No. 2 500-kV T/L [energized at 220 kV]) reveals that the existing Rio Hondo-Vincent No. 1 220-kV T/L loads in excess of its maximum long-term emergency limit (by 5.8%). Therefore, this alternative would compromise system reliability and would therefore not meet CAISO/NERC/WECC requirements.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Eliminates construction in Segments 6 and 11 through the ANF
• Removes the existing Antelope-Mesa 220-kV T/L in Segment 6, which would reduce visual “clutter”</td><td colspan="2">Environmental Disadvantages
• Would require widening the existing LADWP corridor, which may be located with the ANF (Northern).
• Would require establishing a new corridor (300-feet wide) between the exit point of the LADWP corridor and Gould Substation and the City of Duarte in densely populated urban areas resulting in greater land use impacts
• Longer route than proposed Segments 6 and 11 resulting in potentially greater air quality, biology, noise, and visual impacts: Northern route (starting at Antelope Substation) would be approximately 62 miles longer, Southern route (starting at Vincent Substation) would be approximately 45 miles longer</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.3.7 New SCE Corridor Across the ANF Alternative

Alternative Description

This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11E). As shown in Figure 3.3-6, this alternative would locate two new 500-kV T/Ls in a new 300-foot-wide corridor beginning at the Vincent Substation and continuing in a southeast direction through the ANF, turning south and continuing between the San Gabriel Wilderness Area and the Sheep Mountain Wilderness Area generally following State Highway 39 through the ANF. The new corridor would exit the southern boundary of the ANF in the City of Azusa or City of Glendora. A new 300-foot-wide 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 a 200-foot-wide east-west corridor between the City of Duarte and to a point south of the Gould Substation to connect into the southern portion of Segment 11. This route would be approximately 26 miles longer than the proposed Segments 6 and 11.

As part of this alternative, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed as this line segment would be disconnected. Upgrades between the City of Duarte and Mesa Substation (Segment 7), between the Mesa Substation and Mira Loma Substation (Segment 8), and between the Gould Substation area and Mesa Substation (southern portion of Segment 11) would continue to occur, same as the proposed Project/Action.

Implementation of this alternative would result in two existing T/Ls in the ANF in Segment 6 (one 500-kV and one 220-kV) and two existing 220-kV T/Ls in the ANF in Segment 11, in addition to two new 500-kV T/Ls in a new corridor through the ANF and continuing west from the southern boundary of the ANF to a point south of Gould Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, the longer route identified under this alternative would compromise system reliability (see “Feasibility” discussion below). Consequently, this alternative would not allow for the interconnection of the full 4,500 MWs of wind generation, which is one of the primary objectives of the TRTP, and may not adequately improve the South of Lugo transmission constraints. It would, however, be expected to accommodate the projected load growth in the Antelope Valley.

Feasibility

No feasibility issues have been identified.

Reliability

This alternative would increase the distance of the two new 500-kV T/Ls by approximately 26 miles. The increased distance of these two T/Ls would increase the corresponding electrical impedance or resistance and thus results in less efficient use of the new transmission facilities. Consequently, the additional power flow would be carried by the existing T/Ls south of the Vincent Substation as summarized in Table 3.3-3.

Table 3.3-3. Proposed Project/Action versus New SCE Corridor Across the ANF Alternative – Summary of Power Flow on Transmission South of Vincent

Transmission Line	Amp Rating	Proposed Project/Action			New SCE Corridor Across the ANF		
		Amp	MW	Percent	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	2480	2055	789	82.9%	2209	845	89.1%
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	3230	2030	776	62.8%	2171	826	62.8%
Mira Loma-Vincent 500-kV	3950	1800	1610	45.6%	1662	1485	42.1%
Mesa-Vincent No. 2 500-kV partially built to 500-kV	3230	1985	759	61.5%	1105	422	34.2%
Existing Mesa-Vincent 220-kV	2480	2103	807	84.8%	2316	886	93.4%

As shown in Table 3.3-3, loading on the existing Rio Hondo-Vincent No. 1 220-kV and Mesa-Vincent 220-kV T/Ls would increase by approximately 6 and 8 percent respectively when compared to the proposed transmission routing. This increase in power flow under base case conditions would result in a corresponding increase under outage conditions.

Evaluation of single outage conditions, as shown in Table 3.3-4, reveals that the existing Rio Hondo-Vincent No. 1 220-kV T/L would load in excess of its maximum long-term emergency limit of 2850 amps, the maximum overload capability for single outage conditions, with the loss of the Rio Hondo-Vincent No. 2 500-kV T/L (energized at 220-kV). Consequently, this alternative would compromise system reliability and would not meet required CAISO/NERC/WECC Planning Standards.

Table 3.3-4. Proposed Project/Action versus New SCE Corridor Across the ANF Alternative – Summary of Power Flow on Transmission South of Vincent Under Outage Condition

Transmission Line	Amp Rating	Proposed Project/Action			New SCE Corridor Across the ANF		
		Amp	MW	Percent	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	2850	2705	1024	94.9%	2935	1104	103.0%
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	3710	0	0	0	0	0	0
Mira Loma-Vincent 500-kV	4540	1884	1673	41.5%	1749	1550	38.5%
Mesa-Vincent No. 2 500-kV partially built to 500-kV	3710	2275	859	61.3%	1280	481	34.5%
Existing Mesa-Vincent 220-kV	2850	2410	915	84.6%	2681	1012	94.1%

Environmental Advantages

Placement of the new 500-kV T/Ls in a new corridor through the ANF would eliminate the need to construct new T/Ls within Segments 6 and 11 through the ANF. In addition, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed, which would reduce the long-term visual "clutter" within Segment 6.

Environmental Disadvantages

While this alternative would reduce the environmental impacts within Segments 6 and 11 through the ANF, which as proposed would occur within existing T/L corridors (no widening required), this alternative would require the establishment of a new 300-foot-wide corridor to accommodate the new 500-kV T/Ls through the ANF. This alternative would also require the establishment of a new 200-foot-wide corridor between the City of Duarte and Gould Substation, which would traverse through densely populated urban areas resulting in greater land use impacts than the proposed Project/Action.

Furthermore, the longer route identified under this alternative would result in potentially greater air quality, biology, noise, and visual impacts.

Alternative Conclusion

ELIMINATED. While this alternative would have the potential to reduce impacts within Segments 6 and 11 through the ANF, it 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. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>New SCE Corridor Across the ANF Alternative</td><td>Meets Project Purpose?
Partially[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
No[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, it could inhibit full integration of up to 4,500 MW (see #3 below). Furthermore, this alternative may not adequately improve the South of Lugo transmission constraints. It would be expected to generally accommodate the projected load growth in the Antelope Valley.
[2] This alternative would be feasible.
[3] The increased distance of the T/Ls would increase the corresponding electrical impedance and thus result in additional power flow being carried by the existing T/Ls between the Vincent, Rio Hondo, and Mesa Substations. This increase in power flow under base case conditions results in a corresponding increase under outage conditions. Evaluation of single outage conditions (i.e., loss of Rio Hondo-Vincent No. 2 500-kV T/L [energized at 220 kV]) reveals that the existing Rio Hondo-Vincent No. 1 220-kV T/L loads in excess of its maximum long-term emergency limit (by 3%). Therefore, this alternative would compromise system reliability and would therefore not meet CAISO/NERC/WECC requirements.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Eliminates construction in Segments 6 and 11 through the ANF
• Removes the existing Antelope-Mesa 220-kV T/L in Segment 6, which would reduce visual “clutter”</td><td colspan="2">Environmental Disadvantages
• Would require establishing a new ROW (300-feet wide) within a new utility corridor through the ANF
• Would require establishing a new 300-foot-wide ROW between the exit point of the ANF and the City of Duarte and a new 200-foot-wide corridor between the City of Duarte and a point south of Gould Substation through densely populated urban areas resulting in greater land use impacts
• Longer route than proposed Segments 6 and 11 (approximately 26 miles longer) resulting in potentially greater air quality, biology, noise, and visual impacts</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.3.8 New Corridor Along Highway 14 Alternative

Alternative Description

This alternative was considered by SCE in its PEA (RA Eliminated 4). As shown in Figure 3.3-7, this alternative would locate two new 500-kV T/Ls in a new 300-foot-wide corridor beginning at the Vincent Substation and continuing west adjacent to State Highway 14 (outside of the ANF) to the Rinaldi Substation area (near the interchange of the I-5 and Highway 210). At this point, the new 500-kV T/Ls would turn and continue east in a new 300-foot-wide east-west corridor to La Cañada Flintridge (Gould Substation) to connect into the southern portion of Segment 11 and on to the City of Duarte to connect into Segment 7. This route would be approximately 42 miles longer than the proposed Segments 6 and 11.

As part of this alternative, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed as this line segment would be disconnected. Upgrades between the City of Duarte and Mesa Substation (Segment 7), between the Mesa Substation and Mira Loma Substation (Segment 8), and between the Gould Substation area and Mesa Substation (southern portion of Segment 11) would continue to occur, same as the proposed Project/Action.

Implementation of this alternative would result in two existing T/Ls in the ANF in Segment 6 (one 500-kV and one 220-kV) and two existing 220-kV T/Ls in the ANF in Segment 11, in addition to two new 500-kV T/Ls in a new corridor outside of the ANF between Vincent Substation and the City of Duarte.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, the longer route identified under this alternative would compromise system reliability (see "Feasibility" discussion below). Consequently, this alternative would not allow for the interconnection of the full 4,500 MWs of wind generation, which is one of the primary objectives of the TRTP, and may not adequately improve the South of Lugo transmission constraints. It would, however, be expected to accommodate the projected load growth in the Antelope Valley.

Feasibility

No feasibility issues have been identified.

Reliability

This alternative would increase the distance of the two new 500-kV T/Ls by approximately 42 miles. The increased distance of these two T/Ls would increase the corresponding electrical impedance and thus results in less efficient use of the new transmission facilities. Consequently, the additional power flow would be carried by the existing T/Ls south of the Vincent Substation as summarized in Table 3.3-5.

Table 3.3-5. Proposed Project/Action versus New Corridor Along Highway 14 Alternative – Summary of Power Flow on Transmission South of Vincent

Transmission Line	Amp Rating	Proposed Project/Action			New Corridor Along Highway 14		
		Amp	MW	Percent	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	2480	2055	789	82.9%	2237	854	90.2%
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	3230	2030	776	62.8%	2200	835	68.1%
Mira Loma-Vincent 500-kV	3950	1800	1610	45.6%	1123	1221	28.4%
Mesa-Vincent No. 2 500-kV partially built to 500-kV	3230	1985	759	61.5%	1364	428	42.2%
Existing Mesa-Vincent 220-kV	2480	2103	807	84.8%	2352	898	94.8%

As shown in Table 3.3-5, loading on the existing Rio Hondo-Vincent No. 1 220-kV and Mesa-Vincent 220-kV T/Ls in increased by approximately 7 and 10 percent respectively when compared to the proposed transmission routing. This increase in power flow under base case conditions would result in a corresponding increase under outage conditions.

Evaluation of single outage conditions, as shown in Table 3.3-6, reveals that the existing Rio Hondo-Vincent No. 1 220-kV T/L loads in excess of its maximum long-term emergency limit of 2850 amps, the maximum overload capability for single outage conditions, under loss of the Rio Hondo-Vincent No. 2 500-kV T/L (energized at 220 kV). Consequently, this alternative would compromise system reliability and would not meet required CAISO/NERC/WECC Planning Standards.

Environmental Advantages

Placement of the new 500-kV T/Ls in a new corridor along Highway 14 would eliminate the need to construct new T/Ls within Segments 6 and 11 through the ANF. In addition, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed, which would reduce the long-term visual "clutter" within Segment 6.

Table 3.3-6. Proposed Project/Action versus New Corridor Along Highway 14 Alternative – Summary of Power Flow on Transmission South of Vincent Under Outage Condition

Transmission Line	Amp Rating	Proposed Project/Action			New Corridor Along Highway 14		
		Amp	MW	Percent	Amp	MW	Percent
Rio Hondo-Vincent No. 1 220-kV	2850	2705	1024	94.9%	2935	1118	104.4%
Rio Hondo-Vincent No. 2 500-kV energized at 220-kV	3710	0	0	0	0	0	0
Mira Loma-Vincent 500-kV	4540	1884	1673	41.5%	1437	1277	31.7%
Mesa-Vincent No. 2 500-kV partially built to 500-kV	3710	2275	859	61.3%	1300	489	34.5%
Existing Mesa-Vincent 220-kV	2850	2410	915	84.6%	2724	1028	95.6%

Environmental Disadvantages

While this alternative would reduce the environmental impacts within Segments 6 and 11 through the ANF, which as proposed would occur within existing T/L corridors (no widening required), this alternative would require the establishment of a new 300-foot-wide corridor to accommodate the new 500-kV T/Ls between the Vincent Substation and the Rinaldi Substation area (near the interchange of Interstate 5 and Highway 210). This alternative would also require the establishment of a new 300-foot-wide corridor between the Rinaldi Substation area to the City of Duarte, which would traverse through densely populated urban areas resulting in greater land use impacts than the proposed Project/Action. Furthermore, the longer route identified under this alternative would result in potentially greater air quality, biology, noise, and visual impacts.

Alternative Conclusion

ELIMINATED. While this alternative would have the potential to reduce impacts within Segments 6 and 11 through the ANF, it 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. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>New Corridor Along Highway 14 Alternative</td><td>Meets Project Purpose?
Partially[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
No[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, it could inhibit full integration of up to 4,500 MW (see #3 below). Furthermore, this alternative may not adequately improve the South of Lugo transmission constraints. It would be expected to generally accommodate the projected load growth in the Antelope Valley.
[2] This alternative would be feasible.
[3] The increased distance of the T/Ls would increase the corresponding electrical impedance and thus result in additional power flow being carried by the existing T/Ls between the Vincent and Rio Hondo Substations and between the Vincent and Mesa Substations. This increase in power flow under base case conditions results in a corresponding increase under outage conditions. Evaluation of single outage conditions (i.e., loss of Rio Hondo-Vincent No. 2 500-kV T/L [energized at 220 kV]) reveals that the existing Rio Hondo-Vincent No. 1 220-kV T/L loads in excess of its maximum long-term emergency limit (by 4.4%). Therefore, this alternative would compromise system reliability and would therefore not meet CAISO/NERC/WECC requirements.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Eliminates construction in Segments 6 and 11 through the ANF
• Removes the existing Antelope-Mesa 220-kV T/L in Segment 6, which would reduce visual “clutter”</td><td colspan="2">Environmental Disadvantages
• Would require establishing a new ROW (300-feet wide) between the Vincent Substation and the Rinaldi Substation area (near the interchange of Interstate 5 and Highway 210) and from the Rinaldi Substation area to the City of Duarte through densely populated urban areas resulting in greater land use impacts
• Longer route than proposed Segments 6 and 11 (approximately 42 miles longer) resulting in potentially greater air quality, biology, noise, and visual impacts</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.3.9 New Corridor Through the Cajon Pass Alternative

Alternative Description

This alternative was considered by SCE in its PEA (RA Eliminated 5). As shown in Figure 3.3-8, this alternative would route a new 500-kV T/L (Mira Loma-Vincent 500-kV T/L) in a new corridor beginning at Vincent Substation and continuing east towards Lugo Substation, located in Hesperia, then turn south and continue through the Cajon Pass within the San Bernardino National Forest (SBNF) to the cities of Fontana and Rialto. From this point, approximately 18 miles of existing ROW would be utilized to complete the T/L route to Mira Loma Substation. This route would be approximately 10 miles longer than the proposed Segments 6, 7 and 8.

As part of this alternative, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed as this line segment would be disconnected. While this alternative would eliminate construction of the proposed Mira Loma-Vincent 500-kV T/L from Vincent Substation to the southern boundary of the ANF (Segment 6), from the southern boundary of the ANF to the Mesa Substation (Segment 7) and from the San Gabriel Junction to the Mira Loma Substation (Segment 8A), upgrades in Segments 6, 7, 8B, 8C, and 11 would be required. In Segment 6, between the Vincent Substation and the crossover span, the Antelope-Mesa 220-kV T/L would be rebuilt with 500-kV single-circuit structures to complete the Rio Hondo-Vincent No. 2 500-kV T/L. In Segment 7, from the southern boundary of the ANF to the Rio Hondo Substation, the Antelope-Mesa 220-kV T/L would be rebuilt with 500-kV single-circuit structures to accommodate the new Rio Hondo-Vincent No. 2 500-kV T/L. No construction would occur in Segment 7 between Rio Hondo Substation and Mesa Substation. Upgrades in Segment 8 (8B and 8C) would be limited to rebuilding Chino-Mira Loma No. 1, 2, and 3 between Chino Substation and Mira Loma Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would allow for the interconnection of new wind generation resources in the TWRA; however, it would inhibit the full integration of the 4,500 MW of currently planned or expected wind generation due to reliability issues (see "Feasibility" discussion below). Furthermore, it would not improve the South of Lugo transmission constraints. It would, however, be expected to accommodate the projected load growth in the Antelope Valley.

Feasibility

No feasibility issues have been identified.

Reliability

Locating multiple transmission lines in a common corridor increases the potential to compromise overall system reliability if the risk factors of common mode outages are high. In the case of the Cajon Pass, the major significant risk factors are forest fires. History has demonstrated that forest fires are a very real risk factor affecting multiple transmission lines in a common corridor on an annual basis. As an example, all three existing 500-kV T/Ls located in the Cajon Pass were lost due to a forest fire during the heavy load demand period in 2002. Locating the new 500-kV T/L within the same general location of the three existing 500-kV T/Ls traveling from the Victorville area to the Mira Loma area (the Cajon Pass) would expose the new T/L to the same forest fire hazard that has historically occurred on an annual basis when these T/Ls are heavily loaded.

A special protection system (SPS) is already in place to shed a significant amount of SCE system load under outages of the existing Lugo-Mira Loma 500-kV T/Ls. Adding a fourth line in this high risk corridor and increasing power flow transfers would result in severe thermal and voltage stability problems that cannot be mitigated with the use of an SPS. Because of the high risk of forest fires in this common corridor during times of high loading of these transmission lines and the corresponding impact associated with simultaneous outage of 500-kV T/Ls, such limitations would render the new T/L effectively useless in increasing system capabilities until new 500-kV T/Ls in different corridors are constructed.

Consequently, this alternative would require the implementation of a complex SPS, which would not be practical or feasible; therefore, it would not comply with CAISO/NERC/WECC requirements.

Environmental Advantages

Placement of the new 500-kV T/Ls in a new corridor through the Cajon Pass would eliminate the need to construct new T/Ls within Segments 6 and 11 through the ANF. In addition, the existing Antelope-Mesa 220-kV T/L in Segment 6 would be removed, which would reduce the long-term visual "clutter" within Segment 6.

Environmental Disadvantages

While this alternative would reduce the environmental impacts within Segments 6 and 11 through the ANF, which as proposed would occur within existing T/L corridors (no widening required), this alternative would require the establishment of a new 300-foot-wide corridor to accommodate the new 500-kV T/L from the Vincent Substation to the Lugo Substation and then south through the Cajon Pass, which would traverse through the SBNF, to the Cities of Fontana and Rialto. Furthermore, the longer route identified under this alternative would result in potentially greater air quality, biology, noise, and visual impacts.

Alternative Conclusion

ELIMINATED. While this alternative would have the potential to reduce impacts within Segments 6 and 11 through the ANF, it 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. Since this alternative does not fully meet the objectives/purpose and need of the TRTP, does not comply with reliability requirements, and would result in greater environmental impacts, it has been eliminated from further consideration.

SUMMARY

New Corridor Through Cajon Pass Alternative	Meets Project Purpose? Partially[1]	Feasible? No[2]	Meets Reliability Criteria? No[3]
Explanations: [1] This alternative would not result in sufficient system capability to interconnect and deliver up to 4,500 MW of generation resources from the TWRA (see #3 below), and would not improve the South of Lugo transmission constraints. It would, however, be expected to generally accommodate the projected load growth in the Antelope Valley. [2] This alternative would be feasible. [3] Implementation of a complex SPS would be required, which would not be practical or feasible. Therefore it would not comply with CAISO/NERC/WECC requirements.			
Environmental Advantages • Eliminates construction in Segments 6 and 11 through the ANF • Removes the existing Antelope-Mesa 220-kV T/L in Segment 6, which would reduce visual "clutter"		Environmental Disadvantages • Would require establishing a new ROW (300-feet wide) from the Vincent Substation to the Lugo Substation and then south through the Cajon Pass, through the San Bernardino National Forest (SBNF), to the Cities of Fontana and Rialto • Longer route than proposed Project/Action (approximately 10 miles longer) and would impact the SBNF resulting in potentially greater air quality, biology, noise, and visual impacts	
Conclusion: Eliminate from Further Analysis			

3.3.10 West Lancaster Alternative

Alternative Description

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 3.3-9. The West Lancaster Alternative would deviate from the proposed route 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 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/Action (SCE, 2008b: DR#4 – Q4-02).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

The new T/L would be placed along 115th Street West in 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.

Environmental Disadvantages

This alternative would be slightly longer (~0.4 mile) within a new corridor, thereby slightly increasing potential impacts to air quality, biology, noise, and traffic impacts during construction.

Alternative Conclusion

RETAINED FOR FURTHER ANALYSIS. This alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would avoid current residences and access to properties that would otherwise be impacted by the proposed route. These reductions would outweigh the slight increase in construction impacts associated with the incremental increase in route length. Therefore, this alternative has been retained for further analysis in the EIR/EIS.

SUMMARY

<table>
<tr><td>West Lancaster Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints.
[2] This alternative would be feasible.
[3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• The new T/L would be placed along 115th Street West, rather than 110th Street West, where the T/L would be placed between developed areas, minimizing disturbance to current residences and access to properties located along the paved 110th Street West</td><td colspan="2">Environmental Disadvantages
• Would result in a slightly longer alignment (~0.4 mile) within new ROW, thereby increasing air quality, biology, noise, and traffic impacts</td></tr>
<tr><td colspan="4">Conclusion: Retain for Further Analysis</td></tr>
</table>

3.3.11 Chino Hills Route A Alternative

Alternative 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 3.3-10, this alternative would deviate from the proposed Project/Action 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 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 Walnut/Olinda-Mira Loma 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.

At the junction of the existing Walnut/Olinda-Mira Loma 220-kV T/Ls and the existing Serrano-Mira Loma and Serrano-Rancho Vista 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, assuming the use of gas-insulated technology, or as much as 11 to 12 acres for air-insulated technology, allowing for power to be transferred along the existing 500-kV T/Ls to Mira Loma Substation. For the switching station utilizing gas-insulated technology, a lower profile would result. 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#5-07). The entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c – DR#5-07). For an open-air switching station, standard traditional equipment and components would be utilized; however, a higher station profile would result. The two buses would be approximately 360-feet long and 65-feet high, and the six dead-end structures would each be approximately 108-feet high (SCE, 2008c – DR#5-07).

From the point of deviation (S8A MP 19.2) to the new switching station, approximately 20 to 22 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). In addition, approximately 6 new single-circuit 500-kV structures would be required to loop the existing 500-kV T/Ls into the switching station (SCE, 2008b – DR#4: Q4-11).

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. 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 (SCE, 2008b – DR#4: Q4-12).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

This alternative is feasible; however, it would not be consistent with the CHSP General Plan, which makes its legal feasibility dependent on approval of a General Plan amendment by the California Parks and Recreation Commission.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This routing alternative avoids proximity of the T/L to existing residences of the City of Chino Hills. Implementation of this alternative would eliminate construction of approximately 16 miles of 500-kV structures along Segment 8A beginning at approximately S8A MP 19.2 and ending at Mira Loma Substation (S8A MP 35.2), as well as eliminate construction in Segments 8B and 8C between Chino Substation and Mira Loma Substation. Air quality and biology impacts during construction as well as long-term visual impacts through Chino Hills, Chino, and Ontario would be reduced compared to the proposed Project/Action as a result.

Specific to this alternative (not part of the proposed Project), use of gas-insulted technology for the switching station versus open-air technology would result in a lower profile and would impact less land (4 to 5 acres vs. 11 to 12 acres), which would reduce potential visual and land use impacts associated with the new switching station.

Environmental Disadvantages

CHSP is a "premier natural open-space area in the hills of Santa Ana Canyon near Riverside" (CSP, 2007). The Park is an important link in the Puente-Chino Hills biological corridor, and offers sixty miles of trails and fire roads providing opportunities for viewing wildlife and native plants (CSP, 2007). While this alternative would place the new 500-kV T/L parallel to existing T/Ls within CHSP, it would require widening of the existing ROW for approximately 6.2 miles, of which 2.3 miles would be through the Park, by 150 feet to accommodate the new 500-kV T/L. The need for expanded ROW would result in greater biological impacts compared to the proposed route, where construction between S8A MP19.2 and 35.2 would occur within existing ROW, with the exception of approximately 0.45 miles of new ROW west of Mira Loma Substation. The establishment of a new switching station within CHSP would further increase biological impacts and impacts to CHSP. The switching station location for this alternative would require extensive grading and would adversely affect a riparian habitat area. The addition of new 500-kV structures and a switching station within CHSP would also result in substantial long-term visual impacts as well as impacts on recreational use of the Park. The addition of new infrastructure within CHSP would also result in potentially significant land use impacts, as this alternative would be inconsistent with the

CHSP General Plan, and would therefore require the approval of a General Plan amendment by the California Parks and Recreation Commission.

Alternative Conclusion

RETAINED FOR FURTHER ANALYSIS. This alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would have the potential to reduce construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route by approximately 9.8 miles. While impacts would be shifted to CHSP, the proposed 500-kV T/L would parallel existing T/Ls through the park and the switching station would be placed near the existing infrastructure within the park. Furthermore, the use of gas-insulated technology for the switching station would allow it to be built with a profile that minimizes potential visual impacts within the park. Therefore, this alternative has been retained for further analysis in the EIR/EIS.

SUMMARY

<table>
<tr><td>Chino Hills Route A Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints.
[2] This alternative is feasible; however, it would be inconsistent with the CHSP General Plan which makes its legal feasibility dependent on approval of a General Plan amendment by the California Parks and Recreation Commission.
[3] Meets CAISO/NERC/WECC requirements.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Avoids proximity to existing residents in the City of Chino Hills
• Eliminates construction of approximately 16 miles of 500-kV structures along Segment 8A from S8A MP19.2 to Mira Loma Substation through Chino Hills, Chino, and Ontario reducing air quality, biology, noise, and visual impacts
• Eliminates construction in Segments 8B and 8C between Chino and Mira Loma Substations</td><td colspan="2">Environmental Disadvantages
• Would place approximately 6.2 miles of new 500-kV T/L within new ROW (expand ROW by 150 feet), including 2.3 miles within CHSP potentially increasing biology, recreational, and visual impacts
• Would require a new 500-kV switching station within CHSP potentially increasing biology, recreational, and visual impacts
• Switching station location would require extensive grading and would adversely affect a riparian habitat area
• Would be inconsistent with the CHSP General Plan and therefore have potentially significant land use impacts</td></tr>
<tr><td colspan="4">Conclusion: Retained for Further Analysis</td></tr>
</table>

3.3.12 Chino Hills Route B Alternative

Alternative 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 3.3-11, this alternative would deviate from the proposed Project/Action 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 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 Walnut/Olinda-Mira Loma 220-kV double-circuit T/L for approximately 3.9 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 4.3 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 0.4 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 T/Ls. 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 (SCE, 2008b – DR#4: Q4-24).

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, assuming the use of gas-insulated technology, or as much as 11 to 12 acres for air-insulated technology, allowing for power to be transferred along the existing 500-kV T/Ls to Mira Loma Substation. For the switching station utilizing gas-insulated technology, a lower profile would result. 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#5-07). The entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c – DR#5-07). For an open-air switching station, standard traditional equipment and components would be utilized; however, a higher station profile would result. The two buses would be approximately 360-feet long and 65-feet high, and the six dead-end structures would each be approximately 108-feet high (SCE, 2008c – DR#5-07).

From the point of deviation (S8A MP 19.2) to the new switching station, approximately 27 new double-circuit 500-kV structures would be required, of which approximately 13 to 15 structures would be within CHSP (SCE, 2008b – DR#4: Q4-23 Update 2). In addition, approximately 6 new single-circuit and 2 new double-circuit 500-kV structures would be required outside of CHSP to loop the existing 500-kV T/Ls into the switching station (SCE, 2008b – DR#4: Q4-23).

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. 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 (SCE, 2008b – DR#4: Q4-12).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

This alternative is feasible; however, it would not be consistent with the CHSP General Plan, which makes its implementation dependent on approval of a General Plan amendment by the California Parks and Recreation Commission.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This routing alternative avoids proximity of the T/L to existing residences of the City of Chino Hills. Implementation of this alternative would eliminate construction of approximately 16 miles of 500-kV structures along Segment 8A beginning at approximately S8A MP 19.2 and ending at Mira Loma Substation (S8A MP 35.2) , as well as eliminate construction in Segments 8B and 8C between Chino Substation and Mira Loma Substation. Air quality and biology impacts during construction as well as long-term visual impacts through Chino Hills, Chino, and Ontario would be reduced compared to the proposed Project/Action as a result.

Specific to this alternative (not part of the proposed Project), use of gas-insulted technology for the switching station versus open-air technology would result in a lower profile and would impact less land (4 to 5 acres vs. 11 to 12 acres), which would reduce potential visual and land use impacts associated with the new switching station.

Environmental Disadvantages

CHSP is a "premier natural open-space area in the hills of Santa Ana Canyon near Riverside" (CSP, 2007). The Park is a critical link in the Puente-Chino Hills biological corridor, and offers sixty miles of trails and fire roads providing opportunities for viewing wildlife and native plants (CSP, 2007). While this alternative would place the new 500-kV T/L parallel to existing T/Ls within CHSP, it would require widening of the existing ROW for approximately 8.6 miles, of which 4.3 miles would be through the Park, by 150 feet to accommodate the new 500-kV T/L. The need for expanded ROW would result in greater biological impacts compared to the proposed route, where construction between S8A MP19.2 and 35.2 would occur within existing ROW, with the exception of approximately 0.45 miles of new ROW west of Mira Loma Substation. This alternative would also require the establishment of a new switching station east of CHSP, further increasing biological impacts. The addition of new 500-kV structures within CHSP and a new switching station (outside of CHSP) would also result in substantial long-term visual impacts and as well as impacts to the recreational use of the Park. The addition of new infrastructure within CHSP would also result in potentially significant land use impacts, as this alternative it would not be consistent with the CHSP General Plan, and would therefore require the approval of a General Plan amendment by the California Parks and Recreation Commission.

Alternative Conclusion

RETAINED FOR FURTHER ANALYSIS. This alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would have the potential to reduce construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route by approximately 7.4 miles. While impacts would be shifted to CHSP, the proposed 500-kV T/L would parallel existing T/Ls through the park and the switching station would be placed near the existing infrastructure just east of the park. Furthermore, the use gas insulated technology for the switching station would allow it to be built with a profile that closely blends with the surrounding environment, minimizing potential visual impacts. Therefore, this alternative has been retained for further analysis in the EIR/EIS.

SUMMARY

Chino Hills Route B Alternative	Meets Project Purpose? Yes[1]	Feasible? Yes[2]	Meets Reliability Criteria? Yes[3]
Explanations: [1] This alternative would allow for the reliable interconnection of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints. [2] This alternative is feasible; however, it would not be consistent with the CHSP General Plan, which makes its legal feasibility dependent on approval of a General Plan amendment by the California Parks and Recreation Commission. [3] Meets CAISO/NERC/WECC requirements.			
Environmental Advantages • Avoids proximity to existing residents in the City of Chino Hills • Eliminates construction of approximately 16 miles of 500-kV structures along Segment 8A from S8A MP19.2 to Mira Loma Substation through Chino Hills, Chino, and Ontario reducing air quality, biology, noise, and visual impacts • Eliminates construction in Segments 8B and 8C between Chino and Mira Loma Substations		Environmental Disadvantages • Would place approximately 8.6 miles of new 500-kV T/L within new ROW (expand ROW by 150 feet), including 4.3 miles within CHSP, potentially increasing biology, recreational, and visual impacts • Would require a new 500-kV switching station (outside of CHSP) potentially increasing biology, land use, and visual impacts • Would be inconsistent with the CHSP General Plan and therefore have potentially significant land use impacts	
Conclusion: Retained for Further Analysis			

3.3.13 Chino Hills Route C Alternative

Alternative Description

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 3.3-12, this alternative would deviate from the proposed Project/Action 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 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 Walnut/Olinda-Mira Loma 220-kV double-circuit T/L up to the CHSP boundary (approximately 3.9 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 1.6 miles, which would remain just north of the CHSP boundary, to a new 500-kV switching station (SCE, 2008b – DR#4: Q4-34 and Q4-37). Approximately 30 double-circuit 500-kV LSTs would be required for this approximately 5.5-mile re-route to the new switching station (SCE, 2008b – DR#4: Q4-35).

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 a minimum of 4 to 5 acres in size, assuming the use of gas-insulated technology, or as much as 11 to 12 acres for air-insulated technology, allowing for power to be transferred along the existing 500-kV T/Ls to Mira Loma Substation. For the switching station utilizing gas-insulated technology, a lower profile would result. 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#5-07). The entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c – DR#5-07). For an open-air switching station, standard traditional equipment and components would be utilized; however, a higher station profile would result. The two buses would be approximately 360-feet long and 65-feet high, and the six dead-end structures would each be approximately 108-feet high (SCE, 2008c – DR#5-07).

Approximately 3.0 miles of new ROW within CHSP would be required to re-route the existing 500-kV T/Ls in and out of the new switching station. The new north-south re-route into the switching station (1.5 miles) 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 (1.9 mile, of which 0.4 mile is outside of 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). To complete the two re-routes of the 500-kV T/Ls (approximately 3.4-miles) would require approximately 24 new single-circuit 500-kV LSTs (20 within CHSP and 4 outside CHSP) (SCE, 2008b – DR#4: Q4-35). In addition, approximately 15 LSTs (12 of which are within CHSP) of the existing single-circuit 500-kV T/Ls would be removed (2.5 miles) (SCE, 2008b – DR#4: Q4-36).

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 (1.6 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 0.4 mile to the boundary of CHSP. At this point, the re-routed 220-kV and 500-kV T/Ls would enter CHSP for approximately 1.5 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 3.5 mile 220-kV re-route, approximately 20 to 25 new double-circuit 220-kV LSTs would be required (6-8 within CHSP and 14-17 outside CHSP) (SCE, 2008b – DR#4: Q4-34). In addition, approximately 10 to 12 existing 220-kV double-circuit LSTs within CHSP and 2 to 4 outside CHSP would be removed (3.2 miles) (SCE, 2008b – DR#4: Q4-33 Update 2).

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. 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 70 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 (SCE, 2008b – DR#4: Q4-12).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

This alternative is feasible; however, it would not be consistent with the CHSP General Plan, which makes its legal feasibility dependent on approval of a General Plan amendment by the California Parks and Recreation Commission.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This routing alternative avoids proximity of the T/L to existing residences of the City of Chino Hills. Implementation of this alternative would eliminate construction of approximately 16 miles of 500-kV structures along Segment 8A beginning at approximately S8A MP 19.2 and ending at Mira Loma Substation (S8A MP 35.2), as well as eliminate construction in Segments 8B and 8C between Chino Substation and Mira Loma Substation. Air quality and biology impacts during construction as well as long-term visual impacts through Chino Hills, Chino, and Ontario would be reduced compared to the proposed Project/Action as a result. Furthermore, re-routing of the existing 220-kV T/Ls outside of CHSP would result in a net decrease of 1.7 miles of 220-kV T/Ls traversing the park, which would therefore reduce visual and recreational impacts within CHSP compared to baseline environmental conditions. Re-routing these 220-kV T/Ls would also reduce existing T/L impacts on the Water Canyon Preserve within CHSP.

Specific to this alternative (not part of the proposed Project), use of gas-insulted technology for the switching station versus open-air technology would result in a lower profile and would impact less land (4 to 5 acres vs. 11 to 12 acres), which would reduce potential visual and land use impacts associated with the new switching station.

Environmental Disadvantages

While this alternative would place the new 500-kV T/L parallel to existing T/Ls, it would require widening of approximately 3.9 miles of the existing ROW by 150 feet to accommodate the new 500-kV T/L. In addition, approximately 1.6 miles of new 300-foot-wide ROW outside of CHSP would be required to connect into the new switching station, as well as 1.9 miles (1.5 miles within CHSP and 0.4 mile outside CHSP) of new 480-foot to re-route the 220-kV and 500-kV T/Ls from the new switching station, around raptor ridge, to reconnect with the existing T/Ls located in CHSP. Re-routing of the existing 500-kV T/Ls would result in a net *increase* of 0.5 mile of 500-kV T/L within CHSP, although as noted above (Environmental Advantages) the re-routing of the existing 220-kV T/Ls would result in a net *decrease* of 1.7 miles of 220-kV T/L within CHSP. Overall, this alternative would require the establishment of approximately 8.9 miles of new/expanded ROW. The need for expanded/new ROW would result in greater biological impacts compared to the proposed route, where construction between S8A MP 19.2 and 35.2 would occur within existing ROW, with the exception of approximately 0.45 miles of new ROW west of Mira Loma Substation.

This alternative would also require the establishment of a new switching station just west of CHSP, further increasing biological impacts. The area where the switching station is proposed has been identified as an area of potential contamination, which has resulted from activities that previously occurred on the

Aerojet property to the north. The past activities on the Aerojet property, which is currently listed as a Resource Conservation and Recovery Act (RCRA) facility with on-going cleanup, included the open-burn/detonation of waste ordnance. These activities have resulted in radioactive material, such as uranium, tear gas residue, rocket fuel (perchlorate), and fragments of exploded and unexploded ordnance, which may have projected radially out from the open-burn/detonation area. Sweeps of these radial impact areas using geophysical methods have identified ordnance fragments at distances as far as 2,200 feet and within CHSP. Consequently, the Aerojet property and surrounding properties, including areas of CHSP, are under corrective action investigation and cleanup as required by the Department of Toxic Substance Control (DTSC). As of September 2008, all 29 individual Solid Waste Management Units and Areas of Concern identified within the Aerojet facility have been assigned "no further action" status related to chemical contamination. Aerojet has completed field activities designed to fill in data gaps in order to locate and remove ordnance with results and reports anticipated to be submitted to DTSC in late spring or early summer 2009. As such, there remains a remote possibility that munitions and explosives of concern (MEC) may be present along the Route C alignment, access roads, and switching station. ~~As such, this site could be contaminated resulting in potentially significant hazards and hazardous materials impacts.~~ The addition of new infrastructure within CHSP would also result in potentially significant land use impacts, as this alternative would not be consistent with the CHSP General Plan, and would therefore require the approval of a General Plan amendment by the California Parks and Recreation Commission.

Alternative Conclusion

RETAINED FOR FURTHER ANALYSIS. This alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would have the potential to reduce construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route. Furthermore, re-routing of the existing 220-kV T/L results in a net decrease of 1.7 miles of 220-kV T/L within CHSP and reduces existing T/L impacts on the Water Canyon Preserve within CHSP. Therefore, this alternative has been retained for further analysis in the EIR/EIS.

SUMMARY

<table>
<tr><td>Chino Hills Route C Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints.
[2] This alternative would be feasible; however, it would not be consistent with the CHSP General Plan, which makes its legal feasibility dependent on approval of a General Plan amendment by the California Parks and Recreation Commission.
[3] Meets CAISO/NERC/WECC requirements.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Avoids proximity to existing residents in the City of Chino Hills
• Eliminates construction of approximately 16 miles of 500-kV structures along Segment 8A from S8A MP19.2 to Mira Loma Substation through Chino Hills, Chino, and Ontario reducing air quality, biology, noise, and visual impacts
• Eliminates construction in Segments 8B and 8C between Chino and Mira Loma Substations
• Re-routing existing 220-kV T/Ls outside of CHSP would result in a net decrease of 1.7 miles of 220-kV T/Ls traversing the park, thereby reducing visual and recreational impacts within CHSP compared to baseline environmental conditions</td><td colspan="2">Environmental Disadvantages
• Would require approximately 8.9 miles of new ROW, including 3.0 miles of new ROW within CHSP potentially increasing biology, recreational, and visual impacts
• Re-routing existing 500-kV T/Ls outside of CHSP would result in a net increase of 0.5 miles of 500-kV T/Ls traversing the park, thereby increasing visual and recreational impacts within CHSP compared to baseline environmental conditions
• Would require a new 500-kV switching station outside of CHSP potentially increasing biology, land use, and visual impacts
• <s>The switching station and re-routed T/Ls would be located on potentially contaminated land that could result in potentially significant hazards and hazardous materials impacts</s>
• Would be inconsistent with the CHSP General Plan and therefore have potentially significant land use impacts</td></tr>
<tr><td colspan="4">Conclusion: Retain for Further Analysis</td></tr>
</table>

3.3.14 Chino Hills Route D Alternative

Alternative 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 3.3-13, this alternative would deviate from the proposed Project/Action 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 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 Walnut/Olinda-Mira Loma 220-kV double-circuit T/L for approximately 3.9 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 4.0 miles to just east of Bane Canyon. At this point the alignment would turn southeast, traversing the northeast corner of CHSP for approximately 1.3 miles, at which point the new 500-kV T/L would turn northeast again parallel and north of the existing T/Ls for approximately 0.4 mile (outside CHSP) before terminating at a new 500-kV switching station located outside of CHSP, just south of the existing 500-kV T/Ls. The existing 500-kV T/Ls located in this area would be looped into the new switching station, which would require approximately 6 single-circuit and 2 double-circuit 500-kV structures (SCE, 2008b – DR#4: Q4-44 Update 2). For this approximately 9.6-mile re-route, approximately 35 to 37 new double-circuit 500-kV structures would be required, of which approximately 4 to 6 would be within CHSP (SCE, 2008b – DR#4: Q4-44 Update 2).

The new switching station would be a minimum of 4 to 5 acres in size, assuming the use of gas-insulated technology, or as much as 11 to 12 acres for air-insulated technology, allowing for power to be transferred along the existing 500-kV transmission lines to Mira Loma Substation. For the switching station utilizing gas-insulated technology, a lower profile would result. 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#5-07). The entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c – DR#5-07). For an open-air switching station, standard traditional equipment and components would be utilized; however, a higher station profile would result. The two buses would be approximately 360-feet long and 65-feet high, and the six dead-end structures would each be approximately 108-feet high (SCE, 2008c – DR#5-07).

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. 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 (SCE, 2008b – DR#4: Q4-12).

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

This routing alternative eliminates the proximity of the T/L to most of the existing residences in the City of Chino Hills. Implementation of this alternative would eliminate construction of approximately 16 miles of 500-kV structures along Segment 8A beginning at approximately S8A MP 19.2 and ending at Mira Loma Substation (S8A MP 35.2), as well as eliminate construction in Segments 8B and 8C between Chino Substation and Mira Loma Substation. Air quality and biology impacts during construction as well as long-term visual impacts through Chino Hills, Chino, and Ontario would be reduced compared to the proposed Project/Action as a result.

Specific to this alternative (not part of the proposed Project), use of gas-insulted technology for the switching station versus open-air technology would result in a lower profile and would impact less land (4 to 5 acres vs. 11 to 12 acres), which would reduce potential visual and land use impacts associated with the new switching station.

Environmental Disadvantages

While this alternative would place the new 500-kV T/L parallel to existing T/Ls, it would require widening of approximately 3.9 miles of the existing ROW by 150 feet to accommodate the new 500-kV T/L. In addition, approximately 5.7 miles of new 200-foot-wide ROW (1.3 miles within CHSP and 4.4 miles outside CHSP) would be required to connect into the new switching station. The need for expanded/new ROW would result in greater biological impacts compared to the proposed route, where construction between S8A MP 19.2 and 35.2 would occur within existing ROW, with the exception of approximately 0.45 miles of new ROW west of Mira Loma Substation. This alternative would also require the establishment of a new switching station east of CHSP, further increasing biological impacts.

The addition of new 500-kV structures within and in the vicinity of CHSP and a new switching station in the vicinity of CHSP would have the potential to result in substantial long-term visual impacts both to CHSP and to the residents of the City of Chino Hills, as this new infrastructure would be located within several hundred feet of existing residences of the City of Chino Hills and in close proximity to an approved housing development (TT15989). In addition, the new infrastructure within CHSP would result in potentially significant land use impacts, as this alternative would not be consistent with the CHSP General Plan, and would therefore require the approval of a General Plan amendment by the California Parks and Recreation Commission. Furthermore, the portion of the T/L re-route along the northern border of CHSP would be located on land identified as an area of potential contamination. The past activities on the Aerojet property located to the north, which is currently listed as a Resource Conservation and Recovery Act (RCRA) facility with on-going cleanup, included the open-burn/detonation of waste ordnance. These activities have resulted in radioactive material, such as uranium, tear gas residue, rocket fuel (perchlorate), and fragments of exploded and unexploded ordnance, which may have projected radially out from the open-burn/detonation area. Sweeps of these radial impact areas using geophysical methods have identified ordnance fragments at distances as far as 2,200 feet and within CHSP. Consequently, the Aerojet property and surrounding properties, including areas of CHSP, are under corrective action investigation and cleanup as required by the Department of Toxic Substance Control (DTSC). As of September 2008, all 29 individual Solid Waste Management Units and Areas of Concern identified within the Aerojet facility have been assigned "no further action" status related to chemical contamination. Aerojet has completed field activities designed to fill in data gaps in order to locate and remove ordnance with results and reports anticipated to be submitted to DTSC in late spring or early summer 2009. As such, there remains a remote possibility that munitions and explosives of concern (MEC) may be present along the Route D alignment and access roads. ~~As such, this area could be contaminated resulting in potentially significant hazards and hazardous materials impacts.~~

Alternative Conclusion

RETAINED FOR FURTHER ANALYSIS. This alternative would meet the objectives/purpose and need of the TRTP, would be feasible, and would have the potential to reduce construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route by approximately 6.4 miles. Of the four Chino Hills routing alternatives (Routes A to D), Route D would result in the least amount of new double-circuit 500-kV T/L within CHSP (1.3 miles). Therefore, this alternative has been retained for further analysis in the EIR/EIS.

SUMMARY

<table>
<tr><td>Chino Hills Route D Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the reliable interconnection of new wind generation resources in the TWRA, would meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints.
[2] This alternative would be feasible.
[3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Avoids proximity to most existing residents in the City of Chino Hills
• Eliminates construction of approximately 16 miles of 500-kV structures along Segment 8A from S8A MP19.2 to Mira Loma Substation through Chino Hills, Chino, and Ontario reducing air quality, biology, noise, and visual impacts
• Eliminates construction in Segments 8B and 8C between Chino and Mira Loma Substations</td><td colspan="2">Environmental Disadvantages
• Would require approximately 9.6 miles of new ROW, including 1.3 miles of new ROW within CHSP (3.9 miles expanded ROW by 150 feet and 5.7 miles new 200-foot-wide ROW) potentially increasing biology, recreational, and visual impacts
• T/L would be located within several hundred feet of about 25 existing residences of the City of Chino Hills and in close proximity to an approved housing development (TT15989)
• Would require a new 500-kV switching station outside of CHSP potentially increasing biology, land use, and visual impacts
~~• The re-routed T/L would be located on potentially contaminated land that could result in potentially significant hazards and hazardous materials impacts~~
• Would be inconsistent with the CHSP General Plan and therefore have potentially significant land use impacts</td></tr>
<tr><td colspan="4">Conclusion: Retain for Further Analysis</td></tr>
</table>

3.3.15 San Gabriel Valley New Corridor Alternative

Alternative Description

This alternative would differ from the proposed Project/Action within Segments 7 and 8a only. Under the proposed Project/Action, Segment 7 would begin at the southern boundary of the ANF, where the new Rio Hondo-Vincent No. 2 500-kV T/L and the new Mira Loma-Vincent 500-kV T/L would proceed south within the existing T/L corridor to the Rio Hondo and Mira Loma Substations, respectively. Under this alternative, the new Rio Hondo-Vincent No. 2 T/L would follow the existing Antelope-Mesa alignment and terminate at the Rio Hondo Substation, same as the proposed Project/Action. However, unlike the proposed Project/Action, the existing Antelope-Mesa 220-kV T/L would be removed and replaced with single-circuit 500-kV structures rather than double-circuit 500-kV structures. Double-circuit 500-kV structures would not be required between the southern boundary of the ANF and the Rio Hondo Substation as the new Mira Loma-Vincent 500-kV T/L would no longer follow the Antelope-Mesa alignment south of the ANF.

As shown in Figure 3.3-14, the new Mira Loma-Vincent 500-kV T/L would instead proceed east upon leaving the ANF, along the foothills of the San Gabriel Mountains, between the southern border of the ANF and the cities of Azusa, Glendora, San Dimas, La Verne, Claremont, Upland, and Rancho Cucamonga. This alternative route would skirt along the foothills within a new approximately 200-foot wide ROW for approximately 20 miles. The new Mira Loma-Vincent 500-kV T/L would turn south at Blanchard Street in Rancho Cucamonga, and would continue south within the existing Lugo-Serrano transmission corridor, which parallels Day Creek. The new Mira Loma-Vincent 500-kV T/L would stay within this existing corridor for approximately 10 miles 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. The existing Antelope-Mesa 220-kV T/L between Rio Hondo Substation and Mesa Substation would be left in place.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard. It would also meet projected load growth in the Antelope Valley and would address South of Lugo transmission constraints.

Feasibility

No feasibility issues have been identified.

Reliability

Implementation of this alternative would comply with CAISO, NERC, and WECC requirements.

Environmental Advantages

For this alternative, construction activities between Rio Hondo Substation and Chino Substation within Segments 7 and 8a would not occur. As a result, air quality, noise, traffic, and visual impacts in these areas would be eliminated. Construction and operational impacts within several environmentally sensitive areas, including the Puente Hills, would be avoided. Additionally, this alternative would address visual as well as public health and safety concerns raised by the public during the scoping period by eliminating the need to upgrade the transmission network through densely populated residential areas within the City of Chino Hills.

Environmental Disadvantages

The need to establish a new 200-foot-wide east-west corridor for more than 20 miles along the foothills of the San Gabriel Mountains would result in additional impacts to air quality, biology, noise, traffic, and visual resources. In addition, the new corridor would parallel the Sierra Madre Fault, presenting potential geotechnical issues. Although this alternative would reduce the construction-related impacts associated with the upgrades in Segments 7 and 8a along the proposed route, the creation of a new transmission corridor would require new access roads and spur roads along steep terrain. Construction on steep terrain creates a high potential for erosion, and would likely require extensive grading and earth-moving activities. Access to the new transmission corridor would be very difficult in some of the steep canyons that would be traversed by this alternative route, and construction could require extensive use of helicopters, thus increasing air quality and noise impacts. In addition, by skirting the southern boundary of the ANF, this alternative route would pass by several foothill communities, and may require the acquisition of private property and/or residences in order to complete the new transmission corridor. Therefore, the impacts associated with this alternative are expected to be greater in comparison to the proposed Project/Action.

Alternative Conclusion

ELIMINATED. While this alternative would meet the project objectives/purpose and need, and would be feasible, this alternative would require establishment of more than 20 miles of new east-west corridor along the foothills of the San Gabriel Mountains. 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/Action without creating greater impacts of its own. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>San Gabriel Valley New Corridor Alternative</td><td>Meets Project Purpose?
Yes[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the interconnection of up to 4,500 MW of new wind generation resources in the TWRA, would be designed to meet projected load growth in the Antelope Valley, and would address South of Lugo transmission constraints.
[2] This alternative would be feasible.
[3] Meets CAISO/NERC/WECC requirements. No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Avoids environmental impacts associated with construction and operation of a 500-kV T/L along Segments 7 and 8a between the Rio Hondo Substation and Chino Substation</td><td colspan="2">Environmental Disadvantages
• Need to establish a new east-west T/L corridor (200-feet wide) for 20 miles along the foothills of the San Gabriel Mountains between Duarte and Rancho Cucamonga, resulting in additional environmental impacts (air quality, biological resources, land use, noise, traffic, visual)
• East-west corridor would parallel the Sierra Madre Fault (geotechnical issues)
• Potential need to acquire private property and/or residences resulting in additional land use impacts</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.4 System Alternatives

3.4.1 Transmission Lines to Midway Substation Alternative

Alternative Description

This system alternative was suggested by SCE in its PEA (System Alternative 1). This alternative would construct a new 500-kV T/L from Whirlwind Substation northwest to Midway Substation located near Bakersfield, as shown in Figure 3.4-1. The new 500-kV T/L would be located within a new ROW paralleling the existing transmission corridor (Midway-Vincent) between Whirlwind Substation and Midway Substation (approximately 76 miles). As a result of this alternative, upgrades within the approximately 16 miles between Whirlwind Substation and Antelope Substation (Segment 4) would not occur; however, the proposed upgrades for Segments 5 through 11 would continue to be required. This alternative would be approximately 76 miles longer than the proposed route.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

This alternative would allow for the interconnection of new wind generation resources in the TWRA; however the power would enter PG&E's system rather than SCE's system, which would likely result in the need for additional upgrades to the PG&E system to maintain system reliability. Furthermore, this alternative would only provide a minimal benefit to load growth in the Antelope Valley, as the new wind generation would not connect into Antelope Substation. South of Lugo transmission constraints would be addressed by this alternative, as upgrades would continue to occur south of Antelope Substation (Segments 5 through 11).

Feasibility

No feasibility issues have been identified.

Reliability

As noted above the reliability of the PG&E system would need to be evaluated to ensure compliance with CAISO, NERC, and WECC requirements.

Environmental Advantages

Implementation of this alternative would eliminate the need for construction between the Antelope Substation and the Whirlwind Substation, which would reduce air quality, biology, noise, traffic and visual impacts, among others, along this approximately 16-mile segment.

Environmental Disadvantages

As part of this alternative, upgrades within Segments 5 through 11 would continue to be required, same as the proposed Project/Action. In addition, approximately 76 miles of new ROW would need to be established between the Whirlwind and Midway Substations, resulting in increased air quality, biology, land use, noise, and visual impacts.

Alternative Conclusion

ELIMINATED. Not only would this alternative 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/Action, but 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. Therefore, this alternative has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Transmission Lines to Midway Substation Alternative</td><td>Meets Project Purpose?
Partially[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Unknown[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would allow for the interconnection of new wind generation resources in the TWRA; however the power would enter the PG&E system rather than SCE's system. Furthermore, this alternative would only provide a minimal benefit to load growth in the Antelope Valley, as the new wind generation would not connect into Antelope Substation. South of Lugo transmission constraints would be addressed by this alternative.
[2] This alternative would be feasible.
[3] Reliability of the PG&E system would need to be evaluated to ensure compliance with CAISO/NERC/WECC requirements.</td></tr>
<tr><td colspan="2">Environmental Advantages
• Eliminates construction between Antelope and Whirlwind Substations (approximately 16 miles)</td><td colspan="2">Environmental Disadvantages
• Upgrades in Segments 5 through 11 would continue to be required
• Longer than proposed route (approximately 76 miles) and within new ROW, resulting in greater air quality, biology, land use, noise, and visual impacts</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

3.4.2 Non-Transmission System Alternative

Alternative Description

This system alternative was suggested by SCE in its PEA (System Alternative 2). It would include the development of in-basin generation, such as new gas, solar, and/or geothermal power plants, instead of interconnecting generation from the TWRA. Other generation could include distributed generation, such as solar panels installed on building rooftops. In addition, demand-side management and energy efficient programs would be implemented.

Consideration of CEQA/NEPA Criteria

Project Objectives/Purpose and Need

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 Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electrical system. Numerous applications have been submitted by generation developers requesting interconnection with the TWRA. Because SCE is obligated to interconnect generation as requested, non-transmission system alternatives would not fulfill this requirement, nor would they eliminate the need to provide the electrical facilities necessary to integrate up to 4,500 MW of new wind generation in the TWRA. Furthermore, use of in-basin generation, distributed generation, and demand-side management and energy efficient programs would not necessarily meet projected load growth in the Antelope Valley or address the South of Lugo transmission constraints, which have been an ongoing source of reliability concern for the Los Angeles Basin. As such, this alternative would not meet the basic objectives/purpose and need of the TRTP.

Feasibility

This alternative would be feasible, although new sources of in-basin generation would need to be identified, evaluated, and built. Furthermore, SCE would have limited ability to require or increase the use of distributed generation.

Reliability

No reliability issues have been identified.

Environmental Advantages

Upgrades would continue to be required to integrate up to 4,500 MW of new wind generation in the TWRA. As such, this alternative does not appear to offer any substantial or notable environmental advantages.

Environmental Disadvantages

New sources of in-basin generation would result in site-specific impacts associated with the construction and installation of new gas, solar, and/or geothermal power plants, which would result in air quality, biology, land use, noise, traffic, and visual impacts, among others. Similarly, distributed generation would have site-specific impacts. Furthermore, ~~T~~transmission upgrades may also be required to integrate these sources into the transmission system.

Alternative Conclusion

ELIMINATED. Because this alternative does not meet the basic objectives/purpose and need of the TRTP, it has been eliminated from further consideration.

SUMMARY

<table>
<tr><td>Non-Transmission System Alternative</td><td>Meets Project Purpose?
No[1]</td><td>Feasible?
Yes[2]</td><td>Meets Reliability Criteria?
Yes[3]</td></tr>
<tr><td colspan="4">Explanations:
[1] This alternative would not interconnect new wind generation resources in the TWRA, would not necessarily meet projected load growth in the Antelope Valley or address South of Lugo transmission constraints.
[2] This alternative would be feasible, although new sources of in-basin generation would need to be identified, evaluated, and built. SCE would have limited ability to require or increase the use of distributed generation.
[3] No reliability issues identified.</td></tr>
<tr><td colspan="2">Environmental Advantages
• No substantial or notable environmental advantages identified. Upgrades would continue to be required to integrate up to 4,500 MW of new wind generation in the TWRA.</td><td colspan="2">Environmental Disadvantages
• New sources of in-basin generation would result in site-specific impacts associated with the construction and installation of new gas, solar, and/or geothermal power plants, which would result in air quality, biology, land use, noise, traffic, and visual impacts, among others.
• Distributed generation would have site-specific impacts.
• Transmission upgrades may also be required to integrate these sources into the transmission system.</td></tr>
<tr><td colspan="4">Conclusion: Eliminate from Further Analysis</td></tr>
</table>

4.0 Summary of Alternative Screening Results

Proposed alternatives identified by the Applicant (SCE), the EIR/EIS team, public agencies, and the public are listed below in Table 4-1 according to the determination made for EIR/EIS analysis (i.e., whether or not each is analyzed in the EIR/EIS or eliminated from further analysis). Section 3 describes each of the listed alternatives in detail, and presents the rationale for elimination of each alternative that is not analyzed. The table below presents a summary of the conclusions of Section 3, identifying alternatives that were eliminated and those that are carried forward for full EIR/EIS analysis.

Table 4-1. Summary of Alternative Screening Results

Alternative	Retained or Eliminated	Comments / Fatal Flaws
Whirlwind Substation Site A Alternative	Eliminated	Proposed as an aquifer recharge facility resulting in soil stability issues
Whirlwind Substation Site B Alternative	Eliminated	Located on previously undisturbed land; Requires substantially more grading , increasing potential for biological impacts
Upgrade Transmission Through ANF in Segment 6 Only Alternative	Eliminated	Does not meet CAISO/NERC/WECC requirements and is therefore legally infeasible
Upgrade Transmission Through ANF in Segment 11 Only Alternative	Eliminated	Requires new east-west corridor paralleling the Sierra Madre Fault resulting in potentially significant land use and geotechnical impacts
Reduced Upgrades in Segment 6 Alternative	Eliminated	Does not meet basic objectives/purpose and need of the TRTP as the Antelope-Mesa 220-kV T/L, which is a choke point in the transmission system, is not replaced
Co-Locate All SCE T/Ls in Either Segment 6 or 11 Across the ANF Alternative	Eliminated	Does not meet CAISO/NERC/WECC requirements and is therefore legally infeasible
Reduced Number of 220-kV T/Ls in the ANF Alternative	Eliminated	Schedule for upgrades to substations (4 to 5 years) prevents compliance with the Renewables Portfolio Standard; Results in greater construction impacts as a result of additional activities to remove 220-kV T/Ls in Segment 6 and 11; Feasibility of construction in Segment 11 south of Gould unknown
Minimize 500-kV Upgrades Alternative	Eliminated	Does not meet basic objectives/purpose and need of the TRTP as the transmission system would not be designed to allow for future increases in voltage operation from 220 kV to 500 kV preventing the reliable interconnection of the full 4,500 MW
Segments 6 and 11 Double-Circuit Structures Alternative	Eliminated	Requires a new double-circuit structure family to be developed, where the reliability and feasibility of these structures is unknown; results in a less reliable design as failure of a single tower would result in the loss of two T/Ls rather than one, and the potential for such a loss is greater within the ANF due to the extreme weather conditions; new towers would be bulkier and taller (depending on terrain) and would result in a greater potential for skylined conditions; would require additional intermediate towers; may require the placement of towers outside of the existing ROW to circumvent large valleys; fire safety issues may increase as it may be necessary to locate the new towers along ridge tops to circumvent the large valleys; may result in the need for even more additional towers along the existing adjacent lines for clearance purposes; may result in the need for additional towers along the existing adjacent lines for clearance; may not be feasible to construct by helicopter, resulting in the need for additional access roads; and results in increased environmental impacts associated with the removal of the existing 220-kV structures that would otherwise be untouched
Segments 7/8A Single-Circuit 500-kV Structures Alternative	Eliminated	Would require expansion of the existing ROW in Segment 7, which is not viable due to existing infrastructure (San Gabriel River and 605 Freeway), rendering this alternative infeasible

Table 4-1. Summary of Alternative Screening Results

Alternative	Retained or Eliminated	Comments / Fatal Flaws
Partial Underground Alternative	Retained	Reduces potentially significant visual impacts in the City of Chino Hills
Partial Composite Core Conductor Alternative	Eliminated	Limits system capacity such that the objectives/purpose and need of the TRTP are not met; does not reduce significant impacts, except slightly for visual resources
Segment 10A Route Alternative	Eliminated	Would not offer any substantial or noticeable improvement over the proposed route and is longer
Segment 10B Route Alternative	Eliminated	Would not offer any substantial or noticeable improvement over the proposed route and is longer
Windhub Substation to Cottonwind Substation to Whirlwind Station Alternative	Eliminated	Requires new 25-mile, 200-foot-wide corridor along the foothills of the Tehachapi Mountain Range resulting in greater impacts (air quality, biology, noise, traffic, water, visual); potentially interferes with wind generation projects planned in the area
Whirlwind Substation to Antelope Substation Alternative	Eliminated	Establishes a new transmission corridor which would result in a longer alignment and greater impacts (air quality, biology, land use, noise, and visual)
Antelope Substation to Vincent Substation Alternative	Eliminated	Establishes a new transmission corridor which would result in a longer alignment and greater impacts (air quality, biology, land use, noise, and visual)
Use LADWP Transmission Corridor through the ANF Alternative	Eliminated	Establishes a new transmission corridor which would result in a longer alignment and greater impacts (air quality, biology, land use, noise, and visual)
New SCE Corridor Across the ANF Alternative	Eliminated	Establishes a new transmission corridor which would result in a longer alignment and greater impacts (air quality, biology, land use, noise, and visual)
New Corridor along Highway 14 Alternative	Eliminated	Establishes a new transmission corridor which would result in a longer alignment and greater impacts (air quality, biology, land use, noise, and visual)
New Corridor through Cajon Pass Alternative	Eliminated	Establishes a new transmission corridor which would result in a longer alignment and greater impacts (air quality, biology, land use, noise, and visual)
West Lancaster Alternative	Retained	Minimizes disturbance to current residences and access to properties along 110th Street West
Chino Hills Route A Alternative	Retained	Potentially reduces construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route by approximately 9.8 miles
Chino Hills Route B Alternative	Retained	Potentially reduces construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route by approximately 7.4 miles
Chino Hills Route C Alternative	Retained	Potentially reduces construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route, results in a net decrease of 1.7 miles of 220-kV T/L within CHSP, and reduces existing T/L impacts on the Water Canyon Preserve within CHSP
Chino Hills Route D Alternative	Retained	Potentially reduces construction impacts (air quality and biology) and long-term visual impacts to the residences of Chino Hills, Chino, and Ontario as a result of shortening the overall route by approximately 6.4 miles, and would result in the least amount of new double-circuit 500-kV T/L within CHSP (1.3 miles) compared to the other Chino Hills routing alternatives (Routes A to C)
San Gabriel Valley New Corridor Alternative	Eliminated	Requires new 20-mile, 200-foot-wide corridor along the foothills of the San Gabriel Mountains resulting in greater impacts (air quality, biology, land use, noise, traffic, and visual).
Transmission Lines to Midway Substation Alternative	Eliminated	Requires 76 miles of new ROW between Whirlwind and Midway Substations and would likely result in the need for extensive additional (undefined) upgrades with the PG&E transmission system

Table 4-1. Summary of Alternative Screening Results

Alternative	Retained or Eliminated	Comments / Fatal Flaws
Non-Transmission System Alternative	Eliminated	Does not meet basic objectives/purpose and need of the TRTP as SCE is obligated to interconnect and integrate power generation facilities such as those in the TWRA into its electrical system

5.0 References

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Appendix B.
Notices and Angeles National Forest Contact List

Appendix B.1
Notice of Preparation,
Notice of Intent (Federal Register Notice)

Tehachapi Renewable Transmission Project
Proposed by Southern California Edison Company
Application No. A.07-06-031

Notice of Preparation

For a Joint
Environmental Impact Report/Environmental Impact Statement
and
Notice of Public Scoping Meetings

Si usted necesita más información o una copia de este documento en español, por favor, llame al (888) 331-9897 o visite la siguiente página Web.

이 서류의 한국어 사본이 필요하거나 다른 정보를 원하는 분은 전화 (888) 331-9897번을 이용하시거나 아래의 웹 사이트를 방문하십시오.

如果您需要本文件的中文版本或其他相關資訊，請致電(888)331-9897，或拜訪下列 網站。

ftp://ftp.cpuc.ca.gov/gopher-data/environ/tehachapi_renewables/TRTP.htm

A. Introduction

The California Public Utilities Commission (CPUC) and the USDA Forest Service (Forest Service) will direct the preparation of a joint Environmental Impact Report (EIR) and Environmental Impact Statement (EIS), referred to as an EIR/EIS, for the Tehachapi Renewable Transmission Project (TRTP) proposed by Southern California Edison (SCE). Under the direction of the CPUC as the lead California State agency, and the Forest Service as the lead federal agency, a draft and final EIR/EIS will be prepared to comply with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The CPUC and Forest Service invite written comments on the scope of this environmental analysis. In addition, the agencies have provided this notice so that interested and affected agencies, organizations, and individuals are aware of how they may participate and contribute to the final decision.

This Notice of Preparation (NOP) is being sent to affected agencies and interested members of the public. The purpose of the NOP is to inform recipients that the CPUC is beginning preparation of the TRTP EIR/EIS and to solicit information that will be helpful in the environmental review process. **This notice includes a description of the project that SCE proposes to construct, a summary of potential project impacts, the times and locations of public scoping meetings, and information on how to provide comments to the CPUC and Forest Service.**

As required by NEPA, the Forest Service will publish in the Federal Register a Notice of Intent (NOI) to prepare a joint EIR/EIS for the TRTP. Similar to this NOP, the NOI will initiate the public scoping for the EIR/EIS, provide information about the proposed project, and serve as an invitation for agencies and the public to provide comments on the scope and content of the EIR/EIS.

B. Summary of the Proposed Project

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 Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system. In addition, the 2001 National Energy Policy goals are to increase domestic energy supplies, modernize and improve our nation's energy infrastructure, and improve the reliability of the delivery of energy from its sources to points of use. Executive Order 13212 encourages increased production and transmission of energy in a safe and environmentally sound manner. According to Executive Order 13212, for energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects. The agencies shall take such actions to the extent permitted by law and regulations, and where appropriate.

SCE proposes to construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County. The proposed project involves several types of transmission upgrades including: (1) construction of new 500-kV transmission lines; (2) construction of new single-circuit 220-kV transmission lines; (3) re-building of existing 220-kV lines to 500-kV standards; (4) re-building of existing single-circuit transmission lines to double-circuit transmission lines; (5) relocation of several existing 66-kV subtransmission lines; (6) construction of a new 500-kV substation; and (7) upgrades or expansions of five existing substations. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately three miles would require expanded right-of-way within the Angeles National Forest. As indicated in the 2005 Angeles National Forest Land and Resource Management Plan, the proposed routes are within designated utility corridors.

The proposed transmission system upgrades are separated into eight distinct segments as described below.[1] See Figure 1 for the location of these system upgrades.

- **Segment 4:** Construct a new approximately 16-mile single-circuit 500-kV transmission line from the new Whirlwind Substation to the existing Antelope Substation. SCE would initially energize the transmission line at 220 kV with the intent of energizing the system to 500 kV in the future, as more wind projects are developed. The existing right-of-way would be expanded by 200 feet and include construction of two new parallel approximately four-mile single-circuit 220-kV transmission lines from the proposed Cottonwind Substation (not part of this project) to the new Whirlwind Substation.

- **Segment 5:** Replace two single-circuit 220-kV transmission lines (Antelope-Vincent and Antelope-Mesa) with a new approximately 18-mile single-circuit 500-kV transmission line in existing right-of-way between Antelope Substation and Vincent Substation.

- **Segment 6**: Replace 27 miles of the Antelope-Mesa 220-kV transmission line and five miles of the Rio Hondo-Vincent No. 2 with a single-circuit 500-kV transmission line between Vincent Substation and the southern Angeles National Forest boundary.

- **Segment 7:** Replace approximately 16 miles of the Antelope-Mesa 220-kV transmission line with a single-circuit 500-kV transmission line from the southern boundary of the Angeles National Forest to the Mesa Substation. In the Mesa and Chino areas, approximately 45 existing double-circuit 66-kV subtransmission line towers would be removed/relocated within the existing right-of-way or undergrounded.

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1 Segments 1, 2, and 3 are associated with the Antelope Transmission Project, which the CPUC evaluated in a separate and previous proceeding.

- **Segment 8:** Replace approximately 33 miles of 220-kV transmission line (from the San Gabriel Junction (two miles east of Mesa Substation) to the existing Mira Loma Substation) with both single- and double-circuit 500 kV transmission line. This segment would primarily use existing right-of-way except for three miles where expanded right-of-way would be needed in the Rose Hills Cemetery, Hacienda Heights, Fullerton Road, and Ontario.

- **Segment 9**: Construct a new 500/220-kV Whirlwind Substation and upgrade the Antelope Substation to include new 500-kV facilities. Expand and upgrade 500-kV facilities at Vincent Substation. Install reactive compensation equipment at Vincent Substation and Antelope Substation. Upgrade the Gould Substation, Mesa Substation, and Mira Loma Substation within the existing fence line.

- **Segment 10**: Construct a new approximately 17-mile single-circuit 500-kV transmission line in a new 330-foot-wide corridor from the approved WindHub Substation to the new Whirlwind Substation.

- **Segment 11:** Replace approximately 19 miles of single-circuit 220-kV transmission line with a single-circuit 500-kV transmission line from Vincent Substation to Gould Substation. SCE would initially energize this line at 220 kV. A second transmission line, approximately 18 miles of 220-kV circuit, would be installed on the vacant side of existing double-circuit 220-kV lattice steel towers (now carrying the Eagle Rock-Mesa 220-kV transmission line) between Gould Substation and Mesa Substation. This segment would primarily use existing right-of-way but would require expanded right-of-way for approximately three miles (north of Gould Substation on west side of the corridor) within the Angeles National Forest.

Construction activities associated with the proposed project would include upgrading five existing substations and construction of one new substation, construction of approximately 851 new towers, repairing existing access and spur roads along with the temporary use and construction of spur roads, and the temporary use of approximately 141 new pulling locations and 103 new splicing locations.

Purpose and Need for Project

The proposed project would provide the electrical facilities necessary to integrate new wind generation in excess of 700 MW and up to approximately 4,500 MW in the Tehachapi Wind Resource Area and accommodate solar and geothermal projects currently being planned or expected in the future. The project will also address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley and the South of Lugo transmission constraints.

C. Project Alternatives

The CPUC and Forest Service have not yet identified the alternatives that will be analyzed in the EIR/EIS. Preliminary concepts for project alternatives include alternative routes for some transmission segments. Alternative transmission line configurations and designs will also be considered. The alternatives currently under consideration (in addition to the proposed project) are:

- The **No-Project Alternative**, under which the proposed transmission line would not be constructed and no expansion activities would occur.

- The **Non-National Forest System Land Alternative** that would avoid National Forest System lands. This alternative will be developed during the environmental review process.

- **Alternate routing** between Windhub and Whirlwind Substations (Segment 10).

In addition to the alternatives listed above, additional alternatives may be evaluated in the Draft EIR/EIS based on input from agencies and the public and additional independent analysis by the CPUC and the Forest Service. The feasibility of each alternative is one of the considerations used to identify alternatives for further analysis in the EIR/EIS.

D. The EIR/EIS Process

As indicated in the summary of the proposed project, the proposed 500-kV transmission line would traverse National Forest System Land administered by the Forest Service (Segments 6 and 11). Thus, SCE will require right-of-way authorization and special use permits from the Forest Service. As part of the review process for the issuance of these permits, the Forest Service will prepare an EIS pursuant to NEPA requirements.

CEQA requires the CPUC to evaluate the environmental impacts that could result from the proposed project. Based on potential impacts identified in SCE's PEA, the CPUC determined that preparation of an EIR is required pursuant to CEQA. Therefore, a joint EIR/EIS will be prepared under the direction of both the State and federal lead agencies to satisfy permitting and decision-making requirements. CEQA and NEPA also require that the EIR/EIS development process include public notice of the proposed project and address significant issues that the public may have regarding the proposed project.

The Draft EIR/EIS will include an objective analysis of the potential environmental impacts of the proposed project and alternatives. When completed, the Draft EIR/EIS will be distributed for a 45-day public review period. A notice of availability of the Draft EIR/EIS will be sent to the State Clearinghouse by the CPUC and published in the Federal Register by the Forest Service. The CPUC and the Forest Service will consider all comments received on the Draft EIR/EIS during the public review period and will revise the document, as necessary, before issuing a Final EIR/EIS. The Final EIR/EIS will include responses to the comments received on the Draft EIR/EIS.

E. Proposed Scope of the EIR/EIS

The EIR/EIS will present the analysis of the environmental impacts of the proposed project and the alternatives, and will identify mitigation measures for significant impacts. The EIR/EIS will address the significant environmental issues identified during the scoping process or otherwise determined by the lead agencies. Attachment 1 includes a list of potential issues and impacts to the existing environment. No determinations have yet been made as to the significance of these potential impacts; such determinations will be made in the environmental analysis conducted in the EIR/EIS after the issues are considered thoroughly. The EIR/EIS will also evaluate the cumulative impacts of the project in combination with other past, present, and reasonably foreseeable future projects in the area.

Mitigation Measures

As part of its project application, SCE has proposed measures that could reduce or eliminate potential impacts of the proposed project. The effectiveness of these measures (called "applicant proposed measures") will be evaluated in the EIR/EIS, and additional measures ("mitigation measures") will be developed to further reduce impacts, if required. When the CPUC and the Forest Service each make their decisions on whether to approve the proposed project, they will identify the mitigation measures to be adopted as conditions of project approval, and will require monitoring of the implementation of those measures.

F. Project Scoping Process and Scoping Meetings

The process of determining the focus and content of the EIR/EIS is known as scoping. Scoping helps to identify the range of significant issues, alternatives, environmental effects, and mitigation measures to be analyzed in the EIR/EIS, and eliminates from detailed study those issues that are not significant or not relevant to the environmental analysis. Scoping is also an effective way to bring together and address the concerns of the public, affected agencies, and other interested parties. Significant issues may be identified through public and agency comments received during the scoping process.

Scoping is not conducted to resolve issues or make any determinations about the merits of the project. Rather, the purpose of scoping is to help ensure that a comprehensive and focused EIR/EIS will be prepared that helps provide a firm basis for the decision-making process. Members of the public, affected federal, State, and local agencies, the proponent of the project, interest groups, and other interested parties may participate in the scoping process by providing written and verbal comments regarding issues to be analyzed in the EIR/EIS. Comments can be given by attending the scheduled scoping meetings listed below and/or sending written comments to the address listed below.

Public Scoping Meetings. The CPUC and the Forest Service will conduct nine public scoping meetings as noted on Table 1. At these meetings, the CPUC and Forest Service will present information regarding the proposed project, the decision-making processes, and will listen to the views of the public on the range of issues relevant to the preparation of the Draft EIR/EIS.

Table 1. Public Scoping Meetings

Date and Time*	Location
Thursday, September 6, 2007 6:30 pm to 8:30 pm	Whittier La Serna High School, Cafeteria, 15301 Youngwood Drive, Whittier, CA 90605 562-698-8121
Monday, September 10, 2007 2:30 pm to 4:30 pm 6:30 pm to 8:30 pm	Palmdale Palmdale Cultural Center, 38350 Sierra Highway, Palmdale, CA 93550 661-267-5656
Tuesday, September 11, 2007 6:30 pm to 8:30 pm	Rosamond Kern County Library - Wanda Kirk Branch (Rosamond), 3611 Rosamond Blvd., Rosamond, CA 93561 661-256-3236
Wednesday, September 12, 2007 6:30 pm to 8:30 pm	Duarte Duarte Community Center, 1600 Huntington Drive, Duarte, CA 91010 626-357-7931
Thursday, September 13, 2007 6:30 pm to 8:30 pm	Rosemead Garvey Community Center, 9108 Garvey Avenue, Rosemead, CA 91770 626-569-2222
Wednesday, September 19, 2007 6:30 pm to 8:30 pm	Altadena Altadena Community Center, 730 E. Altadena Drive, Altadena, CA 91001 626-398-6174
Thursday, September 20, 2007 2:30 pm to 4:30 pm 6:30 pm to 8:30 pm	Chino Hills Chino Hills Council Chambers, 2001 Grand Avenue, Chino Hills, CA 91709 909-364-2625

*Depending on attendance, meetings may end earlier than noted.

The meeting locations are wheelchair accessible. However, if other accommodations for the handicapped are required (e.g., sign language interpreters), you must call (562) 947-5259. Attendees requiring language interpretation services must also call the EIR/EIS public involvement manager at (562) 947-5259.

Send in written comments by October 1, 2007, to:

John Boccio/ George Farra
California Public Utilities Commission/ Angeles National Forest
c/o Aspen Environmental Group
30423 Canwood Street, Suite 215
Agoura Hills, CA 91301

By Electronic Mail: E-mail communications are welcome; however, please remember to include your name and return address in the e-mail message. E-mail messages should be sent to TRTP@aspeneg.com.

By Fax: You may fax your comment letter to (888) 331-9897. Please remember to include your name and return address in the fax.

A **Scoping Report** will be prepared, summarizing all comments received (including oral comments made at the scoping meetings). This report will be posted on the project website (ftp://ftp.cpuc.ca.gov/gopher-data/environ/tehachapi_renewables/TRTP.htm). In addition, a limited number of copies will be available upon request to the CPUC.

Suggestions for Effective Participation in Scoping

1. **Review the description of the project** (see Section B of this document and the map provided) and **summary of potential impacts** (Attachment 1) that may occur with implementation of the project. The project website (noted above) includes additional information on the project; SCE's application and supporting information may be viewed on the project website.

2. **Attend one of the scoping meetings** to get more information on the project and the environmental review process (see Table 1 for dates and times of these meetings).

3. **Submit written comments**, or attend the scoping meetings and make oral comments. Explain important issues that the EIR/EIS should cover (see Attachment 1 for examples of potential issues). A comment form has been provided as part of this scoping package to facilitate preparation and submittal of written scoping comments.

4. **Suggest mitigation measures** that could reduce the potential impacts associated with SCE's proposed project.

5. **Suggest alternatives** to SCE's proposed project that could avoid or reduce the impacts of the proposed project.

G. Agency Comments

This NOP has been sent to State responsible and trustee agencies, affected local and federal agencies, the State Clearinghouse, and the Federal Register. We need to know the views of your agency as to the scope and content of the environmental information which reflects your agency's statutory responsibilities in connection with the proposed project. Once again, responses should identify the issues to be considered in the Draft EIR/EIS, including significant environmental issues, alternatives, mitigation measures, and whether the responding agency will be a responsible State agency, a cooperating federal agency, or a State trustee agency. In accordance with timeframes set forth in CEQA and NEPA, your response must be sent at the earliest possible date but no later than 30 days (October 1, 2007) after receipt of this notice. Please send your response to:

John Boccio/George Farra
California Public Utilities Commission/Angeles National Forest
c/o Aspen Environmental Group
30423 Canwood Street, Suite 215
Agoura Hills, CA 91301

H. Available Information

This NOP, the NOI, and all future project-related documents are available for review at local agency offices and public libraries near the proposed route. Refer to Attachment 2 for the locations of the document repository sites.

Internet Website: Information about this application and the environmental review process will be posted on the TRTP Internet website (see address below). This website will be used to post all public documents during the environmental review process and to announce upcoming public meetings.

ftp://ftp.cpuc.ca.gov/gopher-data/environ/tehachapi_renewables/TRTP.htm

SCE's Proponent's Environmental Assessment (PEA) is available for review in electronic format at the website. The PEA includes a detailed description of the project that SCE proposes to undertake, and it evaluates potential impacts of the project from SCE's perspective.

Project Information Hotline. You may request project information by leaving a voice message or sending a fax to (888) 331-9897.

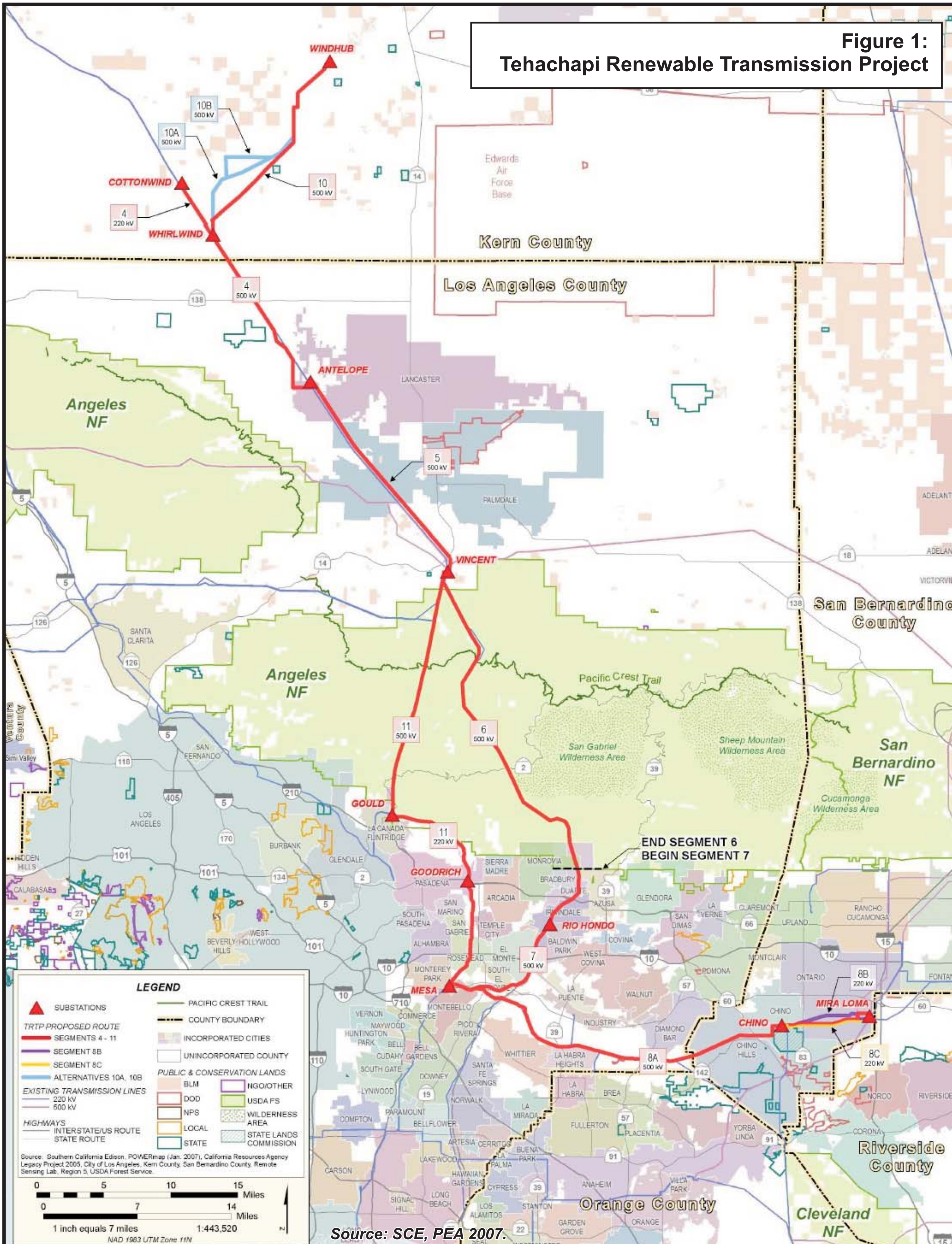
The California Public Utilities Commission and the USDA Forest Service hereby issues this Notice of Preparation of a joint Environmental Impact Report/Environmental Impact Statement.

John Boccio
California Public Utilities Commission
(415) 703-2641

George Farra
USDA Forest Service
(626) 574-5301

August 31, 2007

Figure 1:
Tehachapi Renewable Transmission Project



Source: SCE, PEA 2007.

Attachment 1. Summary of Potential Impacts: Tehachapi Renewable Transmission Project [2]

Environmental Issue Area	Potential Issues or Impacts
Aesthetics/Visual Resources	• Permanent impacts related to visual contrast, alterations in existing scenic integrity, blocked or partially blocked views and the introduction of industrial-like facilities and new sources of light and glare due to the placement of towers, new or expanded substations, and new access and spur roads in all project segments, including scenic vistas and other designated scenic resources. • Construction-related activities would result in the temporary degradation of existing visual character and quality in all project segments, including scenic vistas and other designated scenic resources. • Possible conflicts with federal, State and local plans, regulations or standards applicable to the protection of visual resources.
Agricultural Resources	• Project's potential to impact Prime Farmland, Farmland of Statewide Importance, and lands under Williamson Act Contracts.
Air Quality	• Impacts during construction would occur when heavy equipment, support vehicles, and other internal combustion engines creates fugitive dust and/or generates exhaust containing: carbon monoxide (CO), reactive organic compounds (ROC), nitrogen oxide (NOx), sulfur oxides (SOx), and particulate matter (PM10). • Impacts would result from fugitive dust generated from ground clearing, grading, vehicle traffic on the access roads, and vehicle traffic at the construction sites. • Potential ongoing impacts from emissions and fugitive dust produced during operation and maintenance of proposed transmission line. • Potential temporary and long-term impacts from toxic air contaminants including diesel particulate matter that have localized effects.
Biological Resources	• Construction activities and project facilities would result in temporary and permanent loss of native wildlife and habitat. • Loss of habitat for sensitive species designated by State and federal resource agencies. • Construction and operation of the proposed project could disturb wildlife and cause changes in wildlife behavior. • Construction activities may conflict with local policies or ordinances protecting biological resources.
Cultural & Paleontological Resources	• Construction of new towers and access roads could damage or destroy historic and archaeological sites, traditional cultural properties, or areas containing paleontological resources. • Temporary use of staging areas and conductor pull sites could damage or destroy historic and archaeological sites, traditional cultural properties, or areas containing paleontological resources.
Geology and Soils	• Soil erosion on low fill slopes and steeply graded areas could result in sedimentation of water bodies. • Ground surface rupture could occur where the proposed transmission line would cross active fault lines. • Landslides, mudslides, or other related ground failures from seismic activity, could occur and damage facilities, particularly where the proposed transmission line would cross active fault lines.
Hazards and Hazardous Materials	• Temporary relocation of residents along parts of the project might be required where helicopter construction is required (FAA safety regulations of helicopter flight paths). • Improper storage or handling of hazardous materials and/or hazardous wastes during project construction, operations, or maintenance could present hazards to construction workers or the public. • Leaking or spilling of petroleum or hydraulic fluids from construction equipment or other vehicles during project construction, operation, or maintenance could contaminate soils, surface waters, or groundwater. • The inadvertent uncovering of hazardous materials during excavation activities could cause toxic releases to the environment.
Fire Prevention and Suppression	• Wildfires could be caused by construction or operation of the transmission lines. • Proposed project facilities and activities could interfere with wildfire suppression.
Hydrology and Water Quality	• Increased surface water runoff, erosion, siltation, and sedimentation could diminish water quality. • Water quality of streams or washes could be diminished from violation of water quality standards or waste discharge requirements.
Land Use	• Possible conflicts with applicable local agency land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. • Possible conflict with the Forest Land Management Plan, Puente Hills Landfill Native Habitat Authority Resource Management Plan, and other resource management plans that protect resources along project route. • Construction would temporarily disturb the land uses it traverses or adjacent land uses. • Operation would result in permanent preclusion of, or substantial conflict with, land uses it traverses, or adjacent land uses.

[2] A thorough and detailed analysis of impacts will be completed for the EIR/EIS. This overview is presented to assist the public and agencies in presenting scoping comments.

Attachment 1. Summary of Potential Impacts: Tehachapi Renewable Transmission Project [2]	
Noise	• During construction, noise generated by construction equipment could create nuisance to nearby residents, park users, or other sensitive receptors. Volume range could be 80 to 100 dBA at a range of 50 feet from the active construction site. • Corona noise generated during the operation of the proposed transmission line would increase ambient noise levels surrounding the corridor. • Construction or corona noise in residential areas along the proposed transmission corridor could violate local noise ordinances (for volume and hours of operation).
Socioeconomics	• Employment of construction personnel could be beneficial to regional economy. • Remote areas of Los Angeles, San Bernardino and Kern Counties could lose access to temporary housing due to the possible influx of construction labor, if housing is required during construction of the proposed transmission line. • Additional property-taxes could be provided to local jurisdictions. • Construction activities could temporarily impact local business revenues due to limited access or disruptions of operations. • Operation would have the potential to decrease property values traversed by or adjacent to the transmission line. • Potential for project impacts to disproportionately affect low-income or minority populations (environmental justice).
Public Services and Utilities	• Construction activities could cause increased demand on public resources, services, and utilities. • Construction activities could result in increased generation of waste and disposal needs.
Recreational Resources and Wilderness Areas	• Construction or operation could cause conflicts with established or pending resource management or conservation plans. • Recreational land users would be disturbed by construction and operation where the proposed transmission line crosses the Angeles National Forest and other designated recreational areas. • Road closures and increased traffic during construction activities may impede or prevent access to recreational and wilderness areas.
Transportation and Traffic	• Construction could result in a temporary disruption of traffic flow, transit services, emergency services, or rail services.
Cumulative and Growth Inducing Impacts	• Cumulative impacts could occur (considering other projects that are proposed or under construction in the project area). • Growth-inducing effects could occur.

Attachment 2: Public Repository Sites	
Repository Sites	Address
US Forest Service, Angeles National Forest Area	
ANF Supervisor's Office	701 N. Santa Anita Ave., Arcadia, CA 91006 626-574-5200
Los Angeles River Ranger District	12371 N. Little Tujunga Canyon Road, San Fernando, CA 91342 818-889-1900
Santa Clara/Mojave Rivers Ranger Station	30800 Bouquet Canyon Road, Saugus, CA 91390 661-296-9710
San Gabriel River Ranger District	110 N. Wabash Avenue, Glendora, CA 91741 626-335-1251
Local Agency Offices	
City of Arcadia Development Services Division Planning Services	240 West Huntington Dr., Arcadia, CA 91066 626-574-5423
City of Azusa West Wing	213 E. Foothill Blvd., Azusa, CA 91702 626-812-5236
City of Baldwin Park City Clerk's Office	14403 E. Pacific Ave., Baldwin Park, CA 91706 626-813-5261
City of Bradbury City Manager's Office	600 Winston Ave., Bradbury, CA 91010 626-358-3218
City of Chino City Clerk's Office	13220 Central Ave., Chino, CA 91710 909-591-9824
City of Chino Hills City Clerk's Office	2001 Grand Ave. Chino Hills, CA 91709 909-364-2620
City of Duarte Planning Department	1600 Huntington Drive, Duarte, CA 91010 626-357-7931
City of El Monte Planning Department	11333 Valley Blvd., El Monte, CA 91731 626-580-8626
City of Industry Planning Department	15651 E. Stafford St., City of Industry, CA 91744 626-333-2211
City of Irwindale Planning Department	5050 N. Irwindale Ave., Irwindale, CA 91706 626-430-2207
City of La Cañada Flintridge Public Works Department	1327 Foothill Blvd. La Cañada Flintridge, CA 91011 818-790-8882
City of Lancaster City Clerk's Office	44933 N. Fern Avenue, Lancaster, CA 93534 661-723-6020
City of Monrovia Planning Division	415 S. Ivy Ave. ,Monrovia, CA 91016 626-932-5526
City of Montebello City Clerk's Office	1600 W. Beverly Dr., Montebello, CA 90640 323-887-1437
City of Monterey Park City Manager's Office	320 W. Newmark Ave., Monterey Park, CA 91754 626-307-1255
City of Pasadena Planning Department	175 N. Garfield Ave., Pasadena, CA 91101 626-744-7232
City of Pico Rivera Community Development Department	6615 Passons Blvd., Pico Rivera, CA 90660 562-801-4415
City of Rosemead Planning Department	8838 East Valley Blvd., Rosemead, CA 91770 626-569-2141
City of San Gabriel City Clerk's Office	425 S. Mission Dr., San Gabriel, CA 91776 626-457-4600
City of San Marino Planning & Building Department	2200 Huntington Dr., San Marino, CA 91108 626-300-0705
City of South El Monte Community Development	1415 Santa Anita Ave, South El Monte, CA 91733 626-579-6540

Attachment 2: Public Repository Sites	
Repository Sites	Address
County of Los Angeles Public Libraries	
Baldwin Park Public Library	4181 Baldwin Park Blvd., Baldwin Park, CA 91706 626-962-6947
Diamond Bar Public Library	1061 S. Grand Ave. Diamond Bar, CA 91765 909-861-4978
Duarte Public Library	1301 Buena Vista St., Duarte, CA 91010 626-358-1865
El Monte Public Library	3224 Tyler Ave.,El Monte, CA 91731 626-444-9506
La Cañada Flintridge Public Library	4545 N. Oakwood Ave., La Cañada Flintridge, CA 91011 818-790-3330
Lancaster Regional Public Library	601 W. Lancaster Blvd., Lancaster, CA 93534 661-948-5029
Montebello Public Library	1550 W. Beverly Blvd., Montebello, CA 90640 323-722-6551
Pico Rivera Public Library	9001 Mines Ave., Pico Rivera, CA 90660 562-942-7394
Rosemead Public Library	8800 Valley Blvd., Rosemead, CA 91770 626-573-5220
San Gabriel Public Library	500 S. Del Mar Ave., San Gabriel, CA 91776 626-287-0761
South El Monte Public Library	1430 N. Central Ave. South El Monte, CA 91733 626-443-4158
Temple City Public Library	5939 Golden West Ave., Temple City, CA 91780 626-285-2136
County of San Bernardino Public Library	
James S. Thalman Chino Hills Branch Library	2003 Grand Ave., Chino Hills, CA 91709 909-590-5380
City Libraries	
Arcadia Public Library	20 West Duarte Rd., Arcadia, CA 91006 626-821-5567
Azusa Public Library	729 N. Dalton Ave., Azusa, CA 91702 626-812-5232
Irwindale Public Library	5050 N. Irwindale Ave., Irwindale, CA 91706 626-430-2229
La Habra Public Library	221 E. La Habra Boulevard, La Habra, CA 90631 562-694-0078
Monrovia Public Library	321 South Myrtle Ave., Monrovia, CA 91016 626-256-8274
Monterey Park Bruggemeyer Library	318 S. Ramona Ave., Monterey Park, CA 91754 626-307-1333
Ontario City Library	215 East "C" St., Ontario, CA 91764 909-395-2004
Palmdale Public Library	700 E. Palmdale Blvd., Palmdale, CA 93550 616-267-5600
Pasadena Central Library	285 E. Walnut St., Pasadena, CA 91101 626-744-4066
San Marino Public Library	1890 Huntington Dr., San Marino, CA 91108 626-300-0777
Whittier Central Library	7344 S. Washington Ave., Whittier, CA 90602 562-945-8200

CALIFORNIA PUBLIC UTILITIES COMMISSION
USDA FOREST SERVICE

Scoping Comments

Proposed Tehachapi Renewable Transmission Project

Date: ______________________________

Name*: ______________________________

Affiliation (*if any*):* ______________________________

Address:* ______________________________

City, State, Zip Code:* ______________________________

Telephone Number:* ______________________________

Email:* ______________________________

**Please print. Your name, address, and comments become public information and may be released to interested parties if requested.*

Submit comments by mail using this comment sheet (fold, stamp, and mail); insert additional sheets if needed. Comments may also be submitted to the project hotline at (888) 331-9897 or emailed to TRTP@aspeneg.com. Comments must be postmarked by October 1, 2007.

Place
Postage
Here

John Boccio/George Farra
California Public Utilities Commission/Angeles National Forest
c/o Aspen Environmental Group
30423 Canwood Street, Suite 215
Agoura Hills, CA 91301

Notices

Federal Register

Vol. 72, No. 173

Friday, September 7, 2007

DEPARTMENT OF AGRICULTURE

Forest Service

Angeles National Forest, CA, Tehachapi Renewable Transmission Project

AGENCY: Forest Service, USDA.

ACTION: Notice of intent to prepare a joint environmental impact statement/ report.

SUMMARY: The USDA Forest Service, together with the California Public Utilities Commission (CPUC), will prepare a joint Environmental Impact Statement (EIS) and Environmental Impact Report (EIR) in response to applications received from Southern California Edison for construction of a series of transmission system improvements to deliver electricity from new wind energy projects in eastern Kern County. The proposed project would be located in Kern, Los Angeles, and San Bernardino counties. The purpose of the project is to provide the electrical facilities necessary to integrate levels of new wind generation in the Tehachapi Wind Resource Area, and accommodate solar and geothermal projects currently being planned or expected in the future. It would also improve the reliability of the transmission grid in the Antelope Valley and address existing constraints in the transmission system south of the Lugo Substation in Hesperia, California. The Forest Service is the lead Federal agency for the preparation of this EIS/EIR in compliance with the National Environmental Policy Act (NEPA) and all other applicable federal laws, executive orders, regulations, and direction. The CPUC is the lead State of California agency for the preparation of the EIS/EIR in compliance with the California Environmental Quality Act (CEQA), California Public Resource Code Division 13, and all other applicable state laws and regulations. Both agencies have determined an EIS/ EIR is needed to effectively analyze the proposal and evaluate impacts.

The proposed project involves several types of transmission upgrades, including: (1) Constructing new 500-kV transmission lines; (2) constructing o new single-circuit 220-kV transmission lines; (3) rebuilding existing 220-kV lines to 500-V standards; (4) rebuilding existing single-circuit transmission lines to double-circuit transmission lines; (5) relocating several existing 66-kV subtransmission lines; (6) constructing a new 500-kV substation; and (7) upgrading five existing substations. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately 3 miles would require expanded right-of-way within the Angeles National Forest. The USDA Forest Service and the CPUC invite written comments on the scope of this proposed project. In addition, the agencies give notice of this analysis so that interested and affected individuals are aware of how they may participate and contribute to the final decision.

DATES: Comments concerning the scope of the analysis must be received by October 1, 2007. Nine public scoping meetings are planned to provide information about the proposed project and to allow people to comment on the proposed project. The draft EIS/EIR is expected to be published in July 2008 and the final EIS/EIR is expected in December 2008.

ADDRESSES: To request a copy of the draft or final EIS/EIR and/or to send written comments, please write to the Angeles National Forest and/or California Public Utilities Commission, c/o Aspen Environmental Group, 30423 Canwood Street, Suite 215, Agoura Hills, CA 91301.

E-mail communications are also welcome; however, please include your name and a return address in the e-mail message. E-mail messages should be sent to *TRTP@aspeneg.com.* Information about this application and the environmental review process will be posted on the Internet at: *Ftp://ftp.cpuc.ca.gov/gopher-data/environ/tehachapi_renewables/TRTP.htm.* This site will be used to post all public documents during the environmental review process and to announce upcoming public meetings. See **SUPPLMENTARY INFORMATION** for dates and addresses of future public meetings.

FOR FURTHER INFORMATION CONTACT: For additional information related to the project on National Forest System land, contact George Farra, Project Manager, Forest Service, Angeles National Forest, 701 N. Santa Anita Ave., Arcadia, CA 91006, phone: (626) 574–5301. For additional information related to the project on non-National Forest System land, contact John Boccio, California Public Utilities Commission, 505 Van Ness Avenue, San Francisco, CA 94102; phone: (415) 703–2641. Project information can also be requested by leaving a voice message or sending a fax to the Project Information Hotline at (888) 331–9897.

SUPPLEMENTARY INFORMATION:

Proposed Action

Southern California Edison would construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County, California. The proposed transmission system upgrades are seperated into eight distinct segments. The proposed projects's major components include the following, by segment:

- Segment 4: Construct a new ~16-mile single-circuit 500-kV transmission line from the new Whirlwind Substation to the existing Antelope Substation. The existing right-of-way would be expanded by 200 feet and construct two new parallel ~4-mile single-circuit 220-kV transmission lines from the proposed Cottonwind Substation (not part of this project) to the new Whirlwind Substation. The transmission line would be initially energized at 220 kV with the intent of energizing the system to 500 kV in the future as more wind projects are developed.
- Segment 5: Replace two single-circuit 220-kV transmission lines (Antelope-Vincent and Antelope-Mesa) with a new ~18-mile single-circuit 500-kV transmission line in existing ROW between Antelope Substation and Vincent Substation.
- Segment 6: Replace 27 miles of the Antelope-Mesa 220-kV transmission line and 5 miles of the Rio Hondo-Vincent No. 2 with a single-circuit 500-kV transmission line between Vincent

Substation and the southern Angeles National Forest boundary.

- Segment 7: Replace ~16 miles of the Antelope-Mesa 220-kV transmission line with a single-circuit 500-kV transmission line from the southern boundary of the Angeles National Forest to the Mesa Substation.
- Segment 8: Replace ~33 miles of 220-kV transmission line from the San Gabriel Junction (2 miles east of Mesa Substation) to the existing Mira Loma Substation. Relocate 66-kV subtransmission lines in the Mesa and Chino Areas within existing or public right-of-way. Additionally, ~45 existing double-circuit 66-kV subtransmission lines in the Mesa and Chino Areas would be removed/relocated within existing or public right-of-way or undergrounded.
- Segment 9: Construct new 500/220-kV Whirlwind Substation adjacent to Path 26 and upgrade the Antelope Substation to include new 500-kV facilities. Expand and upgrade 500-kV facilities at Vincent Substation. Install reactive compensation equipment at Vincent Substation and Antelope Substation. Upgrade the Gould Substation, Mesa Substation, and Mira Loma Substation within the existing fence line.
- Segment 10: Construct a new ~17-mile single-circuit 500–kV transmission line in a new 330-foot-wide corridor from the approved WindHub Substation to the new Whirlwind Substation.
- Segment 11: Replace ~19 miles of single-circuit 220-kV transmission line with a single-circuit 500-kV transmission line from Vincent Substation to Gould Substation. Install ~18 miles of 220-kV circuit on the vacant side of existing double-circuit 220-kV lattice steel towers (now carrying the Eagle Rock-Mesa 220-kV transmission line) between Gould Substation and Mesa Substation.

Construction activities associated with the proposed action would include upgrading 5 existing substations, construction of 1 new substation, installation of approximately 851 new towers, repairing existing access and spur roads along with the temporary use and construction of spur roads, and the temporary use of approximately 141 new pulling locations and 103 new splicing locations. Only segments 6 and 11 are located on National Forest System lands.

Purpose and Need for Action

The purpose for this action 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 Tehachapi Wind Resource Area, and accommodate solar and geothermal projects currently being planned or expected in the future. The project will also address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley and the South of Lugo transmission constraints.

Background

Southern California Edison has proposed the construction of a 220/500–kV transmission system that would include a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity from new wind energy projects in eastern Kern County, California. The project would 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.

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 Tariff, Southern California Edison is obligated to interconnect and integrate this wind energy project into its system. In addition, the 2001 National Energy Policy goals are to increase domestic energy supplies, modernize and improve our nation's energy infrastructure, and improve the reliability of the delivery of energy from its sources to points of use.

Executive Order 13212 encourages increased production and transmission of energy in a safe and environmentally sound manner. According to Executive Order 13212, for energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects. The agencies shall take such actions to the extent permitted by law and regulations, and where appropriate. Based on the 2005 Angeles National Forest Land and Resource Management Plan, the proposed routes are within designated utility corridors.

Possible Alternatives

Presently, the USDA Forest Service and the CPUC have identified preliminary action alternatives for consideration in the environmental analysis. The alternatives currently under consideration (besides the proposed action) are:

- The No-Action Alternative, under which the proposed transmission line would not be constructed and no expansion activities would occur.
- The Non-National Forest System Land Alternative that would avoid proposed activities on National Forest System lands. This alternative would be developed during the environmental review process.
- Alternate routing between Windhub and Whirlwind Substations (Segment 10).

Additional alternatives will be developed, as needed, during the environmental review process. The final alternatives analyzed in detail will depend on the issues raised during public scoping and further investigation of the feasibility of alternatives.

Lead and Cooperating Agencies

The USDA Forest Service and the CPUC will be joint lead agencies in accordance with 40 CFR 1501.5(b), and are responsible for the preparation of the EIS/EIR. The Forest Service will serve as the lead agency under NEPA. The CPUC will serve as the lead agency under CEQA in accordance with California Code of Regulations, Title 14, Chapter 3, Article 4, § 15050.

Responsible Official

The Forest Service responsible official for the preparation of the EIS/EIR is Jody Noiron, Forest Supervisor, Angeles National Forest, 701 N. Santa Anita Avenue, Arcadia, CA 91006.

Nature of Decision To Be Made

The Forest Supervisor for the Angeles National Forest will decide whether to authorize a 50-year term Special Use Permit for construction, use, and maintenance of 500-kV transmission lines and a new 220-kV circuit. The authorization will include ancillary improvements on National Forest System lands needed to maintain this system (e.g., towers, roads, communication equipment, helicopter landing sites). The Forest Supervisor will only make a decision regarding impacts on National Forest System lands.

Scoping Process

Public participation will be especially important at several stages during the analysis. The lead agencies will be seeking information, comments, and assistance from Federal, State, local agencies, and other individuals and organizations that may be interested in or affected by the proposed project. This input will be used in preparation of the draft EIS/EIR.

Nine scoping meetings are proposed to provide information about the proposed project to the public and to allow people to comment on the proposed project. The scoping meetings will be held on the following dates, times, and locations:

1. September 6, 2007, 6:30 p.m.; La Serna High School, Cafeteria, 15301 Youngwood Drive, Whittier, CA 90605; 562–698–8121.
2. September 10, 2007, 2:30 p.m. and 6:30 p.m.; Palmdale Cultural Center, 38350 Sierra Highway, Palmdale, CA 93550; 661–267–5656.
3. September 11, 6:30 p.m.; Kern County Library—Wanda Kirk Branch, 3611 Rosamond Blvd., Rosamond, CA 93561; 661–256–3236.
4. September 12, 6:30 p.m.; Duarte Community Center, 1600 Huntington Drive, Duarte, CA 91010; 626–303–8429.
5. September 13, 2007, 6:30 p.m.; Garvey Community Center, 9108 Garvey Avenue, Rosemead, CA 91770; 323–720–5213.
6. September 19, 2007, 6:30 p.m.; Altadena Community Center, 730 E. Altadena Drive, Altadena, CA 91001; (626) 398–6174.
7. September 20, 2007, 2:30 p.m. and 6:30 p.m.; Chino Hills Council Chambers, 2001 Grand Avenue, Chino Hills, CA 91709; 909–930–8495.

Preliminary Issues

A number of potential impacts were identified in the *Proponent's Environmental Assessment Tehachapi Renewable Transmission Project* issued by Southern California Edison on June 29, 2007. The following preliminary issues were identified in this report related to the proposed project's potential effects on the environment: Visual resources; agriculture; air quality; biological, cultural, and geological resources; hazards and hazardous materials; hydrology and water quality; land use and planning; mineral resources; noise; population and housing; public services and utilities; recreation; traffic and transportation; and paleontological resources. Other issues identified are impacts to future forest management projects (e.g., fuel hazard reduction projects and fire fighting strategies).

Permits or Licenses Required

A 50-year term special use permit for the construction, maintenance, and use of the transmission line would be authorized to Southern California Edison by the Forest Supervisor for the Angeles National Forest for Segments 6 and 11, and a Certificate of Public Convenience and Necessity would be issued by the California Public Utilities Commission as part of this decision. Additional permits that may be required of Southern California Edison to construct the proposed project could include: A Permit to Operate issued by the South Coast Air Quality Management District, a National Pollutant Discharge Elimination System General Construction Permit issued by California's Regional Water Quality Control Board, a Section 404 Permit (per Section 404 of the Clean Water Act) issued by the U.S. Army Corps of Engineers, and a Streambed Alteration Agreement (per Section 1601 of the California Fish and Game Code) issued by the California Department of Fish and Game.

Comment Requested

This notice of intent initiates the scoping process that guides the development of the EIS/EIR. The Forest Service is seeking public and agency comment on the proposed project to identify major issues to be analyzed in depth and assistance in identifying potential alternatives to be evaluated. Comments received on this notice, including the names and addresses of those who comment, will be considered as part of the public record on this proposed project, and will be available for public inspection. Comments submitted anonymously will be accepted and considered; however, those who submit anonymous comments will not have standing to appeal the subsequent decision under 36 CFR Part 215. Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality. Persons requesting such confidentiality should be aware that, under the FOIA, confidentiality may be granted in only very limited circumstances, such as to protect trade secrets. The Forest Service will inform the requester of the agency's decision regarding the request for confidentiality. Where the request is denied, the agency will return the submission and notify the requester that the comments may be resubmitted, without names and addresses, within a specified number of days.

Early Notice of Importance of Public Participation in Subsequent Environmental Review: A draft EIS/EIR will be prepared for comment. The comment period on the draft EIS/EIR will be 45 days from the date the Environmental Protection Agency publishes the notice of availability in the **Federal Register**.

The Forest Service believes, at this early stage, that it is important to give reviewers notice of several court rulings related to public participation in the environmental review process. First, reviewers of draft EISs must structure their participation in the environmental review of the proposal so that it is meaningful and alerts an agency to the reviewer's position and contentions. *Vermont Yankee Nuclear Power Corp.* v. *NRDC,* 435 U.S. 519, 553 (1978). Also, environmental objections that could be raised at the draft environmental EIS stage but that are not raised until after completion of the final EIS may be waived or dismissed by the courts. *City of Angoon* v. *Hodel,* 803 F.2d 1016, 1022 (9th Cir. 1986) and *Wisconsin Heritages, Inc.* v. *Harris,* 490 F. Supp. 1334, 1338 (E.D. Wis. 1980). Because of these court rulings, it is very important that those interested in this proposed action participate by the close of the 45-day comment period so that substantive comments and objections are made available to the Forest Service at a time when it is meaningful to consider and respond to comments in the final EIS/EIR.

To assist the Forest Service in identifying and considering issues and concerns on the proposed project, comments on the draft EIS/EIR should be as specific as possible. It is also helpful if comments refer to specific pages or chapters of the draft statement. Comments may also address the adequacy of the draft EIS/EIR or the merits of the alternatives formulated and discussed in the statement. Reviewers may wish to refer to the Council on Environmental Quality Regulations for implementing the procedural provisions of NEPA at 40 CFR 1503.3 in addressing these points.

(Authority: 40 CFR 1501.7 and 1508.22; Forest Service Handbook 1909.15, Section 21)

Dated: August 23, 2007.

Jody Noiron,

Forest Supervisor.

[FR Doc. E7–17168 Filed 9–6–07; 8:45 am]

BILLING CODE 3410–11–P

DEPARTMENT OF COMMERCE

Foreign-Trade Zones Board

[Docket 43–2007]

Foreign-Trade Zone 235—Lakewood, NJ; Application for Expansion

An application has been submitted to the Foreign-Trade Zones (FTZ) Board (the Board) by the Township of Lakewood, New Jersey, grantee of FTZ 235, requesting authority to expand its existing zone to include additional sites in or adjacent to the Philadelphia Customs and Border Protection port of entry. The application was submitted pursuant to the provisions of the Foreign-Trade Zones Act, as amended (19 U.S.C. 81a–81u), and the regulations

Appendix B.2
Angeles National Forest Contact List

APPENDIX B.2 ANGELES NATIONAL FOREST CONTACT LIST

Federal Agencies

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Sacramento, CA 95899-7413

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Linda Chang
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Appendix C.
Air Pollutant Emissions Calculations

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Emission Calculation Assumptions

Proposed Project General Assumptions

1) Construction work occurs 6 days a week excepting major holidays.

Offroad Equipment Emission Calculation Assumptions

1) Emission factors are the latest available from the SCAQMD website, where the nearest horsepower sized equipment given in the SCAQMD emission factor database are used with a ratio of actual assumed equipment horsepower to derive hourly emission factors.
2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.
3) Equipment type, number, and usage estimates are used as estimated using equipment data and quantity estimates are from the PEA revised to create a consistent equipment list given certain variability between the segment construction elements.
4) The following vehicle types, which could be offroad vehicles are assumed to be onroad vehicles considering the project description, needs and location: water trucks and dump trucks.

Onroad Equipment Emission Calculations Assumptions

1) Emission factors are the latest available from the SCAQMD website, where the vehicles have been assigned three classes, passenger (i.e. employee vehicles and pickups), delivery (all nonpassenger vehicles smaller than Heavy-Heavy Duty), and heavy-heavy duty vehicles.
2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.
3) Trip estimates are based on PEA estimates of crew size and onroad vehicle numbers and trips revised to create a consistent basis given certain variability between construction segment elements.
4) For simplification all onroad traffic for the project is assumed to occur within the jurisdiction of the specific project segment construction element.

Fugitive Dust Emission Calculations Assumptions

1) Unpaved road travel per trip is minimized to the extent feasible and shall range from zero for upgrades to paved substation sites to approximately 7.2 miles for construction segments within the ANF. Unpaved road distances were determined using GIS data for each construction site (tower, staging area, etc.) and employees were assumed to park personal vehicles on unpaved surfaces within staging areas requiring 0.1 mile of unpaved travel.
2) Unpaved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt content is assumed to be 12% on average (SCAQMD level for sand and gravel plant roads and the site is in a stream bed); and 2) average vehicle weight based on VMT estimate for unpaved roads
3) Paved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt loading is average for 5000-10000 ADT road; 2) average vehicle weight is calculated on VMT average basis.
4) Earthmoving emission factors are calculated using the recent version of USEPA AP-42 Section 11.9 for Dozing and Grading, and Section 13.2.4 for soil handling (drop emissions).
5) Specific assumptions related to the calculations, such as silt content or silt loading, are noted in the calculation sheets.

Helicopter Emission Calculations Assumptions

1) The type of helicopters and number of helicopter trips for tower helicopter construction are based on estimates provided by SCE.

Emission Estimate Limitations

1) The SCE project schedule has errors and inconsistencies that were corrected to the extent possible.

2) The actual project construction schedule would have greater variability and activity overlap in each segment or subsegment as problems such as weather or other factors delay work and work delays are later compensated for and as foundation/tower/stringing/restoration crews work sequentially down each T-Line Segment.
3) The equipment data provided by SCE was inconsistent between segments. Some consistency was attempted given differences in Segment needs such as more road construction through the ANF than in the LA basin.
4) The annual emissions estimate for each air basin and for the ANF are estimated based on a certain progression and direction of activities in those construction elements that cross borders.
5) There are likely unknown project construction requirements, such as upgrading certain paved roads within the ANF, that are not currently included in the construction assumptions.
6) The helicopter emission factors come from a old source and use engines that do not match the helicopter engines being used, which may cause an overestimation of these emissions depending on the accuracy of the helicopter trip estimate. Unlike large fixed wing aircraft engines helicopter engines do not require emission testing by the ICAO so no new emission factors are readily available.

TRTP Alternative 2 Project Construction Emission Totals
All Jurisdictions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.453	3.303	3.081	0.005	0.134	0.114
Offroad Vehicles/Equipment	0.671	2.060	3.947	0.004	0.260	0.239
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	6.704	1.377
Totals	**1.12**	**5.36**	**7.03**	**0.01**	**7.10**	**1.73**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	6.818	47.537	44.804	0.081	2.057	1.725
Offroad Vehicles/Equipment	11.372	38.644	75.145	0.079	4.586	4.219
Helicopter	1.701	8.184	9.613	0.080	0.531	0.488
Fugitive Dust	---	---	---	---	111.807	26.372
Totals	**19.89**	**94.36**	**129.56**	**0.24**	**118.98**	**32.80**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	4.058	30.579	23.720	0.050	1.104	0.910
Offroad Vehicles/Equipment	6.769	23.688	42.118	0.045	2.739	2.520
Helicopter	1.437	5.629	7.756	0.065	0.427	0.393
Fugitive Dust	---	---	---	---	57.955	11.882
Totals	**12.26**	**59.90**	**73.59**	**0.16**	**62.22**	**15.70**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.264	16.674	13.610	0.030	0.645	0.530
Offroad Vehicles/Equipment	3.178	11.903	20.641	0.023	1.301	1.197
Helicopter	2.660	9.806	11.734	0.098	0.647	0.595
Fugitive Dust	---	---	---	---	36.721	7.848
Totals	**8.10**	**38.38**	**45.99**	**0.15**	**39.31**	**10.17**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.109	0.883	0.474	0.002	0.025	0.019
Offroad Vehicles/Equipment	0.145	0.597	1.015	0.001	0.058	0.053
Helicopter	0.005	0.011	0.022	0.000	0.001	0.001
Fugitive Dust	---	---	---	---	1.852	0.357
Totals	**0.26**	**1.49**	**1.51**	**0.00**	**1.94**	**0.43**

TRTP Alternative 2 Project Construction Emission Totals
SCAQMD Jurisdiction

Worst-Case Day	Emissions (lbs/day)					
(Year 2010)	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	31.91	224.03	207.46	0.38	9.48	7.94
Offroad Vehicles/Equipment	25.54	86.57	165.52	0.17	10.25	9.43
Helicopter	275.95	1,004.12	1,092.23	9.14	60.30	55.47
Fugitive Dust	---	---	---	---	494.30	115.44
Totals	**333.41**	**1,314.72**	**1,465.21**	**9.68**	**574.33**	**188.29**

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.122	0.904	0.813	0.001	0.035	0.029
Offroad Vehicles/Equipment	0.161	0.500	0.772	0.001	0.063	0.058
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	2.010	0.420
Totals	**0.28**	**1.40**	**1.59**	**0.00**	**2.11**	**0.51**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.423	16.383	17.165	0.029	0.782	0.660
Offroad Vehicles/Equipment	4.326	14.971	28.303	0.029	1.772	1.630
Helicopter	1.565	7.879	8.990	0.075	0.497	0.457
Fugitive Dust	---	---	---	---	33.552	7.899
Totals	**8.31**	**39.23**	**54.46**	**0.13**	**36.60**	**10.65**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.942	22.026	17.502	0.037	0.813	0.672
Offroad Vehicles/Equipment	4.988	17.329	30.670	0.033	2.011	1.850
Helicopter	1.294	5.310	7.104	0.059	0.391	0.360
Fugitive Dust	---	---	---	---	39.376	8.107
Totals	**9.22**	**44.67**	**55.28**	**0.13**	**42.59**	**10.99**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	1.429	10.463	8.720	0.019	0.413	0.340
Offroad Vehicles/Equipment	1.868	7.067	12.109	0.014	0.779	0.717
Helicopter	1.158	4.010	5.135	0.043	0.282	0.260
Fugitive Dust	---	---	---	---	22.809	4.838
Totals	**4.46**	**21.54**	**25.96**	**0.08**	**24.28**	**6.15**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.002	0.011	0.015	0.000	0.001	0.001
Offroad Vehicles/Equipment	0.002	0.007	0.009	0.000	0.001	0.001
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.083	0.017
Totals	**0.00**	**0.02**	**0.02**	**0.00**	**0.08**	**0.02**

TRTP Alternative 2 Project Construction Emission Totals
AVAQMD Jurisdiction

Worst-Case Day	Emissions (lbs/day)					
(Year 2012)	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	16.02	120.08	92.13	0.21	4.38	3.58
Offroad Vehicles/Equipment	31.87	114.81	197.89	0.22	12.37	11.38
Helicopter	357.11	1,271.53	1,379.43	11.54	76.13	70.04
Fugitive Dust	---	---	---	---	271.90	53.29
Totals	**405.00**	**1,506.42**	**1,669.44**	**11.98**	**364.78**	**138.30**

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.271	1.950	1.875	0.003	0.083	0.070
Offroad Vehicles/Equipment	0.447	1.365	2.902	0.003	0.172	0.158
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	4.025	0.812
Totals	**0.72**	**3.32**	**4.78**	**0.01**	**4.28**	**1.04**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.233	15.390	15.070	0.026	0.691	0.581
Offroad Vehicles/Equipment	4.037	13.711	26.686	0.029	1.623	1.493
Helicopter	0.044	0.098	0.199	0.002	0.011	0.010
Fugitive Dust	---	---	---	---	44.333	10.589
Totals	**6.31**	**29.20**	**41.96**	**0.06**	**46.66**	**12.67**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.819	6.136	4.874	0.010	0.226	0.187
Offroad Vehicles/Equipment	1.284	4.573	8.110	0.009	0.528	0.486
Helicopter	0.110	0.246	0.503	0.004	0.027	0.025
Fugitive Dust	---	---	---	---	15.025	3.075
Totals	**2.21**	**10.96**	**13.49**	**0.02**	**15.81**	**3.77**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.835	6.211	4.890	0.011	0.233	0.191
Offroad Vehicles/Equipment	1.310	4.836	8.532	0.010	0.522	0.480
Helicopter	1.503	5.796	6.599	0.055	0.364	0.335
Fugitive Dust	---	---	---	---	13.911	3.010
Totals	**3.65**	**16.84**	**20.02**	**0.08**	**15.03**	**4.02**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.108	0.872	0.459	0.002	0.024	0.019
Offroad Vehicles/Equipment	0.143	0.590	1.006	0.001	0.057	0.053
Helicopter	0.005	0.011	0.022	0.000	0.001	0.001
Fugitive Dust	---	---	---	---	1.768	0.340
Totals	**0.26**	**1.47**	**1.49**	**0.00**	**1.85**	**0.41**

TRTP Alternative 2 Project Construction Emission Totals
KCAPCD Jurisdiction

Worst-Case Day	Emissions (lbs/day)					
(Year 2010)	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	34.22	256.16	187.24	0.40	8.59	7.07
Offroad Vehicles/Equipment	41.22	136.98	254.81	0.25	16.39	15.08
Helicopter	2.10	4.69	9.58	0.08	0.52	0.48
Fugitive Dust	---	---	---	---	445.04	88.32
Totals	**77.54**	**397.84**	**451.63**	**0.73**	**470.54**	**110.95**

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.060	0.449	0.393	0.001	0.017	0.014
Offroad Vehicles/Equipment	0.063	0.194	0.273	0.000	0.025	0.023
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.668	0.145
Totals	**0.12**	**0.64**	**0.67**	**0.00**	**0.71**	**0.18**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.162	15.764	12.569	0.025	0.584	0.484
Offroad Vehicles/Equipment	3.009	9.961	20.156	0.021	1.192	1.096
Helicopter	0.093	0.207	0.424	0.004	0.023	0.021
Fugitive Dust	---	---	---	---	33.922	7.883
Totals	**5.26**	**25.93**	**33.15**	**0.05**	**35.72**	**9.49**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.296	2.417	1.344	0.004	0.065	0.052
Offroad Vehicles/Equipment	0.497	1.786	3.338	0.004	0.200	0.184
Helicopter	0.032	0.073	0.149	0.001	0.008	0.007
Fugitive Dust	---	---	---	---	3.555	0.699
Totals	**0.83**	**4.28**	**4.83**	**0.01**	**3.83**	**0.94**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.000	0.000	0.000	0.000	0.000	0.000
Offroad Vehicles/Equipment	0.000	0.000	0.000	0.000	0.000	0.000
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.000	0.000	0.000	0.000	0.000	0.000
Offroad Vehicles/Equipment	0.000	0.000	0.000	0.000	0.000	0.000
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Major Elements																
# Days in Full Month (6 days/week)																
Onsite Construction Elements Begin in 2009					**Employee Vehicle**				**Delivery Truck**				**Heavy Heavy Duty Truck**			
Segment 4	**Crew Size**	**Total Days**	**Start Date**	**End Date**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**
Construction of Marshalling Yards	6	**192**	**6-Mar-09**	**20-Oct-09**	6	60	0.10	360.60	3	60	0.10	180.30	1	60	0.10	60.10
Marshalling Yards, -5 & +5 other elements	4	**250**	**31-Mar-10**	**27-Jan-11**	4	60	0.10	240.40	1	60	0.10	60.10	1	210	0.10	210.10
Road Maintenance	2	**235**	**12-Apr-10**	**21-Jan-11**	2	60	0.10	120.20	1	60	2.94	62.94	0	60	2.94	0.00
500 kV T/L Antelope-Whirlwind																
Road Construction (-5)	8	**39**	**6-Apr-10**	**20-May-10**	8	60	0.10	480.80	2	60	1.41	122.81	3	60	1.41	184.22
Foundation Construction	24	**53**	**20-May-10**	**22-Jul-10**	24	60	0.10	1442.40	8	60	1.41	491.26	7	60	1.41	429.85
Tower Construction	48	**135**	**25-Jun-10**	**4-Dec-10**	48	60	0.10	2884.80	14	60	1.41	859.70	3	60	1.41	184.22
String Cable	40	**54**	**5-Nov-10**	**11-Jan-11**	40	60	0.10	2404.00	15	60	1.41	921.10	6	60	1.41	368.44
Restoration/Guard Poles +3	7	**16**	**23-Dec-10**	**14-Jan-11**	7	60	0.10	420.70	3	60	1.41	184.22	3	60	1.41	184.22
IT/Communications -Antelope to Whirlwind	6	**36**	**2-Feb-11**	**16-Mar-11**	6	60	0.10	360.60	1	60	1.41	61.41	0	60	1.41	0.00
230 kV T/L Drycreek-Whirlwind																
Road Construction	7	**38**	**20-May-10**	**5-Jul-10**	7	60	0.10	420.70	2	60	4.58	129.15	3	60	4.58	193.73
Foundation Construction	24	**55**	**26-Aug-10**	**29-Oct-10**	24	60	0.10	1442.40	8	60	4.58	516.61	7	60	4.58	452.04
Tower Construction	48	**71**	**1-Oct-10**	**27-Dec-10**	48	60	0.10	2884.80	14	60	4.58	904.07	3	60	4.58	193.73
String Cable	40	**35**	**4-Dec-10**	**18-Jan-11**	40	60	0.10	2404.00	15	60	4.58	968.65	6	60	4.58	387.46
Restoration/Guard Poles	7	**4**	**18-Jan-11**	**21-Jan-11**	7	60	0.10	420.70	3	60	4.58	193.73	3	60	4.58	193.73
IT/Communications - Drycreek to Whirlwind	6	**36**	**16-Feb-11**	**30-Mar-11**	6	60	0.10	360.60	1	60	4.58	64.58	0	60	4.58	0.00
Path 26 Loop																
Road Construction	7	**39**	**6-Apr-10**	**20-May-10**	7	60	0.10	420.70	2	60	1.41	122.81	3	60	1.41	184.22
Foundation Construction	24	**30**	**23-Jul-10**	**26-Aug-10**	24	60	0.10	1442.40	8	60	1.41	491.26	7	60	1.41	429.85
Tower Construction	48	**19**	**26-Aug-10**	**17-Sep-10**	48	60	0.10	2884.80	14	60	1.41	859.70	3	60	1.41	184.22
String Cable	40	**13**	**17-Sep-10**	**1-Oct-10**	40	60	0.10	2404.00	15	60	1.41	921.10	6	60	1.41	368.44
Restoration/Guard Poles	7	**2**	**30-Sep-10**	**1-Oct-10**	7	60	0.10	420.70	3	60	1.41	184.22	3	60	1.41	184.22
IT/Communications	6	**37**	**19-Aug-10**	**1-Oct-10**	6	60	0.10	360.60	1	60	1.41	61.41	0	60	1.41	0.00
66 kV Relocate at Antelope																
Construction - Relocate 66 kV at Antelope	6	**142**	**17-Nov-09**	**6-May-10**	6	60	0.10	360.60	2	40	0.10	80.20	2	40	0.10	80.20
					Employee Vehicle				**Delivery Truck**				**Heavy Heavy Duty Truck**			
Segment 5	**Crew Size**	**Total Days**	**Start Date**	**End Date**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**
Construction of Marshalling Yards	6	**308**	**11-Jul-09**	**16-Jul-10**	6	40	0.10	240.60	3	40	1.61	124.84	1	40	1.61	41.61
Marshalling Yards	4	**497**	**10-Nov-09**	**2-Jul-11**	4	40	0.10	160.40	1	40	1.61	41.61	1	190	1.61	191.61
Road Maintenance	2	**364**	**13-Apr-10**	**24-Jun-11**	2	40	0.10	80.20	1	40	1.61	41.61	1	40	1.61	41.61
230 kV Removal T/L Antelope-Vincent																
Wreckout - Antelope-Mesa	26	**7**	**6-Dec-11**	**13-Dec-11**	26	40	0.10	1042.60	12	40	1.61	499.38	10	40	1.61	416.15
Wreckout - Antelope-Vincent	26	**7**	**6-Dec-11**	**13-Dec-11**	26	40	0.10	1042.60	12	40	1.61	499.38	10	40	1.61	416.15
500 kV T/L Antelope-Vincent (#2 - 3a, b, &c)																
Road Construction	8	**39**	**6-Apr-10**	**20-May-10**	8	40	0.10	320.80	2	40	1.61	83.23	3	40	1.61	124.84
Foundation Construction	24	**58**	**11-Sep-10**	**20-Nov-10**	24	40	0.10	962.40	8	40	1.61	332.92	7	40	1.61	291.30
Tower Construction	48	**141**	**23-Oct-10**	**13-Apr-11**	48	40	0.10	1924.80	14	40	1.61	582.61	3	40	1.61	124.84
String Cable	40	**72**	**16-Mar-11**	**23-Jun-11**	40	40	0.10	1604.00	15	40	1.61	624.22	6	40	1.61	249.69
Restoration/Guard Poles	7	**18**	**7-Jun-11**	**27-Jun-11**	7	40	0.10	280.70	3	40	1.61	124.84	3	40	1.61	124.84
Remove 18-mi 230kV T/L Antelope-Mesa	26	**96**	**20-May-10**	**11-Sep-10**	26	40	0.10	1042.60	12	40	1.61	499.38	10	40	1.61	416.15
Remove 18-mi 230kV T/L Antelope-Vincent	26	**96**	**20-May-10**	**11-Sep-10**	26	40	0.10	1042.60	12	40	1.61	499.38	10	40	1.61	416.15
IT/Communications	6	**72**	**23-Feb-11**	**17-May-11**	6	40	0.10	240.60	1	40	1.61	41.61	0	40	1.61	0.00
500 kV T/L Antelope-Vincent (#1)																
Reconfigure 500kV T/L Antelope-Vincent	6	**12**	**16-Jan-12**	**30-Jan-12**	6	40	0.10	240.60	2	40	1.61	83.23	1	40	1.61	41.61
Test/Energize	3	**3**	**30-Jan-12**	**1-Feb-12**	3	40	0.10	120.30	0	40	1.61	0.00	0	40	1.61	0.00
Shoe Fly - Sagebrush Vincent	6	**24**	**17-Nov-09**	**15-Dec-09**	6	40	0.10	240.60	2	40	1.61	83.23	2	40	1.61	83.23
Construction - Sagebrush Vincent	6	**47**	**16-Dec-09**	**11-Feb-10**	6	40	0.10	240.60	2	40	1.61	83.23	2	40	1.61	83.23
Cutover of Sagebrush Vincent	6	**19**	**1-Apr-10**	**22-Apr-10**	6	40	0.10	240.60	2	40	1.61	83.23	2	40	1.61	83.23
Relocate Sagebrush - Antelope																
Shoe Fly - Sagebrush Antelope	6	**24**	**17-Nov-09**	**15-Dec-09**	6	40	0.10	240.60	2	40	1.61	83.23	2	40	1.61	83.23
Construction - Sagebrush Antelope	6	**70**	**16-Dec-09**	**11-Mar-10**	6	40	0.10	240.60	2	40	1.61	83.23	2	40	1.61	83.23
Cutover of Sagebrush Antelope	6	**18**	**12-Mar-10**	**1-Apr-10**	6	40	0.10	240.60	2	40	1.61	83.23	2	40	1.61	83.23

							Employee Vehicle				Delivery Truck				Heavy Heavy Duty Truck			
Segment 6	**Crew Size**	**Total Days**	**Start Date**	**End Date**			**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**
Construction of Marshalling/Heli Yards	6	**468**	**13-Jun-09**	**30-Dec-10**			6	60	0.10	360.60	3	60	0.10	180.30	1	60	0.10	60.10
Marshalling Yards	4	**667**	**31-Mar-10**	**11-Jun-12**			4	60	0.10	240.40	1	60	0.10	60.10	1	130	0.10	130.10
Road Maintenance	2	**533**	**5-Jan-10**	**5-Jun-12**			2	60	0.10	120.20	1	60	5.68	65.68	1	60	5.68	65.68
230 kV Removal Ant-Mesa																		
Wreckout - Antelope-Mesa	26	**133**	**6-Apr-10**	**22-Sep-10**			26	60	0.10	1562.60	12	60	5.68	788.13	10	60	1.08	610.83
500 kV T/L Vincent-Duarte																		
Road Construction	12	**139**	**1-Jul-10**	**15-Dec-10**			12	60	0.10	721.20	4	60	5.68	262.71	7	60	5.68	459.74
Foundation Construction	24	**104**	**23-Sep-10**	**29-Jan-11**			24	60	0.10	1442.40	8	60	5.68	525.42	7	60	5.68	459.74
Tower Construction	48	**238**	**10-Dec-10**	**22-Sep-11**			48	60	0.10	2884.80	14	60	5.68	919.48	3	60	5.68	197.03
String Cable	40	**99**	**13-Jul-11**	**23-Nov-11**			40	60	0.10	2404.00	15	60	5.68	985.16	6	60	5.68	394.06
Restoration/Guard Poles	7	**27**	**26-Oct-11**	**28-Nov-11**			7	60	0.10	420.70	5	60	5.68	328.39	5	60	5.68	328.39
IT/Communications	6	**65**	**31-Jan-11**	**16-Apr-11**			6	60	0.10	360.60	1	60	5.68	65.68	0	60	5.68	0.00
230 kV Removal Rio Hondo-Vincent																		
Wreckout - Antelope-Mesa	26	**17**	**12-Jan-12**	**9-Feb-12**			26	60	0.10	1562.60	12	60	1.08	732.99	10	60	1.08	610.83
500 kV T/L Vincent-Mira Loma																		
Foundation Construction	24	**24**	**9-Feb-12**	**8-Mar-12**			24	60	0.10	1442.40	8	60	1.08	488.66	7	60	1.08	427.58
Tower Construction	28	**73**	**23-Feb-12**	**17-May-12**			28	60	0.10	1682.80	14	60	1.08	855.16	3	60	1.08	183.25
String Cable	40	**25**	**3-May-12**	**1-Jun-12**			40	60	0.10	2404.00	15	60	1.08	916.24	6	60	1.08	366.50
Restoration/Guard Poles	7	**5**	**31-May-12**	**5-Jun-12**			7	60	0.10	420.70	5	60	1.08	305.41	5	60	1.08	305.41
							Employee Vehicle				**Delivery Truck**				**Heavy Heavy Duty Truck**			
Segment 7	**Crew Size**	**Total Days**	**Start Date**	**End Date**			**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**
Construction of Marshalling Yards	6	**95**	**4-Jun-10**	**24-Sep-10**			6	40	0.10	240.60	3	40	0.10	120.30	1	40	0.10	40.10
Marshalling Yards	4	**649**	**24-Jun-10**	**14-Aug-12**			4	40	0.10	160.40	1	40	0.10	40.10	1	70	0.10	70.10
230 kV Removal Ant-Mesa																		
Wreckout - Antelope-Mesa	26	**94**	**30-Jun-10**	**20-Oct-10**			26	40	0.10	1042.60	12	40	0.87	490.45	10	40	0.87	408.71
500 kV Vincent-Rio Hondo																		
Road Construction	3	**39**	**14-Sep-10**	**28-Oct-10**			3	40	0.10	120.30	1	40	1.07	41.07	3	40	1.07	123.20
Foundation Construction	24	**30**	**28-Oct-10**	**3-Dec-10**			24	40	0.10	962.40	8	40	1.07	328.55	7	40	1.07	287.48
Tower Construction	48	**13**	**3-Dec-10**	**17-Dec-10**			48	40	0.10	1924.80	14	40	1.07	574.95	3	40	1.07	123.20
Restoration/Guard Poles	7	**2**	**18-Dec-10**	**19-Dec-10**			7	40	0.10	280.70	3	40	1.07	123.20	3	40	1.07	123.20
IT/Communications	6	**69**	**30-Sep-10**	**24-Dec-10**			6	40	0.10	240.60	1	40	1.07	41.07	0	40	1.07	0.00
500 kV Duarte-Mesa																		
Foundation Construction	24	**100**	**3-Dec-10**	**4-Apr-11**			24	40	0.10	962.40	8	40	0.79	326.33	7	40	0.79	285.54
Tower Construction	48	**376**	**10-Feb-11**	**17-May-12**			48	40	0.10	1924.80	14	40	0.79	571.08	3	40	0.79	122.38
String Cable	40	**156**	**2-Feb-12**	**4-Aug-12**			40	40	0.10	1604.00	15	40	0.87	613.06	6	40	0.87	245.22
Restoration/Guard Poles	7	**16**	**21-Jul-12**	**8-Aug-12**			7	40	0.10	280.70	3	40	0.79	122.38	3	40	0.79	122.38
IT/Communications	6	**73**	**10-May-12**	**4-Aug-12**			6	40	0.10	240.60	1	40	0.79	40.79	0	40	0.79	0.00
66 kV North of Rio Hondo																		
Construction	6	**146**	**6-Apr-10**	**25-Sep-10**			6	40	0.10	240.60	2	40	0.10	80.20	2	40	0.10	80.20
Removal	6	**47**	**29-Sep-10**	**24-Nov-10**			6	40	0.10	240.60	2	40	0.10	80.20	2	40	0.10	80.20
66 kV Rio Hondo-SG River																		
Construction	6	**142**	**3-Oct-10**	**26-Mar-11**			6	40	0.10	240.60	2	40	0.10	80.20	2	40	0.10	80.20
Removal	6	**49**	**26-Mar-11**	**21-May-11**			6	40	0.10	240.60	2	40	0.10	80.20	2	40	0.10	80.20
66 kV SG River to Mesa																		
Construction	6	**150**	**26-Mar-11**	**20-Sep-11**			6	40	0.10	240.60	2	40	0.10	80.20	2	40	0.10	80.20
Removal	6	**47**	**20-Sep-11**	**15-Nov-11**			6	40	0.10	240.60	2	40	0.10	80.20	2	40	0.10	80.20
66 kV Underground																		
Construction	12	**7**	**26-Sep-10**	**2-Oct-10**			12	40	0.10	481.20	2	40	0.10	80.20	2	40	0.10	80.20

							Employee Vehicle				Delivery Truck				Heavy Heavy Duty Truck			
Segment 8	**Crew Size**	**Total Days**	**Start Date**	**End Date**			**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**
Construction of Marshalling Yards	6	**188**	**9-Sep-09**	**23-Apr-10**			6	40	0.10	240.60	3	40	0.10	120.30	1	40	0.10	40.10
Marshalling Yards	4	**631**	**31-Mar-10**	**28-Apr-12**			4	40	0.10	160.40	1	40	0.10	40.10	1	90	0.10	90.10
Road Maintenance	2	**616**	**12-Apr-10**	**23-Apr-12**			2	40	0.10	80.20	1	40	0.48	40.48	1	40	0.48	40.48
230kV Removal																		
Remove 230 kV Rose Hills	26	**7**	**2-Aug-10**	**9-Aug-10**			26	40	0.10	1042.60	12	40	1.25	494.94	10	40	1.25	412.45
Remove 230 kV at Fullerton Rd	26	**6**	**27-Aug-10**	**2-Sep-10**			26	40	0.10	1042.60	12	40	0.45	485.36	10	40	0.45	404.47
Remove 230 kV Chino-Mesa (8A)	26	**96**	**17-Apr-10**	**9-Aug-10**			26	40	0.10	1042.60	12	40	0.62	487.48	10	40	0.62	406.23
Remove 230 kV on North ROW (8B)	26	**48**	**6-Apr-10**	**1-Jun-10**			26	40	0.10	1042.60	12	40	0.27	483.19	10	40	0.27	402.66
Remove 230 kV Chino-Mira Loma (8A)	26	**25**	**24-Aug-10**	**22-Sep-10**			26	40	0.10	1042.60	12	40	0.28	483.37	10	40	0.28	402.81
220 kV Rose Hills																		
Road Construction	3	**39**	**6-Apr-10**	**20-May-10**			3	40	0.10	120.30	1	40	1.25	41.25	3	40	1.25	123.74
Foundation Construction	24	**37**	**20-May-10**	**2-Jul-10**			24	40	0.10	962.40	8	40	1.25	329.96	7	40	1.25	288.72
Tower Construction	48	**24**	**18-Jun-10**	**16-Jul-10**			48	40	0.10	1924.80	14	40	1.25	577.43	3	40	1.25	123.74
String Cable	40	**13**	**16-Jul-10**	**30-Jul-10**			40	40	0.10	1604.00	15	40	1.25	618.68	6	40	1.25	247.47
Restoration/Guard Poles	7	**2**	**29-Jul-10**	**30-Jul-10**			7	40	0.10	280.70	3	40	1.25	123.74	3	40	1.25	123.74
Test/Energize	3	**3**	**30-Jul-10**	**2-Aug-10**			3	40	0.10	120.30	0	40	1.25	0.00	0	40	1.25	0.00
230 kV Fullerton Road																		
Road Construction	3	**39**	**6-Apr-10**	**20-May-10**			3	40	0.10	120.30	1	40	0.45	40.45	3	40	0.45	121.34
Foundation Construction	24	**37**	**20-May-10**	**2-Jul-10**			24	40	0.10	962.40	8	40	0.45	323.58	7	40	0.45	283.13
Tower Construction	48	**29**	**18-Jun-10**	**16-Jul-10**			48	40	0.10	1924.80	14	40	0.45	566.26	3	40	0.45	121.34
String Cable	40	**12**	**23-Jul-10**	**5-Aug-10**			40	40	0.10	1604.00	15	40	0.45	606.70	6	40	0.45	242.68
Restoration/Guard Poles	7	**1**	**5-Aug-10**	**5-Aug-10**			7	40	0.10	280.70	3	40	0.45	121.34	3	40	0.45	121.34
Test/Energize	3	**12**	**6-Aug-10**	**19-Aug-10**			3	40	0.10	120.30	0	40	0.45	0.00	0	40	0.45	0.00
230 kV Chino-Mira Loma (8B)																		
Road Construction	3	**32**	**22-Dec-09**	**29-Jan-10**			3	40	0.10	120.30	1	40	0.27	40.27	3	40	0.27	120.80
Foundation Construction	24	**61**	**29-Jan-10**	**10-Apr-10**			24	40	0.10	962.40	8	40	0.27	322.13	7	40	0.27	281.86
Tower Construction	48	**80**	**18-Mar-10**	**19-Jun-10**			48	40	0.10	1924.80	14	40	0.27	563.72	3	40	0.27	120.80
String Cable	40	**41**	**2-Jun-10**	**20-Jul-10**			40	40	0.10	1604.00	15	40	0.27	603.99	6	40	0.27	241.60
Restoration/Guard Poles	7	**7**	**16-Jul-10**	**23-Jul-10**			7	40	0.10	280.70	3	40	0.27	120.80	3	40	0.27	120.80
Test/Energize	3	**7**	**17-Aug-10**	**24-Aug-10**			3	40	0.10	120.30	0	40	0.27	0.00	0	40	0.27	0.00
500 kV Mesa to Chino (8A)																		
Road Construction	3	**13**	**23-Jun-10**	**6-Aug-10**			3	40	0.10	120.30	1	40	0.62	40.62	3	40	0.62	121.87
Foundation Construction	24	**175**	**9-Aug-10**	**25-Mar-11**			24	40	0.10	962.40	8	40	0.62	324.98	7	40	0.62	284.36
Tower Construction	48	**290**	**30-Dec-10**	**13-Dec-11**			48	40	0.10	1924.80	14	40	0.62	568.72	3	40	0.62	121.87
String Cable	40	**285**	**13-May-11**	**19-Apr-12**			40	40	0.10	1604.00	15	40	0.62	609.35	6	40	0.62	243.74
Restoration/Guard Poles	7	**27**	**23-Mar-12**	**23-Apr-12**			7	40	0.10	280.70	3	40	0.62	121.87	3	40	0.62	121.87
500 kV Chino to Mira Loma (8A/8C)																		
Road Construction	3	**38**	**26-Jun-10**	**10-Aug-10**			3	40	0.10	120.30	1	40	0.28	40.28	3	40	0.28	120.84
Foundation Construction	24	**71**	**22-Sep-10**	**16-Dec-10**			24	40	0.10	962.40	8	40	0.28	322.25	7	40	0.28	281.96
Tower Construction	48	**94**	**24-Nov-10**	**19-Mar-11**			48	40	0.10	1924.80	14	40	0.28	563.93	3	40	0.28	120.84
String Cable	40	**48**	**28-Feb-11**	**23-Apr-11**			40	40	0.10	1604.00	15	40	0.28	604.21	6	40	0.28	241.68
Restoration/Guard Poles	7	**6**	**21-Apr-11**	**27-Apr-11**			7	40	0.10	280.70	3	40	0.28	120.84	3	40	0.28	120.84
Connect Chino-Mira Loma 500 kV	6	**72**	**16-Feb-12**	**10-May-12**			6	40	0.10	240.60	2	40	0.28	80.56	1	40	0.28	40.28
66 kV Construction/Removal																		
Construction Chino	6	**83**	**6-Apr-10**	**13-Jul-10**			6	40	0.00	240.00	2	40	0.00	80.00	2	40	0.00	80.00
Construction Mesa	6	**25**	**11-Jul-10**	**4-Aug-10**			6	40	0.00	240.00	2	40	0.00	80.00	2	40	0.00	80.00
Construction Mira Loma	6	**25**	**7-Jul-10**	**4-Aug-10**			6	40	0.00	240.00	2	40	0.00	80.00	2	40	0.00	80.00
Removal	6	**48**	**14-Jul-10**	**8-Sep-10**			6	40	0.00	240.00	2	40	0.00	80.00	2	40	0.00	80.00
66 kV Underground																		
Construction	12	**43**	**27-May-10**	**16-Jul-10**			12	40	0.10	481.20	2	40	0.10	80.20	2	40	0.10	80.20

Segment 9	Crew Size	Total Days	Start Date	End Date			Employee Vehicle # of vehicle	Paved	Unpaved	Total VMT/day	Delivery Truck # of vehicle	Paved	Unpaved	Total VMT/day	Heavy Heavy Duty Truck # of vehicle	Paved	Unpaved	Total VMT/day
Whirlwind Substation																		
Grading Element	15	**71**	**22-Jan-10**	**15-Apr-10**			15	80	0.25	1203.75	2	60	0.25	120.5	3	60	0.25	180.75
Civil Element	25	**107**	**16-Apr-10**	**20-Aug-10**			25	80	0.25	2006.25	6	60	0.25	361.5	4	100	0.25	401
Electrical Element	25	**199**	**21-Aug-10**	**20-Aug-11**			25	80	0.10	2002.5	6	60	0.1	360.6	0	60	0.1	0
Transformer Assembly*	6	**161**	**4 different durations**		4/Jan/11 ~ 28/Feb/11 16/Feb/11 ~ 30/Mar/11 2/Mar/11 ~ 30/Mar/11 21/Mar/11 ~ 25/May/11		6	80	0.10	480.6	2	60	0.1	120.2	0	60	0.1	0
Testing	4	**48**	**21-Apr-11**	**16-Jun-11**			4	80	0.10	320.4	0	60	0.1	0	0	60	0.1	0
Antelope Substation																		
Grading Element	8	**71**	**17-Nov-09**	**11-Feb-10**			8	60	0.10	480.8	2	50	0.1	100.2	3	50	0.1	150.3
Civil Element	15	**160**	**12-Feb-10**	**20-Aug-10**	7/May/10 ~ 13/Nov/10 9/Feb/12 ~ 4/Apr/12		15	60	0.10	901.5	5	50	0.1	250.5	3	133	0.1	399.3
Electrical Element*	25	**204**	**2 different durations**				25	60	0.10	1502.5	5	50	0.1	250.5	0	50	0.1	0
Transformer Element*	6	**236**	**4 different durations**				6	60	0.00	360	2	50	0.1	100.2	0	50	0.1	0
Testing*	4	**145**	**2 different durations**		20/Dec/10 ~ 15/Feb/11 20/Dec/10 ~ 16/Mar/11 13/Nov/10 ~ 9/Feb/11 1/Mar/11 ~ 26/Apr/11		4	60	0.00	240	0	50	0.1	0	0	50	0.1	0
Construct SVC Antelope	6	**74**	**7-Dec-10**	**8-Mar-12**			6	60	0.00	360	2	50	0.1	100.2	0	50	0.1	0
Vincent Substation																		
Electrical Element	25	**59**	**9-Jan-12**	**19-Mar-12**	23/Jun/11 ~ 19/Aug/11 5/Apr/12 ~ 27/Jul/12		25	60	0.10	1502.5	5	40	0.1	200.5	1	165	0.1	165.1
Transformer Element*	6	**261**	**3 different durations**				6	60	0.10	360.6	2	40	0.1	80.2	1	165	0.1	165.1
Testing*	4	**107**	**2 different durations**				4	60	0.10	240.4	0	40	0.1	0	0	40	0.1	0
Construct SVC Vincent	6	**297**	**1-Aug-12**	**24-Jul-13**	20/Nov/12 ~ 7/Jun/13 9/Oct/10 ~ 5/Jan/11 9/DEc/11 ~ 9/Jan/12		6	60	0.10	360.6	2	40	0.1	80.2	0	40	0.1	0
Reconductor Line Riser on Existing Rio Hondo-Vincent #2 230 kV Position - Seg 6	6	**12**	**10-Jul-09**	**23-Jul-09**			6	60	0.10	360.6	2	40	0.1	80.2	1	165	0.1	165.1
Gould Substation																		
Transformer Element*	6	**59**	**2 different durations**		28/Oct/11 ~ 24/Nov/11 22/Jun/11 ~ 3/Aug/11		6	40	0.00	240	2	40	0	80	1	80	0	80
Testing	4	**6**	**26-Nov-11**	**2-Dec-11**			4	40	0.00	160	0	40	0	0	0	40	0	0
Mira Loma Substation					20/Jul/10 ~ 17/Aug/10 2/Jun/12 ~ 4/Aug/12													
Transformer Element	6	**54**	**2 different durations**				6	40	0.00	240	2	40	0	80	1	120	0	120
Chino Substation																		
Transformer Element	6	**53**	**11-May-10**	**13-Jul-10**			6	40	0.00	240	2	40	0	80	1	105	0	105

					Employee Vehicle				Delivery Truck				Heavy Heavy Duty Truck			
Segment 10	**Crew Size**	**Total Days**	**Start Date**	**End Date**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**
Marshalling Yards	4	**245**	**31-Mar-10**	**21-Jan-11**	4	80	0.10	320.40	1	60	3.14	63.14	1	220	3.14	223.14
Road Maintenance	2	**230**	**12-Apr-10**	**14-Jan-11**	2	80	0.10	160.20	1	60	3.14	63.14	1	60	3.14	63.14
500 kV Whirlwind to Windhub																
Road Construction	10	**39**	**6-Apr-10**	**20-May-10**	10	80	0.10	801.00	2	60	3.14	126.27	3	60	3.14	189.41
Foundation Construction	24	**53**	**20-May-10**	**22-Jul-10**	24	80	0.10	1922.40	8	60	3.14	505.10	7	60	3.14	441.96
Tower Construction	48	**135**	**25-Jun-10**	**4-Dec-10**	48	80	0.10	3844.80	14	60	3.14	883.92	3	60	3.14	189.41
String Cable	40	**59**	**30-Oct-10**	**11-Jan-11**	40	80	0.10	3204.00	15	60	3.14	947.06	6	60	3.14	378.82
Restoration/Guard Poles	7	**17**	**23-Dec-10**	**14-Jan-11**	7	80	0.10	560.70	3	60	3.14	189.41	3	60	3.14	189.41
IT/Communications	6	**68**	**16-Oct-10**	**11-Jan-11**	6	80	0.10	480.60	1	60	3.14	63.14	0	60	3.14	0.00
					Employee Vehicle				**Delivery Truck**				**Heavy Heavy Duty Truck**			
Segment 11	**Crew Size**	**Total Days**	**Start Date**	**End Date**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**	**# of vehicle**	**Paved**	**Unpaved**	**Total VMT/day**
Construction of Marshalling/Heli Yards	6	**264**	**2 different durations**		6	60	0.10	360.60	3	60	3.17	189.52	1	60	3.17	63.17
Marshalling Yards	4	**428**	**18-Apr-11**	**18-Jan-13**	4	60	0.10	240.40	1	60	0.10	60.10	1	130	0.10	130.10
Road Maintenance	2	**320**	**22-Dec-11**	**12-Jan-13**	2	60	0.10	120.20	1	60	4.22	64.22	1	60	4.22	64.22
Removal 230 kV Eagle-Pardee																
Wreckout	26	**59**	**23-Dec-11**	**5-Mar-12**	26	60	0.10	1562.60	12	60	4.22	770.66	10	60	4.22	642.22
500 kV 2nd Circuit Vincent-Gould																
Road Construction	12	**98**	**3-Nov-11**	**2-Mar-12**	12	60	0.10	721.20	4	60	4.22	256.89	7	60	4.22	449.55
Foundation Construction	24	**49**	**5-Mar-12**	**30-Apr-12**	24	60	0.10	1442.40	8	60	4.22	513.77	7	60	4.22	449.55
Tower Construction	48	**136**	**30-Apr-12**	**9-Oct-12**	48	60	0.10	2884.80	14	60	4.22	899.10	3	60	4.22	192.67
String Cable	40	**57**	**1-Nov-12**	**9-Jan-13**	40	60	0.10	2404.00	15	60	4.22	963.33	6	60	4.22	385.33
Restoration/Guard Poles	7	**19**	**20-Dec-12**	**12-Jan-13**	7	60	0.10	420.70	5	60	4.22	321.11	5	60	4.22	321.11
IT/Communications	6	**72**	**13-Oct-12**	**9-Jan-13**	6	60	0.10	360.60	1	60	4.22	64.22	0	60	4.22	0.00
230 kV Mesa-Gould																
String Cable	40	**54**	**8-Aug-12**	**11-Oct-12**	40	60	0.10	2404.00	15	60	0.55	908.29	6	60	0.55	363.32
IT/Communications	6	**72**	**18-Jul-12**	**11-Oct-12**	6	60	0.10	360.60	1	60	0.55	60.55	0	60	0.55	0.00
Test/Energize	3	**7**	**11-Oct-12**	**18-Oct-12**	3	60	0.10	180.30	0	60	0.55	0.00	0	60	0.55	0.00
230 kV Pardee-Vincent																
Road Construction	6	**2**	**22-Apr-11**	**23-Apr-11**	6	60	0.10	360.60	4	60	0.48	241.92	7	60	0.48	423.37
Foundation Construction	24	**6**	**25-Apr-11**	**30-Apr-11**	24	60	0.10	1442.40	8	60	0.48	483.85	7	60	0.48	423.37
Tower Construction	48	**6**	**7-Jun-11**	**13-Jun-11**	48	60	0.10	2884.80	14	60	0.48	846.73	3	60	0.48	181.44
String Cable	40	**7**	**13-Jun-11**	**20-Jun-11**	40	60	0.10	2404.00	15	60	0.48	907.22	6	60	0.48	362.89
Restoration/Guard Poles	7	**1**	**20-Jun-11**	**20-Jun-11**	7	60	0.10	420.70	5	60	0.48	302.41	5	60	0.48	302.41
Test/Energize	3	**7**	**19-Mar-12**	**26-Mar-12**	3	60	0.10	180.30	0	60	0.48	0.00	0	60	0.48	0.00
230 kV Eagle Rock-Gould																
Road Construction	6	**2**	**23-Apr-11**	**8-Jun-11**	6	60	0.10	360.60	4	60	0.25	240.99	7	60	0.25	421.73
Foundation Construction	24	**7**	**8-Jun-11**	**15-Jun-11**	24	60	0.10	1442.40	8	60	0.25	481.98	7	60	0.25	421.73
Tower Construction	48	**7**	**21-Jul-11**	**28-Jul-11**	48	60	0.10	2884.80	14	60	0.25	843.47	3	60	0.25	180.74
String Cable	40	**7**	**29-Jul-11**	**5-Aug-11**	40	60	0.10	2404.00	15	60	0.25	903.72	6	60	0.25	361.49
Restoration/Guard Poles	7	**1**	**6-Aug-11**	**6-Aug-11**	7	60	0.10	420.70	5	60	0.25	301.24	5	60	0.25	301.24

Onroad Emission Calculations

ONROAD EMISSIONS: SCAQMD EMISSION FACTORS FOR 2009

Scenario Year: 2009 -- Model Years: 1965-2009

Passenger Vehicles	
lb/mile	
CO	0.009686
NOx	0.001005
ROG	0.000992
SOx	1.07E-05
PM10	8.6E-05
PM2.5	5.38E-05
CO2	1.097554

Delivery Trucks	
lb/mile	
CO	0.020161
NOx	0.022366
ROG	0.002789
SOx	2.68E-05
PM10	0.000805
PM2.5	0.000692
CO2	2.723305

Heavy-Heavy Duty	
lb/mile	
CO	0.01282236
NOx	0.04184591
ROG	0.0032932
SOx	4.0128E-05
PM10	0.00199572
PM2.5	0.00175227
CO2	4.21080792

Scenario Year: 2010 -- Model Years: 1965-2010

Passenger Vehicles	
lb/mile	
CO	0.008263
Nox	0.000918
ROG	0.000914
Sox	1.08E-05
PM10	8.7E-05
PM2.5	5.48E-05
CO2	1.095682

Delivery Trucks	
lb/mile	
CO	0.018438
Nox	0.020625
ROG	0.00259
Sox	2.7E-05
PM10	0.000751
PM2.5	0.000642
CO2	2.732222

Heavy-Heavy Duty	
lb/mile	
CO	0.01195456
NOx	0.03822102
ROG	0.00304157
SOx	4.1312E-05
PM10	0.00183062
PM2.5	0.00160083
CO2	4.21120578

Scenario Year: 2011 -- Model Years: 1966-2011

Passenger Vehicles	
lb/mile	
CO	0.008263
Nox	0.000845
ROG	0.000852
Sox	1.08E-05
PM10	8.88E-05
PM2.5	5.65E-05
CO2	1.102352

Delivery Trucks	
lb/mile	
CO	0.016932
Nox	0.018934
ROG	0.002419
Sox	2.73E-05
PM10	0.000701
PM2.5	0.000597
CO2	2.751808

Heavy-Heavy Duty	
lb/mile	
CO	0.01112463
NOx	0.03455809
ROG	0.00279543
SOx	3.9722E-05
PM10	0.00166087
PM2.5	0.00144489
CO2	4.2204568

Scenario Year: 2012 -- Model Years: 1967-2012

Passenger Vehicles	
lb/mile	
CO	0.007655
Nox	0.000776
ROG	0.000796
Sox	1.07E-05
PM10	8.98E-05
PM2.5	5.75E-05
CO2	1.101525

Delivery Trucks	
lb/mile	
CO	0.015457
Nox	0.017324
ROG	0.002238
Sox	2.67E-05
PM10	0.00065
PM2.5	0.00055
CO2	2.766284

Heavy-Heavy Duty	
lb/mile	
CO	0.01021519
NOx	0.03092379
ROG	0.00252764
SOx	4.0423E-05
PM10	0.00149566
PM2.5	0.00129354
CO2	4.21590774

Scenario Year: 2013 -- Model Years: 1968-2013

Passenger Vehicles	
lb/mile	
CO	0.007092
Nox	0.000712
ROG	0.000746
Sox	1.07E-05
PM10	9.07E-05
PM2.5	5.83E-05
CO2	1.100874

Delivery Trucks	
lb/mile	
CO	0.014078
Nox	0.015773
ROG	0.002063
Sox	2.68E-05
PM10	0.0006
PM2.5	0.000502
CO2	2.781635

Heavy-Heavy Duty	
lb/mile	
CO	0.0093179
NOx	0.02742935
ROG	0.00226308
SOx	4.0858E-05
PM10	0.00133697
PM2.5	0.00114629
CO2	4.21518556

Scenario Year: 2014 -- Model Years: 1968-2013

Passenger Vehicles	
lb/mile	
CO	0.006604
Nox	0.000655
ROG	0.000702
Sox	1.07E-05
PM10	9.18E-05
PM2.5	5.94E-05
CO2	1.102572

Delivery Trucks	
lb/mile	
CO	0.012843
Nox	0.014252
ROG	0.001896
Sox	2.75E-05
PM10	0.000549
PM2.5	0.000455
CO2	2.798455

Heavy-Heavy Duty	
lb/mile	
CO	0.00846435
NOx	0.02418049
ROG	0.00201594
SOx	4.0922E-05
PM10	0.00118458
PM2.5	0.00100582
CO2	4.21279345

Offroad Equipment Emission Calculations

SCAQMD Offroad Emission Factors

	HP	2009 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM	2010 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM
14 ton Crane	180	0.1284	0.5009	1.0117	0.0009	0.0557	0.1213	0.4785	0.9507	0.0009	0.0534
50 ton Crane	200	0.1317	0.5424	1.1189	0.0010	0.0532	0.1222	0.4408	1.0325	0.0010	0.0516
980 Loader	318	0.1768	0.5461	1.8155	0.0019	0.0672	0.1678	0.5145	1.7078	0.0019	0.0633
Backhoe	85	0.1193	0.3673	0.4618	0.0005	0.0446	0.1083	0.3586	0.4389	0.0005	0.0414
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	0.1193	0.3673	0.4618	0.0005	0.0446	0.1083	0.3586	0.4389	0.0005	0.0414
Compactor	80	0.1322	0.3671	0.4932	0.0005	0.0464	0.1240	0.3601	0.4737	0.0005	0.0442
Compressor, Air	75	0.1165	0.3048	0.3786	0.0004	0.0378	0.1110	0.3005	0.3668	0.0004	0.0365
Crane, Hydraulic, 150 Ton (150 ton crane)	350	0.1553	0.5061	1.5371	0.0015	0.0591	0.1474	0.4728	1.4512	0.0015	0.0556
Crane, Hydraulic, Rough Terrain 35 ton	155	0.1244	0.4490	0.8777	0.0008	0.0589	0.1177	0.4459	0.8298	0.0008	0.0562
Crane, Hydraulic, 150/300 Ton	450	0.1793	0.6458	1.7637	0.0017	0.0681	0.1706	0.5992	1.6652	0.0017	0.0642
Crawler, track type, drill dig, Pheumatic D8	305	0.2347	0.7557	2.2327	0.0020	0.0903	0.2241	0.7105	2.1160	0.0020	0.0854
Crawler, Track Type, w/ blade (D6 Type)	185	0.2055	0.7445	1.6267	0.0014	0.0888	0.1956	0.7350	1.5409	0.0014	0.0846
Crawler, Track Type, w/ blade (D8 type)	305	0.2347	0.7557	2.2327	0.0020	0.0903	0.2241	0.7105	2.1160	0.0020	0.0854
Crawler, Track Type, Sagging (D8 type)	305	0.2347	0.7557	2.2327	0.0020	0.0903	0.2241	0.7105	2.1160	0.0020	0.0854
Ditch Digger	75	0.1808	0.4617	0.5754	0.0005	0.0559	0.1720	0.4534	0.5571	0.0005	0.0538
Drill Rig	250	0.0999	0.3479	1.3113	0.0021	0.0395	0.0957	0.3460	1.1847	0.0021	0.0384
Driller	305	0.1114	0.3944	1.4291	0.0023	0.0446	0.1074	0.3924	1.2992	0.0023	0.0435
Excavator Cat 320	138	0.1534	0.5814	0.9977	0.0010	0.0796	0.1420	0.5771	0.9299	0.0010	0.0742
Excavator, Grade - All	165	0.1556	0.6472	1.1448	0.0012	0.0729	0.1453	0.6450	1.0645	0.0012	0.0684
Forklift	75	0.0723	0.2046	0.2348	0.0003	0.0248	0.0643	0.1973	0.2233	0.0003	0.0227
Forklift, 5 ton	75	0.0723	0.2046	0.2348	0.0003	0.0248	0.0643	0.1973	0.2233	0.0003	0.0227
Forklift, 10 ton	85	0.0709	0.2097	0.2661	0.0003	0.0275	0.0634	0.2033	0.2514	0.0003	0.0252
Generator Concrete Batch Plant	50	0.1182	0.2970	0.3115	0.0004	0.0296	0.1117	0.2904	0.3070	0.0004	0.0284
Grader	285	0.1912	0.5601	1.9514	0.0020	0.0726	0.1815	0.5297	1.8365	0.0020	0.0683
Loader, Front End w/ Bucket	145	0.1416	0.5240	0.9747	0.0009	0.0699	0.1329	0.5203	0.9175	0.0009	0.0662
Manlifts	75	0.0723	0.2046	0.2348	0.0003	0.0248	0.0643	0.1973	0.2233	0.0003	0.0227
Motor, Auxilary Power	5	0.0060	0.0246	0.0399	0.0001	0.0024	0.0057	0.0242	0.0385	0.0001	0.0023
Motor Grader	140	0.1730	0.6218	1.1482	0.0011	0.0871	0.1622	0.6168	1.0818	0.0011	0.0825
Puller, Wire Puller 1 Drum	310	0.1489	0.6170	1.5047	0.0017	0.0635	0.1391	0.5970	1.4037	0.0017	0.0599
Tension Machine, Conductor or Static	135	0.1391	0.5595	0.9629	0.0010	0.0731	0.1279	0.5550	0.8997	0.0010	0.0686
Tractors	85	0.1193	0.3673	0.4618	0.0005	0.0446	0.1083	0.3586	0.4389	0.0005	0.0414
Water Pump	100	0.1494	0.4701	0.7904	0.0008	0.0651	0.1412	0.4648	0.7577	0.0008	0.0627

	HP	2011 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM	2012 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM
14 ton Crane	180	0.1150	0.4752	0.8960	0.0009	0.0509	0.1089	0.4722	0.8423	0.0009	0.0473
50 ton Crane	200	0.1156	0.4330	0.9692	0.0010	0.0486	0.1093	0.4260	0.9077	0.0010	0.0449
980 Loader	318	0.1586	0.4870	1.5801	0.0019	0.0575	0.1502	0.4631	1.4605	0.0019	0.0521
Backhoe	85	0.0980	0.3505	0.4179	0.0005	0.0383	0.0883	0.3431	0.3970	0.0005	0.0349
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	0.0980	0.3505	0.4179	0.0005	0.0383	0.0883	0.3431	0.3970	0.0005	0.0349
Compactor	80	0.1161	0.3533	0.4553	0.0005	0.0421	0.1083	0.3467	0.4367	0.0005	0.0397
Compressor, Air	75	0.1044	0.2947	0.3538	0.0004	0.0350	0.0967	0.2875	0.3390	0.0004	0.0329
Crane, Hydraulic, 150 Ton (150 ton crane)	350	0.1393	0.4421	1.3511	0.0015	0.0508	0.1316	0.4138	1.2558	0.0015	0.0461
Crane, Hydraulic, Rough Terrain 35 ton	155	0.1112	0.4431	0.7838	0.0008	0.0535	0.1050	0.4406	0.7381	0.0008	0.0499
Crane, Hydraulic, 150/300 Ton	450	0.1615	0.5565	1.5499	0.0017	0.0587	0.1529	0.5173	1.4404	0.0017	0.0534
Crawler, track type, drill dig, Pheumatic D8	305	0.2133	0.6694	1.9821	0.0020	0.0789	0.2031	0.6323	1.8555	0.0020	0.0728
Crawler, Track Type, w/ blade (D6 Type)	185	0.1862	0.7264	1.4567	0.0014	0.0806	0.1771	0.7189	1.3752	0.0014	0.0752
Crawler, Track Type, w/ blade (D8 type)	305	0.2133	0.6694	1.9821	0.0020	0.0789	0.2031	0.6323	1.8555	0.0020	0.0728
Crawler, Track Type, Sagging (D8 type)	305	0.2133	0.6694	1.9821	0.0020	0.0789	0.2031	0.6323	1.8555	0.0020	0.0728
Ditch Digger	75	0.1633	0.4453	0.5397	0.0005	0.0517	0.1548	0.4374	0.5222	0.0005	0.0493
Drill Rig	250	0.0892	0.3445	1.0129	0.0021	0.0323	0.0838	0.3435	0.8722	0.0021	0.0268
Driller	305	0.1008	0.3906	1.1181	0.0023	0.0366	0.0951	0.3895	0.9697	0.0023	0.0305
Excavator Cat 320	138	0.1316	0.5732	0.8673	0.0010	0.0693	0.1217	0.5697	0.8057	0.0010	0.0628
Excavator, Grade - All	165	0.1359	0.6430	0.9906	0.0012	0.0644	0.1269	0.6413	0.9192	0.0012	0.0585
Forklift	75	0.0572	0.1917	0.2134	0.0003	0.0208	0.0505	0.1866	0.2034	0.0003	0.0187
Forklift, 5 ton	75	0.0572	0.1917	0.2134	0.0003	0.0208	0.0505	0.1866	0.2034	0.0003	0.0187
Forklift, 10 ton	85	0.0566	0.1984	0.2384	0.0003	0.0231	0.0501	0.1939	0.2252	0.0003	0.0207
Generator Concrete Batch Plant	50	0.1043	0.2826	0.3020	0.0004	0.0270	0.0959	0.2734	0.2966	0.0004	0.0255
Grader	285	0.1718	0.5036	1.7014	0.0020	0.0622	0.1627	0.4806	1.5743	0.0020	0.0564
Loader, Front End w/ Bucket	145	0.1246	0.5171	0.8635	0.0009	0.0627	0.1166	0.5142	0.8100	0.0009	0.0579
Manlifts	75	0.0572	0.1917	0.2134	0.0003	0.0208	0.0505	0.1866	0.2034	0.0003	0.0187
Motor, Auxilary Power	5	0.0055	0.0237	0.0370	0.0001	0.0022	0.0052	0.0233	0.0354	0.0001	0.0020
Motor Grader	140	0.1521	0.6125	1.0195	0.0011	0.0781	0.1423	0.6085	0.9571	0.0011	0.0721
Puller, Wire Puller 1 Drum	310	0.1298	0.5804	1.2927	0.0017	0.0553	0.1220	0.5692	1.1912	0.0017	0.0500
Tension Machine, Conductor or Static	135	0.1176	0.5510	0.8413	0.0010	0.0645	0.1078	0.5473	0.7829	0.0010	0.0588
Tractors	85	0.0980	0.3505	0.4179	0.0005	0.0383	0.0883	0.3431	0.3970	0.0005	0.0349
Water Pump	100	0.1323	0.4588	0.7229	0.0008	0.0600	0.1223	0.4520	0.6836	0.0008	0.0563

	HP	2013 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM	2014 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM
14 ton Crane	180	0.1032	0.4696	0.7914	0.0009	0.0439	0.0977	0.4674	0.7425	0.0009	0.0405
50 ton Crane	200	0.1034	0.4197	0.8495	0.0010	0.0414	0.0978	0.4143	0.7900	0.0010	0.0380
980 Loader	318	0.1424	0.4422	1.3494	0.0019	0.0470	0.1345	0.4242	1.2201	0.0019	0.0424
Backhoe	85	0.0794	0.3364	0.3729	0.0005	0.0311	0.0713	0.3303	0.3509	0.0005	0.0274
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	0.0794	0.3364	0.3729	0.0005	0.0311	0.0713	0.3303	0.3509	0.0005	0.0274
Compactor	80	0.1008	0.3405	0.4156	0.0005	0.0368	0.0936	0.3345	0.3955	0.0005	0.0341
Compressor, Air	75	0.0886	0.2798	0.3210	0.0004	0.0304	0.0805	0.2721	0.3044	0.0004	0.0278
Crane, Hydraulic, 150 Ton (150 ton crane)	350	0.1245	0.3886	1.1661	0.0015	0.0418	0.1175	0.3669	1.0644	0.0015	0.0378
Crane, Hydraulic, Rough Terrain 35 ton	155	0.0990	0.4383	0.6947	0.0008	0.0462	0.0934	0.4363	0.6536	0.0008	0.0427
Crane, Hydraulic, 150/300 Ton	450	0.1449	0.4823	1.3374	0.0017	0.0485	0.1370	0.4522	1.2200	0.0017	0.0439
Crawler, track type, drill dig, Pheumatic D8	305	0.1935	0.5991	1.7363	0.0020	0.0669	0.1836	0.5696	1.6007	0.0020	0.0614
Crawler, Track Type, w/ blade (D6 Type)	185	0.1686	0.7122	1.2984	0.0014	0.0700	0.1604	0.7064	1.2236	0.0014	0.0649
Crawler, Track Type, w/ blade (D8 type)	305	0.1935	0.5991	1.7363	0.0020	0.0669	0.1836	0.5696	1.6007	0.0020	0.0614
Crawler, Track Type, Sagging (D8 type)	305	0.1935	0.5991	1.7363	0.0020	0.0669	0.1836	0.5696	1.6007	0.0020	0.0614
Ditch Digger	75	0.1464	0.4297	0.5014	0.0005	0.0466	0.1382	0.4222	0.4816	0.0005	0.0439
Drill Rig	250	0.0795	0.3429	0.7632	0.0021	0.0221	0.0737	0.3426	0.6140	0.0021	0.0179
Driller	305	0.0905	0.3888	0.8531	0.0023	0.0252	0.0840	0.3885	0.6883	0.0023	0.0205
Excavator Cat 320	138	0.1126	0.5665	0.7492	0.0010	0.0562	0.1042	0.5636	0.6983	0.0010	0.0499
Excavator, Grade - All	165	0.1186	0.6397	0.8542	0.0012	0.0526	0.1109	0.6383	0.7961	0.0012	0.0469
Forklift	75	0.0443	0.1821	0.1916	0.0003	0.0164	0.0384	0.1779	0.1803	0.0003	0.0142
Forklift, 5 ton	75	0.0443	0.1821	0.1916	0.0003	0.0164	0.0384	0.1779	0.1803	0.0003	0.0142
Forklift, 10 ton	85	0.0442	0.1900	0.2110	0.0003	0.0181	0.0385	0.1863	0.1974	0.0003	0.0156
Generator Concrete Batch Plant	50	0.0872	0.2639	0.2847	0.0004	0.0234	0.0785	0.2545	0.2731	0.0004	0.0213
Grader	285	0.1543	0.4605	1.4556	0.0020	0.0510	0.1456	0.4431	1.3180	0.0020	0.0460
Loader, Front End w/ Bucket	145	0.1092	0.5116	0.7600	0.0009	0.0530	0.1023	0.5093	0.7137	0.0009	0.0482
Manlifts	75	0.0443	0.1821	0.1916	0.0003	0.0164	0.0384	0.1779	0.1803	0.0003	0.0142
Motor, Auxilary Power	5	0.0050	0.0228	0.0339	0.0001	0.0019	0.0047	0.0223	0.0324	0.0001	0.0018
Motor Grader	140	0.1331	0.6050	0.8989	0.0011	0.0660	0.1246	0.6018	0.8448	0.0011	0.0601
Puller, Wire Puller 1 Drum	310	0.1150	0.5608	1.0991	0.0017	0.0449	0.1080	0.5540	0.9960	0.0017	0.0402
Tension Machine, Conductor or Static	135	0.0987	0.5439	0.7294	0.0010	0.0527	0.0902	0.5409	0.6818	0.0010	0.0468
Tractors	85	0.0794	0.3364	0.3729	0.0005	0.0311	0.0713	0.3303	0.3509	0.0005	0.0274
Water Pump	100	0.1121	0.4450	0.6427	0.0008	0.0519	0.1020	0.4382	0.6057	0.0008	0.0474

SCAQMD emission factors are linearly interpolated as necessary for the specific hp size of the assumed equipment

Helicopter Emission Calculations

Emission Factor Derivation

Approach/Climbout (i.e. Working)

Equiv. Engs	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
T53-L-11D	1100	1	0.20	2.04	5.00	0.04	0.27
T58-GE-5 (2)	1500	2	1.40	9.92	12.79	0.11	0.71

Note: SOx increased to assume 30 ppm sulfur Jet A fuel Sulfur Content

Idle	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
T53-L-11D	1100	1	9.00	4.21	0.20	0.01	0.01
T58-GE-5 (2)	1500	2	25.86	45.12	0.40	0.02	0.03

Source: FAEED database
FAEED - FAA Aircraft Engine Emission Database

Relating Factors to Potential Construction/Operating Helicopters

Approach/Climbout	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	420	1	0.08	0.78	1.91	0.02	0.10
Eurocopter	847	1	0.15	1.57	3.85	0.03	0.21
Skyking	1400	2	2.61	18.52	23.87	0.20	1.32
Skycrane	4500	2	8.40	59.52	76.74	0.64	4.25

Idle	Engine HP	Number	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	420	1	3.44	1.61	0.08	0.00	0.01
Eurocopter	847	1	6.93	3.24	0.15	0.01	0.01
Skyking	1400	2	48.28	84.23	0.75	0.03	0.05
Skycrane	4500	2	155.19	270.73	2.40	0.10	0.16

Construction
Assumptions:
Only the Hughes 500 size helicopters are used during conductor installation for the proposed project.
Two Hughes helicopters are in operation during line stringing for 2.5 hours/day each.
Basis - PEA and Response to question 054
The Dever-Valley Alternative requires 8 hours per day of Skycrane, 2 hours/day of Eurocopter, and Hughes 500 helicopter use is the same as for the proposed project.
The per tower Skycrane usage is xx hours, Eurocopter is xx hours for the Devers-Valley Alternative
Idle time is 10% of working time for small helicopters and negligible for the Skycrane.
Assumes helicopters stay within 3000 feet of the ground.
Applicant Measure APM-G7 notes use of helicopters assisted construction in sensitive areas, but that APM is not assumed to be implemented in this emission estimate.

Proposed Project - Onroad Emissions by Segment

Segment 4

		VMT	Emissions lbs -2009					
2009	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	82,577	81.95	799.81	83.01	0.88	7.10	4.45
	Delivery	37,585	104.82	757.74	840.64	1.01	30.27	26.02
	Heavy-Heavy Duty	14,507	47.77	186.01	607.04	0.58	28.95	25.42
		Totals	234.55	1,743.56	1,530.69	2.47	66.33	55.88

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	1,227,543	1,121.96	10,142.89	1,127.06	13.23	106.77	67.25
	Delivery	394,706	1,022.12	7,277.44	8,140.65	10.66	296.51	253.53
	Heavy-Heavy Duty	212,297	645.71	2,537.91	8,114.19	8.77	388.63	339.85
		Totals	2,789.79	19,958.24	17,381.90	32.66	791.91	660.63

		VMT	Emissions lbs -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	91,713	78.17	757.80	77.46	0.99	8.14	5.18
	Delivery	30,304	73.30	513.12	573.77	0.83	21.24	18.09
	Heavy-Heavy Duty	15,382	43.00	171.12	531.58	0.61	25.55	22.23
		Totals	194.47	1,442.04	1,182.81	2.43	54.93	45.50

Segment 5

2009		VMT	Emissions lbs -2009					
	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	59,188	58.74	573.27	59.49	0.63	5.09	3.19
	Delivery	25,884	72.19	521.85	578.94	0.69	20.85	17.92
	Heavy-Heavy Duty	20,199	66.52	259.00	845.26	0.81	40.31	35.39
		Totals	197.45	1,354.12	1,483.69	2.14	66.25	56.50

2010		VMT	Emissions lbs -2010					
	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	512,478	468.40	4,234.48	470.53	5.52	44.57	28.07
	Delivery	203,829	527.83	3,758.13	4,203.90	5.51	153.12	130.93
	Heavy-Heavy Duty	193,074	587.25	2,308.12	7,379.49	7.98	353.45	309.08
		Totals	1,583.48	10,300.73	12,053.91	19.00	551.14	468.08

2011		VMT	Emissions lbs -2011					
	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	352,319	300.29	2,911.12	297.57	3.80	31.28	19.91
	Delivery	119,143	288.17	2,017.38	2,255.82	3.25	83.52	71.11
	Heavy-Heavy Duty	72,055	201.43	801.59	2,490.10	2.86	119.68	104.11
		Totals	789.89	5,730.10	5,043.49	9.91	234.47	195.13

2012		VMT	Emissions lbs -2012					
	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	3,248	2.59	24.86	2.52	0.03	0.29	0.19
	Delivery	999	2.23	15.44	17.30	0.03	0.65	0.55
	Heavy-Heavy Duty	499	1.26	5.10	15.44	0.02	0.75	0.65
		Totals	6.08	45.40	35.27	0.08	1.69	1.38

Segment 6

		VMT	Emissions lbs -2009					
2009	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	60,220	59.77	583.27	60.53	0.64	5.18	3.24
	Delivery	30,110	83.98	607.04	673.45	0.81	24.25	20.84
	Heavy-Heavy Duty	10,037	33.05	128.69	419.99	0.40	20.03	17.59
		Totals	176.80	1,319.01	1,153.98	1.85	49.46	41.67

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	652,566	596.44	5,391.99	599.15	7.03	56.76	35.75
	Delivery	275,770	714.13	5,084.56	5,687.66	7.45	207.16	177.14
	Heavy-Heavy Duty	241,825	735.53	2,890.92	9,242.81	9.99	442.69	387.12
		Totals	2,046.09	13,367.47	15,529.62	24.47	706.61	600.00

		VMT	Emissions lbs -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	1,049,767	894.75	8,673.97	886.64	11.31	93.21	59.34
	Delivery	362,425	876.59	6,136.73	6,862.03	9.89	254.05	216.30
	Heavy-Heavy Duty	159,675	446.36	1,776.33	5,518.08	6.34	265.20	230.71
		Totals	2,217.70	16,587.03	13,266.75	27.54	612.46	506.35

		VMT	Emissions lbs -2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	294,310	234.35	2,252.87	228.33	3.16	26.43	16.92
	Delivery	127,700	285.76	1,973.91	2,212.31	3.41	82.97	70.18
	Heavy-Heavy Duty	70,814	178.99	723.38	2,189.84	2.86	105.91	91.60
		Totals	699.11	4,950.16	4,630.48	9.43	215.31	178.70

Segment 7

2010		VMT	Emissions lbs -2010					
	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	311,056	284.30	2,570.18	285.59	3.35	27.06	17.04
	Delivery	115,159	298.21	2,123.26	2,375.11	3.11	86.51	73.97
	Heavy-Heavy Duty	96,893	294.71	1,158.31	3,703.34	4.00	177.37	155.11
		Totals	877.22	5,851.75	6,364.04	10.46	290.94	246.12

2011		VMT	Emissions lbs -2011					
	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	708,808	604.14	5,856.70	598.66	7.64	62.94	40.07
	Delivery	213,958	517.50	3,622.83	4,051.01	5.84	149.98	127.69
	Heavy-Heavy Duty	101,000	282.34	1,123.58	3,490.35	4.01	167.75	145.93
		Totals	1,403.97	10,603.12	8,140.03	17.49	380.66	313.69

2012		VMT	Emissions lbs -2012					
	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	516,247	411.08	3,951.74	400.52	5.54	46.35	29.68
	Delivery	171,542	383.87	2,651.60	2,971.84	4.57	111.46	94.27
	Heavy-Heavy Duty	67,045	169.47	684.88	2,073.30	2.71	100.28	86.73
		Totals	964.41	7,288.23	5,445.66	12.82	258.09	210.68

Segment 8

		VMT	Emissions lbs -2009					
2009	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	23,579	23.40	228.38	23.70	0.25	2.03	1.27
	Delivery	11,630	32.44	234.48	260.13	0.31	9.37	8.05
	Heavy-Heavy Duty	4,736	15.60	60.72	198.17	0.19	9.45	8.30
		Totals	71.43	523.58	482.00	0.75	20.85	17.62

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	1,066,136	974.44	8,809.22	978.86	11.49	92.73	58.40
	Delivery	373,832	968.07	6,892.57	7,710.13	10.10	280.83	240.12
	Heavy-Heavy Duty	265,761	808.33	3,177.06	10,157.67	10.98	486.51	425.44
		Totals	2,750.83	18,878.86	18,846.66	32.56	860.07	723.97

		VMT	Emissions lbs -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	1,208,614	1,030.14	9,986.48	1,020.80	13.02	107.32	68.32
	Delivery	395,232	955.94	6,692.23	7,483.19	10.78	277.05	235.88
	Heavy-Heavy Duty	161,752	452.17	1,799.43	5,589.83	6.43	268.65	233.71
		Totals	2,438.25	18,478.14	14,093.82	30.23	653.01	537.91

		VMT	Emissions lbs -2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	194,285	154.70	1,487.20	150.73	2.08	17.45	11.17
	Delivery	72,316	161.83	1,117.82	1,252.82	1.93	46.99	39.74
	Heavy-Heavy Duty	41,096	103.88	419.80	1,270.84	1.66	61.47	53.16
		Totals	420.41	3,024.82	2,674.39	5.67	125.90	104.07

Segment 9-Whirlwind Substation

2010	VMT	Emissions lbs -2010					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	516,405	471.99	4,266.93	474.13	5.56	44.92	28.29
Delivery	86,181	223.17	1,588.97	1,777.44	2.33	64.74	55.36
Heavy-Heavy Duty	55,740	169.54	666.35	2,130.45	2.30	102.04	89.23
	Totals	864.70	6,522.25	4,382.03	10.19	211.70	172.88

2011	VMT	Emissions lbs -2011					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	274,983	234.38	2,272.12	232.25	2.96	24.42	15.54
Delivery	52,167	126.17	883.31	987.71	1.42	36.57	31.13
Heavy-Heavy Duty	0	0.00	0.00	0.00	0.00	0.00	0.00
	Totals	360.55	3,155.43	1,219.96	4.39	60.98	46.68

Segment 9-Antelope Substation

2009	VMT	Emissions lbs -2009					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	17,790	17.66	172.30	17.88	0.19	1.53	0.96
Delivery	3,707	10.34	74.74	82.92	0.10	2.99	2.57
Heavy-Heavy Duty	5,561	18.31	71.31	232.71	0.22	11.10	9.74
	Totals	46.31	318.35	333.51	0.51	15.61	13.27

2010	VMT	Emissions lbs -2010					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	424,200	387.71	3,505.06	389.48	4.57	36.90	23.24
Delivery	90,531	234.44	1,669.17	1,867.16	2.45	68.01	58.15
Heavy-Heavy Duty	31,158	94.77	372.48	1,190.90	1.29	57.04	49.88
	Totals	716.92	5,546.71	3,447.53	8.30	161.94	131.27

2011	VMT	Emissions lbs -2011					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	95,640	81.52	790.25	80.78	1.03	8.49	5.41
Delivery	23,347	56.47	395.31	442.04	0.64	16.37	13.93
Heavy-Heavy Duty	0	0.00	0.00	0.00	0.00	0.00	0.00
	Totals	137.99	1,185.56	522.81	1.67	24.86	19.34

2012	VMT	Emissions lbs -2012					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	93,658	74.58	716.92	72.66	1.00	8.41	5.38
Delivery	11,774	26.35	181.99	203.97	0.31	7.65	6.47
Heavy-Heavy Duty	0	0.00	0.00	0.00	0.00	0.00	0.00
	Totals	100.92	898.91	276.63	1.32	16.06	11.85

Segment 9-Vincent Substation

		VMT	Emissions lbs -2009					
2009	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	4,327	4.29	41.91	4.35	0.05	0.37	0.23
	Delivery	962	2.68	19.40	21.53	0.03	0.78	0.67
	Heavy-Heavy Duty	165	0.54	2.12	6.91	0.01	0.33	0.29
		Totals	7.52	63.43	32.78	0.08	1.48	1.19

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	25,603	23.40	211.55	23.51	0.28	2.23	1.40
	Delivery	5,373	13.91	99.07	110.82	0.15	4.04	3.45
	Heavy-Heavy Duty	826	2.51	9.87	31.55	0.03	1.51	1.32
		Totals	39.83	320.49	165.88	0.46	7.77	6.18

		VMT	Emissions lbs -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	7,933	6.76	65.55	6.70	0.09	0.70	0.45
	Delivery	1,764	4.27	29.88	33.41	0.05	1.24	1.05
	Heavy-Heavy Duty	826	2.31	9.18	28.53	0.03	1.37	1.19
		Totals	13.34	104.61	68.63	0.17	3.31	2.69

		VMT	Emissions lbs -2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	148,507	118.25	1,136.78	115.22	1.59	13.33	8.54
	Delivery	25,143	56.26	388.64	435.58	0.67	16.34	13.82
	Heavy-Heavy Duty	1,651	4.17	16.87	51.06	0.07	2.47	2.14
		Totals	178.69	1,542.29	601.85	2.33	32.14	24.49

		VMT	Emissions lbs -2013					
2013	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	132,100	98.50	936.89	94.00	1.42	11.98	7.71
	Delivery	24,301	50.13	342.10	383.30	0.65	14.57	12.19
	Heavy-Heavy Duty	0	0.00	0.00	0.00	0.00	0.00	0.00
		Totals	148.63	1,278.99	477.30	2.07	26.55	19.90

Segment 9-Gould Substation

		VMT	Emissions lbs -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	15,120	12.89	124.93	12.77	0.16	1.34	0.85
	Delivery	4,720	11.42	79.92	89.37	0.13	3.31	2.82
	Heavy-Heavy Duty	800	2.24	8.90	27.65	0.03	1.33	1.16
		Totals	26.54	213.75	129.78	0.32	5.98	4.83

Segment 9-Mira Loma Substation

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	6,000	5.48	49.58	5.51	0.06	0.52	0.33
	Delivery	2,000	5.18	36.88	41.25	0.05	1.50	1.28
	Heavy-Heavy Duty	600	1.82	7.17	22.93	0.02	1.10	0.96
		Totals	12.49	93.62	69.69	0.14	3.12	2.57

		VMT	Emissions lbs -2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	6,960	5.54	53.28	5.40	0.07	0.62	0.40
	Delivery	2,320	5.19	35.86	40.19	0.06	1.51	1.27
	Heavy-Heavy Duty	600	1.52	6.13	18.55	0.02	0.90	0.78
		Totals	12.25	95.27	64.15	0.16	3.03	2.45

Segment 9-Chino Substation

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	12,720	11.63	105.10	11.68	0.14	1.11	0.70
	Delivery	4,240	10.98	78.18	87.45	0.11	3.19	2.72
	Heavy-Heavy Duty	525	1.60	6.28	20.07	0.02	0.96	0.84
		Totals	24.20	189.55	119.19	0.27	5.25	4.26

Segment 10

2010	VMT	Emissions lbs -2010					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	951,989	870.11	7,866.05	874.06	10.26	82.80	52.15
Delivery	231,335	599.06	4,265.27	4,771.20	6.25	173.78	148.59
Heavy-Heavy Duty	141,195	429.46	1,687.93	5,396.63	5.83	258.48	226.03

Totals	1,898.62	13,819.25	11,041.89	22.34	515.06	426.77

2011	VMT	Emissions lbs -2011					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	46,778	39.87	386.52	39.51	0.50	4.15	2.64
Delivery	13,069	31.61	221.30	247.45	0.36	9.16	7.80
Heavy-Heavy Duty	9,947	27.81	110.66	343.75	0.40	16.52	14.37

Totals	99.29	718.47	630.71	1.26	29.84	24.82

Segment 11

		VMT	Emissions lbs -2009					
2009	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	56,975	56.54	551.84	57.27	0.61	4.90	3.07
	Delivery	29,945	83.52	603.71	669.75	0.80	24.12	20.73
	Heavy-Heavy Duty	9,982	32.87	127.99	417.69	0.40	19.92	17.49
		Totals	172.93	1,283.53	1,144.71	1.81	48.94	41.29

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	11,179	10.22	92.37	10.26	0.12	0.97	0.61
	Delivery	5,875	15.21	108.32	121.17	0.16	4.41	3.77
	Heavy-Heavy Duty	1,958	5.96	23.41	74.85	0.08	3.59	3.14
		Totals	31.39	224.10	206.29	0.36	8.97	7.52

		VMT	Emissions lbs -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	165,035	140.66	1,363.64	139.39	1.78	14.65	9.33
	Delivery	56,293	136.16	953.18	1,065.84	1.54	39.46	33.60
	Heavy-Heavy Duty	56,045	156.67	623.48	1,936.82	2.23	93.08	80.98
		Totals	433.49	2,940.31	3,142.05	5.54	147.20	123.90

		VMT	Emissions lbs -2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	1,019,597	811.88	7,804.75	791.03	10.94	91.55	58.62
	Delivery	359,866	805.29	5,562.60	6,234.41	9.60	233.82	197.76
	Heavy-Heavy Duty	209,111	528.56	2,136.11	6,466.52	8.45	312.76	270.49
		Totals	2,145.74	15,503.47	13,491.96	28.99	638.13	526.88

		VMT	Emissions lbs -2013					
2013	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	31,132	23.21	220.80	22.15	0.33	2.82	1.82
	Delivery	12,975	26.77	182.66	204.66	0.35	7.78	6.51
	Heavy-Heavy Duty	8,887	20.11	82.81	243.78	0.36	11.88	10.19
		Totals	70.09	486.27	470.59	1.04	22.48	18.51

Summary by Segment

Segment 4

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	1,401,832.50	1,282.08	11,700.50	1,287.52	15.10	122.02	76.88
Delivery	462,594.72	1,200.24	8,548.31	9,555.05	12.49	348.03	297.64
Heavy-Heavy Duty	242,185.40	736.49	2,895.04	9,252.81	9.96	443.13	387.50
	Totals	3,218.81	23,143.85	20,095.39	37.55	913.17	762.01

Segment 5

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	927,232.30	830.02	7,743.74	830.11	9.98	81.24	51.36
Delivery	349,855.57	890.43	6,312.80	7,055.96	9.48	258.13	220.50
Heavy-Heavy Duty	285,828.31	856.46	3,373.81	10,730.29	11.67	514.18	449.23
	Totals	2,576.90	17,430.35	18,616.36	31.13	853.55	721.09

Segment 6

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	2,056,862.40	1,785.31	16,902.10	1,774.65	22.14	181.58	115.25
Delivery	796,005.73	1,960.46	13,802.25	15,435.45	21.55	568.44	484.46
Heavy-Heavy Duty	482,351.75	1,393.94	5,519.32	17,370.73	19.60	833.84	727.02
	Totals	5,139.70	36,223.66	34,580.83	63.29	1,583.85	1,326.73

Segment 7

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	1,536,110.70	1,299.52	12,378.63	1,284.77	16.53	136.35	86.79
Delivery	500,659.49	1,199.58	8,397.69	9,397.96	13.52	347.95	295.93
Heavy-Heavy Duty	264,937.91	746.51	2,966.78	9,267.00	10.72	445.40	387.77
	Totals	3,245.61	23,743.09	19,949.73	40.77	929.69	770.49

Segment 8

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	2,492,613.40	2,182.68	20,511.28	2,174.10	26.85	219.52	139.16
Delivery	853,009.99	2,118.27	14,937.11	16,706.27	23.12	614.23	523.80
Heavy-Heavy Duty	473,344.67	1,379.97	5,457.01	17,216.51	19.26	826.07	720.61
	Totals	5,680.92	40,905.40	36,096.87	69.22	1,659.82	1,383.57

Segment 9

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	1,781,945.00	1,554.58	14,449.16	1,546.31	19.18	156.87	99.43
Delivery	338,529.30	836.96	5,903.42	6,604.12	9.15	242.78	206.89
Heavy-Heavy Duty	98,451.65	299.33	1,176.65	3,761.30	4.06	180.14	157.53
	Totals	2,690.88	21,529.23	11,911.74	32.38	579.79	463.85

Segment 10

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	998,766.90	909.98	8,252.57	913.57	10.76	86.96	54.80
Delivery	244,404.53	630.67	4,486.57	5,018.65	6.60	182.94	156.39
Heavy-Heavy Duty	151,142.45	457.26	1,798.59	5,740.38	6.23	275.00	240.40
	Totals	1,997.91	14,537.73	11,672.60	23.59	544.90	451.59

Segment 11

	VMT	Emissions lbs					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	1,283,916.30	1,042.52	10,033.39	1,020.11	13.78	114.90	73.45
Delivery	464,954.86	1,066.95	7,410.48	8,295.83	12.44	309.60	262.37
Heavy-Heavy Duty	285,984.02	744.17	2,993.81	9,139.65	11.52	441.23	382.29
	Totals	2,853.64	20,437.68	18,455.59	37.74	865.73	718.11

Proposed Project - Onroad Emissions Summary (ton)

2009	VMT	Emissions ton -2009					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	304,656	0.151	1.475	0.153	0.002	0.013	0.008
Delivery	139,824	0.195	1.409	1.564	0.002	0.056	0.048
Heavy-Heavy Duty	65,186	0.107	0.418	1.364	0.001	0.065	0.057

2010	VMT	Emissions ton -2010					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	5,717,873	2.613	23.623	2.625	0.031	0.249	0.157
Delivery	1,788,831	2.316	16.491	18.447	0.024	0.672	0.575
Heavy-Heavy Duty	1,241,853	1.889	7.423	23.732	0.026	1.137	0.994

2011	VMT	Emissions ton -2011					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	4,016,709	1.712	16.595	1.696	0.022	0.178	0.114
Delivery	1,272,423	1.539	10.773	12.046	0.017	0.446	0.380
Heavy-Heavy Duty	577,482	0.807	3.212	9.978	0.011	0.480	0.417

2012	VMT	Emissions ton -2012					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	2,276,811	0.906	8.714	0.883	0.012	0.102	0.065
Delivery	771,660	0.863	5.964	6.684	0.010	0.251	0.212
Heavy-Heavy Duty	390,817	0.494	1.996	6.043	0.008	0.292	0.253

2013	VMT	Emissions ton -2013					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	163,232	0.061	0.579	0.058	0.001	0.007	0.005
Delivery	37,276	0.038	0.262	0.294	0.000	0.011	0.009
Heavy-Heavy Duty	8,887	0.010	0.041	0.122	0.000	0.006	0.005

Proposed Project Onroad Emissions - KCAPCD

		VMT	Emissions ton -2009					
2009	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	40,995	0.020	0.199	0.021	0.000	0.002	0.001
	Delivery	20,497	0.029	0.207	0.229	0.000	0.008	0.007
	Heavy-Heavy Duty	6,832	0.011	0.044	0.143	0.000	0.007	0.006
	Totals	68,324	0.06	0.45	0.39	0.00	0.02	0.01

		VMT	Emissions ton -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	2,154,316	0.985	8.900	0.989	0.012	0.094	0.059
	Delivery	540,856	0.700	4.986	5.577	0.007	0.203	0.174
	Heavy-Heavy Duty	314,084	0.478	1.877	6.002	0.006	0.287	0.251
	Totals	3,009,256	2.16	15.76	12.57	0.03	0.58	0.48

		VMT	Emissions ton -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	381,298	0.162	1.575	0.161	0.002	0.017	0.011
	Delivery	85,097	0.103	0.720	0.806	0.001	0.030	0.025
	Heavy-Heavy Duty	21,814	0.030	0.121	0.377	0.000	0.018	0.016
	Totals	488,208	0.30	2.42	1.34	0.00	0.06	0.05

Proposed Project Onroad Emissions - SCAQMD

	VMT	Emissions ton -2009					
2009 Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	80,554	0.040	0.390	0.040	0.000	0.003	0.002
Delivery	41,575	0.058	0.419	0.465	0.001	0.017	0.014
Heavy-Heavy Duty	14,717	0.024	0.094	0.308	0.000	0.015	0.013
Totals	136,846	0.12	0.90	0.81	0.00	0.03	0.03

	VMT	Emissions ton -2010					
2010 Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	1,765,884	0.807	7.296	0.811	0.010	0.077	0.048
Delivery	662,760	0.858	6.110	6.835	0.009	0.249	0.213
Heavy-Heavy Duty	498,163	0.758	2.978	9.520	0.010	0.456	0.399
Totals	2,926,807	2.42	16.38	17.17	0.03	0.78	0.66

	VMT	Emissions ton -2011					
2011 Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	2,845,577	1.213	11.756	1.202	0.015	0.126	0.080
Delivery	926,950	1.121	7.848	8.775	0.013	0.325	0.277
Heavy-Heavy Duty	435,523	0.609	2.423	7.525	0.009	0.362	0.315
Totals	4,208,050	2.94	22.03	17.50	0.04	0.81	0.67

	VMT	Emissions ton -2012					
2012 Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	1,407,854	0.561	5.388	0.546	0.008	0.063	0.040
Delivery	487,923	0.546	3.771	4.226	0.007	0.159	0.134
Heavy-Heavy Duty	255,283	0.323	1.304	3.947	0.005	0.191	0.165
Totals	2,151,060	1.43	10.46	8.72	0.02	0.41	0.34

	VMT	Emissions ton -2013					
2013 Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	867	0.000	0.003	0.000	0.000	0.000	0.000
Delivery	661	0.001	0.005	0.005	0.000	0.000	0.000
Heavy-Heavy Duty	661	0.001	0.003	0.009	0.000	0.000	0.000
Totals	2,189	0.00	0.01	0.01	0.00	0.00	0.00

Proposed Project Onroad Emissions - AVAQMD

		VMT	Emissions lbs -2009					
2009	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	183,107	0.091	0.887	0.092	0.001	0.008	0.005
	Delivery	77,752	0.108	0.784	0.870	0.001	0.031	0.027
	Heavy-Heavy Duty	43,636	0.072	0.280	0.913	0.001	0.044	0.038
	Totals	304,496	0.27	1.95	1.87	0.00	0.08	0.07

		VMT	Emissions lbs -2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	1,797,673	0.822	7.427	0.825	0.010	0.078	0.049
	Delivery	585,215	0.758	5.395	6.035	0.008	0.220	0.188
	Heavy-Heavy Duty	429,605	0.653	2.568	8.210	0.009	0.393	0.344
	Totals	2,812,494	2.23	15.39	15.07	0.03	0.69	0.58

		VMT	Emissions lbs -2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	789,834	0.337	3.263	0.334	0.004	0.035	0.022
	Delivery	260,376	0.315	2.204	2.465	0.004	0.091	0.078
	Heavy-Heavy Duty	120,146	0.168	0.668	2.076	0.002	0.100	0.087
	Totals	1,170,356	0.82	6.14	4.87	0.01	0.23	0.19

		VMT	Emissions lbs -2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	868,956	0.346	3.326	0.337	0.005	0.039	0.025
	Delivery	283,737	0.317	2.193	2.458	0.004	0.092	0.078
	Heavy-Heavy Duty	135,535	0.171	0.692	2.096	0.003	0.101	0.088
	Totals	1,288,228	0.83	6.21	4.89	0.01	0.23	0.19

		VMT	Emissions lbs -2013					
2013	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	162,365	0.061	0.576	0.058	0.001	0.007	0.005
	Delivery	36,614	0.038	0.258	0.289	0.000	0.011	0.009
	Heavy-Heavy Duty	8,226	0.009	0.038	0.113	0.000	0.005	0.005
	Totals	207,206	0.11	0.87	0.46	0.00	0.02	0.02

Offroad Equipment Emission Calculations

2009 Emission Calculations

Construction of Marshalling Yards

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1244	0.4490	0.8777	0.0008	0.0589	2	0.25	0.90	1.76	0.00	0.12	192	47.77	172.41	337.04	0.30	22.62
Forklift, 5 ton	75	1	0.0723	0.2046	0.2348	0.0003	0.0248	6	0.43	1.23	1.41	0.00	0.15	192	83.24	235.75	270.51	0.29	28.51
Forklift, 10 ton	85	1	0.0709	0.2097	0.2661	0.0003	0.0275	6	0.43	1.26	1.60	0.00	0.17	192	81.69	241.53	306.58	0.32	31.73
Motor, Auxilary Power	5	1	0.0060	0.0246	0.0399	0.0001	0.0024	1	0.01	0.02	0.04	0.00	0.00	192	1.16	4.72	7.66	0.01	0.47
									1.11	3.41	4.80	0.00	0.43		213.87	654.41	921.79	0.92	83.33

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1244	0.4490	0.8777	0.0008	0.0589	2	0.25	0.90	1.76	0.00	0.12	144	35.83	129.31	252.78	0.23	16.96
Forklift, 5 ton	75	1	0.0723	0.2046	0.2348	0.0003	0.0248	6	0.43	1.23	1.41	0.00	0.15	144	62.43	176.81	202.89	0.22	21.39
Forklift, 10 ton	85	1	0.0709	0.2097	0.2661	0.0003	0.0275	6	0.43	1.26	1.60	0.00	0.17	144	61.27	181.15	229.94	0.24	23.80
Motor, Auxilary Power	5	1	0.0060	0.0246	0.0399	0.0001	0.0024	1	0.01	0.02	0.04	0.00	0.00	144	0.87	3.54	5.74	0.01	0.35
									1.11	3.41	4.80	0.00	0.43		160.40	490.81	691.35	0.69	62.50

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1244	0.4490	0.8777	0.0008	0.0589	2	0.25	0.90	1.76	0.00	0.12	167	41.55	149.96	293.15	0.26	19.67
Forklift, 5 ton	75	1	0.0723	0.2046	0.2348	0.0003	0.0248	6	0.43	1.23	1.41	0.00	0.15	167	72.40	205.05	235.29	0.25	24.80
Forklift, 10 ton	85	1	0.0709	0.2097	0.2661	0.0003	0.0275	6	0.43	1.26	1.60	0.00	0.17	167	71.06	210.08	266.66	0.28	27.60
Motor, Auxilary Power	5	1	0.0060	0.0246	0.0399	0.0001	0.0024	1	0.01	0.02	0.04	0.00	0.00	167	1.01	4.11	6.66	0.01	0.41
									1.11	3.41	4.80	0.00	0.43		186.02	569.20	801.77	0.80	72.48

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1244	0.4490	0.8777	0.0008	0.0589	2	0.25	0.90	1.76	0.00	0.12	94	23.39	84.41	165.01	0.15	11.07
Forklift, 5 ton	75	1	0.0723	0.2046	0.2348	0.0003	0.0248	6	0.43	1.23	1.41	0.00	0.15	94	40.75	115.42	132.44	0.14	13.96
Forklift, 10 ton	85	1	0.0709	0.2097	0.2661	0.0003	0.0275	6	0.43	1.26	1.60	0.00	0.17	94	40.00	118.25	150.10	0.16	15.54
Motor, Auxilary Power	5	1	0.0060	0.0246	0.0399	0.0001	0.0024	1	0.01	0.02	0.04	0.00	0.00	94	0.57	2.31	3.75	0.00	0.23
									1.11	3.41	4.80	0.00	0.43		104.71	320.39	451.30	0.45	40.80

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1244	0.4490	0.8777	0.0008	0.0589	2	0.25	0.90	1.76	0.00	0.12	158	39.31	141.88	277.36	0.25	18.61
Forklift, 5 ton	75	1	0.0723	0.2046	0.2348	0.0003	0.0248	6	0.43	1.23	1.41	0.00	0.15	158	68.50	194.00	222.61	0.24	23.47
Forklift, 10 ton	85	1	0.0709	0.2097	0.2661	0.0003	0.0275	6	0.43	1.26	1.60	0.00	0.17	158	67.23	198.76	252.29	0.26	26.11
Motor, Auxilary Power	5	1	0.0060	0.0246	0.0399	0.0001	0.0024	1	0.01	0.02	0.04	0.00	0.00	158	0.95	3.89	6.30	0.01	0.38
									1.11	3.41	4.80	0.00	0.43		176.00	538.53	758.56	0.76	68.58

Marshalling Yards

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1244	0.4490	0.8777	0.0008	0.0589	3	0.31	1.12	2.19	0.00	0.15	42	13.06	47.14	92.16	0.08	6.18
Forklift, 5 ton	75	1	0.0723	0.2046	0.2348	0.0003	0.0248	5	0.36	1.02	1.17	0.00	0.12	42	15.17	42.97	49.31	0.05	5.20
Forklift, 10 ton	85	1	0.0709	0.2097	0.2661	0.0003	0.0275	5	0.35	1.05	1.33	0.00	0.14	42	14.89	44.03	55.89	0.06	5.78
									1.03	3.19	4.70	0.00	0.41		43.13	134.15	197.36	0.19	17.17

Roads & Landing Work

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2347	0.7557	2.2327	0.0020	0.0903	9	2.11	6.80	20.09	0.02	0.81	8	16.90	54.41	160.76	0.15	6.50
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.2055	0.7445	1.6267	0.0014	0.0888	9	1.85	6.70	14.64	0.01	0.80	8	14.80	53.61	117.12	0.10	6.39
Motor Grader	140	1	0.1730	0.6218	1.1482	0.0011	0.0871	5	0.86	3.11	5.74	0.01	0.44	8	6.92	24.87	45.93	0.04	3.48
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.1193	0.3673	0.4618	0.0005	0.0446	3	0.36	1.10	1.39	0.00	0.13	8	2.86	8.82	11.08	0.01	1.07
									5.19	17.71	41.86	0.04	2.18		41.48	141.70	334.89	0.30	17.44

Offroad Equipment Emission Calculations

Construction - 66kV (or other subtransmission lines)

Segment 4 - Relocate at Antelope			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0999	0.3479	1.3113	0.0021	0.0395	4	0.40	1.39	5.25	0.01	0.16	37	14.79	51.49	194.07	0.31	5.85
Backhoe	85	1	0.1193	0.3673	0.4618	0.0005	0.0446	4	0.48	1.47	1.85	0.00	0.18	37	17.66	54.36	68.35	0.07	6.59
									0.88	2.86	7.09	0.01	0.34		32.45	105.85	262.42	0.39	12.45

Segment 5 - Sagebrush/Ant. & Sagebrush Vincent			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0999	0.3479	1.3113	0.0021	0.0395	4	0.40	1.39	5.25	0.01	0.16	74	29.58	102.97	388.15	0.63	11.70
Backhoe	85	1	0.1193	0.3673	0.4618	0.0005	0.0446	4	0.48	1.47	1.85	0.00	0.18	74	35.32	108.73	136.70	0.15	13.19
									0.88	2.86	7.09	0.01	0.34		64.90	211.70	524.84	0.77	24.89

Grading Element

Segment 9 - Antelope Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
980 Loader	318	3	0.1768	0.5461	1.8155	0.0019	0.0672	8	4.24	13.11	43.57	0.04	1.61	37	157.02	484.94	1612.15	1.65	59.70
Compactor	80	2	0.1322	0.3671	0.4932	0.0005	0.0464	5	1.32	3.67	4.93	0.00	0.46	37	48.92	135.82	182.48	0.18	17.16
Grader	285	2	0.1912	0.5601	1.9514	0.0020	0.0726	8	3.06	8.96	31.22	0.03	1.16	37	113.18	331.55	1155.22	1.17	42.95
									8.62	25.74	79.73	0.08	3.24		319.12	952.31	2949.85	3.00	119.81

2010 Emission Calculations

Construction of Marshalling Yards

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	2	0.24	0.89	1.66	0.00	0.11	164	38.59	146.26	272.18	0.26	18.42
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	164	63.27	194.19	219.71	0.25	22.32
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	6	0.38	1.22	1.51	0.00	0.15	164	62.36	200.08	247.36	0.27	24.84
Motor, Auxilary Power	5	1	0.0057	0.0242	0.0385	0.0001	0.0023	1	0.01	0.02	0.04	0.00	0.00	164	0.94	3.97	6.31	0.01	0.38
									1.01	3.32	4.55	0.00	0.40		165.16	544.49	745.57	0.79	65.96

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	2	0.24	0.89	1.66	0.00	0.11	301	70.83	268.44	499.55	0.48	33.81
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	301	116.12	356.41	403.25	0.46	40.96
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	6	0.38	1.22	1.51	0.00	0.15	301	114.45	367.22	454.00	0.50	45.59
Motor, Auxilary Power	5	1	0.0057	0.0242	0.0385	0.0001	0.0023	1	0.01	0.02	0.04	0.00	0.00	301	1.73	7.28	11.58	0.02	0.69
									1.01	3.32	4.55	0.00	0.40		303.13	999.35	1368.39	1.45	121.05

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	2	0.24	0.89	1.66	0.00	0.11	95	22.35	84.72	157.67	0.15	10.67
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	95	36.65	112.49	127.27	0.14	12.93
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	6	0.38	1.22	1.51	0.00	0.15	95	36.12	115.90	143.29	0.16	14.39
Motor, Auxilary Power	5	1	0.0057	0.0242	0.0385	0.0001	0.0023	1	0.01	0.02	0.04	0.00	0.00	95	0.55	2.30	3.65	0.01	0.22
									1.01	3.32	4.55	0.00	0.40		95.67	315.41	431.88	0.46	38.21

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	2	0.24	0.89	1.66	0.00	0.11	94	22.12	83.83	156.01	0.15	10.56
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	94	36.26	111.30	125.93	0.14	12.79
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	6	0.38	1.22	1.51	0.00	0.15	94	35.74	114.68	141.78	0.16	14.24
Motor, Auxilary Power	5	1	0.0057	0.0242	0.0385	0.0001	0.0023	1	0.01	0.02	0.04	0.00	0.00	94	0.54	2.27	3.62	0.00	0.22
									1.01	3.32	4.55	0.00	0.40		94.66	312.09	427.34	0.45	37.80

Offroad Equipment Emission Calculations

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	2	0.24	0.89	1.66	0.00	0.11	31	7.29	27.65	51.45	0.05	3.48
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	31	11.96	36.71	41.53	0.05	4.22
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	6	0.38	1.22	1.51	0.00	0.15	31	11.79	37.82	46.76	0.05	4.70
Motor, Auxilary Power	5	1	0.0057	0.0242	0.0385	0.0001	0.0023	1	0.01	0.02	0.04	0.00	0.00	31	0.18	0.75	1.19	0.00	0.07
									1.01	3.32	4.55	0.00	0.40		31.22	102.92	140.93	0.15	12.47

Marshalling Yards

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	3	0.29	1.11	2.07	0.00	0.14	229	67.36	255.29	475.07	0.45	32.15
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	5	0.32	0.99	1.12	0.00	0.11	229	73.62	225.96	255.66	0.29	25.97
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	5	0.32	1.02	1.26	0.00	0.13	229	72.56	232.82	287.84	0.32	28.91
									0.93	3.12	4.45	0.00	0.38		213.54	714.06	1018.57	1.06	87.03

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	3	0.29	1.11	2.07	0.00	0.14	302	88.83	336.67	626.51	0.60	42.40
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	5	0.32	0.99	1.12	0.00	0.11	302	97.09	297.99	337.16	0.38	34.25
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	5	0.32	1.02	1.26	0.00	0.13	302	95.69	307.03	379.59	0.42	38.12
									0.93	3.12	4.45	0.00	0.38		281.61	941.69	1343.27	1.40	114.77

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	3	0.29	1.11	2.07	0.00	0.14	229	67.36	255.29	475.07	0.45	32.15
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	5	0.32	0.99	1.12	0.00	0.11	229	73.62	225.96	255.66	0.29	25.97
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	5	0.32	1.02	1.26	0.00	0.13	229	72.56	232.82	287.84	0.32	28.91
									0.93	3.12	4.45	0.00	0.38		213.54	714.06	1018.57	1.06	87.03

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	3	0.29	1.11	2.07	0.00	0.14	157	46.18	175.02	325.70	0.31	22.04
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	5	0.32	0.99	1.12	0.00	0.11	157	50.47	154.92	175.28	0.20	17.80
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	5	0.32	1.02	1.26	0.00	0.13	157	49.75	159.62	197.34	0.22	19.82
									0.93	3.12	4.45	0.00	0.38		146.40	489.55	698.32	0.73	59.66

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	3	0.29	1.11	2.07	0.00	0.14	229	67.36	255.29	475.07	0.45	32.15
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	5	0.32	0.99	1.12	0.00	0.11	229	73.62	225.96	255.66	0.29	25.97
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	5	0.32	1.02	1.26	0.00	0.13	229	72.56	232.82	287.84	0.32	28.91
									0.93	3.12	4.45	0.00	0.38		213.54	714.06	1018.57	1.06	87.03

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1177	0.4459	0.8298	0.0008	0.0562	3	0.29	1.11	2.07	0.00	0.14	229	67.36	255.29	475.07	0.45	32.15
Forklift, 5 ton	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	5	0.32	0.99	1.12	0.00	0.11	229	73.62	225.96	255.66	0.29	25.97
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	5	0.32	1.02	1.26	0.00	0.13	229	72.56	232.82	287.84	0.32	28.91
									0.93	3.12	4.45	0.00	0.38		213.54	714.06	1018.57	1.06	87.03

Road Maintenance

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	2	0.32	1.23	2.16	0.00	0.16	219	71.05	270.15	473.85	0.47	36.13
Crawler, Track Type, w/ blade (D6 Type)	300	1	0.1956	0.7350	1.5409	0.0014	0.0846	2	0.39	1.47	3.08	0.00	0.17	219	85.67	321.93	674.90	0.63	37.07
									0.72	2.70	5.25	0.00	0.33		156.72	592.08	1148.74	1.09	73.19

Offroad Equipment Emission Calculations

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	2	0.32	1.23	2.16	0.00	0.16	218	70.72	268.92	471.68	0.47	35.96
Crawler, Track Type, w/ blade (D6 Type)	300	1	0.1956	0.7350	1.5409	0.0014	0.0846	2	0.39	1.47	3.08	0.00	0.17	218	85.28	320.46	671.82	0.62	36.90
									0.72	2.70	5.25	0.00	0.33		156.00	589.38	1143.50	1.09	72.86

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	2	0.32	1.23	2.16	0.00	0.16	125	40.55	154.20	270.46	0.27	20.62
Crawler, Track Type, w/ blade (D6 Type)	300	1	0.1956	0.7350	1.5409	0.0014	0.0846	2	0.39	1.47	3.08	0.00	0.17	125	48.90	183.75	385.22	0.36	21.16
									0.72	2.70	5.25	0.00	0.33		89.45	337.94	655.68	0.62	41.78

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	2	0.32	1.23	2.16	0.00	0.16	219	71.05	270.15	473.85	0.47	36.13
Crawler, Track Type, w/ blade (D6 Type)	300	1	0.1956	0.7350	1.5409	0.0014	0.0846	2	0.39	1.47	3.08	0.00	0.17	219	85.67	321.93	674.90	0.63	37.07
									0.72	2.70	5.25	0.00	0.33		156.72	592.08	1148.74	1.09	73.19

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	2	0.32	1.23	2.16	0.00	0.16	219	71.05	270.15	473.85	0.47	36.13
Crawler, Track Type, w/ blade (D6 Type)	300	1	0.1956	0.7350	1.5409	0.0014	0.0846	2	0.39	1.47	3.08	0.00	0.17	219	85.67	321.93	674.90	0.63	37.07
									0.72	2.70	5.25	0.00	0.33		156.72	592.08	1148.74	1.09	73.19

Roads & Landing Work

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	9	2.02	6.39	19.04	0.02	0.77	116	233.96	741.72	2209.06	2.11	89.15
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	9	1.76	6.61	13.87	0.01	0.76	116	204.20	767.33	1608.66	1.49	88.35
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	5	0.81	3.08	5.41	0.01	0.41	116	94.08	357.74	627.47	0.62	47.84
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	3	0.32	1.08	1.32	0.00	0.12	116	37.69	124.79	152.74	0.17	14.39
									4.91	17.17	39.64	0.04	2.07		569.94	1991.58	4597.93	4.39	239.73

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	9	2.02	6.39	19.04	0.02	0.77	39	78.66	249.37	742.70	0.71	29.97
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	9	1.76	6.61	13.87	0.01	0.76	39	68.65	257.98	540.84	0.50	29.70
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	5	0.81	3.08	5.41	0.01	0.41	39	31.63	120.27	210.96	0.21	16.08
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	3	0.32	1.08	1.32	0.00	0.12	39	12.67	41.95	51.35	0.06	4.84
									4.91	17.17	39.64	0.04	2.07		191.62	669.58	1545.86	1.48	80.60

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D8 type)	305	2	0.2241	0.7105	2.1160	0.0020	0.0854	8	3.59	11.37	33.86	0.03	1.37	139	498.40	1580.07	4705.90	4.49	189.91
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	8	1.56	5.88	12.33	0.01	0.68	139	217.50	817.31	1713.44	1.59	94.11
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	3	0.65	2.15	2.63	0.00	0.25	139	90.34	299.06	366.05	0.42	34.49
Excavator, Grade - All	165	2	0.1453	0.6450	1.0645	0.0012	0.0684	8	2.32	10.32	17.03	0.02	1.09	139	323.14	1434.38	2367.36	2.65	152.19
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	5	0.81	3.08	5.41	0.01	0.41	139	112.73	428.67	751.88	0.74	57.33
									8.94	32.80	71.26	0.07	3.80		1242.11	4559.49	9904.62	9.88	528.03

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	39	22.88	85.99	180.28	0.17	9.90
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	3	0.44	1.93	3.19	0.00	0.21	39	17.00	75.46	124.54	0.14	8.01
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	3	0.49	1.85	3.25	0.00	0.25	39	18.98	72.16	126.58	0.12	9.65
									1.51	5.99	11.06	0.01	0.71		58.86	233.62	431.40	0.43	27.56

Offroad Equipment Emission Calculations

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	153	89.78	337.36	707.26	0.66	38.84
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	3	0.49	1.85	3.25	0.00	0.25	153	74.45	283.11	496.56	0.49	37.86
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	3	0.44	1.93	3.19	0.00	0.21	153	66.69	296.03	488.59	0.55	31.41
									1.51	5.99	11.06	0.01	0.71		230.92	916.50	1692.41	1.69	108.11

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	9	2.02	6.39	19.04	0.02	0.77	39	78.66	249.37	742.70	0.71	29.97
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	9	1.76	6.61	13.87	0.01	0.76	39	68.65	257.98	540.84	0.50	29.70
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	5	0.81	3.08	5.41	0.01	0.41	39	31.63	120.27	210.96	0.21	16.08
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	3	0.32	1.08	1.32	0.00	0.12	39	12.67	41.95	51.35	0.06	4.84
									4.91	17.17	39.64	0.04	2.07		191.62	669.58	1545.86	1.48	80.60

Install Foundations

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	138	80.98	304.29	637.92	0.59	35.04
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	4	0.58	2.58	4.26	0.00	0.27	138	80.20	356.01	587.58	0.66	37.77
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	138	247.41	784.35	2336.02	2.23	94.27
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.87	2.87	3.51	0.00	0.33	138	119.58	395.88	484.56	0.55	45.65
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	138	3.17	13.35	21.24	0.03	1.27
									3.85	13.43	29.47	0.03	1.55		531.34	1853.88	4067.31	4.06	214.00

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	58	34.03	127.89	268.11	0.25	14.73
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	4	0.58	2.58	4.26	0.00	0.27	58	33.71	149.63	246.95	0.28	15.88
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	58	103.98	329.66	981.81	0.94	39.62
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.87	2.87	3.51	0.00	0.33	58	50.26	166.38	203.65	0.23	19.19
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	58	1.33	5.61	8.92	0.01	0.53
									3.85	13.43	29.47	0.03	1.55		223.32	779.17	1709.45	1.71	89.94

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	81	47.53	178.60	374.43	0.35	20.56
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	4	0.58	2.58	4.26	0.00	0.27	81	47.08	208.97	344.89	0.39	22.17
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	81	145.22	460.38	1371.14	1.31	55.33
Generator, Concrete Batch Plant	50	1	0.1117	0.2904	0.3070	0.0004	0.0284	6	0.67	1.74	1.84	0.00	0.17	81	54.28	141.15	149.20	0.19	13.80
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.87	2.87	3.51	0.00	0.33	81	70.19	232.36	284.41	0.32	26.80
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	81	1.86	7.84	12.46	0.02	0.74
									4.52	15.18	31.32	0.03	1.72		366.15	1229.30	2536.53	2.57	139.41

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	53	31.10	116.86	245.00	0.23	13.46
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	4	0.58	2.58	4.26	0.00	0.27	53	30.80	136.73	225.67	0.25	14.51
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	53	95.02	301.24	897.17	0.86	36.21
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.87	2.87	3.51	0.00	0.33	53	45.93	152.04	186.10	0.21	17.53
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	53	1.22	5.13	8.16	0.01	0.49
									3.85	13.43	29.47	0.03	1.55		204.07	712.00	1562.08	1.56	82.19

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	312	183.08	687.95	1442.25	1.34	79.21
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	4	0.58	2.58	4.26	0.00	0.27	312	181.33	804.90	1328.45	1.49	85.40
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	312	559.36	1773.32	5281.44	5.04	213.14
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.87	2.87	3.51	0.00	0.33	312	270.36	895.02	1095.52	1.25	103.21
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	312	7.17	30.19	48.01	0.07	2.86
									3.85	13.43	29.47	0.03	1.55		1201.29	4191.38	9195.66	9.17	483.83

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				

Offroad Equipment Emission Calculations

	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1956	0.7350	1.5409	0.0014	0.0846	3	0.59	2.20	4.62	0.00	0.25	53	31.10	116.86	245.00	0.23	13.46
Excavator, Grade - All	165	1	0.1453	0.6450	1.0645	0.0012	0.0684	4	0.58	2.58	4.26	0.00	0.27	53	30.80	136.73	225.67	0.25	14.51
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	53	95.02	301.24	897.17	0.86	36.21
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.87	2.87	3.51	0.00	0.33	53	45.93	152.04	186.10	0.21	17.53
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	53	1.22	5.13	8.16	0.01	0.49
									3.85	13.43	29.47	0.03	1.55		204.07	712.00	1562.08	1.56	82.19

Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1706	0.5992	1.6652	0.0017	0.0642	8	1.36	4.79	13.32	0.01	0.51	225	307.02	1078.65	2997.44	3.00	115.55
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	8	2.82	10.70	19.92	0.02	1.35	225	635.35	2407.94	4481.01	4.26	303.27
Compressor, Air	75	5	0.1110	0.3005	0.3668	0.0004	0.0365	7.5	4.16	11.27	13.76	0.01	1.37	225	936.55	2535.56	3095.00	3.22	307.78
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	225	5.17	21.77	34.62	0.05	2.06
									8.37	26.86	47.15	0.05	3.24		1884.10	6043.92	10608.07	10.53	728.67

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1706	0.5992	1.6652	0.0017	0.0642	8	1.36	4.79	13.32	0.01	0.51	56	76.41	268.46	746.03	0.75	28.76
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	8	2.82	10.70	19.92	0.02	1.35	56	158.13	599.31	1115.27	1.06	75.48
Compressor, Air	75	5	0.1110	0.3005	0.3668	0.0004	0.0365	7.5	4.16	11.27	13.76	0.01	1.37	56	233.10	631.07	770.31	0.80	76.60
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	56	1.29	5.42	8.62	0.01	0.51
									8.37	26.86	47.15	0.05	3.24		468.93	1504.26	2640.23	2.62	181.36

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1706	0.5992	1.6652	0.0017	0.0642	8	1.36	4.79	13.32	0.01	0.51	17	23.20	81.50	226.47	0.23	8.73
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	8	2.82	10.70	19.92	0.02	1.35	17	48.00	181.93	338.57	0.32	22.91
Compressor, Air	75	5	0.1110	0.3005	0.3668	0.0004	0.0365	7.5	4.16	11.27	13.76	0.01	1.37	17	70.76	191.58	233.84	0.24	23.25
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	17	0.39	1.64	2.62	0.00	0.16
									8.37	26.86	47.15	0.05	3.24		142.35	456.65	801.50	0.80	55.05

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1706	0.5992	1.6652	0.0017	0.0642	8	1.36	4.79	13.32	0.01	0.51	13	17.74	62.32	173.19	0.17	6.68
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	8	2.82	10.70	19.92	0.02	1.35	13	36.71	139.13	258.90	0.25	17.52
Compressor, Air	75	5	0.1110	0.3005	0.3668	0.0004	0.0365	7.5	4.16	11.27	13.76	0.01	1.37	13	54.11	146.50	178.82	0.19	17.78
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	13	0.30	1.26	2.00	0.00	0.12
									8.37	26.86	47.15	0.05	3.24		108.86	349.20	612.91	0.61	42.10

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1706	0.5992	1.6652	0.0017	0.0642	8	1.36	4.79	13.32	0.01	0.51	164	223.78	786.21	2184.80	2.19	84.22
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	8	2.82	10.70	19.92	0.02	1.35	164	463.10	1755.12	3266.16	3.11	221.05
Compressor, Air	75	5	0.1110	0.3005	0.3668	0.0004	0.0365	7.5	4.16	11.27	13.76	0.01	1.37	164	682.64	1848.14	2255.91	2.35	224.34
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	164	3.77	15.87	25.24	0.03	1.50
									8.37	26.86	47.15	0.05	3.24		1373.30	4405.34	7732.10	7.68	531.12

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1706	0.5992	1.6652	0.0017	0.0642	8	1.36	4.79	13.32	0.01	0.51	135	184.21	647.19	1798.46	1.80	69.33
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	8	2.82	10.70	19.92	0.02	1.35	135	381.21	1444.76	2688.61	2.56	181.96
Compressor, Air	75	5	0.1110	0.3005	0.3668	0.0004	0.0365	7.5	4.16	11.27	13.76	0.01	1.37	135	561.93	1521.34	1857.00	1.93	184.67
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01	135	3.10	13.06	20.77	0.03	1.24
									8.37	26.86	47.15	0.05	3.24		1130.46	3626.35	6364.84	6.32	437.20

Offroad Equipment Emission Calculations

Conductor & OHGW Installation

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	3	0.32	1.08	1.32	0.00	0.12	80	26.00	86.06	105.34	0.12	9.92
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	3	1.06	4.01	7.47	0.01	0.51	80	84.71	321.06	597.47	0.57	40.44
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	2	0.45	1.42	4.23	0.00	0.17	80	35.86	113.67	338.55	0.32	13.66
Crawler, Track Type, Sagging (D8 type)	305	2	0.2241	0.7105	2.1160	0.0020	0.0854	2	0.90	2.84	8.46	0.01	0.34	80	71.71	227.35	677.11	0.65	27.33
Motor, Auxilary Power	5	4	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.05	0.19	0.31	0.00	0.02	80	3.68	15.48	24.62	0.03	1.47
Tension machine, conductor	135	2	0.1279	0.5550	0.8997	0.0010	0.0686	3	0.77	3.33	5.40	0.01	0.41	80	61.39	266.41	431.87	0.49	32.95
Tension machine, static	135	1	0.1279	0.5550	0.8997	0.0010	0.0686	2	0.26	1.11	1.80	0.00	0.14	80	20.46	88.80	143.96	0.16	10.98
									3.80	13.99	28.99	0.03	1.71		303.81	1118.84	2318.92	2.34	136.75

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	3	0.32	1.08	1.32	0.00	0.12	50	16.25	53.79	65.84	0.07	6.20
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	3	1.06	4.01	7.47	0.01	0.51	50	52.95	200.66	373.42	0.36	25.27
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	2	0.45	1.42	4.23	0.00	0.17	50	22.41	71.05	211.60	0.20	8.54
Crawler, Track Type, Sagging (D8 type)	305	2	0.2241	0.7105	2.1160	0.0020	0.0854	2	0.90	2.84	8.46	0.01	0.34	50	44.82	142.09	423.19	0.40	17.08
Motor, Auxilary Power	5	4	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.05	0.19	0.31	0.00	0.02	50	2.30	9.67	15.39	0.02	0.92
Tension machine, conductor	135	2	0.1279	0.5550	0.8997	0.0010	0.0686	3	0.77	3.33	5.40	0.01	0.41	50	38.37	166.51	269.92	0.31	20.59
Tension machine, static	135	1	0.1279	0.5550	0.8997	0.0010	0.0686	2	0.26	1.11	1.80	0.00	0.14	50	12.79	55.50	89.97	0.10	6.86
									3.80	13.99	28.99	0.03	1.71		189.88	699.27	1449.32	1.46	85.47

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	3	0.32	1.08	1.32	0.00	0.12	66	21.45	71.00	86.90	0.10	8.19
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	3	1.06	4.01	7.47	0.01	0.51	66	69.89	264.87	492.91	0.47	33.36
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	2	0.45	1.42	4.23	0.00	0.17	66	29.58	93.78	279.31	0.27	11.27
Crawler, Track Type, Sagging (D8 type)	305	2	0.2241	0.7105	2.1160	0.0020	0.0854	2	0.90	2.84	8.46	0.01	0.34	66	59.16	187.56	558.61	0.53	22.54
Motor, Auxilary Power	5	4	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.05	0.19	0.31	0.00	0.02	66	3.03	12.77	20.31	0.03	1.21
Tension machine, conductor	135	2	0.1279	0.5550	0.8997	0.0010	0.0686	3	0.77	3.33	5.40	0.01	0.41	66	50.65	219.79	356.29	0.40	27.18
Tension machine, static	135	1	0.1279	0.5550	0.8997	0.0010	0.0686	2	0.26	1.11	1.80	0.00	0.14	66	16.88	73.26	118.76	0.13	9.06
									3.80	13.99	28.99	0.03	1.71		250.64	923.04	1913.11	1.93	112.82

Restoration & Guard Poles

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	5	0.54	1.79	2.19	0.00	0.21	8	4.33	14.34	17.56	0.02	1.65
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	8	1.30	4.93	8.65	0.01	0.66	8	10.38	39.47	69.24	0.07	5.28
									1.84	6.73	10.85	0.01	0.87		14.71	53.82	86.79	0.09	6.93

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	5	0.54	1.79	2.19	0.00	0.21	2	1.08	3.59	4.39	0.00	0.41
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	8	1.30	4.93	8.65	0.01	0.66	2	2.60	9.87	17.31	0.02	1.32
									1.84	6.73	10.85	0.01	0.87		3.68	13.45	21.70	0.02	1.73

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	5	0.54	1.79	2.19	0.00	0.21	10	5.42	17.93	21.95	0.02	2.07
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	8	1.30	4.93	8.65	0.01	0.66	10	12.98	49.34	86.55	0.09	6.60
									1.84	6.73	10.85	0.01	0.87		18.39	67.27	108.49	0.11	8.67

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	5	0.54	1.79	2.19	0.00	0.21	5	2.71	8.96	10.97	0.01	1.03
Motor Grader	140	1	0.1622	0.6168	1.0818	0.0011	0.0825	8	1.30	4.93	8.65	0.01	0.66	5	6.49	24.67	43.27	0.04	3.30
									1.84	6.73	10.85	0.01	0.87		9.20	33.64	54.25	0.06	4.33

Offroad Equipment Emission Calculations

Wreck-Out (conductors, structures, & Foundations)

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine	135	2	0.1279	0.5550	0.8997	0.0010	0.0686	3	0.77	3.33	5.40	0.01	0.41	192	147.33	639.39	1036.49	1.17	79.08
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	192	344.22	1091.27	3250.12	3.10	131.16
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.1083	0.3586	0.4389	0.0005	0.0414	8	3.47	11.47	14.05	0.02	1.32	192	665.49	2203.13	2696.67	3.07	254.06
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1177	0.4459	0.8298	0.0008	0.0562	4	0.94	3.57	6.64	0.01	0.45	192	180.72	684.92	1274.60	1.21	86.26
Motor, Auxilary Power	5	3	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.03	0.15	0.23	0.00	0.01	192	6.62	27.86	44.32	0.06	2.64
									7.00	24.20	43.24	0.04	2.88		1344.39	4646.58	8302.19	8.61	553.21

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine, Conductor or Static	135	2	0.1279	0.5550	0.8997	0.0010	0.0686	3	0.77	3.33	5.40	0.01	0.41	133	102.06	442.91	717.99	0.81	54.78
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	133	238.44	755.93	2251.38	2.15	90.86
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.1083	0.3586	0.4389	0.0005	0.0414	8	3.47	11.47	14.05	0.02	1.32	133	460.99	1526.13	1868.00	2.13	175.99
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1177	0.4459	0.8298	0.0008	0.0562	4	0.94	3.57	6.64	0.01	0.45	133	125.19	474.45	882.92	0.84	59.76
Motor, Auxilary Power	5	3	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.03	0.15	0.23	0.00	0.01	133	4.59	19.30	30.70	0.04	1.83
									7.00	24.20	43.24	0.04	2.88		931.27	3218.73	5751.00	5.97	383.21

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine, Conductor or Static	135	2	0.1279	0.5550	0.8997	0.0010	0.0686	3	0.77	3.33	5.40	0.01	0.41	94	72.13	313.03	507.45	0.57	38.71
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	94	168.52	534.27	1591.20	1.52	64.22
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.1083	0.3586	0.4389	0.0005	0.0414	8	3.47	11.47	14.05	0.02	1.32	94	325.81	1078.62	1320.24	1.50	124.39
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1177	0.4459	0.8298	0.0008	0.0562	4	0.94	3.57	6.64	0.01	0.45	94	88.48	335.33	624.02	0.59	42.23
Motor, Auxilary Power	5	3	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.03	0.15	0.23	0.00	0.01	94	3.24	13.64	21.70	0.03	1.29
									7.00	24.20	43.24	0.04	2.88		658.19	2274.89	4064.61	4.22	270.84

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
(Removal of 230kV Fullerton, Chino-Mesa, North RO	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine, Conductor or Static	135	2	0.1279	0.5550	0.8997	0.0010	0.0686	3	0.77	3.33	5.40	0.01	0.41	182	139.66	606.09	982.51	1.11	74.96
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2241	0.7105	2.1160	0.0020	0.0854	8	1.79	5.68	16.93	0.02	0.68	182	326.29	1034.44	3080.84	2.94	124.33
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.1083	0.3586	0.4389	0.0005	0.0414	8	3.47	11.47	14.05	0.02	1.32	182	630.83	2088.39	2556.21	2.91	240.83
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1177	0.4459	0.8298	0.0008	0.0562	4	0.94	3.57	6.64	0.01	0.45	182	171.31	649.25	1208.21	1.15	81.77
Motor, Auxilary Power	5	3	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.03	0.15	0.23	0.00	0.01	182	6.28	26.41	42.01	0.06	2.50
									7.00	24.20	43.24	0.04	2.88		1274.37	4404.57	7869.78	8.16	524.40

Grading Element

Segment 9 - Whirlwind Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
980 Loader	318	3	0.1678	0.5145	1.7078	0.0019	0.0633	8	4.03	12.35	40.99	0.04	1.52	71	285.96	876.72	2910.05	3.16	107.82
Grader	285	2	0.1815	0.5297	1.8365	0.0020	0.0683	8	2.90	8.47	29.38	0.03	1.09	71	206.21	601.71	2086.29	2.25	77.55
Compactor	80	2	0.1240	0.3601	0.4737	0.0005	0.0442	6	1.49	4.32	5.68	0.01	0.53	71	105.67	306.77	403.62	0.42	37.65
									8.42	25.14	76.06	0.08	3.14		597.84	1785.20	5399.95	5.82	223.02

Segment 9 - Antelope Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
980 Loader	318	3	0.1678	0.5145	1.7078	0.0019	0.0633	8	4.03	12.35	40.99	0.04	1.52	34	136.94	419.84	1393.54	1.51	51.63
Grader	285	2	0.1815	0.5297	1.8365	0.0020	0.0683	8	2.90	8.47	29.38	0.03	1.09	34	98.75	288.14	999.07	1.08	37.14
Compactor	80	2	0.1240	0.3601	0.4737	0.0005	0.0442	5	1.24	3.60	4.74	0.00	0.44	34	42.17	122.42	161.07	0.17	15.03
									8.17	24.42	75.11	0.08	3.05		277.86	830.40	2553.68	2.76	103.79

Offroad Equipment Emission Calculations

Civil Element

Segment 9 - Whirlwind Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
14 ton Crane	180	1	0.1213	0.4785	0.9507	0.0009	0.0534	4	0.49	1.91	3.80	0.00	0.21	107	51.92	204.81	406.88	0.40	22.85
Driller	305	2	0.1074	0.3924	1.2992	0.0023	0.0435	8	1.72	6.28	20.79	0.04	0.70	107	183.79	671.71	2224.25	3.98	74.43
Ditch Digger	75	2	0.1720	0.4534	0.5571	0.0005	0.0538	6	2.06	5.44	6.69	0.01	0.65	107	220.85	582.22	715.31	0.70	69.02
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	4	0.26	0.79	0.89	0.00	0.09	107	27.52	84.46	95.57	0.11	9.71
Tractors	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	6	1.30	4.30	5.27	0.01	0.50	107	139.08	460.42	563.56	0.64	53.10
									5.82	18.73	37.44	0.05	2.14		623.16	2003.62	4005.57	5.82	229.10

Segment 9 - Antelope Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
14 ton Crane	180	1	0.1213	0.4785	0.9507	0.0009	0.0534	4	0.49	1.91	3.80	0.00	0.21	160	77.63	306.25	608.42	0.59	34.17
Driller	305	2	0.1074	0.3924	1.2992	0.0023	0.0435	8	1.72	6.28	20.79	0.04	0.70	160	274.83	1004.42	3325.98	5.95	111.30
Ditch Digger	75	1	0.1720	0.4534	0.5571	0.0005	0.0538	6	1.03	2.72	3.34	0.00	0.32	160	165.12	435.31	534.81	0.52	51.60
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	4	0.26	0.79	0.89	0.00	0.09	160	41.15	126.30	142.90	0.16	14.52
Tractors	85	2	0.1083	0.3586	0.4389	0.0005	0.0414	6	1.30	4.30	5.27	0.01	0.50	160	207.97	688.48	842.71	0.96	79.39
									4.79	16.00	34.09	0.05	1.82		766.70	2560.76	5454.82	8.19	290.98

Electrical Element

Segment 9 - Whirlwind Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
14 ton Crane	180	2	0.1213	0.4785	0.9507	0.0009	0.0534	6	1.46	5.74	11.41	0.01	0.64	108	157.21	620.17	1232.05	1.20	69.19
Crane, Hydraulic, 150 Ton (150 ton crane)	350	2	0.1474	0.4728	1.4512	0.0015	0.0556	6	1.77	5.67	17.41	0.02	0.67	108	191.07	612.76	1880.80	1.90	72.04
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	108	41.66	127.88	144.69	0.16	14.70
Manlifts	75	4	0.0643	0.1973	0.2233	0.0003	0.0227	6	1.54	4.74	5.36	0.01	0.54	108	166.66	511.52	578.76	0.66	58.79
									5.15	17.34	35.52	0.04	1.99		556.59	1872.32	3836.30	3.92	214.72

Segment 9 - Antelope Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
14 ton Crane	180	2	0.1213	0.4785	0.9507	0.0009	0.0534	6	1.46	5.74	11.41	0.01	0.64	157	228.53	901.54	1791.04	1.75	100.58
Crane, Hydraulic, 150 Ton (150 ton crane)	350	2	0.1474	0.4728	1.4512	0.0015	0.0556	6	1.77	5.67	17.41	0.02	0.67	157	277.75	890.77	2734.13	2.76	104.73
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	157	60.57	185.90	210.33	0.24	21.37
Manlifts	75	4	0.0643	0.1973	0.2233	0.0003	0.0227	6	1.54	4.74	5.36	0.01	0.54	157	242.27	743.60	841.34	0.95	85.46
									5.15	17.34	35.52	0.04	1.99		809.12	2721.80	5576.84	5.70	312.14

Transformer Assembly and Processing Element

Segment 9 - Antelope Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1222	0.4408	1.0325	0.0010	0.0516	6	1.47	5.29	12.39	0.01	0.62	57	83.55	301.48	706.25	0.70	35.27
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	57	21.99	67.49	76.36	0.09	7.76
Manlifts	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	57	21.99	67.49	76.36	0.09	7.76
									2.24	7.66	15.07	0.02	0.89		127.53	436.47	858.98	0.87	50.78

Segment 9 - Vincent Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1222	0.4408	1.0325	0.0010	0.0516	6	1.47	5.29	12.39	0.01	0.62	67	98.21	354.37	830.16	0.82	41.45
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	67	25.85	79.33	89.76	0.10	9.12
Manlifts	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	67	25.85	79.33	89.76	0.10	9.12
									2.24	7.66	15.07	0.02	0.89		149.91	513.04	1009.68	1.03	59.69

Segment 9 - Mira Loma Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1222	0.4408	1.0325	0.0010	0.0516	6	1.47	5.29	12.39	0.01	0.62	25	36.65	132.23	309.76	0.31	15.47
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	25	9.64	29.60	33.49	0.04	3.40
Manlifts	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	25	9.64	29.60	33.49	0.04	3.40
									2.24	7.66	15.07	0.02	0.89		55.94	191.43	376.75	0.38	22.27

Offroad Equipment Emission Calculations

Segment 9 - Chino Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1222	0.4408	1.0325	0.0010	0.0516	6	1.47	5.29	12.39	0.01	0.62	53	77.69	280.33	656.69	0.65	32.79
Forklift	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	53	20.45	62.76	71.00	0.08	7.21
Manlifts	75	1	0.0643	0.1973	0.2233	0.0003	0.0227	6	0.39	1.18	1.34	0.00	0.14	53	20.45	62.76	71.00	0.08	7.21
									2.24	7.66	15.07	0.02	0.89		118.58	405.84	798.70	0.81	47.22

Construction - 66kV (or other subtransmission lines)

Segment 4 - Relocate at Antelope			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0957	0.3460	1.1847	0.0021	0.0384	4	0.38	1.38	4.74	0.01	0.15	70	26.78	96.89	331.70	0.59	10.76
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	70	30.33	100.40	122.89	0.14	11.58
									0.82	2.82	6.49	0.01	0.32		57.11	197.29	454.60	0.73	22.34

Segment 5 - Sagebrush/Ant. & Sagebrush Vincent			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0957	0.3460	1.1847	0.0021	0.0384	4	0.38	1.38	4.74	0.01	0.15	81	30.99	112.12	383.83	0.69	12.45
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	81	35.09	116.18	142.21	0.16	13.40
									0.82	2.82	6.49	0.01	0.32		66.09	228.30	526.03	0.85	25.85

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0957	0.3460	1.1847	0.0021	0.0384	4	0.38	1.38	4.74	0.01	0.15	218	83.41	301.75	1033.02	1.85	33.50
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	218	94.45	312.68	382.73	0.44	36.06
									0.82	2.82	6.49	0.01	0.32		177.86	614.43	1415.75	2.28	69.56

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0957	0.3460	1.1847	0.0021	0.0384	4	0.38	1.38	4.74	0.01	0.15	90	34.43	124.57	426.47	0.76	13.83
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	90	38.99	129.09	158.01	0.18	14.89
									0.82	2.82	6.49	0.01	0.32		73.43	253.66	584.48	0.94	28.72

Wreckout - 66kV (or other subtransmission lines)

Segment 4 - Relocate at Antelope			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Puller, Wire Puller 1 Drum	310	1	0.1391	0.5970	1.4037	0.0017	0.0599	4	0.56	2.39	5.61	0.01	0.24	35	19.48	83.58	196.52	0.24	8.39
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	35	15.16	50.20	61.45	0.07	5.79
									0.99	3.82	7.37	0.01	0.41		34.64	133.78	257.97	0.31	14.18

Segment 5 - Sagebrush/Ant. & Sagebrush Vincent			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Puller, Wire Puller 1 Drum	310	1	0.1391	0.5970	1.4037	0.0017	0.0599	4	0.56	2.39	5.61	0.01	0.24	37	20.59	88.36	207.75	0.26	8.87
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	37	16.03	53.07	64.96	0.07	6.12
									0.99	3.82	7.37	0.01	0.41		36.62	141.43	272.71	0.33	14.99

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Puller, Wire Puller 1 Drum	310	1	0.1391	0.5970	1.4037	0.0017	0.0599	4	0.56	2.39	5.61	0.01	0.24	47	26.16	112.24	263.90	0.33	11.26
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	47	20.36	67.41	82.52	0.09	7.77
									0.99	3.82	7.37	0.01	0.41		46.52	179.65	346.41	0.42	19.04

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Puller, Wire Puller 1 Drum	310	1	0.1391	0.5970	1.4037	0.0017	0.0599	4	0.56	2.39	5.61	0.01	0.24	48	26.71	114.62	269.51	0.33	11.50
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	48	20.80	68.85	84.27	0.10	7.94
									0.99	3.82	7.37	0.01	0.41		47.51	183.47	353.78	0.43	19.44

Offroad Equipment Emission Calculations

66 kV Underground Construction

Segment 7

Trenching

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator Cat 320	138	1	0.1420	0.5771	0.9299	0.0010	0.0742	8	1.14	4.62	7.44	0.01	0.59	3	3.41	13.85	22.32	0.02	1.78
Forklift - 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	4	0.25	0.81	1.01	0.00	0.10	3	0.76	2.44	3.02	0.00	0.30
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	3	1.30	4.30	5.27	0.01	0.50
Water Pumps - 100 hp	100	1	0.1412	0.4648	0.7577	0.0008	0.0627	4	0.56	1.86	3.03	0.00	0.25	3	1.69	5.58	9.09	0.01	0.75
Loader, Front End w/ Bucket	145	1	0.1329	0.5203	0.9175	0.0009	0.0662	4	0.53	2.08	3.67	0.00	0.26	3	1.59	6.24	11.01	0.01	0.79
									2.92	10.80	16.90	0.02	1.38		8.76	32.41	50.70	0.05	4.13

End Structures

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0957	0.3460	1.1847	0.0021	0.0384	4	0.38	1.38	4.74	0.01	0.15	4	1.53	5.54	18.95	0.03	0.61
Loader, Front End w/ Bucket	145	1	0.1329	0.5203	0.9175	0.0009	0.0662	2	0.27	1.04	1.84	0.00	0.13	4	1.06	4.16	7.34	0.01	0.53
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	2	0.22	0.72	0.88	0.00	0.08	4	0.87	2.87	3.51	0.00	0.33
									0.86	3.14	7.45	0.01	0.37		3.46	12.57	29.81	0.05	1.48

Segment 8

Trenching

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator Cat 320	138	1	0.1420	0.5771	0.9299	0.0010	0.0742	8	1.14	4.62	7.44	0.01	0.59	27	30.68	124.65	200.85	0.21	16.03
Forklift - 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	4	0.25	0.81	1.01	0.00	0.10	27	6.84	21.96	27.15	0.03	2.73
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	4	0.43	1.43	1.76	0.00	0.17	27	11.70	38.73	47.40	0.05	4.47
Water Pumps - 100 hp	100	1	0.1412	0.4648	0.7577	0.0008	0.0627	4	0.56	1.86	3.03	0.00	0.25	27	15.25	50.20	81.83	0.08	6.77
Loader, Front End w/ Bucket	145	1	0.1329	0.5203	0.9175	0.0009	0.0662	4	0.53	2.08	3.67	0.00	0.26	27	14.35	56.20	99.09	0.10	7.15
									2.92	10.80	16.90	0.02	1.38		78.82	291.73	456.33	0.48	37.14

Vault Construction

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator Cat 320	138	1	0.1420	0.5771	0.9299	0.0010	0.0742	6	0.85	3.46	5.58	0.01	0.45	6	5.11	20.77	33.48	0.04	2.67
Water Pumps - 100 hp	100	1	0.1412	0.4648	0.7577	0.0008	0.0627	6	0.85	2.79	4.55	0.00	0.38	6	5.08	16.73	27.28	0.03	2.26
Forklift, 10 ton	85	1	0.0634	0.2033	0.2514	0.0003	0.0252	2	0.13	0.41	0.50	0.00	0.05	6	0.76	2.44	3.02	0.00	0.30
Loader, Front End w/ Bucket	145	1	0.1329	0.5203	0.9175	0.0009	0.0662	1	0.13	0.52	0.92	0.00	0.07	6	0.80	3.12	5.51	0.01	0.40
									1.96	7.18	11.55	0.01	0.94		11.75	43.07	69.27	0.07	5.63

End Structures

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0957	0.3460	1.1847	0.0021	0.0384	4	0.38	1.38	4.74	0.01	0.15	10	3.83	13.84	47.39	0.08	1.54
Loader, Front End w/ Bucket	145	1	0.1329	0.5203	0.9175	0.0009	0.0662	2	0.27	1.04	1.84	0.00	0.13	10	2.66	10.41	18.35	0.02	1.32
Backhoe	85	1	0.1083	0.3586	0.4389	0.0005	0.0414	2	0.22	0.72	0.88	0.00	0.08	10	2.17	7.17	8.78	0.01	0.83
									0.86	3.14	7.45	0.01	0.37		8.65	31.42	74.51	0.11	3.69

2011 Emission Calculations

Marshalling Yards

Segment 4

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	3	0.28	1.11	1.96	0.00	0.13	21	5.84	23.26	41.15	0.04	2.81
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	5	0.29	0.96	1.07	0.00	0.10	21	6.01	20.13	22.41	0.03	2.18
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	5	0.28	0.99	1.19	0.00	0.12	21	5.94	20.83	25.04	0.03	2.42
									0.85	3.06	4.22	0.00	0.35		17.79	64.22	88.59	0.10	7.41

Segment 5

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	3	0.28	1.11	1.96	0.00	0.13	153	42.54	169.50	299.82	0.30	20.47
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	5	0.29	0.96	1.07	0.00	0.10	153	43.78	146.64	163.24	0.19	15.88
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	5	0.28	0.99	1.19	0.00	0.12	153	43.31	151.76	182.41	0.21	17.66
									0.85	3.06	4.22	0.00	0.35		129.64	467.90	645.47	0.71	54.00

Offroad Equipment Emission Calculations

Segment 6

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	3	0.28	1.11	1.96	0.00	0.13	303	84.25	335.67	593.75	0.60	40.53
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	5	0.29	0.96	1.07	0.00	0.10	303	86.71	290.40	323.27	0.38	31.44
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	5	0.28	0.99	1.19	0.00	0.12	303	85.78	300.55	361.25	0.42	34.97
									0.85	3.06	4.22	0.00	0.35		256.74	926.63	1278.28	1.40	106.95

Segment 7

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	3	0.28	1.11	1.96	0.00	0.13	303	84.25	335.67	593.75	0.60	40.53
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	5	0.29	0.96	1.07	0.00	0.10	303	86.71	290.40	323.27	0.38	31.44
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	5	0.28	0.99	1.19	0.00	0.12	303	85.78	300.55	361.25	0.42	34.97
									0.85	3.06	4.22	0.00	0.35		256.74	926.63	1278.28	1.40	106.95

Segment 8

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	3	0.28	1.11	1.96	0.00	0.13	303	84.25	335.67	593.75	0.60	40.53
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	5	0.29	0.96	1.07	0.00	0.10	303	86.71	290.40	323.27	0.38	31.44
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	5	0.28	0.99	1.19	0.00	0.12	303	85.78	300.55	361.25	0.42	34.97
									0.85	3.06	4.22	0.00	0.35		256.74	926.63	1278.28	1.40	106.95

Segment 10

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	3	0.28	1.11	1.96	0.00	0.13	16	4.45	17.73	31.35	0.03	2.14
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	5	0.29	0.96	1.07	0.00	0.10	16	4.58	15.33	17.07	0.02	1.66
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	5	0.28	0.99	1.19	0.00	0.12	16	4.53	15.87	19.08	0.02	1.85
									0.85	3.06	4.22	0.00	0.35		13.56	48.93	67.50	0.07	5.65

Segment 11

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	3	0.28	1.11	1.96	0.00	0.13	110	30.59	121.86	215.55	0.22	14.72
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	5	0.29	0.96	1.07	0.00	0.10	110	31.48	105.43	117.36	0.14	11.42
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	5	0.28	0.99	1.19	0.00	0.12	110	31.14	109.11	131.15	0.15	12.69
									0.85	3.06	4.22	0.00	0.35		93.20	336.40	464.06	0.51	38.83

Road Maintenance

Segment 4

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	2	0.30	1.22	2.04	0.00	0.16	16	4.87	19.60	32.62	0.03	2.50
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	2	0.37	1.45	2.91	0.00	0.16	16	5.96	23.25	46.62	0.05	2.58
									0.68	2.68	4.95	0.00	0.32		10.82	42.85	79.24	0.08	5.08

Segment 5

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	2	0.30	1.22	2.04	0.00	0.16	146	44.41	178.84	297.68	0.31	22.79
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	2	0.37	1.45	2.91	0.00	0.16	146	54.36	212.12	425.36	0.42	23.53
									0.68	2.68	4.95	0.00	0.32		98.77	390.96	723.04	0.73	46.32

Segment 6

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	2	0.30	1.22	2.04	0.00	0.16	278	84.56	340.53	566.82	0.59	43.40
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	2	0.37	1.45	2.91	0.00	0.16	278	103.51	403.91	809.94	0.80	44.81
									0.68	2.68	4.95	0.00	0.32		188.06	744.43	1376.76	1.39	88.20

Segment 8

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	2	0.30	1.22	2.04	0.00	0.16	303	92.16	371.15	617.79	0.65	47.30
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	2	0.37	1.45	2.91	0.00	0.16	303	112.81	440.23	882.77	0.87	48.83
									0.68	2.68	4.95	0.00	0.32		204.97	811.38	1500.56	1.51	96.14

Offroad Equipment Emission Calculations

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	2	0.30	1.22	2.04	0.00	0.16	11	3.35	13.47	22.43	0.02	1.72
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	2	0.37	1.45	2.91	0.00	0.16	11	4.10	15.98	32.05	0.03	1.77
									0.68	2.68	4.95	0.00	0.32		7.44	29.46	54.48	0.05	3.49

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	2	0.30	1.22	2.04	0.00	0.16	7	2.13	8.57	14.27	0.01	1.09
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	2	0.37	1.45	2.91	0.00	0.16	7	2.61	10.17	20.39	0.02	1.13
									0.68	2.68	4.95	0.00	0.32		4.74	18.74	34.67	0.03	2.22

Roads & Landing Work (Road Work)

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
(Upgrade Existing Road, Construct New Roads and L	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	8	3.41	10.71	31.71	0.03	1.26	48	163.82	514.08	1522.26	1.55	60.63
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	8	1.49	5.81	11.65	0.01	0.64	48	71.49	278.96	559.38	0.55	30.94
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	3	0.59	2.10	2.51	0.00	0.23	48	28.22	100.95	120.35	0.14	11.04
Excavator, Grade - All	165	2	0.1359	0.6430	0.9906	0.0012	0.0644	8	2.17	10.29	15.85	0.02	1.03	48	104.36	493.82	760.78	0.91	49.49
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	5	0.76	3.06	5.10	0.01	0.39	48	36.50	146.99	244.67	0.26	18.73
									8.42	31.97	66.82	0.07	3.56		404.39	1534.80	3207.44	3.41	170.84

Install Foundations

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	3	0.56	2.18	4.37	0.00	0.24	23	12.85	50.12	100.51	0.10	5.56
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	8	1.71	5.36	15.86	0.02	0.63	23	39.25	123.17	364.71	0.37	14.53
Generator, Concrete Batch Plant	50	1	0.1043	0.2826	0.3020	0.0004	0.0270	6	0.63	1.70	1.81	0.00	0.16	23	14.39	39.00	41.68	0.05	3.73
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	4	0.78	2.80	3.34	0.00	0.31	23	18.03	64.49	76.89	0.09	7.06
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	23	0.50	2.18	3.40	0.00	0.20
Excavator, Grade - All	165	1	0.1359	0.6430	0.9906	0.0012	0.0644	4	0.54	2.57	3.96	0.00	0.26	23	12.50	59.16	91.14	0.11	5.93
									4.24	14.70	29.49	0.03	1.61		97.52	338.13	678.33	0.73	37.00

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	3	0.56	2.18	4.37	0.00	0.24	77	43.00	167.81	336.50	0.33	18.62
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	8	1.71	5.36	15.86	0.02	0.63	77	131.40	412.34	1220.98	1.24	48.63
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	4	0.78	2.80	3.34	0.00	0.31	77	60.36	215.91	257.42	0.31	23.62
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	77	1.69	7.31	11.39	0.02	0.67
Excavator, Grade - All	165	1	0.1359	0.6430	0.9906	0.0012	0.0644	4	0.54	2.57	3.96	0.00	0.26	77	41.85	198.04	305.10	0.37	19.85
									3.61	13.01	27.68	0.03	1.45		278.31	1001.42	2131.40	2.26	111.38

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	3	0.56	2.18	4.37	0.00	0.24	69	38.54	150.37	301.54	0.30	16.68
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	8	1.71	5.36	15.86	0.02	0.63	69	117.75	369.50	1094.12	1.11	43.58
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	4	0.78	2.80	3.34	0.00	0.31	69	54.09	193.48	230.67	0.28	21.17
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	69	1.51	6.55	10.21	0.01	0.60
Excavator, Grade - All	165	1	0.1359	0.6430	0.9906	0.0012	0.0644	4	0.54	2.57	3.96	0.00	0.26	69	37.50	177.47	273.41	0.33	17.79
									3.61	13.01	27.68	0.03	1.45		249.39	897.37	1909.95	2.03	99.81

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	3	0.56	2.18	4.37	0.00	0.24	13	7.26	28.33	56.81	0.06	3.14
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	8	1.71	5.36	15.86	0.02	0.63	13	22.18	69.62	206.14	0.21	8.21
Generator, Concrete Batch Plant	50	1	0.1043	0.2826	0.3020	0.0004	0.0270	6	0.63	1.70	1.81	0.00	0.16	13	8.14	22.04	23.56	0.03	2.11
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	4	0.78	2.80	3.34	0.00	0.31	13	10.19	36.45	43.46	0.05	3.99
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	13	0.29	1.23	1.92	0.00	0.11
Excavator, Grade - All	165	1	0.1359	0.6430	0.9906	0.0012	0.0644	4	0.54	2.57	3.96	0.00	0.26	13	7.07	33.44	51.51	0.06	3.35
									4.24	14.70	29.49	0.03	1.61		55.12	191.12	383.41	0.41	20.91

Offroad Equipment Emission Calculations

Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1615	0.5565	1.5499	0.0017	0.0587	8	1.29	4.45	12.40	0.01	0.47	85	109.80	378.42	1053.93	1.13	39.92
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	8	2.67	10.64	18.81	0.02	1.28	85	226.89	903.99	1599.01	1.61	109.16
Compressor, Air	75	5	0.1044	0.2947	0.3538	0.0004	0.0350	7.5	3.92	11.05	13.27	0.01	1.31	85	332.91	939.50	1127.83	1.22	111.44
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	85	1.86	8.07	12.58	0.02	0.74
									7.90	26.24	44.63	0.05	3.07		671.47	2229.99	3793.35	3.98	261.26

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1615	0.5565	1.5499	0.0017	0.0587	8	1.29	4.45	12.40	0.01	0.47	221	285.48	983.90	2740.21	2.95	103.80
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	8	2.67	10.64	18.81	0.02	1.28	221	589.91	2350.37	4157.44	4.19	283.82
Compressor, Air	75	5	0.1044	0.2947	0.3538	0.0004	0.0350	7.5	3.92	11.05	13.27	0.01	1.31	221	865.58	2442.71	2932.36	3.16	289.75
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	221	4.85	20.99	32.70	0.05	1.92
									7.90	26.24	44.63	0.05	3.07		1745.82	5797.97	9862.71	10.34	679.28

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1615	0.5565	1.5499	0.0017	0.0587	8	1.29	4.45	12.40	0.01	0.47	265	342.32	1179.80	3285.78	3.53	124.46
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	8	2.67	10.64	18.81	0.02	1.28	265	707.36	2818.31	4985.16	5.02	340.33
Compressor, Air	75	5	0.1044	0.2947	0.3538	0.0004	0.0350	7.5	3.92	11.05	13.27	0.01	1.31	265	1037.91	2929.04	3516.17	3.79	347.44
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	265	5.81	25.17	39.21	0.06	2.30
									7.90	26.24	44.63	0.05	3.07		2093.40	6952.32	11826.33	12.40	814.52

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1615	0.5565	1.5499	0.0017	0.0587	8	1.29	4.45	12.40	0.01	0.47	353	456.00	1571.58	4376.90	4.71	165.79
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	8	2.67	10.64	18.81	0.02	1.28	353	942.25	3754.21	6640.61	6.69	453.34
Compressor, Air	75	5	0.1044	0.2947	0.3538	0.0004	0.0350	7.5	3.92	11.05	13.27	0.01	1.31	353	1382.58	3901.70	4683.81	5.05	462.81
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	353	7.74	33.53	52.24	0.07	3.06
									7.90	26.24	44.63	0.05	3.07		2788.57	9261.01	15753.56	16.52	1085.01

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1615	0.5565	1.5499	0.0017	0.0587	8	1.29	4.45	12.40	0.01	0.47	13	16.79	57.88	161.19	0.17	6.11
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	8	2.67	10.64	18.81	0.02	1.28	13	34.70	138.26	244.56	0.25	16.70
Compressor, Air	75	5	0.1044	0.2947	0.3538	0.0004	0.0350	7.5	3.92	11.05	13.27	0.01	1.31	13	50.92	143.69	172.49	0.19	17.04
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.02	0.09	0.15	0.00	0.01	13	0.29	1.23	1.92	0.00	0.11
									7.90	26.24	44.63	0.05	3.07		102.70	341.06	580.16	0.61	39.96

Conductor & OHGW Installation

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	3	0.29	1.05	1.25	0.00	0.12	22	6.47	23.13	27.58	0.03	2.53
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	3	1.00	3.99	7.05	0.01	0.48	22	22.02	87.74	155.20	0.16	10.60
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.43	1.34	3.96	0.00	0.16	22	9.39	29.45	87.21	0.09	3.47
Crawler, Track Type, Sagging (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.85	2.68	7.93	0.01	0.32	22	18.77	58.91	174.43	0.18	6.95
Motor, Auxilary Power	5	4	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.04	0.19	0.30	0.00	0.02	22	0.97	4.18	6.51	0.01	0.38
Tension machine, conductor	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	22	15.52	72.73	111.05	0.13	8.52
Tension machine, static	135	1	0.1176	0.5510	0.8413	0.0010	0.0645	2	0.24	1.10	1.68	0.00	0.13	22	5.17	24.24	37.02	0.04	2.84
									3.56	13.65	27.23	0.03	1.60		78.31	300.38	598.99	0.64	35.28

Offroad Equipment Emission Calculations

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	3	0.29	1.05	1.25	0.00	0.12	72	21.17	75.71	90.26	0.11	8.28
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	3	1.00	3.99	7.05	0.01	0.48	72	72.07	287.15	507.92	0.51	34.67
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.43	1.34	3.96	0.00	0.16	72	30.72	96.39	285.42	0.29	11.37
Crawler, Track Type, Sagging (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.85	2.68	7.93	0.01	0.32	72	61.43	192.78	570.85	0.58	22.74
Motor, Auxilary Power	5	4	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.04	0.19	0.30	0.00	0.02	72	3.16	13.68	21.31	0.03	1.25
Tension machine, conductor	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	72	50.79	238.02	363.42	0.44	27.87
Tension machine, static	135	1	0.1176	0.5510	0.8413	0.0010	0.0645	2	0.24	1.10	1.68	0.00	0.13	72	16.93	79.34	121.14	0.15	9.29
									3.56	13.65	27.23	0.03	1.60		256.27	983.07	1960.33	2.11	115.47

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	3	0.29	1.05	1.25	0.00	0.12	99	29.10	104.10	124.11	0.15	11.39
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	3	1.00	3.99	7.05	0.01	0.48	99	99.10	394.83	698.39	0.70	47.68
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.43	1.34	3.96	0.00	0.16	99	42.24	132.54	392.46	0.40	15.63
Crawler, Track Type, Sagging (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.85	2.68	7.93	0.01	0.32	99	84.47	265.07	784.92	0.80	31.26
Motor, Auxilary Power	5	4	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.04	0.19	0.30	0.00	0.02	99	4.34	18.81	29.30	0.04	1.72
Tension machine, conductor	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	99	69.84	327.28	499.70	0.60	38.32
Tension machine, static	135	1	0.1176	0.5510	0.8413	0.0010	0.0645	2	0.24	1.10	1.68	0.00	0.13	99	23.28	109.09	166.57	0.20	12.77
									3.56	13.65	27.23	0.03	1.60		352.37	1351.72	2695.45	2.90	158.77

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	3	0.29	1.05	1.25	0.00	0.12	242	71.14	254.47	303.39	0.36	27.84
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	3	1.00	3.99	7.05	0.01	0.48	242	242.24	965.14	1707.18	1.72	116.55
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.43	1.34	3.96	0.00	0.16	242	103.24	323.98	959.34	0.98	38.21
Crawler, Track Type, Sagging (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.85	2.68	7.93	0.01	0.32	242	206.48	647.96	1918.68	1.95	76.42
Motor, Auxilary Power	5	4	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.04	0.19	0.30	0.00	0.02	242	10.62	45.97	71.62	0.10	4.20
Tension machine, conductor	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	242	170.73	800.02	1221.50	1.48	93.67
Tension machine, static	135	1	0.1176	0.5510	0.8413	0.0010	0.0645	2	0.24	1.10	1.68	0.00	0.13	242	56.91	266.67	407.17	0.49	31.22
									3.56	13.65	27.23	0.03	1.60		861.36	3304.21	6588.88	7.08	388.11

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	3	0.29	1.05	1.25	0.00	0.12	9	2.65	9.46	11.28	0.01	1.04
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	3	1.00	3.99	7.05	0.01	0.48	9	9.01	35.89	63.49	0.06	4.33
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.43	1.34	3.96	0.00	0.16	9	3.84	12.05	35.68	0.04	1.42
Crawler, Track Type, Sagging (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.85	2.68	7.93	0.01	0.32	9	7.68	24.10	71.36	0.07	2.84
Motor, Auxilary Power	5	4	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.04	0.19	0.30	0.00	0.02	9	0.39	1.71	2.66	0.00	0.16
Tension machine, conductor	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	9	6.35	29.75	45.43	0.05	3.48
Tension machine, static	135	1	0.1176	0.5510	0.8413	0.0010	0.0645	2	0.24	1.10	1.68	0.00	0.13	9	2.12	9.92	15.14	0.02	1.16
									3.56	13.65	27.23	0.03	1.60		32.03	122.88	245.04	0.26	14.43

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	3	0.29	1.05	1.25	0.00	0.12	13	3.82	13.67	16.30	0.02	1.50
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	3	1.00	3.99	7.05	0.01	0.48	13	13.01	51.85	91.71	0.09	6.26
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.43	1.34	3.96	0.00	0.16	13	5.55	17.40	51.53	0.05	2.05
Crawler, Track Type, Sagging (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	2	0.85	2.68	7.93	0.01	0.32	13	11.09	34.81	103.07	0.10	4.11
Motor, Auxilary Power	5	4	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.04	0.19	0.30	0.00	0.02	13	0.57	2.47	3.85	0.01	0.23
Tension machine, conductor	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	13	9.17	42.98	65.62	0.08	5.03
Tension machine, static	135	1	0.1176	0.5510	0.8413	0.0010	0.0645	2	0.24	1.10	1.68	0.00	0.13	13	3.06	14.33	21.87	0.03	1.68
									3.56	13.65	27.23	0.03	1.60		46.27	177.50	353.95	0.38	20.85

Offroad Equipment Emission Calculations

Restoration & Guard Poles

Segment 4			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	5	0.49	1.75	2.09	0.00	0.19	14	6.86	24.54	29.25	0.03	2.68
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	8	1.22	4.90	8.16	0.01	0.62	14	17.03	68.60	114.18	0.12	8.74
									1.71	6.65	10.25	0.01	0.82		23.89	93.13	143.43	0.15	11.43

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	5	0.49	1.75	2.09	0.00	0.19	18	8.82	31.55	37.61	0.04	3.45
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	8	1.22	4.90	8.16	0.01	0.62	18	21.90	88.19	146.80	0.15	11.24
									1.71	6.65	10.25	0.01	0.82		30.72	119.74	184.41	0.20	14.69

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	5	0.49	1.75	2.09	0.00	0.19	27	13.23	47.32	56.41	0.07	5.18
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	8	1.22	4.90	8.16	0.01	0.62	27	32.85	132.29	220.20	0.23	16.86
									1.71	6.65	10.25	0.01	0.82		46.08	179.61	276.62	0.30	22.04

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	5	0.49	1.75	2.09	0.00	0.19	6	2.94	10.52	12.54	0.01	1.15
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	8	1.22	4.90	8.16	0.01	0.62	6	7.30	29.40	48.93	0.05	3.75
									1.71	6.65	10.25	0.01	0.82		10.24	39.91	61.47	0.07	4.90

Segment 10			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	5	0.49	1.75	2.09	0.00	0.19	12	5.88	21.03	25.07	0.03	2.30
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	8	1.22	4.90	8.16	0.01	0.62	12	14.60	58.80	97.87	0.10	7.49
									1.71	6.65	10.25	0.01	0.82		20.48	79.83	122.94	0.13	9.79

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	5	0.49	1.75	2.09	0.00	0.19	2	0.98	3.51	4.18	0.00	0.38
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	8	1.22	4.90	8.16	0.01	0.62	2	2.43	9.80	16.31	0.02	1.25
									1.71	6.65	10.25	0.01	0.82		3.41	13.30	20.49	0.02	1.63

Wreck-Out (Conductors, Structures & Foundations)

Segment 5			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
(Antelope-Mesa & Antelope-Vincent)	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	14	9.88	46.28	70.67	0.09	5.42
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	8	1.71	5.36	15.86	0.02	0.63	14	23.89	74.97	222.00	0.23	8.84
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.0980	0.3505	0.4179	0.0005	0.0383	8	3.14	11.22	13.37	0.02	1.23	14	43.90	157.03	187.21	0.22	17.18
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1112	0.4431	0.7838	0.0008	0.0535	4	0.89	3.55	6.27	0.01	0.43	14	12.46	49.63	87.79	0.09	5.99
Motor, Auxilary Power	5	3	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.03	0.14	0.22	0.00	0.01	14	0.46	1.99	3.11	0.00	0.18
									6.47	23.56	40.77	0.04	2.69		90.58	329.91	570.77	0.63	37.62

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	3	0.71	3.31	5.05	0.01	0.39	7	4.94	23.14	35.33	0.04	2.71
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	8	1.71	5.36	15.86	0.02	0.63	7	11.95	37.49	111.00	0.11	4.42
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.0980	0.3505	0.4179	0.0005	0.0383	8	3.14	11.22	13.37	0.02	1.23	7	21.95	78.51	93.61	0.11	8.59
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1112	0.4431	0.7838	0.0008	0.0535	4	0.89	3.55	6.27	0.01	0.43	7	6.23	24.82	43.89	0.04	3.00
Motor, Auxilary Power	5	3	0.0055	0.0237	0.0370	0.0001	0.0022	2	0.03	0.14	0.22	0.00	0.01	7	0.23	1.00	1.55	0.00	0.09
									6.47	23.56	40.77	0.04	2.69		45.29	164.95	285.39	0.31	18.81

Construction - 66kV (or other subtransmission lines)

Segment 7 - Rio Hondo/SG River & SG River to Mesa			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.0892	0.3445	1.0129	0.0021	0.0323	4	0.36	1.38	4.05	0.01	0.13	220	78.53	303.15	891.31	1.86	28.41
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	4	0.39	1.40	1.67	0.00	0.15	220	86.23	308.45	367.74	0.44	33.75
									0.75	2.78	5.72	0.01	0.28		164.76	611.60	1259.05	2.30	62.16

Offroad Equipment Emission Calculations

Wreckout - 66kV (or other subtransmission lines)

Segment 4 - Relocate at Antelope			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Puller, Wire Puller 1 Drum	310	1	0.1298	0.5804	1.2927	0.0017	0.0553	4	0.52	2.32	5.17	0.01	0.22	96	49.85	222.86	496.40	0.67	21.22
Backhoe	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	4	0.39	1.40	1.67	0.00	0.15	96	37.63	134.60	160.47	0.19	14.73
									0.91	3.72	6.84	0.01	0.37		87.48	357.46	656.87	0.86	35.94

Electrical Element

Segment 9 - Whirlwind Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
14 ton Crane	180	2	0.1150	0.4752	0.8960	0.0009	0.0509	6	1.38	5.70	10.75	0.01	0.61	91	125.60	518.92	978.39	1.01	55.55
Crane, Hydraulic, 150 Ton (150 ton crane)	350	2	0.1393	0.4421	1.3511	0.0015	0.0508	6	1.67	5.30	16.21	0.02	0.61	91	152.09	482.73	1475.35	1.60	55.43
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	91	31.25	104.66	116.51	0.14	11.33
Manlifts	75	4	0.0572	0.1917	0.2134	0.0003	0.0208	6	1.37	4.60	5.12	0.01	0.50	91	125.00	418.64	466.03	0.55	45.33
									4.77	16.76	33.37	0.04	1.84		433.95	1524.95	3036.28	3.30	167.65

Transformer Assembly and Processing Element

Segment 9 - Whirlwind Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1156	0.4330	0.9692	0.0010	0.0486	6	1.39	5.20	11.63	0.01	0.58	161	223.36	836.62	1872.45	1.98	93.84
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	161	55.29	185.17	206.13	0.24	20.05
Manlifts	75	2	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.69	2.30	2.56	0.00	0.25	161	110.58	370.34	412.25	0.49	40.10
									2.42	8.65	15.47	0.02	0.96		389.23	1392.12	2490.83	2.71	153.99

Segment 9 - Antelope Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1156	0.4330	0.9692	0.0010	0.0486	6	1.39	5.20	11.63	0.01	0.58	179	248.33	930.15	2081.80	2.20	104.33
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	179	61.47	205.87	229.17	0.27	22.29
Manlifts	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	179	61.47	205.87	229.17	0.27	22.29
									2.07	7.50	14.19	0.02	0.83		371.27	1341.89	2540.14	2.74	148.91

Segment 9 - Vincent Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1156	0.4330	0.9692	0.0010	0.0486	6	1.39	5.20	11.63	0.01	0.58	22	30.52	114.32	255.86	0.27	12.82
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	22	7.56	25.30	28.17	0.03	2.74
Manlifts	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	22	7.56	25.30	28.17	0.03	2.74
									2.07	7.50	14.19	0.02	0.83		45.63	164.93	312.20	0.34	18.30

Segment 9 - Gould Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1156	0.4330	0.9692	0.0010	0.0486	6	1.39	5.20	11.63	0.01	0.58	59	81.85	306.59	686.18	0.72	34.39
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	59	20.26	67.86	75.54	0.09	7.35
Manlifts	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	6	0.34	1.15	1.28	0.00	0.12	59	20.26	67.86	75.54	0.09	7.35
									2.07	7.50	14.19	0.02	0.83		122.37	442.30	837.25	0.90	49.08

2012 Emission Calculations

Construction of Marshalling Yards

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1050	0.4406	0.7381	0.0008	0.0499	2	0.21	0.88	1.48	0.00	0.10	75	15.75	66.09	110.71	0.12	7.49
Forklift, 5 ton	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	6	0.30	1.12	1.22	0.00	0.11	75	22.72	83.95	91.52	0.11	8.40
Forklift, 10 ton	85	1	0.0501	0.1939	0.2252	0.0003	0.0207	6	0.30	1.16	1.35	0.00	0.12	75	22.56	87.25	101.35	0.13	9.30
Motor, Auxilary Power	5	1	0.0052	0.0233	0.0354	0.0001	0.0020	1	0.01	0.02	0.04	0.00	0.00	75	0.39	1.75	2.66	0.00	0.15
									0.82	3.19	4.08	0.00	0.34		61.42	239.04	306.25	0.36	25.34

Offroad Equipment Emission Calculations

Marshalling Yards

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.26	1.10	1.85	0.00	0.12	135	35.43	148.71	249.11	0.27	16.84
Forklift, 5 ton	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	5	0.25	0.93	1.02	0.00	0.09	135	34.08	125.93	137.29	0.17	12.60
Forklift, 10 ton	85	1	0.0501	0.1939	0.2252	0.0003	0.0207	5	0.25	0.97	1.13	0.00	0.10	135	33.84	130.88	152.03	0.19	13.95
									0.77	3.00	3.99	0.00	0.32		103.34	405.51	538.42	0.62	43.39

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.26	1.10	1.85	0.00	0.12	189	49.60	208.19	348.75	0.37	23.58
Forklift, 5 ton	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	5	0.25	0.93	1.02	0.00	0.09	189	47.71	176.30	192.20	0.24	17.64
Forklift, 10 ton	85	1	0.0501	0.1939	0.2252	0.0003	0.0207	5	0.25	0.97	1.13	0.00	0.10	189	47.38	183.23	212.84	0.26	19.53
									0.77	3.00	3.99	0.00	0.32		144.68	567.72	753.79	0.87	60.75

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.26	1.10	1.85	0.00	0.12	99	25.98	109.05	182.68	0.20	12.35
Forklift, 5 ton	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	5	0.25	0.93	1.02	0.00	0.09	99	24.99	92.35	100.68	0.13	9.24
Forklift, 10 ton	85	1	0.0501	0.1939	0.2252	0.0003	0.0207	5	0.25	0.97	1.13	0.00	0.10	99	24.82	95.98	111.49	0.14	10.23
									0.77	3.00	3.99	0.00	0.32		75.79	297.38	394.84	0.46	31.82

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.26	1.10	1.85	0.00	0.12	303	79.52	333.76	559.11	0.60	37.80
Forklift, 5 ton	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	5	0.25	0.93	1.02	0.00	0.09	303	76.48	282.64	308.13	0.38	28.28
Forklift, 10 ton	85	1	0.0501	0.1939	0.2252	0.0003	0.0207	5	0.25	0.97	1.13	0.00	0.10	303	75.95	293.75	341.22	0.42	31.32
									0.77	3.00	3.99	0.00	0.32		231.95	910.15	1208.46	1.40	97.39

Road Maintenance

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	2	0.28	1.22	1.91	0.00	0.14	130	37.00	158.22	248.85	0.28	18.75
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1771	0.7189	1.3752	0.0014	0.0752	2	0.35	1.44	2.75	0.00	0.15	130	46.05	186.90	357.54	0.37	19.55
									0.64	2.65	4.66	0.00	0.29		83.04	345.12	606.39	0.65	38.30

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	2	0.28	1.22	1.91	0.00	0.14	94	26.75	114.40	179.93	0.20	13.56
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1771	0.7189	1.3752	0.0014	0.0752	2	0.35	1.44	2.75	0.00	0.15	94	33.30	135.15	258.53	0.27	14.14
									0.64	2.65	4.66	0.00	0.29		60.05	249.55	438.46	0.47	27.70

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	2	0.28	1.22	1.91	0.00	0.14	303	86.23	368.76	580.00	0.65	43.70
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1771	0.7189	1.3752	0.0014	0.0752	2	0.35	1.44	2.75	0.00	0.15	303	107.32	435.63	833.34	0.87	45.58
									0.64	2.65	4.66	0.00	0.29		193.56	804.39	1413.35	1.51	89.27

Construct New Roads & Landing Work

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
(500kV 2nd Circuit Vincent-Gould)	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D8 type)	305	2	0.2031	0.6323	1.8555	0.0020	0.0728	8	3.25	10.12	29.69	0.03	1.16	50	162.50	505.83	1484.43	1.61	58.23
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1771	0.7189	1.3752	0.0014	0.0752	8	1.42	5.75	11.00	0.01	0.60	50	70.84	287.54	550.06	0.57	30.08
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0883	0.3431	0.3970	0.0005	0.0349	3	0.53	2.06	2.38	0.00	0.21	50	26.49	102.93	119.11	0.15	10.48
Excavator, Grade - All	165	2	0.1269	0.6413	0.9192	0.0012	0.0585	8	2.03	10.26	14.71	0.02	0.94	50	101.54	513.01	735.38	0.95	46.79
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	5	0.71	3.04	4.79	0.01	0.36	50	35.57	152.13	239.28	0.27	18.03
									7.94	31.23	62.57	0.07	3.27		396.94	1561.45	3128.26	3.56	163.62

Offroad Equipment Emission Calculations

Install Foundations

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1771	0.7189	1.3752	0.0014	0.0752	3	0.53	2.16	4.13	0.00	0.23	24	12.75	51.76	99.01	0.10	5.42
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	8	1.62	5.06	14.84	0.02	0.58	24	39.00	121.40	356.26	0.39	13.98
Generator, Concrete Batch Plant	50	1	0.0959	0.2734	0.2966	0.0004	0.0255	6	0.58	1.64	1.78	0.00	0.15	24	13.81	39.37	42.71	0.06	3.67
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0883	0.3431	0.3970	0.0005	0.0349	4	0.71	2.74	3.18	0.00	0.28	24	16.95	65.87	76.23	0.10	6.71
Motor, Auxilary Power	5	2	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.02	0.09	0.14	0.00	0.01	24	0.50	2.23	3.40	0.01	0.20
Excavator, Grade - All	165	1	0.1269	0.6413	0.9192	0.0012	0.0585	4	0.51	2.57	3.68	0.00	0.23	24	12.18	61.56	88.25	0.11	5.61
									3.97	14.26	27.74	0.03	1.48		95.20	342.20	665.86	0.76	35.58

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1771	0.7189	1.3752	0.0014	0.0752	3	0.53	2.16	4.13	0.00	0.23	49	26.03	105.67	202.15	0.21	11.06
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	8	1.62	5.06	14.84	0.02	0.58	49	79.62	247.86	727.37	0.79	28.53
Generator, Concrete Batch Plant	50	1	0.0959	0.2734	0.2966	0.0004	0.0255	6	0.58	1.64	1.78	0.00	0.15	49	28.19	80.39	87.20	0.12	7.49
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0883	0.3431	0.3970	0.0005	0.0349	4	0.71	2.74	3.18	0.00	0.28	49	34.61	134.49	155.64	0.20	13.69
Motor, Auxilary Power	5	2	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.02	0.09	0.14	0.00	0.01	49	1.02	4.56	6.94	0.01	0.40
Excavator, Grade - All	165	1	0.1269	0.6413	0.9192	0.0012	0.0585	4	0.51	2.57	3.68	0.00	0.23	49	24.88	125.69	180.17	0.23	11.46
									3.97	14.26	27.74	0.03	1.48		194.37	698.66	1359.47	1.56	72.64

Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1529	0.5173	1.4404	0.0017	0.0534	8	1.22	4.14	11.52	0.01	0.43	73	89.27	302.13	841.20	0.97	31.21
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	8	2.52	10.57	17.71	0.02	1.20	73	183.91	771.95	1293.15	1.38	87.43
Compressor, Air	75	5	0.0967	0.2875	0.3390	0.0004	0.0329	7.5	3.63	10.78	12.71	0.01	1.23	73	264.83	786.98	927.89	1.05	90.15
Motor, Auxilary Power	5	2	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.02	0.09	0.14	0.00	0.01	73	1.53	6.80	10.34	0.02	0.60
									7.39	25.59	42.09	0.05	2.87		539.54	1867.86	3072.58	3.42	209.39

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1529	0.5173	1.4404	0.0017	0.0534	8	1.22	4.14	11.52	0.01	0.43	111	135.73	459.40	1279.09	1.48	47.46
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	8	2.52	10.57	17.71	0.02	1.20	111	279.65	1173.79	1966.29	2.10	132.94
Compressor, Air	75	5	0.0967	0.2875	0.3390	0.0004	0.0329	7.5	3.63	10.78	12.71	0.01	1.23	111	402.69	1196.65	1410.90	1.59	137.08
Motor, Auxilary Power	5	2	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.02	0.09	0.14	0.00	0.01	111	2.32	10.33	15.73	0.02	0.91
									7.39	25.59	42.09	0.05	2.87		820.39	2840.17	4672.01	5.20	318.39

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1529	0.5173	1.4404	0.0017	0.0534	8	1.22	4.14	11.52	0.01	0.43	136	166.30	562.87	1567.17	1.81	58.15
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	8	2.52	10.57	17.71	0.02	1.20	136	342.64	1438.16	2409.15	2.58	162.88
Compressor, Air	75	5	0.0967	0.2875	0.3390	0.0004	0.0329	7.5	3.63	10.78	12.71	0.01	1.23	136	493.38	1466.16	1728.67	1.95	167.96
Motor, Auxilary Power	5	2	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.02	0.09	0.14	0.00	0.01	136	2.84	12.66	19.27	0.03	1.11
									7.39	25.59	42.09	0.05	2.87		1005.16	3479.85	5724.26	6.37	390.10

Conductor & OHGW Installation

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	3	0.26	1.03	1.19	0.00	0.10	25	6.62	25.73	29.78	0.04	2.62
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.94	3.97	6.64	0.01	0.45	25	23.62	99.14	166.07	0.18	11.23
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.41	1.26	3.71	0.00	0.15	25	10.16	31.61	92.78	0.10	3.64
Crawler, Track Type, Sagging (D8 type)	305	2	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.81	2.53	7.42	0.01	0.29	25	20.31	63.23	185.55	0.20	7.28
Motor, Auxilary Power	5	4	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.04	0.19	0.28	0.00	0.02	25	1.04	4.65	7.09	0.01	0.41
Tension machine, conductor	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	3	0.65	3.28	4.70	0.01	0.35	25	16.17	82.09	117.43	0.15	8.82
Tension machine, static	135	1	0.1078	0.5473	0.7829	0.0010	0.0588	2	0.22	1.09	1.57	0.00	0.12	25	5.39	27.36	39.14	0.05	2.94
									3.33	13.35	25.51	0.03	1.48		83.31	333.83	637.84	0.73	36.93

Offroad Equipment Emission Calculations

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	3	0.26	1.03	1.19	0.00	0.10	156	41.32	160.57	185.81	0.23	16.35
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.94	3.97	6.64	0.01	0.45	156	147.38	618.62	1036.29	1.11	70.06
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.41	1.26	3.71	0.00	0.15	156	63.37	197.27	578.93	0.63	22.71
Crawler, Track Type, Sagging (D8 type)	305	2	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.81	2.53	7.42	0.01	0.29	156	126.75	394.55	1157.86	1.26	45.42
Motor, Auxilary Power	5	4	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.04	0.19	0.28	0.00	0.02	156	6.52	29.04	44.21	0.07	2.55
Tension machine, conductor	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	3	0.65	3.28	4.70	0.01	0.35	156	100.89	512.26	732.75	0.95	55.03
Tension machine, static	135	1	0.1078	0.5473	0.7829	0.0010	0.0588	2	0.22	1.09	1.57	0.00	0.12	156	33.63	170.75	244.25	0.32	18.34
									3.33	13.35	25.51	0.03	1.48		519.87	2083.07	3980.10	4.57	230.47

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	3	0.26	1.03	1.19	0.00	0.10	91	24.11	93.66	108.39	0.14	9.54
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.94	3.97	6.64	0.01	0.45	91	85.97	360.86	604.50	0.65	40.87
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.41	1.26	3.71	0.00	0.15	91	36.97	115.08	337.71	0.37	13.25
Crawler, Track Type, Sagging (D8 type)	305	2	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.81	2.53	7.42	0.01	0.29	91	73.94	230.15	675.42	0.73	26.50
Motor, Auxilary Power	5	4	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.04	0.19	0.28	0.00	0.02	91	3.80	16.94	25.79	0.04	1.49
Tension machine, conductor	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	3	0.65	3.28	4.70	0.01	0.35	91	58.85	298.82	427.44	0.56	32.10
Tension machine, static	135	1	0.1078	0.5473	0.7829	0.0010	0.0588	2	0.22	1.09	1.57	0.00	0.12	91	19.62	99.61	142.48	0.19	10.70
									3.33	13.35	25.51	0.03	1.48		303.26	1215.12	2321.72	2.66	134.44

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	3	0.26	1.03	1.19	0.00	0.10	103	27.28	106.02	122.68	0.15	10.80
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	3	0.94	3.97	6.64	0.01	0.45	103	97.31	408.45	684.22	0.73	46.26
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.41	1.26	3.71	0.00	0.15	103	41.84	130.25	382.24	0.42	15.00
Crawler, Track Type, Sagging (D8 type)	305	2	0.2031	0.6323	1.8555	0.0020	0.0728	2	0.81	2.53	7.42	0.01	0.29	103	83.69	260.50	764.48	0.83	29.99
Motor, Auxilary Power	5	4	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.04	0.19	0.28	0.00	0.02	103	4.30	19.18	29.19	0.04	1.68
Tension machine, conductor	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	3	0.65	3.28	4.70	0.01	0.35	103	66.61	338.23	483.80	0.63	36.33
Tension machine, static	135	1	0.1078	0.5473	0.7829	0.0010	0.0588	2	0.22	1.09	1.57	0.00	0.12	103	22.20	112.74	161.27	0.21	12.11
									3.33	13.35	25.51	0.03	1.48		343.25	1375.36	2627.88	3.01	152.17

Restoration & Guard Poles

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	5	0.44	1.72	1.99	0.00	0.17	5	2.21	8.58	9.93	0.01	0.87
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	8	1.14	4.87	7.66	0.01	0.58	5	5.69	24.34	38.28	0.04	2.88
									1.58	6.58	9.64	0.01	0.75		7.90	32.92	48.21	0.06	3.76

Segment 7			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	5	0.44	1.72	1.99	0.00	0.17	16	7.06	27.45	31.76	0.04	2.79
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	8	1.14	4.87	7.66	0.01	0.58	16	18.21	77.89	122.51	0.14	9.23
									1.58	6.58	9.64	0.01	0.75		25.28	105.34	154.27	0.18	12.02

Segment 8			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	5	0.44	1.72	1.99	0.00	0.17	27	11.92	46.32	53.60	0.07	4.72
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	8	1.14	4.87	7.66	0.01	0.58	27	30.74	131.44	206.73	0.23	15.57
									1.58	6.58	9.64	0.01	0.75		42.66	177.76	260.33	0.30	20.29

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	5	0.44	1.72	1.99	0.00	0.17	9	3.97	15.44	17.87	0.02	1.57
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	8	1.14	4.87	7.66	0.01	0.58	9	10.25	43.81	68.91	0.08	5.19
									1.58	6.58	9.64	0.01	0.75		14.22	59.25	86.78	0.10	6.76

Offroad Equipment Emission Calculations

Wreck-Out (conductors, structures, & Foundations)

Segment 6			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine, Conductor or Static	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	3	0.65	3.28	4.70	0.01	0.35	17	10.99	55.82	79.85	0.10	6.00
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	8	1.62	5.06	14.84	0.02	0.58	17	27.62	85.99	252.35	0.27	9.90
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.0883	0.3431	0.3970	0.0005	0.0349	8	2.83	10.98	12.70	0.02	1.12	17	48.04	186.64	215.98	0.27	19.01
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1050	0.4406	0.7381	0.0008	0.0499	4	0.84	3.52	5.90	0.01	0.40	17	14.28	59.92	100.38	0.11	6.79
Motor, Auxilary Power	5	3	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.03	0.14	0.21	0.00	0.01	17	0.53	2.37	3.61	0.01	0.21
									5.97	22.99	38.36	0.04	2.46		101.46	390.75	652.18	0.76	41.90

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Tension Machine, Conductor or Static	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	3	0.65	3.28	4.70	0.01	0.35	52	33.63	170.75	244.25	0.32	18.34
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	8	1.62	5.06	14.84	0.02	0.58	52	84.50	263.03	771.91	0.84	30.28
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.0883	0.3431	0.3970	0.0005	0.0349	8	2.83	10.98	12.70	0.02	1.12	52	146.93	570.91	660.66	0.83	58.13
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1050	0.4406	0.7381	0.0008	0.0499	4	0.84	3.52	5.90	0.01	0.40	52	43.67	183.29	307.05	0.33	20.76
Motor, Auxilary Power	5	3	0.0052	0.0233	0.0354	0.0001	0.0020	2	0.03	0.14	0.21	0.00	0.01	52	1.63	7.26	11.05	0.02	0.64
									5.97	22.99	38.36	0.04	2.46		310.36	1195.25	1994.91	2.33	128.16

Electrical Element

Segment 9 - Antelope Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
14 ton Crane	180	2	0.1089	0.4722	0.8423	0.0009	0.0473	6	1.31	5.67	10.11	0.01	0.57	47	61.45	266.34	475.04	0.52	26.70
Crane, Hydraulic, 150 Ton (150 ton crane)	350	2	0.1316	0.4138	1.2558	0.0015	0.0461	6	1.58	4.97	15.07	0.02	0.55	47	74.21	233.39	708.28	0.83	26.02
Forklift	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	6	0.30	1.12	1.22	0.00	0.11	47	14.24	52.61	57.36	0.07	5.26
Manlifts	75	4	0.0505	0.1866	0.2034	0.0003	0.0187	6	1.21	4.48	4.88	0.01	0.45	47	56.95	210.44	229.42	0.29	21.05
									4.40	16.23	31.28	0.04	1.68		206.84	762.78	1470.10	1.71	79.04

Segment 9 - Vincent Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
14 ton Crane	180	2	0.1089	0.4722	0.8423	0.0009	0.0473	6	1.31	5.67	10.11	0.01	0.57	59	77.13	334.34	596.33	0.66	33.52
Crane, Hydraulic, 150 Ton (150 ton crane)	350	2	0.1316	0.4138	1.2558	0.0015	0.0461	6	1.58	4.97	15.07	0.02	0.55	59	93.16	292.98	889.12	1.04	32.67
Forklift	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	6	0.30	1.12	1.22	0.00	0.11	59	17.87	66.04	72.00	0.09	6.61
Manlifts	75	4	0.0505	0.1866	0.2034	0.0003	0.0187	6	1.21	4.48	4.88	0.01	0.45	59	71.48	264.17	288.00	0.36	26.43
									4.40	16.23	31.28	0.04	1.68		259.65	957.53	1845.44	2.14	99.22

Transformer Assembly and Processing Element

Segment 9 - Vincent Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1093	0.4260	0.9077	0.0010	0.0449	6	1.31	5.11	10.89	0.01	0.54	40	52.48	204.46	435.69	0.49	21.56
Forklift	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	6	0.30	1.12	1.22	0.00	0.11	40	12.12	44.78	48.81	0.06	4.48
Manlifts	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	6	0.30	1.12	1.22	0.00	0.11	40	12.12	44.78	48.81	0.06	4.48
									1.92	7.35	13.33	0.02	0.76		76.71	294.01	533.31	0.61	30.52

Segment 9 - Mira Loma Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1093	0.4260	0.9077	0.0010	0.0449	6	1.31	5.11	10.89	0.01	0.54	29	38.05	148.23	315.87	0.36	15.63
Forklift	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	6	0.30	1.12	1.22	0.00	0.11	29	8.78	32.46	35.39	0.04	3.25
Manlifts	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	6	0.30	1.12	1.22	0.00	0.11	29	8.78	32.46	35.39	0.04	3.25
									1.92	7.35	13.33	0.02	0.76		55.62	213.16	386.65	0.44	22.12

Offroad Equipment Emission Calculations

2013 Emission Calculations

Marshalling Yards

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.0990	0.4383	0.6947	0.0008	0.0462	3	0.25	1.10	1.74	0.00	0.12	15	3.71	16.44	26.05	0.03	1.73
Forklift, 5 ton	75	1	0.0443	0.1821	0.1916	0.0003	0.0164	5	0.22	0.91	0.96	0.00	0.08	15	3.32	13.66	14.37	0.02	1.23
Forklift, 10 ton	85	1	0.0442	0.1900	0.2110	0.0003	0.0181	5	0.22	0.95	1.05	0.00	0.09	15	3.31	14.25	15.82	0.02	1.36
									0.69	2.96	3.75	0.00	0.29		10.35	44.34	56.24	0.07	4.32

Road Maintenance

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Motor Grader	140	1	0.1331	0.6050	0.8989	0.0011	0.0660	2	0.27	1.21	1.80	0.00	0.13	10	2.66	12.10	17.98	0.02	1.32
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1686	0.7122	1.2984	0.0014	0.0700	2	0.34	1.42	2.60	0.00	0.14	10	3.37	14.24	25.97	0.03	1.40
									0.60	2.63	4.39	0.00	0.27		6.03	26.34	43.95	0.05	2.72

Conductor & OHGW Installation

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0794	0.3364	0.3729	0.0005	0.0311	3	0.24	1.01	1.12	0.00	0.09	8	1.91	8.07	8.95	0.01	0.75
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.0990	0.4383	0.6947	0.0008	0.0462	3	0.89	3.95	6.25	0.01	0.42	8	7.13	31.56	50.02	0.06	3.33
Crawler, Track Type, w/ blade (D8 type)	305	1	0.1935	0.5991	1.7363	0.0020	0.0669	2	0.39	1.20	3.47	0.00	0.13	8	3.10	9.59	27.78	0.03	1.07
Crawler, Track Type, Sagging (D8 type)	305	2	0.1935	0.5991	1.7363	0.0020	0.0669	2	0.77	2.40	6.95	0.01	0.27	8	6.19	19.17	55.56	0.06	2.14
Motor, Auxilary Power	5	4	0.0050	0.0228	0.0339	0.0001	0.0019	2	0.04	0.18	0.27	0.00	0.02	8	0.32	1.46	2.17	0.00	0.12
Tension machine, conductor	135	2	0.0987	0.5439	0.7294	0.0010	0.0527	3	0.59	3.26	4.38	0.01	0.32	8	4.74	26.11	35.01	0.05	2.53
Tension machine, static	135	1	0.0987	0.5439	0.7294	0.0010	0.0527	2	0.20	1.09	1.46	0.00	0.11	8	1.58	8.70	11.67	0.02	0.84
									3.12	13.08	23.89	0.03	1.35		24.96	104.66	191.16	0.23	10.78

Restoration & Guard Poles

Segment 11			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Backhoe	85	1	0.0794	0.3364	0.3729	0.0005	0.0311	5	0.40	1.68	1.86	0.00	0.16	10	3.97	16.82	18.65	0.02	1.55
Motor Grader	140	1	0.1331	0.6050	0.8989	0.0011	0.0660	8	1.07	4.84	7.19	0.01	0.53	10	10.65	48.40	71.91	0.09	5.28
									1.46	6.52	9.06	0.01	0.68		14.62	65.22	90.55	0.11	6.83

Transformer Assembly & Processing Element

Segment 9 - Vincent Substation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1034	0.4197	0.8495	0.0010	0.0414	6	1.24	5.04	10.19	0.01	0.50	132	163.84	664.75	1345.60	1.62	65.54
Forklift	75	1	0.0443	0.1821	0.1916	0.0003	0.0164	6	0.27	1.09	1.15	0.00	0.10	132	35.05	144.21	151.73	0.20	12.99
Manlifts	75	1	0.0443	0.1821	0.1916	0.0003	0.0164	6	0.27	1.09	1.15	0.00	0.10	132	35.05	144.21	151.73	0.20	12.99
									1.77	7.22	12.49	0.02	0.69		233.95	953.16	1649.06	2.02	91.51

Offroad Equipment Emissions Calculation

Segement 4

Year	Activity	Equipment	ROG	CO	NOX	SOX	PM
			Annual Emissions lbs				
2009	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	47.77	172.41	337.04	0.30	22.62
		Forklift, 5 ton	83.24	235.75	270.51	0.29	28.51
		Forklift, 10 ton	81.69	241.53	306.58	0.32	31.73
		Motor, Auxilary Power	1.16	4.72	7.66	0.01	0.47
	Construction - 66kV (or other subtransmission lines)	Drill Rig	14.79	51.49	194.07	0.31	5.85
	Segment 4 - Relocate at Antelope	Backhoe	17.66	54.36	68.35	0.07	6.59
	2009 Total Emission		**246.32**	**760.26**	**1,184.22**	**1.31**	**95.78**

Year	Activity	Equipment	ROG	CO	NOX	SOX	PM
			Annual Emissions lbs				
2010	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	67.36	255.29	475.07	0.45	32.15
		Forklift, 5 ton	73.62	225.96	255.66	0.29	25.97
		Forklift, 10 ton	72.56	232.82	287.84	0.32	28.91
	Road Maintenance	Motor Grader	71.05	270.15	473.85	0.47	36.13
		Crawler, Track Type, w/ blade (D6 Type)	85.67	321.93	674.90	0.63	37.07
	Roads & Landing Work	Crawler, Track Type, w/ blade (D8 type)	233.96	741.72	2,209.06	2.11	89.15
		Crawler, Track Type, w/ blade (D6 Type)	204.20	767.33	1,608.66	1.49	88.35
		Motor Grader	94.08	357.74	627.47	0.62	47.84
		Backhoe w/ Bucket; backhoe w/ concrete hammer	37.69	124.79	152.74	0.17	14.39
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	80.98	304.29	637.92	0.59	35.04
		Excavator, Grade - All	80.20	356.01	587.58	0.66	37.77
		Crawler, track type, drill dig, Pheumatic D8	247.41	784.35	2,336.02	2.23	94.27
		Backhoe w/ Bucket; backhoe w/ concrete hammer	119.58	395.88	484.56	0.55	45.65
		Motor, Auxilary Power	3.17	13.35	21.24	0.03	1.27
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	307.02	1,078.65	2,997.44	3.00	115.55
		Crane, Hydraulic, Rough Terrain 35 ton	635.35	2,407.94	4,481.01	4.26	303.27
		Compressor, Air	936.55	2,535.56	3,095.00	3.22	307.78
		Motor, Auxilary Power	5.17	21.77	34.62	0.05	2.06
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	26.00	86.06	105.34	0.12	9.92
		Crane, Hydraulic, Rough Terrain 35 ton	84.71	321.06	597.47	0.57	40.44
		Crawler, Track Type, w/ blade (D8 type)	35.86	113.67	338.55	0.32	13.66
		Crawler, Track Type, Sagging (D8 type)	71.71	227.35	677.11	0.65	27.33
		Motor, Auxilary Power	3.68	15.48	24.62	0.03	1.47
		Tension machine, conductor	61.39	266.41	431.87	0.49	32.95
		Tension machine, static	20.46	88.80	143.96	0.16	10.98
	Restoration & Guard Poles	Backhoe	4.33	14.34	17.56	0.02	1.65
		Motor Grader	10.38	39.47	69.24	0.07	5.28
	Construction - 66kV (or other subtransmission lines)	Drill Rig	26.78	96.89	331.70	0.59	10.76
	Segment 4 - Relocate at Antelope	Backhoe	30.33	100.40	122.89	0.14	11.58
	Wreckout - 66kV (or other subtransmission lines)	Puller, Wire Puller 1 Drum	19.48	83.58	196.52	0.24	8.39
	Segment 4 - Relocate at Antelope	Backhoe	15.16	50.20	61.45	0.07	5.79
	2010 Total Emission		**3,765.91**	**12,699.25**	**24,558.90**	**24.61**	**1,522.82**

Year	Activity	Equipment	ROG	CO	NOX	SOX	PM
			Annual Emissions lbs				
2011	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	5.84	23.26	41.15	0.04	2.81
		Forklift, 5 ton	6.01	20.13	22.41	0.03	2.18
		Forklift, 10 ton	5.94	20.83	25.04	0.03	2.42
	Road Maintenance	Motor Grader	4.87	19.60	32.62	0.03	2.50
		Crawler, Track Type, w/ blade (D6 Type)	5.96	23.25	46.62	0.05	2.58
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	6.47	23.13	27.58	0.03	2.53
		Crane, Hydraulic, Rough Terrain 35 ton	22.02	87.74	155.20	0.16	10.60
		Crawler, Track Type, w/ blade (D8 type)	9.39	29.45	87.21	0.09	3.47
		Crawler, Track Type, Sagging (D8 type)	18.77	58.91	174.43	0.18	6.95
		Motor, Auxilary Power	0.97	4.18	6.51	0.01	0.38
		Tension machine, conductor	15.52	72.73	111.05	0.13	8.52
		Tension machine, static	5.17	24.24	37.02	0.04	2.84
	Restoration & Guard Poles	Backhoe	6.86	24.54	29.25	0.03	2.68
		Motor Grader	17.03	68.60	114.18	0.12	8.74
	Wreckout - 66kV (or other subtransmission lines)	Puller, Wire Puller 1 Drum	49.85	222.86	496.40	0.67	21.22
	Segment 4 - Relocate at Antelope	Backhoe	37.63	134.60	160.47	0.19	14.73
	2011 Total Emission		**218.29**	**858.04**	**1,567.12**	**1.83**	**95.14**

Offroad Equipment Emissions Calculation

Segment 5

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2009	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	35.83	129.31	252.78	0.23	16.96
		Forklift, 5 ton	62.43	176.81	202.89	0.22	21.39
		Forklift, 10 ton	61.27	181.15	229.94	0.24	23.80
		Motor, Auxilary Power	0.87	3.54	5.74	0.01	0.35
	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	13.06	47.14	92.16	0.08	6.18
		Forklift, 5 ton	15.17	42.97	49.31	0.05	5.20
		Forklift, 10 ton	14.89	44.03	55.89	0.06	5.78
	Construction - 66kV (or other subtransmission lines)	Drill Rig	29.58	102.97	388.15	0.63	11.70
	Segment 5 - Sagebrush/Ant. & Sage	Backhoe	35.32	108.73	136.70	0.15	13.19
	2009 Total Emission		**268.43**	**836.66**	**1,413.55**	**1.66**	**104.56**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2010	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	38.59	146.26	272.18	0.26	18.42
		Forklift, 5 ton	63.27	194.19	219.71	0.25	22.32
		Forklift, 10 ton	62.36	200.08	247.36	0.27	24.84
		Motor, Auxilary Power	0.94	3.97	6.31	0.01	0.38
	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	88.83	336.67	626.51	0.60	42.40
		Forklift, 5 ton	97.09	297.99	337.16	0.38	34.25
		Forklift, 10 ton	95.69	307.03	379.59	0.42	38.12
	Road Maintenance	Motor Grader	70.72	268.92	471.68	0.47	35.96
		Crawler, Track Type, w/ blade (D6 Type)	85.28	320.46	671.82	0.62	36.90
	Roads & Landing Work	Crawler, Track Type, w/ blade (D8 type)	78.66	249.37	742.70	0.71	29.97
		Crawler, Track Type, w/ blade (D6 Type)	68.65	257.98	540.84	0.50	29.70
		Motor Grader	31.63	120.27	210.96	0.21	16.08
		Backhoe w/ Bucket; backhoe w/ concrete hammer	12.67	41.95	51.35	0.06	4.84
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	34.03	127.89	268.11	0.25	14.73
		Excavator, Grade - All	33.71	149.63	246.95	0.28	15.88
		Crawler, track type, drill dig, Pheumatic D8	103.98	329.66	981.81	0.94	39.62
		Backhoe w/ Bucket; backhoe w/ concrete hammer	50.26	166.38	203.65	0.23	19.19
		Motor, Auxilary Power	1.33	5.61	8.92	0.01	0.53
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	76.41	268.46	746.03	0.75	28.76
		Crane, Hydraulic, Rough Terrain 35 ton	158.13	599.31	1,115.27	1.06	75.48
		Compressor, Air	233.10	631.07	770.31	0.80	76.60
		Motor, Auxilary Power	1.29	5.42	8.62	0.01	0.51
	Wreck-Out (conductors, structures, & Foundations)	Tension Machine	147.33	639.39	1,036.49	1.17	79.08
		Crawler, Track Type, w/ blade (D8 type)	344.22	1,091.27	3,250.12	3.10	131.16
		Backhoe w/ Bucket; backhoe w/ concrete hammer	665.49	2,203.13	2,696.67	3.07	254.06
		Crane, Hydraulic, Rough Terrain 35 ton	180.72	684.92	1,274.60	1.21	86.26
		Motor, Auxilary Power	6.62	27.86	44.32	0.06	2.64
	Construction - 66kV (or other subtransmission lines)	Drill Rig	30.99	112.12	383.83	0.69	12.45
	Segment 5 - Sagebrush/Ant. & Sagebrush Vincent	Backhoe	35.09	116.18	142.21	0.16	13.40
	Wreckout - 66kV (or other subtransmission lines)	Puller, Wire Puller 1 Drum	20.59	88.36	207.75	0.26	8.87
	Segment 5 - Sagebrush/Ant. & Sagebrush Vincent	Backhoe	16.03	53.07	64.96	0.07	6.12
	2010 Total Emission		**2,933.73**	**10,044.88**	**18,228.80**	**18.87**	**1,199.53**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2011	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	42.54	169.50	299.82	0.30	20.47
		Forklift, 5 ton	43.78	146.64	163.24	0.19	15.88
		Forklift, 10 ton	43.31	151.76	182.41	0.21	17.66
	Road Maintenance	Motor Grader	44.41	178.84	297.68	0.31	22.79
		Crawler, Track Type, w/ blade (D6 Type)	54.36	212.12	425.36	0.42	23.53
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	109.80	378.42	1,053.93	1.13	39.92
		Crane, Hydraulic, Rough Terrain 35 ton	226.89	903.99	1,599.01	1.61	109.16
		Compressor, Air	332.91	939.50	1,127.83	1.22	111.44
		Motor, Auxilary Power	1.86	8.07	12.58	0.02	0.74
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	21.17	75.71	90.26	0.11	8.28
		Crane, Hydraulic, Rough Terrain 35 ton	72.07	287.15	507.92	0.51	34.67
		Crawler, Track Type, w/ blade (D8 type)	30.72	96.39	285.42	0.29	11.37
		Crawler, Track Type, Sagging (D8 type)	61.43	192.78	570.85	0.58	22.74
		Motor, Auxilary Power	3.16	13.68	21.31	0.03	1.25
		Tension machine, conductor	50.79	238.02	363.42	0.44	27.87
		Tension machine, static	16.93	79.34	121.14	0.15	9.29
	Wreck-Out (Conductors, Structures & Foundations)	Tension Machine	9.88	46.28	70.67	0.09	5.42
	(Antelope-Mesa & Antelope-Vincent)	Crawler, Track Type, w/ blade (D8 type)	23.89	74.97	222.00	0.23	8.84
		Backhoe w/ Bucket; backhoe w/ concrete hammer	43.90	157.03	187.21	0.22	17.18
		Crane, Hydraulic, Rough Terrain 35 ton	12.46	49.63	87.79	0.09	5.99
		Motor, Auxilary Power	0.46	1.99	3.11	0.00	0.18
	Restoration & Guard Poles	Backhoe	8.82	31.55	37.61	0.04	3.45
		Motor Grader	21.90	88.19	146.80	0.15	11.24
	2011 Total Emission		**1,277.45**	**4,521.57**	**7,877.37**	**8.35**	**529.37**

Offroad Equipment Emissions Calculation

Segment 6

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2009	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	41.55	149.96	293.15	0.26	19.67
		Forklift, 5 ton	72.40	205.05	235.29	0.25	24.80
		Forklift, 10 ton	71.06	210.08	266.66	0.28	27.60
		Motor, Auxilary Power	1.01	4.11	6.66	0.01	0.41
	2009 Total Emission		**186.02**	**569.20**	**801.77**	**0.80**	**72.48**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2010	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	70.83	268.44	499.55	0.48	33.81
		Forklift, 5 ton	116.12	356.41	403.25	0.46	40.96
		Forklift, 10 ton	114.45	367.22	454.00	0.50	45.59
		Motor, Auxilary Power	1.73	7.28	11.58	0.02	0.69
	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	67.36	255.29	475.07	0.45	32.15
		Forklift, 5 ton	73.62	225.96	255.66	0.29	25.97
		Forklift, 10 ton	72.56	232.82	287.84	0.32	28.91
	Road Maintenance	Motor Grader	40.55	154.20	270.46	0.27	20.62
		Crawler, Track Type, w/ blade (D6 Type)	48.90	183.75	385.22	0.36	21.16
	Roads & Landing Work	Crawler, Track Type, w/ blade (D8 type)	498.40	1,580.07	4,705.90	4.49	189.91
		Crawler, Track Type, w/ blade (D6 Type)	217.50	817.31	1,713.44	1.59	94.11
		Backhoe w/ Bucket; backhoe w/ concrete hammer	90.34	299.06	366.05	0.42	34.49
		Excavator, Grade - All	323.14	1,434.38	2,367.36	2.65	152.19
		Motor Grader	112.73	428.67	751.88	0.74	57.33
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	47.53	178.60	374.43	0.35	20.56
		Excavator, Grade - All	47.08	208.97	344.89	0.39	22.17
		Crawler, track type, drill dig, Pheumatic D8	145.22	460.38	1,371.14	1.31	55.33
		Generator, Concrete Batch Plant	54.28	141.15	149.20	0.19	13.80
		Backhoe w/ Bucket; backhoe w/ concrete hammer	70.19	232.36	284.41	0.32	26.80
		Motor, Auxilary Power	1.86	7.84	12.46	0.02	0.74
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	23.20	81.50	226.47	0.23	8.73
		Crane, Hydraulic, Rough Terrain 35 ton	48.00	181.93	338.57	0.32	22.91
		Compressor, Air	70.76	191.58	233.84	0.24	23.25
		Motor, Auxilary Power	0.39	1.64	2.62	0.00	0.16
	Wreck-Out (conductors, structures, & Foundations)	Tension Machine, Conductor or Static	102.06	442.91	717.99	0.81	54.78
		Crawler, Track Type, w/ blade (D8 type)	238.44	755.93	2,251.38	2.15	90.86
		Backhoe w/ Bucket; backhoe w/ concrete hammer	460.99	1,526.13	1,868.00	2.13	175.99
		Crane, Hydraulic, Rough Terrain 35 ton	125.19	474.45	882.92	0.84	59.76
		Motor, Auxilary Power	4.59	19.30	30.70	0.04	1.83
	2010 Total Emission		**3,288.00**	**11,515.51**	**22,036.28**	**22.35**	**1,355.56**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2011	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	84.25	335.67	593.75	0.60	40.53
		Forklift, 5 ton	86.71	290.40	323.27	0.38	31.44
		Forklift, 10 ton	85.78	300.55	361.25	0.42	34.97
	Road Maintenance	Motor Grader	84.56	340.53	566.82	0.59	43.40
		Crawler, Track Type, w/ blade (D6 Type)	103.51	403.91	809.94	0.80	44.81
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	12.85	50.12	100.51	0.10	5.56
		Crawler, track type, drill dig, Pheumatic D8	39.25	123.17	364.71	0.37	14.53
		Generator, Concrete Batch Plant	14.39	39.00	41.68	0.05	3.73
		Backhoe w/ Bucket; backhoe w/ concrete hammer	18.03	64.49	76.89	0.09	7.06
		Motor, Auxilary Power	0.50	2.18	3.40	0.00	0.20
		Excavator, Grade - All	12.50	59.16	91.14	0.11	5.93
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	285.48	983.90	2,740.21	2.95	103.80
		Crane, Hydraulic, Rough Terrain 35 ton	589.91	2,350.37	4,157.44	4.19	283.82
		Compressor, Air	865.58	2,442.71	2,932.36	3.16	289.75
		Motor, Auxilary Power	4.85	20.99	32.70	0.05	1.92
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	29.10	104.10	124.11	0.15	11.39
		Crane, Hydraulic, Rough Terrain 35 ton	99.10	394.83	698.39	0.70	47.68
		Crawler, Track Type, w/ blade (D8 type)	42.24	132.54	392.46	0.40	15.63
		Crawler, Track Type, Sagging (D8 type)	84.47	265.07	784.92	0.80	31.26
		Motor, Auxilary Power	4.34	18.81	29.30	0.04	1.72
		Tension machine, conductor	69.84	327.28	499.70	0.60	38.32
		Tension machine, static	23.28	109.09	166.57	0.20	12.77
	Restoration & Guard Poles	Backhoe	13.23	47.32	56.41	0.07	5.18
		Motor Grader	32.85	132.29	220.20	0.23	16.86
	2011 Total Emission		**2,686.59**	**9,338.49**	**16,168.14**	**17.06**	**1,092.24**

Offroad Equipment Emissions Calculation

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2012	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	35.43	148.71	249.11	0.27	16.84
		Forklift, 5 ton	34.08	125.93	137.29	0.17	12.60
		Forklift, 10 ton	33.84	130.88	152.03	0.19	13.95
	Road Maintenance	Motor Grader	37.00	158.22	248.85	0.28	18.75
		Crawler, Track Type, w/ blade (D6 Type)	46.05	186.90	357.54	0.37	19.55
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	12.75	51.76	99.01	0.10	5.42
		Crawler, track type, drill dig, Pheumatic D8	39.00	121.40	356.26	0.39	13.98
		Generator, Concrete Batch Plant	13.81	39.37	42.71	0.06	3.67
		Backhoe w/ Bucket; backhoe w/ concrete hammer	16.95	65.87	76.23	0.10	6.71
		Motor, Auxilary Power	0.50	2.23	3.40	0.01	0.20
		Excavator, Grade - All	12.18	61.56	88.25	0.11	5.61
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	89.27	302.13	841.20	0.97	31.21
		Crane, Hydraulic, Rough Terrain 35 ton	183.91	771.95	1,293.15	1.38	87.43
		Compressor, Air	264.83	786.98	927.89	1.05	90.15
		Motor, Auxilary Power	1.53	6.80	10.34	0.02	0.60
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	6.62	25.73	29.78	0.04	2.62
		Crane, Hydraulic, Rough Terrain 35 ton	23.62	99.14	166.07	0.18	11.23
		Crawler, Track Type, w/ blade (D8 type)	10.16	31.61	92.78	0.10	3.64
		Crawler, Track Type, Sagging (D8 type)	20.31	63.23	185.55	0.20	7.28
		Motor, Auxilary Power	1.04	4.65	7.09	0.01	0.41
		Tension machine, conductor	16.17	82.09	117.43	0.15	8.82
		Tension machine, static	5.39	27.36	39.14	0.05	2.94
	Wreck-Out (conductors, structures, & Foundations)	Tension Machine, Conductor or Static	10.99	55.82	79.85	0.10	6.00
		Crawler, Track Type, w/ blade (D8 type)	27.62	85.99	252.35	0.27	9.90
		Backhoe w/ Bucket; backhoe w/ concrete hammer	48.04	186.64	215.98	0.27	19.01
		Crane, Hydraulic, Rough Terrain 35 ton	14.28	59.92	100.38	0.11	6.79
		Motor, Auxilary Power	0.53	2.37	3.61	0.01	0.21
	Restoration & Guard Poles	Backhoe	2.21	8.58	9.93	0.01	0.87
		Motor Grader	5.69	24.34	38.28	0.04	2.88
	2012 Total Emission		**1,013.80**	**3,718.19**	**6,221.48**	**7.00**	**409.25**

Offroad Equipment Emissions Calculation

Segment 7

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2010	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	22.35	84.72	157.67	0.15	10.67
		Forklift, 5 ton	36.65	112.49	127.27	0.14	12.93
		Forklift, 10 ton	36.12	115.90	143.29	0.16	14.39
		Motor, Auxilary Power	0.55	2.30	3.65	0.01	0.22
	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	46.18	175.02	325.70	0.31	22.04
		Forklift, 5 ton	50.47	154.92	175.28	0.20	17.80
		Forklift, 10 ton	49.75	159.62	197.34	0.22	19.82
	Roads & Landing Work	Crawler, Track Type, w/ blade (D6 Type)	22.88	85.99	180.28	0.17	9.90
		Excavator, Grade - All	17.00	75.46	124.54	0.14	8.01
		Motor Grader	18.98	72.16	126.58	0.12	9.65
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	31.10	116.86	245.00	0.23	13.46
		Excavator, Grade - All	30.80	136.73	225.67	0.25	14.51
		Crawler, track type, drill dig, Pheumatic D8	95.02	301.24	897.17	0.86	36.21
		Backhoe w/ Bucket; backhoe w/ concrete hammer	45.93	152.04	186.10	0.21	17.53
		Motor, Auxilary Power	1.22	5.13	8.16	0.01	0.49
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	17.74	62.32	173.19	0.17	6.68
		Crane, Hydraulic, Rough Terrain 35 ton	36.71	139.13	258.90	0.25	17.52
		Compressor, Air	54.11	146.50	178.82	0.19	17.78
		Motor, Auxilary Power	0.30	1.26	2.00	0.00	0.12
	Restoration & Guard Poles	Backhoe	1.08	3.59	4.39	0.00	0.41
		Motor Grader	2.60	9.87	17.31	0.02	1.32
	Wreck-Out (conductors, structures, & Foundations)	Tension Machine, Conductor or Static	72.13	313.03	507.45	0.57	38.71
		Crawler, Track Type, w/ blade (D8 type)	168.52	534.27	1,591.20	1.52	64.22
		Backhoe w/ Bucket; backhoe w/ concrete hammer	325.81	1,078.62	1,320.24	1.50	124.39
		Crane, Hydraulic, Rough Terrain 35 ton	88.48	335.33	624.02	0.59	42.23
		Motor, Auxilary Power	3.24	13.64	21.70	0.03	1.29
	Construction - 66kV (or other subtransmission lines)	Drill Rig	83.41	301.75	1,033.02	1.85	33.50
		Backhoe	94.45	312.68	382.73	0.44	36.06
	Wreckout - 66kV (or other subtransmission lines)	Puller, Wire Puller 1 Drum	26.16	112.24	263.90	0.33	11.26
		Backhoe	20.36	67.41	82.52	0.09	7.77
	66 kV Underground Construction						
	Trenching	Excavator Cat 320	3.41	13.85	22.32	0.02	1.78
		Forklift - 10 ton	0.76	2.44	3.02	0.00	0.30
		Backhoe	1.30	4.30	5.27	0.01	0.50
		Water Pumps - 100 hp	1.69	5.58	9.09	0.01	0.75
		Loader, Front End w/ Bucket	1.59	6.24	11.01	0.01	0.79
	Vault Construction	Excavator Cat 320	0.00	0.00	0.00	0.00	0.00
		Water Pumps - 100 hp	0.00	0.00	0.00	0.00	0.00
		Forklift, 10 ton	0.00	0.00	0.00	0.00	0.00
		Loader, Front End w/ Bucket	0.00	0.00	0.00	0.00	0.00
	End Structures	Drill Rig	1.53	5.54	18.95	0.03	0.61
		Loader, Front End w/ Bucket	1.06	4.16	7.34	0.01	0.53
		Backhoe	0.87	2.87	3.51	0.00	0.33
	2010 Total Emission		**1,512.33**	**5,227.19**	**9,665.58**	**10.82**	**616.49**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2011	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	84.25	335.67	593.75	0.60	40.53
		Forklift, 5 ton	86.71	290.40	323.27	0.38	31.44
		Forklift, 10 ton	85.78	300.55	361.25	0.42	34.97
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	43.00	167.81	336.50	0.33	18.62
		Crawler, track type, drill dig, Pheumatic D8	131.40	412.34	1,220.98	1.24	48.63
		Backhoe w/ Bucket; backhoe w/ concrete hammer	60.36	215.91	257.42	0.31	23.62
		Motor, Auxilary Power	1.69	7.31	11.39	0.02	0.67
		Excavator, Grade - All	41.85	198.04	305.10	0.37	19.85
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	342.32	1,179.80	3,285.78	3.53	124.46
		Crane, Hydraulic, Rough Terrain 35 ton	707.36	2,818.31	4,985.16	5.02	340.33
		Compressor, Air	1,037.91	2,929.04	3,516.17	3.79	347.44
		Motor, Auxilary Power	5.81	25.17	39.21	0.06	2.30
	Construction - 66kV (or other subtransmission lines)	Drill Rig	78.53	303.15	891.31	1.86	28.41
	Segment 7 - Rio Hondo/SG River & S	Backhoe	86.23	308.45	367.74	0.44	33.75
	2011 Total Emission		**2,793.21**	**9,491.96**	**16,495.05**	**18.37**	**1,095.01**

Offroad Equipment Emissions Calculation

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2012	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	49.60	208.19	348.75	0.37	23.58
		Forklift, 5 ton	47.71	176.30	192.20	0.24	17.64
		Forklift, 10 ton	47.38	183.23	212.84	0.26	19.53
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	135.73	459.40	1,279.09	1.48	47.46
		Crane, Hydraulic, Rough Terrain 35 ton	279.65	1,173.79	1,966.29	2.10	132.94
		Compressor, Air	402.69	1,196.65	1,410.90	1.59	137.08
		Motor, Auxilary Power	2.32	10.33	15.73	0.02	0.91
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	41.32	160.57	185.81	0.23	16.35
		Crane, Hydraulic, Rough Terrain 35 ton	147.38	618.62	1,036.29	1.11	70.06
		Crawler, Track Type, w/ blade (D8 type)	63.37	197.27	578.93	0.63	22.71
		Crawler, Track Type, Sagging (D8 type)	126.75	394.55	1,157.86	1.26	45.42
		Motor, Auxilary Power	6.52	29.04	44.21	0.07	2.55
		Tension machine, conductor	100.89	512.26	732.75	0.95	55.03
		Tension machine, static	33.63	170.75	244.25	0.32	18.34
	Restoration & Guard Poles	Backhoe	7.06	27.45	31.76	0.04	2.79
		Motor Grader	18.21	77.89	122.51	0.14	9.23
	2012 Total Emission		**1,510.22**	**5,596.30**	**9,560.17**	**10.81**	**621.63**

Offroad Equipment Emissions Calculation

Segment 8

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2009	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	23.39	84.41	165.01	0.15	11.07
		Forklift, 5 ton	40.75	115.42	132.44	0.14	13.96
		Forklift, 10 ton	40.00	118.25	150.10	0.16	15.54
		Motor, Auxilary Power	0.57	2.31	3.75	0.00	0.23
	Roads & Landing Work	Crawler, Track Type, w/ blade (D8 type)	16.90	54.41	160.76	0.15	6.50
		Crawler, Track Type, w/ blade (D6 Type)	14.80	53.61	117.12	0.10	6.39
		Motor Grader	6.92	24.87	45.93	0.04	3.48
		Backhoe w/ Bucket; backhoe w/ concrete hammer	2.86	8.82	11.08	0.01	1.07
	2009 Total Emission		**146.19**	**462.09**	**786.19**	**0.76**	**58.24**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2010	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	22.12	83.83	156.01	0.15	10.56
		Forklift, 5 ton	36.26	111.30	125.93	0.14	12.79
		Forklift, 10 ton	35.74	114.68	141.78	0.16	14.24
		Motor, Auxilary Power	0.54	2.27	3.62	0.00	0.22
	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	67.36	255.29	475.07	0.45	32.15
		Forklift, 5 ton	73.62	225.96	255.66	0.29	25.97
		Forklift, 10 ton	72.56	232.82	287.84	0.32	28.91
	Road Maintenance	Motor Grader	71.05	270.15	473.85	0.47	36.13
		Crawler, Track Type, w/ blade (D6 Type)	85.67	321.93	674.90	0.63	37.07
	Roads & Landing Work	Crawler, Track Type, w/ blade (D6 Type)	89.78	337.36	707.26	0.66	38.84
		Motor Grader	74.45	283.11	496.56	0.49	37.86
		Excavator, Grade - All	66.69	296.03	488.59	0.55	31.41
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	183.08	687.95	1,442.25	1.34	79.21
		Excavator, Grade - All	181.33	804.90	1,328.45	1.49	85.40
		Crawler, track type, drill dig, Pheumatic D8	559.36	1,773.32	5,281.44	5.04	213.14
		Backhoe w/ Bucket; backhoe w/ concrete hammer	270.36	895.02	1,095.52	1.25	103.21
		Motor, Auxilary Power	7.17	30.19	48.01	0.07	2.86
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	223.78	786.21	2,184.80	2.19	84.22
		Crane, Hydraulic, Rough Terrain 35 ton	463.10	1,755.12	3,266.16	3.11	221.05
		Compressor, Air	682.64	1,848.14	2,255.91	2.35	224.34
		Motor, Auxilary Power	3.77	15.87	25.24	0.03	1.50
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	21.45	71.00	86.90	0.10	8.19
		Crane, Hydraulic, Rough Terrain 35 ton	69.89	264.87	492.91	0.47	33.36
		Crawler, Track Type, w/ blade (D8 type)	29.58	93.78	279.31	0.27	11.27
		Crawler, Track Type, Sagging (D8 type)	59.16	187.56	558.61	0.53	22.54
		Motor, Auxilary Power	3.03	12.77	20.31	0.03	1.21
		Tension machine, conductor	50.65	219.79	356.29	0.40	27.18
		Tension machine, static	16.88	73.26	118.76	0.13	9.06
	Restoration & Guard Poles	Backhoe	5.42	17.93	21.95	0.02	2.07
		Motor Grader	12.98	49.34	86.55	0.09	6.60
	Wreck-Out (conductors, structures, & Foundations)	Tension Machine, Conductor or Static	139.66	606.09	982.51	1.11	74.96
		Crawler, Track Type, w/ blade (D8 type)	326.29	1,034.44	3,080.84	2.94	124.33
		Backhoe w/ Bucket; backhoe w/ concrete hammer	630.83	2,088.39	2,556.21	2.91	240.83
		Crane, Hydraulic, Rough Terrain 35 ton	171.31	649.25	1,208.21	1.15	81.77
		Motor, Auxilary Power	6.28	26.41	42.01	0.06	2.50
	Construction - 66kV (or other subtransmission lines)	Drill Rig	34.43	124.57	426.47	0.76	13.83
		Backhoe	38.99	129.09	158.01	0.18	14.89
	Wreckout - 66kV (or other subtransmission lines)	Puller, Wire Puller 1 Drum	26.71	114.62	269.51	0.33	11.50
		Backhoe	20.80	68.85	84.27	0.10	7.94
	66 kV Underground Construction						
	Trenching	Excavator Cat 320	30.68	124.65	200.85	0.21	16.03
		Forklift - 10 ton	6.84	21.96	27.15	0.03	2.73
		Backhoe	11.70	38.73	47.40	0.05	4.47
		Water Pumps - 100 hp	15.25	50.20	81.83	0.08	6.77
		Loader, Front End w/ Bucket	14.35	56.20	99.09	0.10	7.15
	Vault Construction	Excavator Cat 320	5.11	20.77	33.48	0.04	2.67
		Water Pumps - 100 hp	5.08	16.73	27.28	0.03	2.26
		Forklift, 10 ton	0.76	2.44	3.02	0.00	0.30
		Loader, Front End w/ Bucket	0.80	3.12	5.51	0.01	0.40
	End Structures	Drill Rig	3.83	13.84	47.39	0.08	1.54
		Loader, Front End w/ Bucket	2.66	10.41	18.35	0.02	1.32
		Backhoe	2.17	7.17	8.78	0.01	0.83
	2010 Total Emission		**5,034.00**	**17,329.69**	**32,644.59**	**33.39**	**2,061.59**

Offroad Equipment Emissions Calculation

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2011	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	84.25	335.67	593.75	0.60	40.53
		Forklift, 5 ton	86.71	290.40	323.27	0.38	31.44
		Forklift, 10 ton	85.78	300.55	361.25	0.42	34.97
	Road Maintenance	Motor Grader	92.16	371.15	617.79	0.65	47.30
		Crawler, Track Type, w/ blade (D6 Type)	112.81	440.23	882.77	0.87	48.83
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	38.54	150.37	301.54	0.30	16.68
		Crawler, track type, drill dig, Pheumatic D8	117.75	369.50	1,094.12	1.11	43.58
		Backhoe w/ Bucket; backhoe w/ concrete hammer	54.09	193.48	230.67	0.28	21.17
		Motor, Auxilary Power	1.51	6.55	10.21	0.01	0.60
		Excavator, Grade - All	37.50	177.47	273.41	0.33	17.79
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	456.00	1,571.58	4,376.90	4.71	165.79
		Crane, Hydraulic, Rough Terrain 35 ton	942.25	3,754.21	6,640.61	6.69	453.34
		Compressor, Air	1,382.58	3,901.70	4,683.81	5.05	462.81
		Motor, Auxilary Power	7.74	33.53	52.24	0.07	3.06
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	71.14	254.47	303.39	0.36	27.84
		Crane, Hydraulic, Rough Terrain 35 ton	242.24	965.14	1,707.18	1.72	116.55
		Crawler, Track Type, w/ blade (D8 type)	103.24	323.98	959.34	0.98	38.21
		Crawler, Track Type, Sagging (D8 type)	206.48	647.96	1,918.68	1.95	76.42
		Motor, Auxilary Power	10.62	45.97	71.62	0.10	4.20
		Tension machine, conductor	170.73	800.02	1,221.50	1.48	93.67
		Tension machine, static	56.91	266.67	407.17	0.49	31.22
	Restoration & Guard Poles	Backhoe	2.94	10.52	12.54	0.01	1.15
		Motor Grader	7.30	29.40	48.93	0.05	3.75
	2011 Total Emission		**4,371.26**	**15,240.52**	**27,092.70**	**28.61**	**1,780.91**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2012	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	25.98	109.05	182.68	0.20	12.35
		Forklift, 5 ton	24.99	92.35	100.68	0.13	9.24
		Forklift, 10 ton	24.82	95.98	111.49	0.14	10.23
	Road Maintenance	Motor Grader	26.75	114.40	179.93	0.20	13.56
		Crawler, Track Type, w/ blade (D6 Type)	33.30	135.15	258.53	0.27	14.14
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	24.11	93.66	108.39	0.14	9.54
		Crane, Hydraulic, Rough Terrain 35 ton	85.97	360.86	604.50	0.65	40.87
		Crawler, Track Type, w/ blade (D8 type)	36.97	115.08	337.71	0.37	13.25
		Crawler, Track Type, Sagging (D8 type)	73.94	230.15	675.42	0.73	26.50
		Motor, Auxilary Power	3.80	16.94	25.79	0.04	1.49
		Tension machine, conductor	58.85	298.82	427.44	0.56	32.10
		Tension machine, static	19.62	99.61	142.48	0.19	10.70
	Restoration & Guard Poles	Backhoe	11.92	46.32	53.60	0.07	4.72
		Motor Grader	30.74	131.44	206.73	0.23	15.57
	2012 Total Emission		**481.75**	**1,939.81**	**3,415.36**	**3.89**	**214.25**

Offroad Equipment Emissions Calculation

Segment 9

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2009	Grading Element						
	Segment 9 - Antelope Substation	980 Loader	157.02	484.94	1,612.15	1.65	59.70
		Compactor	48.92	135.82	182.48	0.18	17.16
		Grader	113.18	331.55	1,155.22	1.17	42.95
	2009 Total Emission		**319.12**	**952.31**	**2,949.85**	**3.00**	**119.81**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2010	Grading Element						
	Segment 9 - Whirlwind Substation	980 Loader	285.96	876.72	2,910.05	3.16	107.82
		Grader	206.21	601.71	2,086.29	2.25	77.55
		Compactor	105.67	306.77	403.62	0.42	37.65
	Segment 9 - Antelope Substation	980 Loader	136.94	419.84	1,393.54	1.51	51.63
		Grader	98.75	288.14	999.07	1.08	37.14
		Compactor	42.17	122.42	161.07	0.17	15.03
	Civil Element						
	Segment 9 - Whirlwind Substation	14 ton Crane	51.92	204.81	406.88	0.40	22.85
		Driller	183.79	671.71	2,224.25	3.98	74.43
		Ditch Digger	220.85	582.22	715.31	0.70	69.02
		Forklift	27.52	84.46	95.57	0.11	9.71
		Tractors	139.08	460.42	563.56	0.64	53.10
	Segment 9 - Antelope Substation	14 ton Crane	77.63	306.25	608.42	0.59	34.17
		Driller	274.83	1,004.42	3,325.98	5.95	111.30
		Ditch Digger	165.12	435.31	534.81	0.52	51.60
		Forklift	41.15	126.30	142.90	0.16	14.52
		Tractors	207.97	688.48	842.71	0.96	79.39
	Electrical Element						
	Segment 9 - Whirlwind Substation	14 ton Crane	157.21	620.17	1,232.05	1.20	69.19
		Crane, Hydraulic, 150 Ton (150 ton crane)	191.07	612.76	1,880.80	1.90	72.04
		Forklift	41.66	127.88	144.69	0.16	14.70
		Manlifts	166.66	511.52	578.76	0.66	58.79
	Segment 9 - Antelope Substation	14 ton Crane	228.53	901.54	1,791.04	1.75	100.58
		Crane, Hydraulic, 150 Ton (150 ton crane)	277.75	890.77	2,734.13	2.76	104.73
		Forklift	60.57	185.90	210.33	0.24	21.37
		Manlifts	242.27	743.60	841.34	0.95	85.46
	Transformer Assembly and Processing Element						
	Segment 9 - Antelope Substation	50 ton Crane	83.55	301.48	706.25	0.70	35.27
		Forklift	21.99	67.49	76.36	0.09	7.76
		Manlifts	21.99	67.49	76.36	0.09	7.76
	Segment 9 - Vincent Substation	50 ton Crane	98.21	354.37	830.16	0.82	41.45
		Forklift	25.85	79.33	89.76	0.10	9.12
		Manlifts	25.85	79.33	89.76	0.10	9.12
	Segment 9 - Mira Loma Substation	50 ton Crane	36.65	132.23	309.76	0.31	15.47
		Forklift	9.64	29.60	33.49	0.04	3.40
		Manlifts	9.64	29.60	33.49	0.04	3.40
	Segment 9 - Chino Substation	50 ton Crane	77.69	280.33	656.69	0.65	32.79
		Forklift	20.45	62.76	71.00	0.08	7.21
		Manlifts	20.45	62.76	71.00	0.08	7.21
	2010 Total Emission		**4,083.23**	**13,320.89**	**29,871.27**	**35.30**	**1,553.70**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2011	Electrical Element						
	Segment 9 - Whirlwind Substation	14 ton Crane	125.60	518.92	978.39	1.01	55.55
		Crane, Hydraulic, 150 Ton (150 ton crane)	152.09	482.73	1,475.35	1.60	55.43
		Forklift	31.25	104.66	116.51	0.14	11.33
		Manlifts	125.00	418.64	466.03	0.55	45.33
	Transformer Assembly and Processing Element						
	Segment 9 - Whirlwind Substation	50 ton Crane	223.36	836.62	1,872.45	1.98	93.84
		Forklift	55.29	185.17	206.13	0.24	20.05
		Manlifts	110.58	370.34	412.25	0.49	40.10
	Segment 9 - Antelope Substation	50 ton Crane	248.33	930.15	2,081.80	2.20	104.33
		Forklift	61.47	205.87	229.17	0.27	22.29
		Manlifts	61.47	205.87	229.17	0.27	22.29
	Segment 9 - Vincent Substation	50 ton Crane	30.52	114.32	255.86	0.27	12.82
		Forklift	7.56	25.30	28.17	0.03	2.74
		Manlifts	7.56	25.30	28.17	0.03	2.74
	Segment 9 - Gould Substation	50 ton Crane	81.85	306.59	686.18	0.72	34.39
		Forklift	20.26	67.86	75.54	0.09	7.35
		Manlifts	20.26	67.86	75.54	0.09	7.35
	2011 Total Emission		**1,362.45**	**4,866.19**	**9,216.70**	**9.99**	**537.94**

Offroad Equipment Emissions Calculation

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2012	Electrical Element						
	Segment 9 - Antelope Substation	14 ton Crane	61.45	266.34	475.04	0.52	26.70
		Crane, Hydraulic, 150 Ton (150 ton crane)	74.21	233.39	708.28	0.83	26.02
		Forklift	14.24	52.61	57.36	0.07	5.26
		Manlifts	56.95	210.44	229.42	0.29	21.05
	Segment 9 - Vincent Substation	14 ton Crane	77.13	334.34	596.33	0.66	33.52
		Crane, Hydraulic, 150 Ton (150 ton crane)	93.16	292.98	889.12	1.04	32.67
		Forklift	17.87	66.04	72.00	0.09	6.61
		Manlifts	71.48	264.17	288.00	0.36	26.43
	Transformer Assembly and Processing Element						
	Segment 9 - Vincent Substation	50 ton Crane	52.48	204.46	435.69	0.49	21.56
		Forklift	12.12	44.78	48.81	0.06	4.48
		Manlifts	12.12	44.78	48.81	0.06	4.48
	Segment 9 - Mira Loma Substation	50 ton Crane	38.05	148.23	315.87	0.36	15.63
		Forklift	8.78	32.46	35.39	0.04	3.25
		Manlifts	8.78	32.46	35.39	0.04	3.25
	2012 Total Emission		**598.81**	**2,227.47**	**4,235.50**	**4.90**	**230.89**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2013	Transformer Assembly & Processing Element						
	Segment 9 - Vincent Substation	50 ton Crane	163.84	664.75	1,345.60	1.62	65.54
		Forklift	35.05	144.21	151.73	0.20	12.99
		Manlifts	35.05	144.21	151.73	0.20	12.99
	2013 Total Emission		**233.95**	**953.16**	**1,649.06**	**2.02**	**91.51**

Offroad Equipment Emissions Calculation

Segment 10

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2010	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	67.36	255.29	475.07	0.45	32.15
		Forklift, 5 ton	73.62	225.96	255.66	0.29	25.97
		Forklift, 10 ton	72.56	232.82	287.84	0.32	28.91
	Road Maintenance	Motor Grader	71.05	270.15	473.85	0.47	36.13
		Crawler, Track Type, w/ blade (D6 Type)	85.67	321.93	674.90	0.63	37.07
	Roads & Landing Work	Crawler, Track Type, w/ blade (D8 type)	78.66	249.37	742.70	0.71	29.97
		Crawler, Track Type, w/ blade (D6 Type)	68.65	257.98	540.84	0.50	29.70
		Motor Grader	31.63	120.27	210.96	0.21	16.08
		Backhoe w/ Bucket; backhoe w/ concrete hammer	12.67	41.95	51.35	0.06	4.84
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	31.10	116.86	245.00	0.23	13.46
		Excavator, Grade - All	30.80	136.73	225.67	0.25	14.51
		Crawler, track type, drill dig, Pheumatic D8	95.02	301.24	897.17	0.86	36.21
		Backhoe w/ Bucket; backhoe w/ concrete hammer	45.93	152.04	186.10	0.21	17.53
		Motor, Auxilary Power	1.22	5.13	8.16	0.01	0.49
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	184.21	647.19	1,798.46	1.80	69.33
		Crane, Hydraulic, Rough Terrain 35 ton	381.21	1,444.76	2,688.61	2.56	181.96
		Compressor, Air	561.93	1,521.34	1,857.00	1.93	184.67
		Motor, Auxilary Power	3.10	13.06	20.77	0.03	1.24
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	16.25	53.79	65.84	0.07	6.20
		Crane, Hydraulic, Rough Terrain 35 ton	52.95	200.66	373.42	0.36	25.27
		Crawler, Track Type, w/ blade (D8 type)	22.41	71.05	211.60	0.20	8.54
		Crawler, Track Type, Sagging (D8 type)	44.82	142.09	423.19	0.40	17.08
		Motor, Auxilary Power	2.30	9.67	15.39	0.02	0.92
		Tension machine, conductor	38.37	166.51	269.92	0.31	20.59
		Tension machine, static	12.79	55.50	89.97	0.10	6.86
	Restoration & Guard Poles	Backhoe	2.71	8.96	10.97	0.01	1.03
		Motor Grader	6.49	24.67	43.27	0.04	3.30
	2010 Total Emission		**2,095.47**	**7,046.98**	**13,143.66**	**13.03**	**850.01**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2011	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	4.45	17.73	31.35	0.03	2.14
		Forklift, 5 ton	4.58	15.33	17.07	0.02	1.66
		Forklift, 10 ton	4.53	15.87	19.08	0.02	1.85
	Road Maintenance	Motor Grader	3.35	13.47	22.43	0.02	1.72
		Crawler, Track Type, w/ blade (D6 Type)	4.10	15.98	32.05	0.03	1.77
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	2.65	9.46	11.28	0.01	1.04
		Crane, Hydraulic, Rough Terrain 35 ton	9.01	35.89	63.49	0.06	4.33
		Crawler, Track Type, w/ blade (D8 type)	3.84	12.05	35.68	0.04	1.42
		Crawler, Track Type, Sagging (D8 type)	7.68	24.10	71.36	0.07	2.84
		Motor, Auxilary Power	0.39	1.71	2.66	0.00	0.16
		Tension machine, conductor	6.35	29.75	45.43	0.05	3.48
		Tension machine, static	2.12	9.92	15.14	0.02	1.16
	Restoration & Guard Poles	Backhoe	5.88	21.03	25.07	0.03	2.30
		Motor Grader	14.60	58.80	97.87	0.10	7.49
	2011 Total Emission		**73.51**	**281.10**	**489.96**	**0.52**	**33.37**

Offroad Equipment Emissions Calculation

Segment 11

Year	Activity	Equipment	ROG	CO	NOX	SOX	PM
			Annual Emissions lbs				
2009	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	39.31	141.88	277.36	0.25	18.61
		Forklift, 5 ton	68.50	194.00	222.61	0.24	23.47
		Forklift, 10 ton	67.23	198.76	252.29	0.26	26.11
		Motor, Auxilary Power	0.95	3.89	6.30	0.01	0.38
	2009 Total Emission		**176.00**	**538.53**	**758.56**	**0.76**	**68.58**

Year	Activity	Equipment	ROG	CO	NOX	SOX	PM
			Annual Emissions lbs				
2010	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	7.29	27.65	51.45	0.05	3.48
		Forklift, 5 ton	11.96	36.71	41.53	0.05	4.22
		Forklift, 10 ton	11.79	37.82	46.76	0.05	4.70
		Motor, Auxilary Power	0.18	0.75	1.19	0.00	0.07
	2010 Total Emission		**31.22**	**102.92**	**140.93**	**0.15**	**12.47**

Year	Activity	Equipment	ROG	CO	NOX	SOX	PM
			Annual Emissions lbs				
2011	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	30.59	121.86	215.55	0.22	14.72
		Forklift, 5 ton	31.48	105.43	117.36	0.14	11.42
		Forklift, 10 ton	31.14	109.11	131.15	0.15	12.69
	Road Maintenance	Motor Grader	2.13	8.57	14.27	0.01	1.09
		Crawler, Track Type, w/ blade (D6 Type)	2.61	10.17	20.39	0.02	1.13
	Roads & Landing Work (Road Work)	Crawler, Track Type, w/ blade (D8 type)	163.82	514.08	1,522.26	1.55	60.63
	(Upgrade Existing Road, Construct New Roads and Landing Work)	Crawler, Track Type, w/ blade (D6 Type)	71.49	278.96	559.38	0.55	30.94
		Backhoe w/ Bucket; backhoe w/ concrete hammer	28.22	100.95	120.35	0.14	11.04
		Excavator, Grade - All	104.36	493.82	760.78	0.91	49.49
		Motor Grader	36.50	146.99	244.67	0.26	18.73
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	7.26	28.33	56.81	0.06	3.14
		Crawler, track type, drill dig, Pheumatic D8	22.18	69.62	206.14	0.21	8.21
		Generator, Concrete Batch Plant	8.14	22.04	23.56	0.03	2.11
		Backhoe w/ Bucket; backhoe w/ concrete hammer	10.19	36.45	43.46	0.05	3.99
		Motor, Auxilary Power	0.29	1.23	1.92	0.00	0.11
		Excavator, Grade - All	7.07	33.44	51.51	0.06	3.35
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	16.79	57.88	161.19	0.17	6.11
		Crane, Hydraulic, Rough Terrain 35 ton	34.70	138.26	244.56	0.25	16.70
		Compressor, Air	50.92	143.69	172.49	0.19	17.04
		Motor, Auxilary Power	0.29	1.23	1.92	0.00	0.11
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	3.82	13.67	16.30	0.02	1.50
		Crane, Hydraulic, Rough Terrain 35 ton	13.01	51.85	91.71	0.09	6.26
		Crawler, Track Type, w/ blade (D8 type)	5.55	17.40	51.53	0.05	2.05
		Crawler, Track Type, Sagging (D8 type)	11.09	34.81	103.07	0.10	4.11
		Motor, Auxilary Power	0.57	2.47	3.85	0.01	0.23
		Tension machine, conductor	9.17	42.98	65.62	0.08	5.03
		Tension machine, static	3.06	14.33	21.87	0.03	1.68
	Wreck-Out (Conductors, Structures & Foundations)	Tension Machine	4.94	23.14	35.33	0.04	2.71
		Crawler, Track Type, w/ blade (D8 type)	11.95	37.49	111.00	0.11	4.42
		Backhoe w/ Bucket; backhoe w/ concrete hammer	21.95	78.51	93.61	0.11	8.59
		Crane, Hydraulic, Rough Terrain 35 ton	6.23	24.82	43.89	0.04	3.00
		Motor, Auxilary Power	0.23	1.00	1.55	0.00	0.09
	Restoration & Guard Poles	Backhoe	0.98	3.51	4.18	0.00	0.38
		Motor Grader	2.43	9.80	16.31	0.02	1.25
	2011 Total Emission		**755.12**	**2,777.87**	**5,329.56**	**5.70**	**314.05**

Offroad Equipment Emissions Calculation

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2012	Construction of Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	15.75	66.09	110.71	0.12	7.49
		Forklift, 5 ton	22.72	83.95	91.52	0.11	8.40
		Forklift, 10 ton	22.56	87.25	101.35	0.13	9.30
		Motor, Auxilary Power	0.39	1.75	2.66	0.00	0.15
	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	79.52	333.76	559.11	0.60	37.80
		Forklift, 5 ton	76.48	282.64	308.13	0.38	28.28
		Forklift, 10 ton	75.95	293.75	341.22	0.42	31.32
	Road Maintenance	Motor Grader	86.23	368.76	580.00	0.65	43.70
		Crawler, Track Type, w/ blade (D6 Type)	107.32	435.63	833.34	0.87	45.58
	Construct New Roads & Landing Work	Crawler, Track Type, w/ blade (D8 type)	162.50	505.83	1,484.43	1.61	58.23
	(500kV 2nd Circuit Vincent-Gould)	Crawler, Track Type, w/ blade (D6 Type)	70.84	287.54	550.06	0.57	30.08
		Backhoe w/ Bucket; backhoe w/ concrete hammer	26.49	102.93	119.11	0.15	10.48
		Excavator, Grade - All	101.54	513.01	735.38	0.95	46.79
		Motor Grader	35.57	152.13	239.28	0.27	18.03
	Install Foundations	Crawler, Track Type, w/ blade (D6 Type)	26.03	105.67	202.15	0.21	11.06
		Crawler, track type, drill dig, Pheumatic D8	79.62	247.86	727.37	0.79	28.53
		Generator, Concrete Batch Plant	28.19	80.39	87.20	0.12	7.49
		Backhoe w/ Bucket; backhoe w/ concrete hammer	34.61	134.49	155.64	0.20	13.69
		Motor, Auxilary Power	1.02	4.56	6.94	0.01	0.40
		Excavator, Grade - All	24.88	125.69	180.17	0.23	11.46
	Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)	Crane, Hydraulic, 150/300 Ton	166.30	562.87	1,567.17	1.81	58.15
		Crane, Hydraulic, Rough Terrain 35 ton	342.64	1,438.16	2,409.15	2.58	162.88
		Compressor, Air	493.38	1,466.16	1,728.67	1.95	167.96
		Motor, Auxilary Power	2.84	12.66	19.27	0.03	1.11
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	27.28	106.02	122.68	0.15	10.80
		Crane, Hydraulic, Rough Terrain 35 ton	97.31	408.45	684.22	0.73	46.26
		Crawler, Track Type, w/ blade (D8 type)	41.84	130.25	382.24	0.42	15.00
		Crawler, Track Type, Sagging (D8 type)	83.69	260.50	764.48	0.83	29.99
		Motor, Auxilary Power	4.30	19.18	29.19	0.04	1.68
		Tension machine, conductor	66.61	338.23	483.80	0.63	36.33
		Tension machine, static	22.20	112.74	161.27	0.21	12.11
	Wreck-Out (conductors, structures, & Foundations)	Tension Machine, Conductor or Static	33.63	170.75	244.25	0.32	18.34
		Crawler, Track Type, w/ blade (D8 type)	84.50	263.03	771.91	0.84	30.28
		Backhoe w/ Bucket; backhoe w/ concrete hammer	146.93	570.91	660.66	0.83	58.13
		Crane, Hydraulic, Rough Terrain 35 ton	43.67	183.29	307.05	0.33	20.76
		Motor, Auxilary Power	1.63	7.26	11.05	0.02	0.64
	Restoration & Guard Poles	Backhoe	3.97	15.44	17.87	0.02	1.57
		Motor Grader	10.25	43.81	68.91	0.08	5.19
	2012 Total Emission		**2,751.22**	**10,323.41**	**17,849.62**	**20.20**	**1,125.45**

			Annual Emissions lbs				
			ROG	CO	NOX	SOX	PM
2013	Marshalling Yards	Crane, Hydraulic, Rough Terrain 35 ton	3.71	16.44	26.05	0.03	1.73
		Forklift, 5 ton	3.32	13.66	14.37	0.02	1.23
		Forklift, 10 ton	3.31	14.25	15.82	0.02	1.36
	Road Maintenance	Motor Grader	2.66	12.10	17.98	0.02	1.32
		Crawler, Track Type, w/ blade (D6 Type)	3.37	14.24	25.97	0.03	1.40
	Conductor & OHGW Installation	Backhoe w/ Bucket; backhoe w/ concrete hammer	1.91	8.07	8.95	0.01	0.75
		Crane, Hydraulic, Rough Terrain 35 ton	7.13	31.56	50.02	0.06	3.33
		Crawler, Track Type, w/ blade (D8 type)	3.10	9.59	27.78	0.03	1.07
		Crawler, Track Type, Sagging (D8 type)	6.19	19.17	55.56	0.06	2.14
		Motor, Auxilary Power	0.32	1.46	2.17	0.00	0.12
		Tension machine, conductor	4.74	26.11	35.01	0.05	2.53
		Tension machine, static	1.58	8.70	11.67	0.02	0.84
	Restoration & Guard Poles	Backhoe	3.97	16.82	18.65	0.02	1.55
		Motor Grader	10.65	48.40	71.91	0.09	5.28
	2013 Total Emission		**55.96**	**240.56**	**381.89**	**0.46**	**24.65**

Summary - Offroad Equipment Emissions Calculation by Segment

	Total Annual Emissions (lbs)					
Segment	Year	ROG	CO	NOx	SOx	PM
4	2009	246.32	760.26	1,184.22	1.31	95.78
	2010	3,765.91	12,699.25	24,558.90	24.61	1,522.82
	2011	218.29	858.04	1,567.12	1.83	95.14
5	2009	268.43	836.66	1,413.55	1.66	104.56
	2010	2,933.73	10,044.88	18,228.80	18.87	1,199.53
	2011	1,277.45	4,521.57	7,877.37	8.35	529.37
6	2009	186.02	569.20	801.77	0.80	72.48
	2010	3,288.00	11,515.51	22,036.28	22.35	1,355.56
	2011	2,686.59	9,338.49	16,168.14	17.06	1,092.24
	2012	1,013.80	3,718.19	6,221.48	7.00	409.25
7	2010	1,512.33	5,227.19	9,665.58	10.82	616.49
	2011	2,793.21	9,491.96	16,495.05	18.37	1,095.01
	2012	1,510.22	5,596.30	9,560.17	10.81	621.63
8	2009	146.19	462.09	786.19	0.76	58.24
	2010	5,034.00	17,329.69	32,644.59	33.39	2,061.59
	2011	4,371.26	15,240.52	27,092.70	28.61	1,780.91
	2012	481.75	1,939.81	3,415.36	3.89	214.25
9	2009	319.12	952.31	2,949.85	3.00	119.81
	2010	4,083.23	13,320.89	29,871.27	35.30	1,553.70
	2011	1,362.45	4,866.19	9,216.70	9.99	537.94
	2012	598.81	2,227.47	4,235.50	4.90	230.89
	2013	233.95	953.16	1,649.06	2.02	91.51
10	2010	2,095.47	7,046.98	13,143.66	13.03	850.01
	2011	73.51	281.10	489.96	0.52	33.37
11	2009	176.00	538.53	758.56	0.76	68.58
	2010	31.22	102.92	140.93	0.15	12.47
	2011	755.12	2,777.87	5,329.56	5.70	314.05
	2012	2,751.22	10,323.41	17,849.62	20.20	1,125.45
	2013	55.96	240.56	381.89	0.46	24.65

Summary - Offroad Equipment Emissions Calculation by Segment

	Total Annual Emissions (ton)					
Segment	Year	ROG	CO	NOx	SOx	PM
4	2009	0.12	0.38	0.59	0.00	0.05
	2010	1.88	6.35	12.28	0.01	0.76
	2011	0.11	0.43	0.78	0.00	0.05
5	2009	0.13	0.42	0.71	0.00	0.05
	2010	1.47	5.02	9.11	0.01	0.60
	2011	0.64	2.26	3.94	0.00	0.26
6	2009	0.09	0.28	0.40	0.00	0.04
	2010	1.64	5.76	11.02	0.01	0.68
	2011	1.34	4.67	8.08	0.01	0.55
	2012	0.51	1.86	3.11	0.00	0.20
7	2010	0.76	2.61	4.83	0.01	0.31
	2011	1.40	4.75	8.25	0.01	0.55
	2012	0.76	2.80	4.78	0.01	0.31
8	2009	0.07	0.23	0.39	0.00	0.03
	2010	2.52	8.66	16.32	0.02	1.03
	2011	2.19	7.62	13.55	0.01	0.89
	2012	0.24	0.97	1.71	0.00	0.11
9	2009	0.16	0.48	1.47	0.00	0.06
	2010	2.04	6.66	14.94	0.02	0.78
	2011	0.68	2.43	4.61	0.00	0.27
	2012	0.30	1.11	2.12	0.00	0.12
	2013	0.12	0.48	0.82	0.00	0.05
10	2010	1.05	3.52	6.57	0.01	0.43
	2011	0.04	0.14	0.24	0.00	0.02
11	2009	0.09	0.27	0.38	0.00	0.03
	2010	0.02	0.05	0.07	0.00	0.01
	2011	0.38	1.39	2.66	0.00	0.16
	2012	1.38	5.16	8.92	0.01	0.56
	2013	0.03	0.12	0.19	0.00	0.01

Summary - Offroad Equipment Emissions Calculation by Substation

Substation	Total Annual Emissions (lbs)					
	Year	ROG	CO	NOx	SOx	PM
Antelope	2009	319.12	952.31	2,949.85	3.00	119.81
	2010	1,981.21	6,549.44	14,444.32	17.51	757.68
	2011	371.27	1,341.89	2,540.14	2.74	148.91
	2012	206.84	762.78	1,470.10	1.71	79.04
Whirlwind	2010	1,777.59	5,661.15	13,241.82	15.57	666.84
	2011	823.17	2,917.07	5,527.11	6.01	321.64
Vincent	2010	149.91	513.04	1,009.68	1.03	59.69
	2011	45.63	164.93	312.20	0.34	18.30
	2012	336.36	1,251.54	2,378.75	2.75	129.73
	2013	233.95	953.16	1,649.06	2.02	91.51
Mira Loma	2010	55.94	191.43	376.75	0.38	22.27
	2012	55.62	213.16	386.65	0.44	22.12
Chino	2010	118.58	405.84	798.70	0.81	47.22
Gould	2011	122.37	442.30	837.25	0.90	49.08

Substation	Total Annual Emissions (ton)					
	Year	ROG	CO	NOx	SOx	PM
Antelope	2009	0.160	0.476	1.475	0.001	0.060
	2010	0.991	3.275	7.222	0.009	0.379
	2011	0.186	0.671	1.270	0.001	0.074
	2012	0.103	0.381	0.735	0.001	0.040
Whirlwind	2010	0.889	2.831	6.621	0.008	0.333
	2011	0.412	1.459	2.764	0.003	0.161
Vincent	2010	0.075	0.257	0.505	0.001	0.030
	2011	0.023	0.082	0.156	0.000	0.009
	2012	0.168	0.626	1.189	0.001	0.065
	2013	0.117	0.477	0.825	0.001	0.046
Mira Loma	2010	0.028	0.096	0.188	0.000	0.011
	2012	0.028	0.107	0.193	0.000	0.011
Chino	2010	0.059	0.203	0.399	0.000	0.024
Gould	2011	0.061	0.221	0.419	0.000	0.025

Summary - Offroad Equipment Emissions Calculation by Jurisdiction

Jurisdiction	Segment	Year	Total Annual Emissions (lbs)				
			ROG	CO	NOx	SOx	PM
KCAPCD	4	2009	126.63	387.48	545.80	0.55	49.34
		2010	2,145.02	7,213.55	13,926.40	13.76	866.41
		2011	97.88	374.20	659.82	0.71	44.33
	9	2010	1,777.59	5,661.15	13,241.82	15.57	666.84
		2011	823.17	2,917.07	5,527.11	6.01	321.64
	10	2010	2,095.47	7,046.98	13,143.66	13.03	850.01
		2011	73.51	281.10	489.96	0.52	33.37
SCAQMD	6	2010	1,922.58	6,759.72	13,080.76	13.30	792.75
		2011	1,933.20	6,704.36	11,584.56	12.24	783.12
		2012	186.39	750.63	1,144.81	1.27	81.69
	7	2010	1,512.33	5,227.19	9,665.58	10.82	616.49
		2011	2,793.21	9,491.96	16,495.05	18.37	1,095.01
		2012	1,510.22	5,596.30	9,560.17	10.81	621.63
	8	2009	146.19	462.09	786.19	0.76	58.24
		2010	5,034.00	17,329.69	32,644.59	33.39	2,061.59
		2011	4,371.26	15,240.52	27,092.70	28.61	1,780.91
		2012	481.75	1,939.81	3,415.36	3.89	214.25
	9	2010	174.52	597.27	1,175.45	1.19	69.49
		2011	122.37	442.30	837.25	0.90	49.08
		2012	55.62	213.16	386.65	0.44	22.12
	11	2009	176.00	538.53	758.56	0.76	68.58
		2010	8.80	29.01	39.72	0.04	3.51
		2011	755.12	2,777.87	5,329.56	5.70	314.05
		2012	1,502.76	5,633.21	9,710.74	10.98	618.11
		2013	3.01	13.43	18.65	0.02	1.41
AVAQMD	4	2009	119.69	372.78	638.42	0.76	46.44
		2010	1,620.89	5,485.70	10,632.50	10.85	656.40
		2011	120.41	483.84	907.30	1.13	50.81
	5	2009	268.43	836.66	1,413.55	1.66	104.56
		2010	2,933.73	10,044.88	18,228.80	18.87	1,199.53
		2011	1,277.45	4,521.57	7,877.37	8.35	529.37
	6	2009	186.02	569.20	801.77	0.80	72.48
		2010	1,365.42	4,755.79	8,955.52	9.05	562.81
		2011	753.39	2,634.13	4,583.58	4.82	309.12
		2012	827.41	2,967.56	5,076.67	5.73	327.56
	9	2009	319.12	952.31	2,949.85	3.00	119.81
		2010	2,131.12	7,062.48	15,454.00	18.54	817.37
		2011	416.90	1,506.82	2,852.34	3.08	167.22
		2012	543.19	2,014.31	3,848.85	4.46	208.77
		2013	233.95	953.16	1,649.06	2.02	91.51
	11	2010	22.42	73.92	101.21	0.11	8.95
		2012	1,248.46	4,690.19	8,138.88	9.22	507.34
		2013	52.95	227.13	363.24	0.44	23.25

Jurisdiction	Segment	Year	Total Annual Emissions (ton)				
			ROG	CO	NOx	SOx	PM
KCAPCD	4	2009	0.06	0.19	0.27	0.00	0.02
		2010	1.07	3.61	6.96	0.01	0.43
		2011	0.05	0.19	0.33	0.00	0.02
	9	2010	0.89	2.83	6.62	0.01	0.33
		2011	0.41	1.46	2.76	0.00	0.16
	10	2010	1.05	3.52	6.57	0.01	0.43
		2011	0.04	0.14	0.24	0.00	0.02
SCAQMD	6	2010	0.96	3.38	6.54	0.01	0.40
		2011	0.97	3.35	5.79	0.01	0.39
		2012	0.09	0.38	0.57	0.00	0.04
	7	2010	0.76	2.61	4.83	0.01	0.31
		2011	1.40	4.75	8.25	0.01	0.55
		2012	0.76	2.80	4.78	0.01	0.31
	8	2009	0.07	0.23	0.39	0.00	0.03
		2010	2.52	8.66	16.32	0.02	1.03
		2011	2.19	7.62	13.55	0.01	0.89
		2012	0.24	0.97	1.71	0.00	0.11
	9	2010	0.09	0.30	0.59	0.00	0.03
		2011	0.06	0.22	0.42	0.00	0.02
		2012	0.03	0.11	0.19	0.00	0.01
	11	2009	0.09	0.27	0.38	0.00	0.03
		2010	0.00	0.01	0.02	0.00	0.00
		2011	0.38	1.39	2.66	0.00	0.16
		2012	0.75	2.82	4.86	0.01	0.31
		2013	0.00	0.01	0.01	0.00	0.00
AVAQMD	4	2009	0.06	0.19	0.32	0.00	0.02
		2010	0.81	2.74	5.32	0.01	0.33
		2011	0.06	0.24	0.45	0.00	0.03
	5	2009	0.13	0.42	0.71	0.00	0.05
		2010	1.47	5.02	9.11	0.01	0.60
		2011	0.64	2.26	3.94	0.00	0.26
	6	2009	0.09	0.28	0.40	0.00	0.04
		2010	0.68	2.38	4.48	0.00	0.28
		2011	0.38	1.32	2.29	0.00	0.15
		2012	0.41	1.48	2.54	0.00	0.16
	9	2009	0.16	0.48	1.47	0.00	0.06
		2010	1.07	3.53	7.73	0.01	0.41
		2011	0.21	0.75	1.43	0.00	0.08
		2012	0.27	1.01	1.92	0.00	0.10
		2013	0.12	0.48	0.82	0.00	0.05
	11	2010	0.01	0.04	0.05	0.00	0.00
		2012	0.62	2.35	4.07	0.00	0.25
		2013	0.03	0.11	0.18	0.00	0.01

Total Annual Emission for different jurisductions (lbs)

Jurisdiction	Segment	Total Annual Emissions (lbs)				
		ROG	CO	NOx	SOx	PM
KCAPCD	2009	126.63	387.48	545.80	0.55	49.34
	2010	6,018.09	19,921.68	40,311.88	42.35	2,383.26
	2011	994.57	3,572.36	6,676.89	7.24	399.34
SCAQMD	2009	322.18	1,000.62	1,544.75	1.52	126.82
	2010	8,652.22	29,942.88	56,606.09	58.75	3,543.83
	2011	9,975.17	34,657.00	61,339.12	65.82	4,022.16
	2012	3,736.73	14,133.11	24,217.73	27.40	1,557.81
	2013	3.01	13.43	18.65	0.02	1.41
AVAQMD	2009	893.26	2,730.96	5,803.58	6.23	343.29
	2010	8,073.58	27,422.76	53,372.03	57.42	3,245.06
	2011	2,568.15	9,146.36	16,220.59	17.38	1,056.51
	2012	2,619.06	9,672.07	17,064.40	19.41	1,043.66
	2013	286.90	1,180.29	2,012.30	2.46	114.76

Total Annual Emission for different jurisductions (ton)

Jurisdiction	Segment	Total Annual Emissions (ton)				
		ROG	CO	NOx	SOx	PM
KCAPCD	2009	0.06	0.19	0.27	0.00	0.02
	2010	3.01	9.96	20.16	0.02	1.19
	2011	0.50	1.79	3.34	0.00	0.20
SCAQMD	2009	0.16	0.50	0.77	0.00	0.06
	2010	4.33	14.97	28.30	0.03	1.77
	2011	4.99	17.33	30.67	0.03	2.01
	2012	1.87	7.07	12.11	0.01	0.78
	2013	0.00	0.01	0.01	0.00	0.00
AVAQMD	2009	0.45	1.37	2.90	0.00	0.17
	2010	4.04	13.71	26.69	0.03	1.62
	2011	1.28	4.57	8.11	0.01	0.53
	2012	1.31	4.84	8.53	0.01	0.52
	2013	0.14	0.59	1.01	0.00	0.06

TRTP Alternative 2 Project Construction Emission Totals
All Jurisdictions - ANF Total

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.124	0.923	0.819	0.001	0.035	0.030
Offroad Vehicles/Equipment	0.128	0.391	0.550	0.001	0.050	0.046
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	2.258	0.454
Totals	**0.25**	**1.31**	**1.37**	**0.00**	**2.34**	**0.53**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.834	5.417	6.420	0.010	0.291	0.248
Offroad Vehicles/Equipment	1.314	4.613	8.864	0.009	0.542	0.498
Helicopter	1.495	7.724	8.674	0.072	0.479	0.441
Fugitive Dust	---	---	---	---	22.135	4.907
Totals	**3.64**	**17.75**	**23.96**	**0.09**	**23.45**	**6.09**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	1.109	8.150	6.899	0.014	0.319	0.265
Offroad Vehicles/Equipment	1.466	5.166	9.078	0.010	0.601	0.553
Helicopter	1.053	4.770	6.000	0.050	0.331	0.305
Fugitive Dust	---	---	---	---	24.427	4.900
Totals	**3.63**	**18.09**	**21.98**	**0.07**	**25.68**	**6.02**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.916	6.523	5.940	0.012	0.281	0.232
Offroad Vehicles/Equipment	1.350	5.033	8.598	0.010	0.550	0.506
Helicopter	2.355	9.121	10.335	0.086	0.571	0.525
Fugitive Dust	---	---	---	---	20.167	4.342
Totals	**4.62**	**20.68**	**24.87**	**0.11**	**21.57**	**5.60**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.009	0.061	0.071	0.000	0.003	0.003
Offroad Vehicles/Equipment	0.008	0.033	0.049	0.000	0.003	0.003
Helicopter	0.001	0.002	0.003	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.02**	**0.10**	**0.12**	**0.00**	**0.01**	**0.01**

TRTP Alternative 2 Project Construction Emission Totals
ANF - SCAQMD Jurisdiction

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.068	0.508	0.453	0.001	0.019	0.016
Offroad Vehicles/Equipment	0.070	0.213	0.300	0.000	0.027	0.025
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	1.592	0.314
Totals	**0.14**	**0.72**	**0.75**	**0.00**	**1.64**	**0.36**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.615	4.011	4.711	0.007	0.213	0.181
Offroad Vehicles/Equipment	0.979	3.439	6.656	0.007	0.403	0.371
Helicopter	1.495	7.724	8.674	0.072	0.479	0.441
Fugitive Dust	---	---	---	---	13.946	3.099
Totals	**3.09**	**15.17**	**20.04**	**0.09**	**15.04**	**4.09**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.872	6.391	5.463	0.011	0.253	0.210
Offroad Vehicles/Equipment	1.176	4.152	7.326	0.008	0.482	0.443
Helicopter	1.033	4.724	5.906	0.049	0.326	0.300
Fugitive Dust	---	---	---	---	19.940	4.047
Totals	**3.08**	**15.27**	**18.69**	**0.07**	**21.00**	**5.00**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.463	3.303	2.982	0.006	0.141	0.117
Offroad Vehicles/Equipment	0.645	2.409	4.039	0.005	0.264	0.243
Helicopter	0.871	3.368	3.823	0.032	0.211	0.194
Fugitive Dust	---	---	---	---	12.088	2.595
Totals	**1.98**	**9.08**	**10.84**	**0.04**	**12.71**	**3.15**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.006	0.034	0.046	0.000	0.002	0.002
Offroad Vehicles/Equipment	0.005	0.021	0.030	0.000	0.002	0.002
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.01**	**0.06**	**0.08**	**0.00**	**0.00**	**0.00**

TRTP Alternative 2 Project Construction Emission Totals
ANF - AVAQMD Jurisdiction

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.056	0.415	0.366	0.001	0.016	0.013
Offroad Vehicles/Equipment	0.058	0.178	0.250	0.000	0.023	0.021
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.666	0.140
Totals	**0.11**	**0.59**	**0.62**	**0.00**	**0.70**	**0.17**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.219	1.406	1.709	0.003	0.078	0.066
Offroad Vehicles/Equipment	0.336	1.174	2.208	0.002	0.138	0.127
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	8.189	1.808
Totals	**0.55**	**2.58**	**3.92**	**0.00**	**8.41**	**2.00**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.236	1.759	1.436	0.003	0.066	0.055
Offroad Vehicles/Equipment	0.290	1.015	1.753	0.002	0.119	0.110
Helicopter	0.021	0.046	0.094	0.001	0.005	0.005
Fugitive Dust	---	---	---	---	4.487	0.853
Totals	**0.55**	**2.82**	**3.28**	**0.01**	**4.68**	**1.02**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.453	3.220	2.958	0.006	0.139	0.115
Offroad Vehicles/Equipment	0.705	2.624	4.559	0.005	0.286	0.263
Helicopter	1.484	5.753	6.512	0.054	0.360	0.331
Fugitive Dust	---	---	---	---	8.078	1.747
Totals	**2.64**	**11.60**	**14.03**	**0.07**	**8.86**	**2.46**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.004	0.027	0.025	0.000	0.001	0.001
Offroad Vehicles/Equipment	0.003	0.012	0.020	0.000	0.001	0.001
Helicopter	0.001	0.002	0.003	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.01**	**0.04**	**0.05**	**0.00**	**0.00**	**0.00**

TRTP Alternative 2 Project Construction Emission Totals
USACE Land Total - All SCAQMD Jurisdiction

Worst-Case Day	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles						
Offroad Vehicles/Equipment						
Helicopter						
Fugitive Dust						
Totals						

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles						
Offroad Vehicles/Equipment						
Helicopter						
Fugitive Dust	---	---	---	---		
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.204	1.378	1.446	0.002	0.066	0.056
Offroad Vehicles/Equipment	0.361	1.246	2.323	0.003	0.148	0.136
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	2.244	0.526
Totals	**0.57**	**2.62**	**3.77**	**0.00**	**2.46**	**0.72**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.264	1.997	1.530	0.003	0.071	0.059
Offroad Vehicles/Equipment	0.510	1.747	3.054	0.003	0.202	0.186
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	2.290	0.457
Totals	**0.77**	**3.74**	**4.58**	**0.01**	**2.56**	**0.70**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.142	1.065	0.809	0.002	0.038	0.031
Offroad Vehicles/Equipment	0.216	0.806	1.379	0.002	0.089	0.082
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	1.090	0.213
Totals	**0.36**	**1.87**	**2.19**	**0.00**	**1.22**	**0.33**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles						
Offroad Vehicles/Equipment						
Helicopter						
Fugitive Dust	---	---	---	---		
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Helicopter Emission Calculations

Helicopter Construction
Assumptions:
1) Hughes 500 size helicopters are used during conductor installation for the proposed project, and two Hughes helicopters are in operation during line stringing for 2.5 hours/day each.
2) Use of Eurocopter, Skyking, and Skycrane helicopters for helicopter tower site construction and wreckout are based on estimates provided by SCE.
3) Idle time is 10% of working time for Hughes 500, Eurocopter, and Skyking helicopters and negligible for the Skycrane.
4) Assumes helicopters stay within 3000 feet of the ground.

Segment 6

Wreck Out	Eurocopter		Skyking		Skycrane	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Site Preparation						
Personnel to Site	6	6	0	0	0	0
Brush Clearing	16	16	0	0	0	0
Temporary Heli Pad Construction	6	6	0	0	0	0
Soil Borings	0	0	0.5	0.5	0	0
Incidental	12	12	0	0	0	0
Conductor Removal						
Personnel to Site	4	4	0	0	0	0
Insulators &Hardware & Travelers	8	12	0	0	0	0
Unclip Conductor & OHGW	4	0	0	0	0	0
Break Tension/Sock Thru	0	4	0	0	0	0
Remove Jumper Loops & OHGW	0	4	0	0	0	0
Incidental	4	4	0	0	0	0
Excavate Foundation						
Personnel to Site	4	4	0	0	0	0
Tools & Equipment to Site	2	2	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Footing Steel Removal	0	0	4	4	0	0
Incidental	0	0	0	0	0	0
Suspension Tower Removal						
Personnal to Site	4	4	0	0	0	0
Tools & Equipment to Site	4	4	0	0	0	0
Tower Components	0	0	4	6	0	6
Incidental	4	4	0	0	0	0
Total Number of Trips per Tower Site	78	86	11	13	0	6

Construction	Eurocopter		Skyking		Skycrane	
	Suspension	Dead-End	Suspension	Dead-End	Suspension	Dead-End
Foundations, Conventional Piers						
Personnel to Site	16	32	0	0	0	0
Tools to Site	6	12	0	0	0	0
Equipment (Air Compressor)	0	0	2	2	0	0
Spoil Removal	0	0	28	132	0	0
Rebar to Site	0	0	8	8	0	0
Stubs & Material to Site	8	8	0	0	0	0
Concrete to Site	0	0	28	120	0	0
Strip and Cleanup Site	8	8	0	0	0	0
Incidental	12	24	0	0	0	0
Tower Erection						
Personnel to Site	8	8	0	0	0	0
Tools to Site	4	4	0	0	0	0
Tower Components	0	0	0	0	16	24
Incidental	4	4	0	0	0	0
Conductor & OHGW Installation						
Personnel to Site	4	12	0	0	0	0
Install Insulators, Hardware & Travelers	8	24	0	0	0	0
Clip-in or Dead-end Conductor	4	12	0	0	0	0
Space Conductor	6	0	0	0	0	0
Install Jumper Loops	0	6	0	0	0	0
Incidental	8	24	0	0	0	0
Site Restoration						
Personnel to Site	2	2	0	0	0	0
Remove Temporary Heli Pad	6	6	0	0	0	0
Cleanup Site & Restoration	8	8	0	0	0	0
Total Number of Trips per Tower Site	112	194	66	262	16	24

Assumptions in time period

	Min	Hour
to helicopter pod	5	0.08
from helicopter pod	5	0.08
load/trip	10	0.17

Total Required Time for Each Helicopter Round Trip

Helicopter Type	Working Hour/Round Trip	Idle Hour/Round Trip
Hughes 500		
Eurocopter	0.33	0.033
Skyking	0.33	0.033
Skycrane	0.33	0.000

Stringing Helicopter - Hughes 500

Hughes 500 Total Emissions (ton)

		HC	CO	NOx	SOx	PM
Segment 4	2010	0.084	0.188	0.383	0.003	0.021
	2011	0.023	0.052	0.105	0.001	0.006
Segment 5	2011	0.075	0.169	0.345	0.003	0.019
Segment 6	2011	0.104	0.232	0.474	0.004	0.026
	2012	0.026	0.059	0.120	0.001	0.007
Segment 7	2012	0.163	0.366	0.748	0.006	0.041
Segment 8	2010	0.069	0.155	0.316	0.003	0.017
	2011	0.254	0.568	1.160	0.010	0.063
	2012	0.095	0.214	0.436	0.004	0.024
Segment 9		0.000	0.000	0.000	0.000	0.000
Segment 10	2010	0.052	0.117	0.240	0.002	0.013
	2011	0.009	0.021	0.043	0.000	0.002
Segment 11	2011	0.008	0.019	0.038	0.000	0.002
	2012	0.061	0.137	0.280	0.002	0.015
	2013	0.005	0.011	0.022	0.000	0.001

Totals	HC	CO	NOx	SOx	PM
Segment 4	0.11	0.24	0.49	0.00	0.03
Segment 5	0.08	0.17	0.35	0.00	0.02
Segment 6	0.13	0.29	0.59	0.00	0.03
Segment 7	0.16	0.37	0.75	0.01	0.04
Segment 8	0.42	0.94	1.91	0.02	0.10
Segment 9	0.00	0.00	0.00	0.00	0.00
Segment 10	0.06	0.14	0.28	0.00	0.02
Segment 11	0.07	0.17	0.34	0.00	0.02
Total	1.03	2.31	4.71	0.04	0.26

Totals	HC	CO	NOx	SOx	PM
2010	0.21	0.46	0.94	0.01	0.05
2011	0.47	1.06	2.17	0.02	0.12
2012	0.35	0.78	1.58	0.01	0.09
2013	0.00	0.01	0.02	0.00	0.00
Total	1.03	2.31	4.71	0.04	0.26

Proposed Project

Helicopter Trip Emissions for SCE's Proposed Project (Segment 6)

Summary of Total Number of Helicopter Trips

	220 kV Construction	500 kV Construction
Eurocopter	1326	1904
Skyking	187	1122
Skycrane	0	272

220 kV	Suspension	1513
	Dead End	0
500 kV	Suspension	3298
	Dead End	0

230kV Wreckout - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	373.50	836.78	1,708.60	14.17	92.97
(personnel)	2011					
Skyking	2010	463.78	1,679.28	1,492.84	12.56	82.76
(foundation)	2011					
Skycrane	2010	0.00	0.00	0.00	0.00	0.00
(tower)	2011					

500kV Construction - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	189.29	424.07	865.90	7.18	47.12
(personnel)	2011	347.02	777.46	1,587.48	13.16	86.38
Skyking	2010	1,964.26	7,112.25	6,322.62	53.18	350.51
(foundation)	2011	818.44	2,963.44	2,634.43	22.16	146.04
Skycrane	2010	0.00	5,396.60	6,957.76	57.83	385.47
(tower)	2011	761.31	5,396.60	6,957.76	57.83	385.47

Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	562.79	1,260.85	2,574.49	21.34	140.09
(personnel)	2011	347.02	777.46	1,587.48	13.16	86.38
Skyking	2010	2,428.04	8,791.53	7,815.46	65.73	433.26
(foundation)	2011	818.44	2,963.44	2,634.43	22.16	146.04
Skycrane	2010	0.00	5,396.60	6,957.76	57.83	385.47
(tower)	2011	761.31	5,396.60	6,957.76	57.83	385.47

Total Emissions (ton)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	0.28	0.63	1.29	0.01	0.07
(personnel)	2011	0.17	0.39	0.79	0.01	0.04
Skyking	2010	1.21	4.40	3.91	0.03	0.22
(foundation)	2011	0.41	1.48	1.32	0.01	0.07
Skycrane	2010	0.00	2.70	3.48	0.03	0.19
(tower)	2011	0.38	2.70	3.48	0.03	0.19

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Eurocopter	0.45	1.02	2.08	0.02	0.11
Skyking	1.62	5.88	5.22	0.04	0.29
Skycrane	0.38	2.70	3.48	0.03	0.19

Helicopter Trip Emissions for SCE's Proposed Project (Segment 11)

Summary of Total Number of Helicopter Trips

	220 kV Construction	500 kV Construction
Eurocopter	1248	1792
Skyking	176	1056
Skycrane	0	256

220 kV	Suspension	1424
	Dead End	0
500 kV	Suspension	3104
	Dead End	0

230kV Wreckout - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2011	0.00	0.00	0.00	0.00	0.00
	2012	351.53	787.56	1,608.09	13.33	87.50
Skyking	2011	0.00	0.00	0.00	0.00	0.00
	2012	436.50	1,580.50	1,405.03	11.82	77.89
Skycrane	2011	0.00	0.00	0.00	0.00	0.00
	2012	0.00	0.00	0.00	0.00	0.00

500kV Construction - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2012	504.76	1,130.85	2,309.06	19.14	125.64
Skyking	2012	2,619.01	9,483.00	8,430.16	70.90	467.34
Skycrane	2012	716.52	5,079.15	6,548.48	54.43	362.80

Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2011	0.00	0.00	0.00	0.00	0.00
	2012	856.29	1,918.41	3,917.15	32.48	213.15
Skyking	2011	0.00	0.00	0.00	0.00	0.00
	2012	3,055.51	11,063.49	9,835.19	82.72	545.23
Skycrane	2011	0.00	0.00	0.00	0.00	0.00
	2012	716.52	5,079.15	6,548.48	54.43	362.80

Total Emissions (ton)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2011	0.00	0.00	0.00	0.00	0.00
	2012	0.43	0.96	1.96	0.02	0.11
Skyking	2011	0.00	0.00	0.00	0.00	0.00
	2012	1.53	5.53	4.92	0.04	0.27
Skycrane	2011	0.00	0.00	0.00	0.00	0.00
	2012	0.36	2.54	3.27	0.03	0.18

Total Helipcopter Emissions - Proposed Project

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Hughes 500	2010	0.205	0.460	0.939	0.008	0.051
	2011	0.473	1.061	2.166	0.018	0.118
	2012	0.346	0.776	1.584	0.013	0.086
	2013	0.005	0.011	0.022	0.000	0.001
Eurocopter	2010	0.28	0.63	1.29	0.01	0.07
	2011	0.17	0.39	0.79	0.01	0.04
	2012	0.43	0.96	1.96	0.02	0.11
Skyking	2010	1.21	4.40	3.91	0.03	0.22
	2011	0.41	1.48	1.32	0.01	0.07
	2012	1.53	5.53	4.92	0.04	0.27
Skycrane	2010	0.00	2.70	3.48	0.03	0.19
	2011	0.38	2.70	3.48	0.03	0.19
	2012	0.36	2.54	3.27	0.03	0.18

Total Emissions (ton)

Year	HC	CO	NOx	SOx	PM
2010	1.701	8.184	9.613	0.080	0.531
2011	1.437	5.629	7.756	0.065	0.427
2012	2.660	9.806	11.734	0.098	0.647
2013	0.005	0.011	0.022	0.000	0.001

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500	1.03	2.31	4.71	0.04	0.26
Eurocopter	0.88	1.98	4.04	0.03	0.22
Skyking	3.15	11.41	10.14	0.09	0.56
Skycrane	0.74	7.94	10.23	0.09	0.57
Totals	5.80	23.63	29.12	0.24	1.61

Proposed Project By Jurisdiction

Hughes 500 - 500 kV 2nd Circuit Vincent-Gould Construction (ton)

KCAPCD

	Year	HC	CO	NOx	SOx	PM
Segment 4	2010	0.040	0.090	0.184	0.002	0.010
	2011	0.023	0.052	0.105	0.001	0.006
Segment 10	2010	0.052	0.117	0.240	0.002	0.013
	2011	0.009	0.021	0.043	0.000	0.002

Totals	Year	HC	CO	NOx	SOx	PM
	2010	0.093	0.207	0.424	0.004	0.023
	2011	0.032	0.073	0.149	0.001	0.008

SCAQMD

	Year	HC	CO	NOx	SOx	PM
Segment 6	2011	0.069	0.155	0.316	0.003	0.017
	2012	0.000	0.000	0.000	0.000	0.000
Segment 7	2012	0.163	0.366	0.748	0.006	0.041
Segment 8	2010	0.069	0.155	0.316	0.003	0.017
	2011	0.254	0.568	1.160	0.010	0.063
	2012	0.095	0.214	0.436	0.004	0.024
Segment 11	2011	0.008	0.019	0.038	0.000	0.002
	2012	0.046	0.104	0.212	0.002	0.012

Totals	Year	HC	CO	NOx	SOx	PM
	2010	0.069	0.155	0.316	0.003	0.017
	2011	0.331	0.742	1.514	0.013	0.082
	2012	0.305	0.683	1.395	0.012	0.076

AVAQMD

	Year	HC	CO	NOx	SOx	PM
Segment 4	2010	0.044	0.098	0.199	0.002	0.011
Segment 5	2011	0.075	0.169	0.345	0.003	0.019
Segment 6	2011	0.035	0.077	0.158	0.001	0.009
	2012	0.026	0.059	0.120	0.001	0.007
Segment 11	2012	0.015	0.034	0.069	0.001	0.004
	2013	0.005	0.011	0.022	0.000	0.001

Totals	Year	HC	CO	NOx	SOx	PM
	2010	0.044	0.098	0.199	0.002	0.011
	2011	0.110	0.246	0.503	0.004	0.027
	2012	0.041	0.092	0.188	0.002	0.010
	2013	0.005	0.011	0.022	0.000	0.001

Helicopter Trip Emissions for SCE's Proposed Project (Segment 6)

SCAQMD

		Helicopter Type	Year	HC	CO	NOx	SOx	PM
Segment 6	Wreckout	Eurocopter	2010	373.50	836.78	1,708.60	14.17	92.97
			2011	0.00	0.00	0.00	0.00	0.00
		Skyking	2010	463.78	1,679.28	1,492.84	12.56	82.76
			2011	0.00	0.00	0.00	0.00	0.00
		Skycrane	2010	0.00	0.00	0.00	0.00	0.00
			2011	0.00	0.00	0.00	0.00	0.00
Segment 6	Construction	Eurocopter	2010	189.29	424.07	865.90	7.18	47.12
			2011	347.02	777.46	1,587.48	13.16	86.38
		Skyking	2010	1,964.26	7,112.25	6,322.62	53.18	350.51
			2011	818.44	2,963.44	2,634.43	22.16	146.04
		Skycrane	2010	0.00	5,396.60	6,957.76	57.83	385.47
			2011	761.31	5,396.60	6,957.76	57.83	385.47

Segment 6 Totals (ton)	Year	HC	CO	NOx	SOx	PM
	2010	1.50	7.72	8.67	0.07	0.48
	2011	0.96	4.57	5.59	0.05	0.31

Helicopter Trip Emissions for SCE's Proposed Project (Segment 11)

SCAQMD

		Helicopter Type	Year	HC	CO	NOx	SOx	PM
Segment 11	Wreckout	Eurocopter	2012	129.51	290.15	592.46	4.91	32.24
		Skyking	2012	160.82	582.29	517.64	4.35	28.70
		Skycrane	2012	0.00	0.00	0.00	0.00	0.00
Segment 11	Construction	Eurocopter	2012	185.97	416.63	850.70	7.05	46.29
		Skyking	2012	964.90	3,493.74	3,105.85	26.12	172.18
		Skycrane	2012	263.98	1,871.27	2,412.60	20.05	133.66

Segment 11 Totals (ton)	Year	HC	CO	NOx	SOx	PM
	2012	0.85	3.33	3.74	0.03	0.21

AVAQMD

		Helicopter Type	Year	HC	CO	NOx	SOx	PM
Segment 11	Wreckout	Eurocopter	2012	222.02	497.40	1,015.64	8.42	55.26
		Skyking	2012	275.69	998.21	887.39	7.46	49.19
		Skycrane	2012	0.00	0.00	0.00	0.00	0.00
Segment 11	Construction	Eurocopter	2012	318.80	714.22	1,458.35	12.09	79.35
		Skyking	2012	1,654.11	5,989.26	5,324.31	44.78	295.16
		Skycrane	2012	452.54	3,207.89	4,135.88	34.38	229.13

Segment 11 Totals (ton)	Year	HC	CO	NOx	SOx	PM
	2012	1.46	5.70	6.41	0.05	0.35

Total Helicopter Trip Emissions for SCE's Proposed Project by Jurisdiction (tons)

KCAPCD

Year	HC	CO	NOx	SOx	PM
2010	0.093	0.207	0.424	0.004	0.023
2011	0.032	0.073	0.149	0.001	0.008

SCAQMD

Year	HC	HC	HC	HC	HC
2010	1.565	7.879	8.990	0.075	0.497
2011	1.294	5.310	7.104	0.059	0.391
2012	1.158	4.010	5.135	0.043	0.282

AVAQMD

Year	HC	HC	HC	HC	HC
2010	0.044	0.098	0.199	0.002	0.011
2011	0.110	0.246	0.503	0.004	0.027
2012	1.503	5.796	6.599	0.055	0.364
2013	0.005	0.011	0.022	0.000	0.001

Fugitive Dust Emissions - Segment 4

Emission Categories

1) Earthmoving
2) Road Dust Paved/Unpaved
3) Disturbed Area Windblown Emissions

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling
D) Disturbed Area Windblown Emissions

A) Dozing (AP-42 Section 11.9 for overburden)

E = k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.910914419 lb/hr

PM2.5 Emission Factor
0.835618668 lb/hr

Total Dozer Use

	Hrs/year
2009	0
2010	4636
2011	76
2012	0
2013	0

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	4.43	1.94
2011	0.07	0.03
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 4

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	0	0
2010	1082	3246
2011	144	432
2012	0	0
2013	0	0

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68
2013		

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.45	0.03
2011	0.06	0.00
2012	0.00	0.00
2013	0.00	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = (k)(0.0032)[$(U/5)^{1.3}$]/[$(M/2)^{1.4}$]
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Four separate drops are assumed

2009	0	Annual tons
2010	675,000	Annual tons
2011	0	Annual tons
2012	0	Annual tons
2013	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.39	0.12
2011	0.00	0.00
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 4

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	82,440	37,520	14,480	134,440	6.7
2010	1,225,500	380,100	206,070	1,811,670	6.4
2011	91,560	28,860	14,850	135,270	6.4
2012	0	0	0	0	0.0
2013	0	0	0	0	0.0

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0115	0.0026
2010	0.0108	0.0025
2011	0.0106	0.0024
2012	0.0000	0.0000
2013	0.0000	0.0000

Emissions tons/year

	PM10	PM2.5
2009	0.77	0.18
2010	9.79	2.23
2011	0.71	0.16
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 4

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	137	65	27	229	7.0
2010	2,043	14,606	6,227	22,875	13.5
2011	153	1,444	532	2,129	13.1
2012	0	0	0	0	0.0
2013	0	0	0	0	0.0

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
6.27	0.96	62688.27	9612.20

	PM10 Annual	PM2.5 Annual
2009	2.84	0.44
2010	3.82	0.59
2011	3.77	0.58
2012	0.00	0.00
2013	0.00	0.00

Emissions tons/year

	PM10	PM2.5
2009	0.32	0.05
2010	43.66	6.70
2011	4.01	0.62
2012	0.00	0.00
2013	0.00	0.00

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
10030.12	1537.95

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.05	0.01
2010	6.99	1.07
2011	0.64	0.10
2012	0.00	0.00
2013	0.00	0.00

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control
Restoration of disturbed acres creates no net emission increase of permanently disturbed acres

Disturbed Acres (acre-years)

2009	17
2010	132
2011	54
2012	0
2013	0

Emissions (tons/year)

PM10	PM2.5
0.5147328	0.1054272
3.9967488	0.8186112
1.6350336	0.3348864
0	0
0	0

Fugitive Dust Emissions - Segment 4

Fugitive Dust Emissions - Segment 4

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	4.43	1.94	0.07	0.03
Grading	0.00	0.00	0.45	0.03	0.06	0.00
Soil Handling	0.00	0.00	0.39	0.12	0.00	0.00
Paved Road Dust	0.77	0.18	9.79	2.23	0.71	0.16
Unpaved Road Dust	0.05	0.01	6.99	1.07	0.64	0.10
Disturbed Area Dust	0.51	0.11	4.00	0.82	1.64	0.33
Totals	1.34	0.29	26.04	6.21	3.12	0.63

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00
Soil Handling	0.00	0.00	0.00	0.00
Paved Road Dust	0.00	0.00	0.00	0.00
Unpaved Road Dust	0.00	0.00	0.00	0.00
Disturbed Area Dust	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.00

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	50.00%	50.00%	0.00%
	2010	55.00%	45.00%	0.00%
	2011	65.00%	35.00%	0.00%
	2012	0.00%	0.00%	0.00%
	2013	0.00%	0.00%	0.00%
Emissions per Jurisdiction				
PM10	2009	0.67	0.67	0.00
	2010	14.32	11.72	0.00
	2011	2.03	1.09	0.00
	2012	0.00	0.00	0.00
	2013	0.00	0.00	0.00
PM2.5	2009	0.14	0.14	0.00
	2010	3.41	2.79	0.00
	2011	0.41	0.22	0.00
	2012	0.00	0.00	0.00
	2013	0.00	0.00	0.00

Fugitive Dust Emissions - Segment 5

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.910914419 lb/hr

PM2.5 Emission Factor
0.835618668 lb/hr

Total Dozer Use

	Hrs/year
2009	0
2010	2848
2011	548
2012	0
2013	0

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	2.72	1.19
2011	0.52	0.23
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 5

B) Grading

$E = k \times 0.051 \times (S)^{2.0}$ for PM10 and $k \times 0.040 \times (S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	0	0
2010	1016	3048
2011	436	1308
2012	0	0
2013	0	0

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.42	0.03
2011	0.18	0.01
2012	0.00	0.00
2013	0.00	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

$E = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Three separate drops are assumed

2009	0	Annual tons
2010	195,085	Annual tons
2011	195,085	Annual tons
2012	0	Annual tons
2013	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.11	0.04
2011	0.11	0.04
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 5

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	59,040	24,880	19,660	103,580	8.8
2010	511,200	195,920	187,340	894,460	9.2
2011	351,440	114,520	70,150	536,110	6.9
2012	3,240	960	480	4,680	6.1
2013	0	0	0	0	0.0

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0174	0.0041
2010	0.0187	0.0044
2011	0.0121	0.0028
2012	0.0099	0.0022
2013	0.0000	0.0000

Emissions tons/year

	PM10	PM2.5
2009	0.90	0.21
2010	8.36	1.98
2011	3.26	0.75
2012	0.02	0.01
2013	0.00	0.00

Fugitive Dust Emissions - Segment 5

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	148	1,004	539	1,691	14.5
2010	1,278	7,909	5,734	14,921	15.9
2011	879	4,623	1,905	7,407	12.9
2012	8	39	19	66	13.7
2013	0	0	0	0	0.0

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
6.27	0.96	62688.27	9612.20

	PM10 Annual	PM2.5 Annual
2009	3.95	0.61
2010	4.12	0.63
2011	3.75	0.58
2012	3.85	0.59
2013	0.00	0.00

Emissions tons/year

	PM10	PM2.5
2009	3.34	0.51
2010	30.74	4.71
2011	13.90	2.13
2012	0.13	0.02
2013	0.00	0.00

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
10030.12	1537.95

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.53	0.08
2010	4.92	0.75
2011	2.22	0.34
2012	0.02	0.00
2013	0.00	0.00

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

Disturbed Acres (acre-years)

2009	9
2010	63
2011	51
2012	0
2013	0

Emissions (tons/year)

PM10	PM2.5
0.2725056	0.0558144
1.9075392	0.3907008
1.5441984	0.3162816
0	0
0	0

Fugitive Dust Emissions - Segment 5

Fugitive Dust Emissions - Segment 5

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	2.72	1.19	0.52	0.23
Grading	0.00	0.00	0.42	0.03	0.18	0.01
Soil Handling	0.00	0.00	0.11	0.04	0.11	0.04
Paved Road Dust	0.90	0.21	8.36	1.98	3.26	0.75
Unpaved Road Dust	0.53	0.08	4.92	0.75	2.22	0.34
Disturbed Area Dust	0.27	0.06	1.91	0.39	1.54	0.32
Totals	1.71	0.35	18.44	4.38	7.84	1.68

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00
Soil Handling	0.00	0.00	0.00	0.00
Paved Road Dust	0.02	0.01	0.00	0.00
Unpaved Road Dust	0.02	0.00	0.00	0.00
Disturbed Area Dust	0.00	0.00	0.00	0.00
Totals	0.04	0.01	0.00	0.00

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	0.00%	100.00%	0.00%
	2010	0.00%	100.00%	0.00%
	2011	0.00%	100.00%	0.00%
	2012	0.00%	100.00%	0.00%
	2013	0.00%	100.00%	0.00%
Emissions per Jurisdiction				
PM10	2009	0.00	1.71	0.00
	2010	0.00	18.44	0.00
	2011	0.00	7.84	0.00
	2012	0.00	0.04	0.00
	2013	0.00	0.00	0.00
PM2.5	2009	0.00	0.35	0.00
	2010	0.00	4.38	0.00
	2011	0.00	1.68	0.00
	2012	0.00	0.01	0.00
	2013	0.00	0.00	0.00

Fugitive Dust Emissions - Segment 6

Emission Categories

1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.241175323 lb/hr

PM2.5 Emission Factor
0.591672862 lb/hr

Total Dozer Use

	Hrs/year
2009	0
2010	4893
2011	823
2012	710
2013	0

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	3.04	1.45
2011	0.51	0.24
2012	0.44	0.21
2013	0.00	0.00

Fugitive Dust Emissions - Segment 6

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	0	0
2010	945	2835
2011	772	2316
2012	300	900
2013	0	0

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.39	0.03
2011	0.32	0.02
2012	0.12	0.01
2013	0.00	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = $(k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Three separate drops are assumed

2009	0	Annual tons
2010	362,689	Annual tons
2011	362,689	Annual tons
2012	0	Annual tons
2013	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.21	0.07
2011	0.21	0.07
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 6

2) Road Dust

Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	60,120	30,060	10,020	100,200	6.6
2010	651,480	257,700	230,590	1,139,770	9.0
2011	1,048,020	332,640	149,250	1,529,910	6.0
2012	293,820	124,980	69,270	488,070	7.5
2013	0	0	0	0	0.0

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0112	0.0026
2010	0.0182	0.0043
2011	0.0098	0.0022
2012	0.0137	0.0032
2013	0.0000	0.0000

Emissions tons/year

	PM10	PM2.5
2009	0.56	0.13
2010	10.38	2.46
2011	7.46	1.68
2012	3.35	0.78
2013	0.00	0.00

Fugitive Dust Emissions - Segment 6

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	100	50	17	167	6.6
2010	1,086	18,070	11,235	30,392	15.9
2011	1,747	29,785	10,425	41,957	13.2
2012	490	2,720	1,544	4,754	14.5
2013	0	0	0	0	0.0

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
2.59	0.40	25930.71	3976.04

	PM10 Annual	PM2.5 Annual
2009	2.14	0.33
2010	3.18	0.49
2011	2.92	0.45
2012	3.05	0.47
2013	0.00	0.00

Emissions tons/year

	PM10	PM2.5
2009	0.18	0.03
2010	48.30	7.41
2011	61.33	9.40
2012	7.25	1.11
2013	0.00	0.00

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
4148.91	636.17

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.03	0.00
2010	7.73	1.19
2011	9.81	1.50
2012	1.16	0.18
2013	0.00	0.00

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

Disturbed Acres (acre-years)

2009	21
2010	74
2011	103
2012	26
2013	0

Emissions (tons/year)

PM10	PM2.5
0.6358464	0.1302336
2.2406016	0.4589184
3.1186752	0.6387648
0.7872384	0.1612416
0	0

Fugitive Dust Emissions - Segment 6

Fugitive Dust Emissions - Segment 6

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	3.04	1.45	0.51	0.24
Grading	0.00	0.00	0.39	0.03	0.32	0.02
Soil Handling	0.00	0.00	0.21	0.07	0.21	0.07
Paved Road Dust	0.56	0.13	10.38	2.46	7.46	1.68
Unpaved Road Dust	0.03	0.00	7.73	1.19	9.81	1.50
Disturbed Area Dust	0.64	0.13	2.24	0.46	3.12	0.64
Totals	1.23	0.26	23.98	5.64	21.43	4.15

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.44	0.21	0.00	0.00
Grading	0.12	0.01	0.00	0.00
Soil Handling	0.00	0.00	0.00	0.00
Paved Road Dust	3.35	0.78	0.00	0.00
Unpaved Road Dust	1.16	0.18	0.00	0.00
Disturbed Area Dust	0.79	0.16	0.00	0.00
Totals	5.86	1.34	0.00	0.00

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	0.00%	100.00%	0.00%
	2010	0.00%	42.00%	58.00%
	2011	0.00%	28.00%	72.00%
	2012	0.00%	70.00%	30.00%
	2013	0.00%	0.00%	0.00%
Emissions per Jurisdiction				
PM10	2009	0.00	1.23	0.00
	2010	0.00	10.07	13.91
	2011	0.00	6.00	15.43
	2012	0.00	4.10	1.76
	2013	0.00	0.00	0.00
PM2.5	2009	0.00	0.26	0.00
	2010	0.00	2.37	3.27
	2011	0.00	1.16	2.99
	2012	0.00	0.93	0.40
	2013	0.00	0.00	0.00

Fugitive Dust Emissions - Segment 7

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.241175323 lb/hr

PM2.5 Emission Factor
0.591672862 lb/hr

Total Dozer Use

	Hrs/year
2009	0
2010	1028
2011	231
2012	312
2013	0

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.64	0.30
2011	0.14	0.07
2012	0.19	0.09
2013	0.00	0.00

Fugitive Dust Emissions - Segment 7

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	0	0
2010	133	399
2011	0	0
2012	128	384
2013	0	0

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.05	0.00
2011	0.00	0.00
2012	0.05	0.00
2013	0.00	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = $(k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Three separate drops are assumed

2009	0	Annual tons
2010	33,723	Annual tons
2011	33,723	Annual tons
2012	0	Annual tons
2013	0	Annual tons

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.02	0.01
2011	0.02	0.01
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 7

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	0	0	0	0	0.0
2010	310,280	113,360	95,470	519,110	8.5
2011	707,040	210,440	99,850	1,017,330	6.0
2012	514,960	168,160	65,910	749,030	5.8
2013	0	0	0	0	0.0

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0000	0.0000
2010	0.0073	0.0016
2011	0.0041	0.0008
2012	0.0039	0.0007
2013	0.0000	0.0000

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	1.89	0.41
2011	2.11	0.40
2012	1.48	0.28
2013	0.00	0.00

Fugitive Dust Emissions - Segment 7

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	0	0	0	0	0.0
2010	776	1,799	1,423	3,997	14.7
2011	1,768	3,518	1,150	6,435	10.3
2012	1,287	3,382	1,135	5,805	11.0
2013	0	0	0	0	0.0

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
2.59	0.40	25930.71	3976.04

	PM10 Annual	PM2.5 Annual
2009	0.00	0.00
2010	3.06	0.47
2011	2.61	0.40
2012	2.69	0.41
2013	0.00	0.00

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	6.12	0.94
2011	8.40	1.29
2012	7.80	1.20
2013	0.00	0.00

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
4148.91	636.17

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.98	0.15
2011	1.34	0.21
2012	1.25	0.19
2013	0.00	0.00

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

	Disturbed Acres (acre-years)	Emissions (tons/year) PM10	Emissions (tons/year) PM2.5
2009	0	0	0
2010	49	1.4836416	0.3038784
2011	64	1.9378176	0.3969024
2012	6	0.1816704	0.0372096
2013	0	0	0

Fugitive Dust Emissions - Segment 7

Fugitive Dust Emissions - Segment 7

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	0.64	0.30	0.14	0.07
Grading	0.00	0.00	0.05	0.00	0.00	0.00
Soil Handling	0.00	0.00	0.02	0.01	0.02	0.01
Paved Road Dust	0.00	0.00	1.89	0.41	2.11	0.40
Unpaved Road Dust	0.00	0.00	0.98	0.15	1.34	0.21
Disturbed Area Dust	0.00	0.00	1.48	0.30	1.94	0.40
Totals	0.00	0.00	5.07	1.18	5.56	1.08

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.19	0.09	0.00	0.00
Grading	0.05	0.00	0.00	0.00
Soil Handling	0.00	0.00	0.00	0.00
Paved Road Dust	1.48	0.28	0.00	0.00
Unpaved Road Dust	1.25	0.19	0.00	0.00
Disturbed Area Dust	0.18	0.04	0.00	0.00
Totals	3.15	0.60	0.00	0.00

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	0.00%	0.00%	100.00%
	2010	0.00%	0.00%	100.00%
	2011	0.00%	0.00%	100.00%
	2012	0.00%	0.00%	100.00%
	2013	0.00%	0.00%	100.00%
Emissions per Jurisdiction				
PM10	2009	0.00	0.00	0.00
	2010	0.00	0.00	5.07
	2011	0.00	0.00	5.56
	2012	0.00	0.00	3.15
	2013	0.00	0.00	0.00
PM2.5	2009	0.00	0.00	0.00
	2010	0.00	0.00	1.18
	2011	0.00	0.00	1.08
	2012	0.00	0.00	0.60
	2013	0.00	0.00	0.00

Fugitive Dust Emissions - Segment 8

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.241175323 lb/hr

PM2.5 Emission Factor
0.591672862 lb/hr

Total Dozer Use

	Hrs/year
2009	144
2010	3421
2011	1297
2012	370
2013	0

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.09	0.04
2010	2.12	1.01
2011	0.80	0.38
2012	0.23	0.11
2013	0.00	0.00

Fugitive Dust Emissions - Segment 8

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	40	120
2010	977	2931
2011	654	1962
2012	404	1212
2013	0	0

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68

Tons/year	PM10	PM2.5
2009	0.02	0.00
2010	0.40	0.03
2011	0.27	0.02
2012	0.17	0.01
2013	0.00	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = $(k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Three separate drops are assumed

2009	0	Annual tons
2010	325,637	Annual tons
2011	325,637	Annual tons
2012	72,364	Annual tons
2013	0	Annual tons

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.19	0.06
2011	0.19	0.06
2012	0.04	0.01
2013	0.00	0.00

Fugitive Dust Emissions - Segment 8

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	23,520	11,600	4,720	39,840	7.1
2010	1,063,560	369,640	262,850	1,696,050	7.6
2011	1,205,600	389,920	159,870	1,755,390	5.9
2012	193,800	71,320	40,630	305,750	7.1
2013	0	0	0	0	0.0

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0054	0.0011
2010	0.0062	0.0013
2011	0.0040	0.0008
2012	0.0055	0.0011
2013	0.0000	0.0000

Emissions tons/year

	PM10	PM2.5
2009	0.11	0.02
2010	5.25	1.11
2011	3.53	0.67
2012	0.84	0.17
2013	0.00	0.00

Fugitive Dust Emissions - Segment 8

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365-P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	59	30	16	105	7.9
2010	2,576	4,192	2,911	9,679	13.0
2011	3,014	5,312	1,882	10,207	10.3
2012	485	996	466	1,947	11.8
2013	0	0	0	0	0.0

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
2.59	0.40	25930.71	3976.04

	PM10 Annual	PM2.5 Annual
2009	2.33	0.36
2010	2.90	0.45
2011	2.61	0.40
2012	2.77	0.43
2013	0.00	0.00

Emissions tons/year

	PM10	PM2.5
2009	0.12	0.02
2010	14.05	2.15
2011	13.33	2.04
2012	2.70	0.41
2013	0.00	0.00

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
4148.91	636.17

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.02	0.00
2010	2.25	0.34
2011	2.13	0.33
2012	0.43	0.07
2013	0.00	0.00

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

Disturbed Acres (acre-years)

2009	5
2010	128
2011	193
2012	74
2013	0

Emissions (tons/year)

PM10	PM2.5
0.151392	0.031008
3.8756352	0.7938048
5.8437312	1.1969088
2.2406016	0.4589184
0	0

Fugitive Dust Emissions - Segment 8

Fugitive Dust Emissions - Segment 8

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.09	0.04	2.12	1.01	0.80	0.38
Grading	0.02	0.00	0.40	0.03	0.27	0.02
Soil Handling	0.00	0.00	0.19	0.06	0.19	0.06
Paved Road Dust	0.11	0.02	5.25	1.11	3.53	0.67
Unpaved Road Dust	0.02	0.00	2.25	0.34	2.13	0.33
Disturbed Area Dust	0.15	0.03	3.88	0.79	5.84	1.20
Totals	0.39	0.10	14.09	3.35	12.77	2.66

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.23	0.11	0.00	0.00
Grading	0.17	0.01	0.00	0.00
Soil Handling	0.04	0.01	0.00	0.00
Paved Road Dust	0.84	0.17	0.00	0.00
Unpaved Road Dust	0.43	0.07	0.00	0.00
Disturbed Area Dust	2.24	0.46	0.00	0.00
Totals	3.95	0.83	0.00	0.00

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	0.00%	0.00%	100.00%
	2010	0.00%	0.00%	100.00%
	2011	0.00%	0.00%	100.00%
	2012	0.00%	0.00%	100.00%
	2013	0.00%	0.00%	100.00%
Emissions per Jurisdiction				
PM10	2009	0.00	0.00	0.39
	2010	0.00	0.00	14.09
	2011	0.00	0.00	12.77
	2012	0.00	0.00	3.95
	2013	0.00	0.00	0.00
PM2.5	2009	0.00	0.00	0.10
	2010	0.00	0.00	3.35
	2011	0.00	0.00	2.66
	2012	0.00	0.00	0.83
	2013	0.00	0.00	0.00

Fugitive Dust Emissions - Segment 9

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.910914419 lb/hr

PM2.5 Emission Factor
0.835618668 lb/hr

Total Dozer Use

	Hrs/year
2009	0
2010	3204
2011	0
2012	0
2013	0

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	3.06	1.34
2011	0.00	0.00
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 9

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	592	1776
2010	1680	5040
2011	0	0
2012	0	0
2013	0	0

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68

Tons/year	PM10	PM2.5
2009	0.24	0.02
2010	0.69	0.05
2011	0.00	0.00
2012	0.00	0.00
2013	0.00	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = (k)(0.0032)$[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Three separate drops are assumed

2009	0	Annual tons
2010	121,950	Annual tons
2011	2,750	Annual tons
2012	0	Annual tons
2013	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.07	0.02
2011	0.00	0.00
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 9

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	22,080	4,660	5,715	32,455	7.8
2010	983,020	187,870	88,630	1,259,520	4.9
2011	393,320	81,860	1,625	476,805	3.1
2012	248,760	39,150	2,250	290,160	3.0
2013	131,880	24,240	0	156,120	2.9

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0064	0.0014
2010	0.0029	0.0005
2011	0.0013	0.0001
2012	0.0012	0.0001
2013	0.0011	0.0000

Emissions tons/year

	PM10	PM2.5
2009	0.10	0.02
2010	1.83	0.31
2011	0.30	0.02
2012	0.17	0.01
2013	0.09	0.00

Fugitive Dust Emissions - Segment 9

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	37	10	11	58	8.4
2010	1,907	455	219	2,581	5.4
2011	357	138	1	495	3.7
2012	365	86	1	452	3.2
2013	220	61	0	280	3.3

Uncontrolled Emission Factors and Emissions
Emission Factors (lb/VMT) Emissions lbs/day

PM10 Daily	PM2.5 Daily	PM10	PM2.5
2.59	0.40	25930.71	3976.04

	PM10 Annual	PM2.5 Annual
2009	3.10	0.47
2010	2.54	0.39
2011	2.14	0.33
2012	2.00	0.31
2013	2.03	0.31

Emissions tons/year

	PM10	PM2.5
2009	0.09	0.01
2010	3.28	0.50
2011	0.53	0.08
2012	0.45	0.07
2013	0.28	0.04

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
4148.91	636.17

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.01	0.00
2010	0.52	0.08
2011	0.08	0.01
2012	0.07	0.01
2013	0.05	0.01

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

Disturbed Acres (acre-years)

2009	2
2010	55
2011	0
2012	8
2013	11

Emissions (tons/year)

PM10	PM2.5
0.0605568	0.0124032
1.665312	0.341088
0	0
0.2422272	0.0496128
0.3330624	0.0682176

Fugitive Dust Emissions - Segment 9

Fugitive Dust Emissions - Segment 9

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	3.06	1.34	0.00	0.00
Grading	0.24	0.02	0.69	0.05	0.00	0.00
Soil Handling	0.00	0.00	0.07	0.02	0.00	0.00
Paved Road Dust	0.10	0.02	1.83	0.31	0.30	0.02
Unpaved Road Dust	0.01	0.00	0.52	0.08	0.08	0.01
Disturbed Area Dust	0.06	0.01	1.67	0.34	0.00	0.00
Totals	0.42	0.05	7.85	2.14	0.39	0.03

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00
Soil Handling	0.00	0.00	0.00	0.00
Paved Road Dust	0.17	0.01	0.09	0.00
Unpaved Road Dust	0.07	0.01	0.05	0.01
Disturbed Area Dust	0.24	0.05	0.33	0.07
Totals	0.49	0.07	0.47	0.08

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	0.00%	100.00%	0.00%
	2010	60.00%	39.00%	1.00%
	2011	75.00%	23.00%	2.00%
	2012	0.00%	98.00%	2.00%
	2013	0.00%	100.00%	0.00%
Emissions per Jurisdiction				
PM10	2009	0.00	0.42	0.00
	2010	4.71	3.06	0.08
	2011	0.29	0.09	0.01
	2012	0.00	0.48	0.01
	2013	0.00	0.47	0.00
PM2.5	2009	0.00	0.05	0.00
	2010	1.28	0.83	0.02
	2011	0.02	0.01	0.00
	2012	0.00	0.07	0.00
	2013	0.00	0.08	0.00

Fugitive Dust Emissions - Segment 10

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.910914419 lb/hr

PM2.5 Emission Factor
0.835618668 lb/hr

Total Dozer Use

	Hrs/year
2009	0
2010	1399
2011	118
2012	0
2013	0

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	1.34	0.58
2011	0.11	0.05
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 10

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	0	0
2010	673	2019
2011	118	354
2012	0	0
2013	0	0

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.28	0.02
2011	0.05	0.00
2012	0.00	0.00
2013	0.00	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = $(k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Three separate drops are assumed

2009	0	Annual tons
2010	448,800	Annual tons
2011	0	Annual tons
2012	0	Annual tons
2013	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.26	0.08
2011	0.00	0.00
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 10

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	0	0	0	0	0.0
2010	950,800	219,840	136,000	1,306,640	5.9
2011	46,720	12,420	9,580	68,720	7.0
2012	0	0	0	0	0.0
2013	0	0	0	0	0.0

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0000	0.0000
2010	0.0095	0.0021
2011	0.0123	0.0028
2012	0.0000	0.0000
2013	0.0000	0.0000

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	6.19	1.39
2011	0.42	0.10
2012	0.00	0.00
2013	0.00	0.00

Fugitive Dust Emissions - Segment 10

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365-P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	0	0	0	0	0.0
2010	1,189	11,495	5,195	17,879	14.0
2011	58	649	367	1,075	15.2
2012	0	0	0	0	0.0
2013	0	0	0	0	0.0

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
2.59	0.40	25930.71	3976.04

	PM10 Annual	PM2.5 Annual
2009	0.00	0.00
2010	3.89	0.60
2011	4.03	0.62
2012	0.00	0.00
2013	0.00	0.00

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	34.74	5.33
2011	2.17	0.33
2012	0.00	0.00
2013	0.00	0.00

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
4148.91	636.17

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	5.56	0.85
2011	0.35	0.05
2012	0.00	0.00
2013	0.00	0.00

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

	Disturbed Acres (acre-years)	Emissions (tons/year) PM10	PM2.5
2009	0	0	0
2010	42	1.2716928	0.2604672
2011	10	0.302784	0.062016
2012	0	0	0
2013	0	0	0

Fugitive Dust Emissions - Segment 10

Fugitive Dust Emissions - Segment 10

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	1.34	0.58	0.11	0.05
Grading	0.00	0.00	0.28	0.02	0.05	0.00
Soil Handling	0.00	0.00	0.26	0.08	0.00	0.00
Paved Road Dust	0.00	0.00	6.19	1.39	0.42	0.10
Unpaved Road Dust	0.00	0.00	5.56	0.85	0.35	0.05
Disturbed Area Dust	0.00	0.00	1.27	0.26	0.30	0.06
Totals	0.00	0.00	14.89	3.19	1.23	0.26

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00
Soil Handling	0.00	0.00	0.00	0.00
Paved Road Dust	0.00	0.00	0.00	0.00
Unpaved Road Dust	0.00	0.00	0.00	0.00
Disturbed Area Dust	0.00	0.00	0.00	0.00
Totals	0.00	0.00	0.00	0.00

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	100.00%	0.00%	0.00%
	2010	100.00%	0.00%	0.00%
	2011	100.00%	0.00%	0.00%
	2012	100.00%	0.00%	0.00%
	2013	100.00%	0.00%	0.00%
Emissions per Jurisdiction				
PM10	2009	0.00	0.00	0.00
	2010	14.89	0.00	0.00
	2011	1.23	0.00	0.00
	2012	0.00	0.00	0.00
	2013	0.00	0.00	0.00
PM2.5	2009	0.00	0.00	0.00
	2010	3.19	0.00	0.00
	2011	0.26	0.00	0.00
	2012	0.00	0.00	0.00
	2013	0.00	0.00	0.00

Fugitive Dust Emissions - Segment 11

Emission Categories

1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.241175323 lb/hr

PM2.5 Emission Factor
0.591672862 lb/hr

Total Dozer Use

	Hrs/year
2009	0
2010	0
2011	1287
2012	2575
2013	36

Dozer Emissions

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.00	0.00
2011	0.80	0.38
2012	1.60	0.76
2013	0.02	0.01

Fugitive Dust Emissions - Segment 11

B) Grading

$E = k \times 0.051 \times (S)^{2.0}$ for PM10 and $k \times 0.040 \times (S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2009	0	0
2010	0	0
2011	270	810
2012	928	2784
2013	100	300

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	13.22	0.93
2010	26.44	1.86
2011	9.91	0.70
2012	23.96	1.68

Tons/year	PM10	PM2.5
2009	0.00	0.00
2010	0.00	0.00
2011	0.11	0.01
2012	0.38	0.03
2013	0.04	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

$E = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Three separate drops are assumed

2009	0	Annual tons
2010	0	Annual tons
2011	31,750	Annual tons
2012	284,134	Annual tons
2013	0	Annual tons

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions lbs/day

PM10	PM2.5
1.03	0.32

Emissions tons/year

	PM10	PM2.5
2009	0.00	0.00
2010	0.00	0.00
2011	0.02	0.01
2012	0.16	0.05
2013	0.00	0.00

Fugitive Dust Emissions - Segment 11

2) Road Dust

Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.0 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2009	56,880	28,440	9,480	94,800	6.6
2010	11,160	5,580	1,860	18,600	6.6
2011	164,760	54,900	54,200	273,860	8.7
2012	1,017,900	340,620	199,110	1,557,630	6.9
2013	31,080	12,180	8,430	51,690	8.0

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily
0.0793	0.0196

Emissions lbs/day

PM10	PM2.5
792.66	195.74

	PM10 Annual	PM2.5 Annual
2009	0.0112	0.0026
2010	0.0112	0.0026
2011	0.0174	0.0041
2012	0.0120	0.0028
2013	0.0151	0.0035

Emissions tons/year

	PM10	PM2.5
2009	0.53	0.12
2010	0.10	0.02
2011	2.38	0.56
2012	9.35	2.15
2013	0.39	0.09

Fugitive Dust Emissions - Segment 11

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Average Weight = 40.5 Tons

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unaved VMT	Average Weight (Tons)
2009	95	1,505	502	2,101	13.0
2010	19	295	98	412	13.0
2011	275	1,393	1,845	3,513	19.1
2012	1,697	19,246	10,001	30,944	14.8
2013	52	795	457	1,304	15.5

Uncontrolled Emission Factors and Emissions
Emission Factors (lb/VMT) Emissions lbs/day

PM10 Daily	PM2.5 Daily	PM10	PM2.5
2.59	0.40	25930.71	3976.04

	PM10 Annual	PM2.5 Annual
2009	2.90	0.44
2010	2.90	0.44
2011	3.45	0.53
2012	3.07	0.47
2013	3.14	0.48

Emissions tons/year

	PM10	PM2.5
2009	3.05	0.47
2010	0.60	0.09
2011	6.06	0.93
2012	47.57	7.29
2013	2.05	0.31

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

PM10	PM2.5
4148.91	636.17

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2009	0.49	0.07
2010	0.10	0.01
2011	0.97	0.15
2012	7.61	1.17
2013	0.33	0.05

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

Disturbed Acres (acre-years)

2009	20
2010	41
2011	44
2012	136
2013	20

Emissions (tons/year)

PM10	PM2.5
0.605568	0.124032
1.2414144	0.2542656
1.3322496	0.2728704
4.1178624	0.8434176
0.605568	0.124032

Fugitive Dust Emissions - Segment 11

Fugitive Dust Emissions - Segment 11

Fugitive Dust Emission Totals	2009		2010		2011	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	0.00	0.00	0.00	0.00	0.80	0.38
Grading	0.00	0.00	0.00	0.00	0.11	0.01
Soil Handling	0.00	0.00	0.00	0.00	0.02	0.01
Paved Road Dust	0.53	0.12	0.10	0.02	2.38	0.56
Unpaved Road Dust	0.49	0.07	0.10	0.01	0.97	0.15
Disturbed Area Dust	0.61	0.12	1.24	0.25	1.33	0.27
Totals	1.62	0.32	1.44	0.29	5.61	1.38

Fugitive Dust Emission Totals	2012		2013	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	1.60	0.76	0.02	0.01
Grading	0.38	0.03	0.04	0.00
Soil Handling	0.16	0.05	0.00	0.00
Paved Road Dust	9.35	2.15	0.39	0.09
Unpaved Road Dust	7.61	1.17	0.33	0.05
Disturbed Area Dust	4.12	0.84	0.61	0.12
Totals	23.22	5.00	1.39	0.28

Percent each Jurisdiction		KCAPCD	AVAQMD	SCAQMD
	2009	0.00%	0.00%	100.00%
	2010	0.00%	72.00%	28.00%
	2011	0.00%	0.00%	100.00%
	2012	0.00%	40.00%	60.00%
	2013	0.00%	94.00%	6.00%
Emissions per Jurisdiction				
PM10	2009	0.00	0.00	1.62
	2010	0.00	1.04	0.40
	2011	0.00	0.00	5.61
	2012	0.00	9.29	13.93
	2013	0.00	1.30	0.08
PM2.5	2009	0.00	0.00	0.32
	2010	0.00	0.21	0.08
	2011	0.00	0.00	1.38
	2012	0.00	2.00	3.00
	2013	0.00	0.26	0.02

Fugitive Dust Emissions - KCAPCD Maximum Daily

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

E = k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.910914419 lb/hr

PM2.5 Emission Factor
0.835618668 lb/hr

Maximum Daily Dozer Use

	Hrs/day
Oct-10	12

Dozer Emissions

Lbs/Day	PM10	PM2.5
Oct-10	22.93	10.03

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Maximum Daily Grader VMT

	Hrs/day	VMT/day
Oct-10	4	12

Grading Emissions

Lbs/Day	PM10	PM2.5
Oct-10	3.30	0.23

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = (k)(0.0032)[$(U/5)^{1.3}$]/[$(M/2)^{1.4}$]
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 26.5 MPH worst day, 6.4 MPH avg from Norco Met File
M = moisture content = 10% (mitigated)
Three separate drops are assumed

Max Daily 54 Maximum daily tons

Emission Factors and Emissions

Emission Factors		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
0.00103	0.00032	0.06	0.02

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Worst Case Day VMT

17560	Passenger Vehicles
4560	Delivery/Work Vehicles
1810	Heavy-Heavy Duty Vehicles
23930	Total Paved VMT

Average Weight = 5.3 Tons

Emission Factors and Emissions

Emission Factors	
PM10 Daily	PM2.5 Daily
0.0078	0.0017

Emissions lbs/day	
PM10	PM2.5
187.82	41.15

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Worst Case Day VMT

25	Passenger Vehicles
224	Delivery/Work Vehicles
85	Heavy-Heavy Duty Vehicles
334	Total Unpaved VMT

Average Weight = 13.2 Tons

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
3.78	0.58	1262.86	193.64

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Controlled Emissions lbs/day	
PM10	PM2.5
202.06	30.98

Emission Control
84%

3) Disturbed Area Windblown Emissions

Assumption

Average day in 2010 for Segments 4 and 10

PM10	PM2.5
29	6

Fugitive Dust Emission Totals Maximum Day

	PM10 lb/day	PM2.5 lb/day
Dozer	22.93	10.03
Grading	3.30	0.23
Soil Handling	0.06	0.02
Paved Road Dust	187.82	41.15
Unpaved Road Dust	202.06	30.98
Wind Blown Dust	28.87	5.91

Totals	445.04	88.32

Fugitive Dust Emissions - AVAQMD Maximum Daily

Emission Categories

1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

E = k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.910914419 lb/hr

PM2.5 Emission Factor
0.835618668 lb/hr

Maximum Daily Dozer Use

	Hrs/day
Apr-12	4

Dozer Emissions

Lbs/Day	PM10	PM2.5
Apr-12	7.64	3.34

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Maximum Daily Grader VMT

	Hrs/day	VMT/day
Apr-12	4	12

Grading Emissions

Lbs/Day	PM10	PM2.5
Apr-12	3.30	0.23

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = (k)(0.0032)[$(U/5)^{1.3}$]/[$(M/2)^{1.4}$]
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 26.5 MPH worst day, 6.4 MPH avg from Norco Met File
M = moisture content = 10% (mitigated)
Three separate drops are assumed

Max Daily 54 Maximum daily tons

Emission Factors and Emissions

Emission Factors		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
0.00103	0.00032	0.06	0.02

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Worst Case Day VMT

8460	Passenger Vehicles
2650	Delivery/Work Vehicles
1160	Heavy-Heavy Duty Vehicles
12270	Total Paved VMT

Average Weight = 5.9 Tons

Emission Factors and Emissions

Emission Factors	
PM10 Daily	PM2.5 Daily
0.0095	0.0021

Emissions lbs/day	
PM10	PM2.5
116.78	26.22

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 16% - SCAQMD Handbook for Farm Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Worst Case Day VMT

14	Passenger Vehicles
119	Delivery/Work Vehicles
56	Heavy-Heavy Duty Vehicles
188	Total Unpaved VMT

Average Weight = 14.1 Tons

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
3.90	0.60	732.79	112.36

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day	
PM10	PM2.5
117.25	17.98

Emission Control
84%

3) Disturbed Area Windblown Emissions

Assumption

Average day in 2012 for Segments 6 and 11

PM10	PM2.5
27	6

Fugitive Dust Emission Totals Maximum Day

	PM10 lb/day	PM2.5 lb/day
Dozer	7.64	3.34
Grading	3.30	0.23
Soil Handling	0.06	0.02
Paved Road Dust	116.78	26.22
Unpaved Road Dust	117.25	17.98
Wind Blown Dust	26.88	5.50

Totals	271.90	53.29

Fugitive Dust Emissions - SCAQMD Maximum Daily

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.241175323 lb/hr

PM2.5 Emission Factor
0.591672862 lb/hr

Maximum Daily Dozer Use

	Hrs/day
2009	40

Dozer Emissions

Lbs/Day	PM10	PM2.5
2009	76.44	33.42

B) Grading

$E = k \times 0.051 \times (S)^{2.0}$ for PM10 and $k \times 0.040 \times (S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Maximum Daily Grader VMT

	Hrs/day	VMT/day
2009	9	27

Grading Emissions

Lbs/Day	PM10	PM2.5
2009	7.44	0.52

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

$E = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 26.5 MPH worst day, 6.4 MPH avg from Norco Met File
M = moisture content = 10% (mitigated)
Three separate drops are assumed

Max Daily 216 Maximum daily tons

Emission Factors and Emissions

Emission Factors		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
0.00103	0.00032	0.22	0.07

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.2 g/m2 - assumes 500 to 5,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Worst Case Day VMT

13360	Passenger Vehicles
4180	Delivery/Work Vehicles
2630	Heavy-Heavy Duty Vehicles
20170	Total Paved VMT

Average Weight = 6.9 Tons

Emission Factors and Emissions

Emission Factors	
PM10 Daily	PM2.5 Daily
0.0120	0.0028

Emissions lbs/day	
PM10	PM2.5
242.22	55.66

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365-P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Worst Case Day VMT

29	Passenger Vehicles
188	Delivery/Work Vehicles
119	Heavy-Heavy Duty Vehicles
335.8649512	Total Unpaved VMT

Average Weight = 15.3 Tons

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)		Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10	PM2.5
3.13	0.48	1049.92	160.99

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day	
PM10	PM2.5
167.99	25.76

Emission Control
84%

3) Disturbed Area Windblown Emissions

Assumption

Average day in 2010 for Segments 6, 7, 8, and 11

PM10	PM2.5
49	10

Fugitive Dust Emission Totals Maximum Day

	PM10 lb/day	PM2.5 lb/day
Dozer	76.44	33.42
Grading	7.44	0.52
Soil Handling	0.22	0.07
Paved Road Dust	242.22	55.66
Unpaved Road Dust	167.99	25.76

Totals	494.30	115.44

LST Daily Emissions Estimate

Assumptions:
1) Three Worst-Case Construction Types - 1) Construction of Marshalling Yards, 2) Tower Construction, and 3) Substation Construction
2) Localized emissions include the on-site emissions only, so are comprised of the offroad equipment and their associated Fugitive Dust activities and onroad emissions and the unpaved road dust within 0.1 miles (0.05 miles each way).

Marshalling Yards - 2009 Emission Factor Basis

Offroad Emissions

			SCAQMD Emission Factor lbs/hour				
	HP	Number	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1244	0.4490	0.8777	0.0008	0.0589
Forklift, 5 ton	75	1	0.0723	0.2046	0.2348	0.0003	0.0248
Forklift, 10 ton	85	1	0.0709	0.2097	0.2661	0.0003	0.0275
Motor, Auxilary Power	5	1	0.0060	0.0246	0.0399	0.0001	0.0024

	Daily Emissions lbs				
Hours/day	ROG	CO	NOX	SOX	PM
2	0.25	0.90	1.76	0.00	0.12
6	0.43	1.23	1.41	0.00	0.15
6	0.43	1.26	1.60	0.00	0.17
1	0.01	0.02	0.04	0.00	0.00
	1.11	3.41	4.80	0.00	0.43

Onroad Emissions

	Emissions Factor lb/mile				
Vehicle Type	VOC	CO	NOx	SOx	PM
Passenger	0.0010	0.0097	0.0010	0.0000	0.0001
Delivery	0.0028	0.0202	0.0224	0.0000	0.0008
Heavy-Heavy Duty	0.0033	0.0128	0.0418	0.0000	0.0020

VMT	Daily Emissions lbs				
Total	VOC	CO	NOx	SOx	PM
0.6	0.00	0.01	0.00	0.00	0.00
0.3	0.00	0.01	0.01	0.00	0.00
0.1	0.00	0.00	0.00	0.00	0.00
Totals	0.00	0.01	0.01	0.00	0.00

Fugitive Dust Emissions

	PM10	PM2.5
	lb/mile	lbs/mile
Unpaved Road Efs	0.50	0.08
	PM10	PM2.5
(based on SCAQMD worst case day)	lbs/day	lbs/day
	0.50	0.08

Total Miles
1.0

No dozing/grading or soil movement

Local Daily Emission Totals		VOC	CO	NOx	SOx	PM10	PM2.5
Marshalling Yard Construction	Offroad	1.11	3.41	4.80	0.00	0.43	0.40
	Onroad	0.00	0.01	0.01	0.00	0.00	0.00
	Fugitive Dust	--	--	--	--	0.50	0.08
Total		1.12	3.42	4.81	0.00	0.93	0.48

LST Daily Emissions Estimate

Tower Construction - 2010 Tower Steel

Offroad Emissions

			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, 150/300 Ton	450	1	0.1706	0.5992	1.6652	0.0017	0.0642	8	1.36	4.79	13.32	0.01	0.51
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1177	0.4459	0.8298	0.0008	0.0562	8	2.82	10.70	19.92	0.02	1.35
Compressor, Air	75	5	0.1110	0.3005	0.3668	0.0004	0.0365	7.5	4.16	11.27	13.76	0.01	1.37
Motor, Auxilary Power	5	2	0.0057	0.0242	0.0385	0.0001	0.0023	2	0.02	0.10	0.15	0.00	0.01
									8.37	26.86	47.15	0.05	3.24

Onroad Emissions

	Emissions Factor lb/mile					VMT	Daily Emissions lbs				
Vehicle Type	VOC	CO	NOx	SOx	PM	Total	VOC	CO	NOx	SOx	PM
Passenger	0.0009	0.0083	0.0009	0.0000	0.0001	4.8	0.00	0.04	0.00	0.00	0.00
Delivery	0.0026	0.0184	0.0206	0.0000	0.0008	1.4	0.00	0.03	0.03	0.00	0.00
Heavy-Heavy Duty	0.0030	0.0120	0.0382	0.0000	0.0018	0.3	0.00	0.00	0.01	0.00	0.00
						Totals	0.01	0.07	0.04	0.00	0.00

Fugitive Dust Emissions

	PM10	PM2.5
	lb/mile	lbs/mile
Unpaved Road Efs	0.50	0.08
	PM10	PM2.5
(based on SCAQMD worst case day)	lbs/day	lbs/day
	3.25	0.50

Total Miles
6.5

No dozing/grading or soil movement

Local Daily Emission Totals		VOC	CO	NOx	SOx	PM10	PM2.5
Tower Construction	Offroad	8.37	26.86	47.15	0.05	3.24	2.98
	Onroad	0.01	0.07	0.04	0.00	0.00	0.00
	Fugitive Dust	--	--	--	--	3.25	0.50
Total		8.38	26.93	47.19	0.05	6.49	3.48

LST Daily Emissions Estimate

Substation Construction - Transformer Element in SCAQMD Jurisdiction - 2011

Offroad Emissions

			SCAQMD Emission Factor lbs/hour				
	HP	Number	ROG	CO	NOX	SOX	PM
50 ton Crane	200	2	0.1156	0.4330	0.9692	0.0010	0.0486
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208
Manlifts	75	1	0.0572	0.1917	0.2134	0.0003	0.0208

	Daily Emissions lbs				
Hours/day	ROG	CO	NOX	SOX	PM
6	1.39	5.20	11.63	0.01	0.58
6	0.34	1.15	1.28	0.00	0.12
6	0.34	1.15	1.28	0.00	0.12
	2.07	7.50	14.19	0.02	0.83

Onroad Emissions

	Emissions Factor lb/mile				
Vehicle Type	VOC	CO	NOx	SOx	PM
Passenger	0.0009	0.0083	0.0008	0.0000	0.0001
Delivery	0.0024	0.0169	0.0189	0.0000	0.0007
Heavy-Heavy Duty	0.0028	0.0111	0.0346	0.0000	0.0017

VMT	Daily Emissions lbs				
Total	VOC	CO	NOx	SOx	PM
4.8	0.00	0.04	0.00	0.00	0.00
1.4	0.00	0.02	0.03	0.00	0.00
0.3	0.00	0.00	0.01	0.00	0.00
Totals	0.01	0.07	0.04	0.00	0.00

Fugitive Dust Emissions

Negligible at existing SCAQMD paved substation sites

Local Daily Emission Totals		VOC	CO	NOx	SOx	PM10	PM2.5
Substation Construction	Offroad	2.07	7.50	14.19	0.02	0.83	0.77
	Onroad	0.01	0.07	0.04	0.00	0.00	0.00
	Fugitive Dust	--	--	--	--	0.00	0.00
Total		2.08	7.56	14.23	0.02	0.83	0.77

Alternative 2. - Operating Emissions

Daily Emissions (lbs)

AVAQMD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	4.16	15.84	32.93	0.04	1.66	1.52
	Onroad	0.69	4.61	4.97	0.01	0.25	0.23
	Fugitive Dust	--	--	--	--	55.00	18.70
Helicopter - Hughes 500		1.68	3.76	7.67	0.06	0.42	0.38
Total		6.53	24.20	45.56	0.11	57.32	20.84

SCAQMD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	4.16	15.84	32.93	0.04	1.66	1.52
	Onroad	1.08	7.10	7.82	0.02	0.39	0.35
	Fugitive Dust	--	--	--	--	58.27	17.08
Helicopter - Hughes 500		1.68	3.76	7.67	0.06	0.42	0.38
Total		6.91	26.69	48.41	0.12	60.72	19.35

KCAPCD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	4.16	15.84	32.93	0.04	1.66	1.52
	Onroad	1.17	8.09	7.64	0.02	0.39	0.36
	Fugitive Dust	--	--	--	--	65.22	20.60
Helicopter - Hughes 500		1.68	3.76	7.67	0.06	0.42	0.38
Total		7.01	27.68	48.24	0.12	67.68	22.87

Annual Emissions (lbs)

AVAQMD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	83.25	316.71	658.51	0.76	33.11	30.46
	Onroad	13.87	92.20	99.31	0.22	4.92	4.52
	Fugitive Dust	--	--	--	--	1,099.93	374.06
Helicopter - Hughes 500		8.38	18.78	38.34	0.32	2.09	1.92
Total		105.50	427.69	796.15	1.29	1,140.04	410.96

SCAQMD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	83.25	316.71	658.51	0.76	33.11	30.46
	Onroad	21.51	141.90	156.37	0.33	7.72	7.10
	Fugitive Dust	--	--	--	--	1,165.30	341.69
Helicopter - Hughes 500		8.38	18.78	38.34	0.32	2.09	1.92
Total		113.14	477.39	853.21	1.41	1,208.21	381.17

KCAPCD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	83.25	316.71	658.51	0.76	33.11	30.46
	Onroad	23.34	161.75	152.86	0.36	7.74	7.12
	Fugitive Dust	--	--	--	--	1,304.34	412.08
Helicopter - Hughes 500		8.38	18.78	38.34	0.32	2.09	1.92
Total		114.97	497.23	849.71	1.44	1,347.27	451.58

Annual Emissions (ton)

AVAQMD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	0.04	0.16	0.33	0.00	0.02	0.02
	Onroad	0.01	0.05	0.05	0.00	0.00	0.00
	Fugitive Dust	--	--	--	--	0.55	0.19
Helicopter - Hughes 500		0.00	0.01	0.02	0.00	0.00	0.00
Total		0.05	0.21	0.40	0.00	0.57	0.21

SCAQMD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	0.04	0.16	0.33	0.00	0.02	0.02
	Onroad	0.01	0.07	0.08	0.00	0.00	0.00
	Fugitive Dust	--	--	--	--	0.58	0.17
Helicopter - Hughes 500		0.00	0.01	0.02	0.00	0.00	0.00
Total		0.06	0.24	0.43	0.00	0.60	0.19

KCAPCD		VOC	CO	NOx	SOx	PM10	PM2.5
Road Construction	Offroad	0.04	0.16	0.33	0.00	0.02	0.02
	Onroad	0.01	0.08	0.08	0.00	0.00	0.00
	Fugitive Dust	--	--	--	--	0.65	0.21
Helicopter - Hughes 500		0.00	0.01	0.02	0.00	0.00	0.00
Total		0.06	0.25	0.42	0.00	0.67	0.23

GHG Emission Calculations

Alternative 2 - Proposed Project

Construction			Emission Factors			Emissions
		Fuel Use	CO_2	CH_4	N_2O	CO_2-eq
		gallons	kg/gal	kg/gal	kg/gal	tonnes
Offroad	Diesel	1,238,195	10.15	0.0014	0.0001	12,642
	Gasoline		8.81	0.0013	0.0001	0
	Jet A	709,571	9.57	0.0014	0.0001	6,833
Onroad	Passenger	623,964	8.55	0.0014	0.002	5,740
	Delivery	334,168	9.96	0.00072	0.0006	3,396
	HHDT	439,274	9.96	0.000312	0.00026	4,413
					Total	**33,025**

Construction	SF_6 losses	CO_2-eq
	lbs	tonnes
Elect. Eq.	1992.5	21,597

797 lbs/year final leakage rate with 5 years at 50%

Total **54,622 tonnes, CO_2-eq**

Operation			Emission Factors			Emissions
		Fuel Use	CO_2	CH_4	N_2O	CO_2-eq
		gallons	kg/gal	kg/gal	kg/gal	tonnes
Offroad	Diesel	6,213	10.15	0.0014	0.0001	63
	Gasoline		8.81	0.0013	0.0001	0
	Jet A	787	9.57	0.0014	0.0001	8
Onroad	Passenger	641	8.55	0.0014	0.002	6
	Delivery	210	9.96	0.00072	0.0006	2
	HHDT	729	9.96	0.000312	0.00026	7
					Total	**86**

Construction	SF_6 losses	CO_2-eq
	lbs	tonnes
Elect. Eq.	797	8,639

Total **8,725 tonnes, CO_2-eq**

Indirect GHG Emission Reductions from Wind/Solar Energy in SCE Territory

613 SCE Service Area Average GHG emissions lbs/MWh
12 Wind/Solar Energy (maintenance) GHG emissions lbs/MWh (based on Beacon Solar Project)

TRTP Renewable Capacity
3800 MW

Renewable Annual Capacity Factor
35 Percent

* Note: e-mail noted 35 percent but used 30 percent

Net Renewable Energy MWh/yr
11650800

GHG Emissions CO2eq Metric Tons/Year
3175570

<u>Assumption</u>
Renewable Energy Connected to TRTP is primarily Wind but will also include Solar

TRTP Alternative 3 Project Construction Emission Totals
AVAQMD Jurisdiction

Worst-Case Day
Same as Alternative 2

Incremental Annual Emissions

2009 Emissions
Same as Alternative 2

2010 Emissions - would be reduced by following;

	Emissions (ton/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0085	-0.0605	-0.0527	-0.0001	-0.0024	-0.0020
Offroad Vehicles/Equipm	-0.0114	-0.0385	-0.0744	-0.0001	-0.0046	-0.0042
Helicopter	-0.0005	-0.0011	-0.0023	0.0000	-0.0001	-0.0001
Fugitive Dust	--	--	--	--	-0.16	-0.04
Totals	-0.02	-0.10	-0.13	0.00	-0.17	-0.04

2011 Emissions
Same as Alternative 2

2012 Emissions
Same as Alternative 2

2013 Emissions
Same as Alternative 2

2014 Emissions
Same as Alternative 2

Note: This alternative does not significantly impact the SCAQMD, KCAPCD, or the ANF.

TRTP Alternative 4.C. Project Construction Emission Totals
SCAQMD Juridiction

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	-0.01	-0.02	0.00	0.00	0.00
Offroad Vehicles/Equipment	-0.11	-0.37	-0.76	0.00	-0.04	-0.04
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-0.18	-0.06
Totals	**-0.11**	**-0.38**	**-0.78**	**0.00**	**-0.22**	**-0.10**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.46	-3.19	-3.09	-0.01	-0.14	-0.12
Offroad Vehicles/Equipment	-0.89	-3.05	-5.60	-0.01	-0.36	-0.33
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	--	--	--	--	-4.61	-1.12
Totals	**-1.35**	**-6.23**	**-8.69**	**-0.01**	**-5.11**	**-1.57**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.76	5.36	5.55	0.01	0.23	0.19
Offroad Vehicles/Equipment	1.28	4.77	11.63	0.01	0.53	0.49
Helicopter	-0.019	-0.042	-0.086	-0.001	-0.005	-0.004
Fugitive Dust	--	--	--	--	10.53	2.47
Totals	**2.02**	**10.08**	**17.09**	**0.02**	**11.28**	**3.15**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.20	1.51	1.13	0.00	0.05	0.04
Offroad Vehicles/Equipment	0.61	2.30	4.03	0.00	0.24	0.22
Helicopter	-0.017	-0.038	-0.077	-0.001	-0.004	-0.004
Fugitive Dust	--	--	--	--	2.93	0.58
Totals	**0.80**	**3.77**	**5.09**	**0.01**	**3.22**	**0.84**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Offroad Vehicles/Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	0.00	0.00
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

TRTP Alternative 4.A. Project Construction Emission Totals
SCAQMD Juridiction

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	-0.01	-0.02	0.00	0.00	0.00
Offroad Vehicles/Equipment	-0.11	-0.37	-0.76	0.00	-0.04	-0.04
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-0.18	-0.06
Totals	**-0.11**	**-0.38**	**-0.78**	**0.00**	**-0.22**	**-0.10**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.46	-3.19	-3.09	-0.01	-0.14	-0.12
Offroad Vehicles/Equipment	-0.89	-3.05	-5.60	-0.01	-0.36	-0.33
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-4.61	-1.12
Totals	**-1.35**	**-6.23**	**-8.69**	**-0.01**	**-5.11**	**-1.57**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.42	2.85	3.53	0.00	0.14	0.12
Offroad Vehicles/Equipment	0.49	1.70	5.26	0.01	0.18	0.17
Helicopter	-0.047	-0.105	-0.215	-0.002	-0.012	-0.011
Fugitive Dust	--	--	--	--	2.22	1.12
Totals	**0.87**	**4.45**	**8.58**	**0.01**	**2.53**	**1.39**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.02	1.78	1.27	0.00	0.06	0.05
Offroad Vehicles/Equipment	0.33	2.11	3.81	0.00	0.22	0.20
Helicopter	-0.064	-0.143	-0.291	-0.002	-0.016	-0.01
Fugitive Dust	--	--	--	--	-0.15	-0.03
Totals	**0.29**	**3.75**	**4.79**	**0.01**	**0.12**	**0.20**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Offroad Vehicles/Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	0.00	0.00
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

TRTP Alternative 4.B. Project Construction Emission Totals
SCAQMD Juridiction

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	-0.01	-0.02	0.00	0.00	0.00
Offroad Vehicles/Equipment	-0.11	-0.37	-0.76	0.00	-0.04	-0.04
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-0.18	-0.06
Totals	**-0.11**	**-0.38**	**-0.78**	**0.00**	**-0.22**	**-0.10**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.46	-3.19	-3.09	-0.01	-0.14	-0.12
Offroad Vehicles/Equipment	-0.89	-3.05	-5.60	-0.01	-0.36	-0.33
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-4.61	-1.12
Totals	**-1.35**	**-6.23**	**-8.69**	**-0.01**	**-5.11**	**-1.57**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.58	4.04	4.49	0.01	0.18	0.15
Offroad Vehicles/Equipment	0.86	3.16	8.29	0.01	0.35	0.32
Helicopter	-0.034	-0.075	-0.154	-0.001	-0.008	-0.008
Fugitive Dust	--	--	--	--	5.75	1.38
Totals	**1.42**	**7.12**	**12.62**	**0.02**	**6.27**	**1.85**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.11	0.85	0.51	0.00	0.03	0.02
Offroad Vehicles/Equipment	0.47	1.72	3.06	0.00	0.18	0.16
Helicopter	-0.041	-0.093	-0.189	-0.002	-0.010	-0.009
Fugitive Dust	--	--	--	--	1.31	0.26
Totals	**0.53**	**2.48**	**3.39**	**0.00**	**1.51**	**0.43**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Offroad Vehicles/Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	0.00	0.00
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

TRTP Alternative 4.D. Project Construction Emission Totals
SCAQMD Juridiction

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	-0.01	-0.02	0.00	0.00	0.00
Offroad Vehicles/Equipment	-0.11	-0.37	-0.76	0.00	-0.04	-0.04
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-0.18	-0.06
Totals	**-0.11**	**-0.38**	**-0.78**	**0.00**	**-0.22**	**-0.10**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.46	-3.19	-3.09	-0.01	-0.14	-0.12
Offroad Vehicles/Equipment	-0.89	-3.05	-5.60	-0.01	-0.36	-0.33
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-4.61	-1.12
Totals	**-1.35**	**-6.23**	**-8.69**	**-0.01**	**-5.11**	**-1.57**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.67	4.67	4.99	0.01	0.20	0.17
Offroad Vehicles/Equipment	1.06	3.93	9.88	0.01	0.43	0.40
Helicopter	-0.027	-0.059	-0.121	-0.001	-0.007	-0.006
Fugitive Dust	--	--	--	--	8.02	1.90
Totals	**1.70**	**8.53**	**14.75**	**0.02**	**8.65**	**2.47**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.15	1.16	0.81	0.00	0.04	0.03
Offroad Vehicles/Equipment	0.54	2.00	3.52	0.00	0.21	0.19
Helicopter	-0.030	-0.066	-0.136	-0.001	-0.007	-0.007
Fugitive Dust	--	--	--	--	2.08	0.41
Totals	**0.66**	**3.09**	**4.20**	**0.01**	**2.32**	**0.63**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Offroad Vehicles/Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	0.00	0.00
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

TRTP Alternative 4.C Modified . Project Construction Emission Totals SCAQMD Juridiction

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	-0.01	-0.02	0.00	0.00	0.00
Offroad Vehicles/Equipment	-0.11	-0.37	-0.76	0.00	-0.04	-0.04
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-0.18	-0.06
Totals	**-0.11**	**-0.38**	**-0.78**	**0.00**	**-0.22**	**-0.10**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.46	-3.19	-3.09	-0.01	-0.14	-0.12
Offroad Vehicles/Equipment	-0.89	-3.05	-5.60	-0.01	-0.36	-0.33
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	-4.61	-1.12
Totals	**-1.35**	**-6.23**	**-8.69**	**-0.01**	**-5.11**	**-1.57**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.37	16.61	18.35	0.03	0.70	0.59
Offroad Vehicles/Equipment	1.06	3.93	9.88	0.01	0.43	0.40
Helicopter	-0.03	-0.06	-0.12	0.00	-0.01	-0.01
Fugitive Dust	--	--	--	--	13.90	2.68
Totals	**3.41**	**20.48**	**28.11**	**0.04**	**15.03**	**3.67**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.15	1.16	0.81	0.00	0.04	0.03
Offroad Vehicles/Equipment	0.54	2.00	3.52	0.00	0.21	0.19
Helicopter	-0.03	-0.07	-0.14	0.00	-0.01	-0.01
Fugitive Dust	--	--	--	--	2.08	0.41
Totals	**0.66**	**3.09**	**4.20**	**0.01**	**2.32**	**0.63**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Offroad Vehicles/Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	--	--	--	--	0.00	0.00
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

Alternative 4C Schedule

Major Elements
 # Days in Full Month (6 days/week)
Onsite Construction Elements Begin in 2009

Segment 8	Crew Size	Total Days	Start Date	End Date	Employee Vehicel no. of vehicle	Paved	Unpaved	Total VMT/day	Delivery Truck no. of vehicle	Paved	Unpaved	Total VMT/day	Heavy Heavy Duty Truck no. of vehicle	Paved	Unpaved	Total VMT/day
Marshalling Yards, -5 & +5 other elements	4	**282**	**1-May-11**	**5-Apr-12**	4	40	0.10	160.40	1	40	0.10	40.10	1	90	0.10	90.10
Road Maintenance	2	**253**	**1-Jun-11**	**31-Mar-12**	2	40	0.10	80.20	1	40	3.00	43.00	0	60	3.00	0.00
500 kV T/L Construction	**Crew Size**															
Road Construction	8	**60**	**1-May-11**	**12-Jul-11**	8	40	0.10	320.80	2	40	3.00	86.00	3	40	3.00	129.00
Foundation Construction	24	**85**	**16-May-11**	**23-Aug-11**	24	40	0.10	962.40	8	40	3.00	344.00	7	40	3.00	301.00
Tower Construction	48	**175**	**16-Jun-11**	**13-Jan-12**	48	40	0.10	1924.80	14	40	3.00	602.00	3	40	3.00	129.00
String Cable	40	**120**	**5-Nov-11**	**31-Mar-12**	40	40	0.10	1604.00	15	40	3.00	645.00	6	40	3.00	258.00
Restoration/Guard Poles	7	**75**	**7-Jan-12**	**5-Apr-12**	7	40	0.10	280.70	3	40	3.00	129.00	3	40	3.00	129.00
IT/Communications	6	**20**	**6-Apr-12**	**29-Apr-12**	6	40	0.10	240.60	1	40	3.00	43.00	0	40	3.00	0.00
230 kV Wreckout	26	**65**	**20-Jan-12**	**5-Apr-12**	26	40	0.10	1042.60	12	40	0.50	486.00	10	40	0.50	405.00
New Switchyard																
Grading Element	15	**111**	**1-May-11**	**10-Sep-11**	15	40	0.25	603.75	81	40	0.25	3260.25	3	40	0.25	120.75
Civil Element	25	**138**	**5-Aug-11**	**20-Jan-12**	25	40	0.25	1006.25	6	40	0.25	241.5	4	90	0.25	361
Electrical Element	25	**166**	**5-Dec-11**	**20-Jun-12**	25	40	0.10	1002.5	6	40	0.1	240.6	0	40	0.1	0
Testing	4	**14**	**19-Apr-12**	**4-May-12**	4	40	0.10	160.4	0	40	0.1	0	0	40	0.1	0

Assumptions/Notes

No incremental change in construction of marshalling yards for Segment 8 as a whole.

New switchyard estimate, not provided by SCE, is based partially on Whirlwind Substation estimate assuming more per acre grading required at the switchyard site and assuming no transformer element assumed for a switchyard and total construction duration of one year.

Crew sizes and equipment for various constrution elements have been made consistent with those assumed for the proposed project.

Many of the SCE durations are inconsistently long in comparison to other segment/subsegment construction assumptions and may overestimate the construction requirements for the T-Line construction.

Marshalling Yard duration increased to account for 6 day/week construction schedule and otherwise fill schedule during other elements

Alternative 4C Schedule

Major Elements	PAVED						UNPAVED						TOTAL					
# Days in Full Month (6 days/week)	**2011**			**2012**			**2011**			**2012**			**2011**			**2012**		
Onsite Construction Elements Begin in 2009																		
Segment 8	**Employ Vehicle**	**Delivery Truck**	**HHDT**	**Employ Vehicle**	**Delivery Truck**	**HHDT**	**Employ Vehicle**	**Delivery Truck**	**HHDT**	**Employ Vehicle**	**Delivery Truck**	**HHDT**	**Employ Vehicle**	**Delivery Truck**	**HHDT**	**Employ Vehicle**	**Delivery Truck**	**HHDT**
Marshalling Yards, -5 & +5 other elements	32480	8120	18270	12640	3160	7110	81.20	20.30	20.30	31.60	7.90	7.90	32561.20	8140.30	18290.30	12671.60	3167.90	7117.90
Road Maintenance	14240	7120	0	6000	3000	0	35.60	534.00	0.00	15.00	225.00	0.00	14275.60	7654.00	0.00	6015.00	3225.00	0.00
500 kV T/L Construction																		
Road Construction	19200	4800	7200	0	0	0	48	360	540	0	0	0	19248	5160	7740	0	0	0
Foundation Construction	81600	27200	23800	0	0	0	204	2040	1785	0	0	0	81804	29240	25585	0	0	0
Tower Construction	316800	92400	19800	19200	5600	1200	792	6930	1485	48	420	90	317592	99330	21285	19248	6020	1290
String Cable	72000	27000	10800	120000	45000	18000	180	2025	810	300	3375	1350	72180	29025	11610	120300	48375	19350
Restoration/Guard Poles	0	0	0	21000	9000	9000	0	0	0	53	675	675	0	0	0	21053	9675	9675
IT/Communications	0	0	0	4800	800	0	0	0	0	12	60	0	0	0	0	4812	860	0
230 kV Wreckout	0	0	0	67600	31200	26000	0	0	0	169	390	325	0	0	0	67769	31590	26325
New Switchyard																		
Grading Element	66600	359640	13320	0	0	0	416	2248	83	0	0	0	67016	361888	13403	0	0	0
Civil Element	123000	29520	44280	15000	3600	5400	769	185	123	94	23	15	123769	29705	44403	15094	3623	5415
Electrical Element	23000	5520	0	143000	34320	0	58	14	0	358	86	0	23058	5534	0	143358	34406	0
Testing	0	0	0	2240	0	0	0	0	0	6	0	0	0	0	0	2246	0	0
	748920	561320	137470	411480	135680	66710	2583.3	14355.4	4846.55	1084.95	5261.2	2462.9	751503.3	575675	142317	412565	140941	69172.9

Alternative 4 C

Onroad Equipment Maximum Daily Emissions

Segment 8

			Emissions lbs/year-2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	751,503	640.53	6,209.49	634.72	8.10	66.73	42.48
	Delivery	575,675	1,392.38	9,747.58	10,899.64	15.70	403.53	343.57
	Heavy-Heavy Duty	142,317	397.84	1,583.22	4,918.19	5.65	236.37	205.63
		Totals	2,430.74	17,540.29	16,452.55	29.45	706.63	591.68
		Tons/year	1.22	8.77	8.23	0.01	0.35	0.30

			Emissions lbs/day-2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	412,565	328.52	3,158.08	320.08	4.43	37.04	23.72
	Delivery	140,941	315.39	2,178.59	2,441.70	3.76	91.58	77.45
	Heavy-Heavy Duty	69,173	174.84	706.61	2,139.09	2.80	103.46	89.48
		Totals	818.75	6,043.28	4,900.87	10.98	232.08	190.65
		Tons/year	0.41	3.02	2.45	0.01	0.12	0.10

Swtichyard construction only

			Emissions lbs/year-2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	213,843	182.26	1,766.93	180.61	2.30	18.99	12.09
	Delivery	397,126	960.52	6,724.31	7,519.05	10.83	278.37	237.01
	Heavy-Heavy Duty	57,806	161.59	643.07	1,997.67	2.30	96.01	83.52
		Totals	1,304.38	9,134.31	9,697.34	15.43	393.37	332.62
		Tons/year	0.65	4.57	4.85	0.01	0.20	0.17

			Emissions lbs/day-2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	160,697	127.96	1,230.09	124.67	1.72	14.43	9.24
	Delivery	38,028	85.10	587.82	658.81	1.01	24.71	20.90
	Heavy-Heavy Duty	5,415	13.69	55.32	167.45	0.22	8.10	7.00
		Totals	226.74	1,873.23	950.94	2.96	47.24	37.14
		Tons/year	0.11	0.94	0.48	0.00	0.02	0.02

500 kV Line Addition

			Emissions lbs/year-2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	537,661	458.27	4,442.56	454.11	5.79	47.74	30.39
	Delivery	178,549	431.85	3,023.27	3,380.59	4.87	125.16	106.56
	Heavy-Heavy Duty	84,510	236.24	940.15	2,920.51	3.36	140.36	122.11
		Totals	1,126.36	8,405.98	6,755.22	14.02	313.26	259.06
		Tons/year	0.56	4.20	3.38	0.01	0.16	0.13

			Emissions lbs/day-2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	251,868	200.56	1,927.99	195.41	2.70	22.62	14.48
	Delivery	102,913	230.29	1,590.77	1,782.89	2.74	66.87	56.55
	Heavy-Heavy Duty	63,758	161.16	651.30	1,971.64	2.58	95.36	82.47
		Totals	592.01	4,170.05	3,949.93	8.02	184.84	153.51
		Tons/year	0.30	2.09	1.97	0.00	0.09	0.08

Alt. 4 C - Offroad Equipment Emission Calculations

2011 Emission Calculations

Marshalling Yards

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1112	0.4431	0.7838	0.0008	0.0535	69.3640	3	0.28	1.11	1.96	0.00	0.13	173.41	203	56.44	224.89	397.79	0.40	27.16	35,202
Forklift, 5 ton	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	20.5837	5	0.29	0.96	1.07	0.00	0.10	102.92	203	58.09	194.56	216.58	0.26	21.07	20,892
Forklift, 10 ton	85	1	0.0566	0.1984	0.2384	0.0003	0.0231	22.9484	5	0.28	0.99	1.19	0.00	0.12	114.74	203	57.47	201.36	242.03	0.28	23.43	23,293
										0.85	3.06	4.22	0.00	0.35	391.07		172.01	620.81	856.40	0.94	71.65	79,387

Road Maintenance

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	92.7673	2	0.30	1.22	2.04	0.00	0.16	185.53	178	54.14	218.04	362.93	0.38	27.79	33,025
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	127.1803	2	0.37	1.45	2.91	0.00	0.16	254.36	178	66.27	258.62	518.59	0.51	28.69	45,276
										0.68	2.68	4.95	0.00	0.32	439.90		120.41	476.65	881.52	0.89	56.48	78,301

Roads & Landing Work

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Crawler, Track Type, w/ blade (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	186.6131	8	3.41	10.71	31.71	0.03	1.26	2985.81	60	204.78	642.60	1902.83	1.94	75.79	179,149
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	127.1803	8	1.49	5.81	11.65	0.01	0.64	1017.44	60	89.36	348.69	699.23	0.69	38.68	61,047
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	41.0376	3	0.59	2.10	2.51	0.00	0.23	246.23	60	35.28	126.18	150.44	0.18	13.81	14,774
Excavator, Grade - All	165	2	0.1359	0.6430	0.9906	0.0012	0.0644	105.2037	8	2.17	10.29	15.85	0.02	1.03	1683.26	60	130.45	617.28	950.97	1.14	61.86	100,996
Motor Grader	140	1	0.1521	0.6125	1.0195	0.0011	0.0781	92.7673	5	0.76	3.06	5.10	0.01	0.39	463.84	60	45.62	183.74	305.84	0.32	23.42	27,830
										8.42	31.97	66.82	0.07	3.56	6396.57		505.48	1918.50	4009.30	4.27	213.55	383,794

Install Foundations

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1862	0.7264	1.4567	0.0014	0.0806	127.1803	3	0.56	2.18	4.37	0.00	0.24	381.54	85	47.47	185.24	371.46	0.36	20.55	32,431
Crawler, track type, drill dig, Pheumatic D8	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	186.6131	8	1.71	5.36	15.86	0.02	0.63	1492.91	85	145.05	455.18	1347.83	1.37	53.68	126,897
Generator, Concrete Batch Plant	50	1	0.1043	0.2826	0.3020	0.0004	0.0270	30.6230	6	0.63	1.70	1.81	0.00	0.16	183.74	85	53.19	144.14	154.04	0.20	13.78	15,618
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	41.0376	4	0.78	2.80	3.34	0.00	0.31	328.30	85	66.63	238.35	284.16	0.34	26.08	27,906
Motor, Auxilary Power	5	2	0.0055	0.0237	0.0370	0.0001	0.0022	3.4026	2	0.02	0.09	0.15	0.00	0.01	13.61	85	1.86	8.07	12.58	0.02	0.74	1,157
Excavator, Grade - All	165	1	0.1359	0.6430	0.9906	0.0012	0.0644	105.2037	4	0.54	2.57	3.96	0.00	0.26	420.81	85	46.20	218.62	336.80	0.40	21.91	35,769
										4.24	14.70	29.49	0.03	1.61	2820.91		360.41	1249.60	2506.88	2.70	136.73	239,777

Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Crane, Hydraulic, 150/300 Ton	450	1	0.1615	0.6498	1.0628	0.0012	0.0691	107.8679	8	1.29	5.20	8.50	0.01	0.55	862.94	165	213.14	857.74	1402.89	1.61	91.15	142,386
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4200	0.4951	0.0006	0.0475	46.1118	8	2.67	10.08	11.88	0.01	1.14	1106.68	165	440.43	1663.03	1960.62	2.23	187.94	182,603
Compressor, Air	75	5	0.1044	0.4421	1.3511	0.0015	0.0508	139.3358	7.5	3.92	16.58	50.66	0.05	1.90	5225.09	165	646.25	2735.25	8359.63	9.06	314.10	862,141
Motor, Auxilary Power	5	2	0.0055	0.1917	0.2134	0.0003	0.0208	20.5837	2	0.02	0.77	0.85	0.00	0.08	82.33	165	3.62	126.51	140.83	0.17	13.70	13,585
										7.90	32.62	71.90	0.08	3.68	7277.06		1303.44	5382.53	11863.97	13.07	606.89	1,200,714

Conductor & OHGW Installation

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0980	0.3505	0.4179	0.0005	0.0383	41.0376	3	0.29	1.05	1.25	0.00	0.12	123.11	45	13.23	47.32	56.41	0.07	5.18	5,540
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1112	0.4431	0.7838	0.0008	0.0535	69.3640	3	1.00	3.99	7.05	0.01	0.48	624.28	45	45.04	179.47	317.45	0.32	21.67	28,092
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2133	0.6694	1.9821	0.0020	0.0789	186.6131	2	0.43	1.34	3.96	0.00	0.16	373.23	45	19.20	60.24	178.39	0.18	7.11	16,795
Crawler, Track Type, Sagging (D8 type)	305	2	0.2133	0.6694	1.9821	0.0020	0.0789	186.6131	2	0.85	2.68	7.93	0.01	0.32	746.45	45	38.40	120.49	356.78	0.36	14.21	33,590
Motor, Auxilary Power	5	4	0.0055	0.0237	0.0370	0.0001	0.0022	3.4026	2	0.04	0.19	0.30	0.00	0.02	27.22	45	1.97	8.55	13.32	0.02	0.78	1,225
Tension machine, conductor	135	2	0.1176	0.5510	0.8413	0.0010	0.0645	87.8561	3	0.71	3.31	5.05	0.01	0.39	527.14	45	31.75	148.76	227.14	0.27	17.42	23,721
Tension machine, static	135	1	0.1176	0.5510	0.8413	0.0010	0.0645	87.8561	2	0.24	1.10	1.68	0.00	0.13	175.71	45	10.58	49.59	75.71	0.09	5.81	7,907
										3.56	13.65	27.23	0.03	1.60	2597.14		160.17	614.42	1225.20	1.32	72.17	116,871

New Switchyard Construction

Grading Element

Segment 8 - New Switchyard			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
980 Loader	318	3	0.1586	0.4870	1.5801	0.0019	0.0575	172.9213	8	3.81	11.69	37.92	0.04	1.38	4150.11	111	422.55	1297.49	4209.26	4.94	153.19	460,662
Grader	285	2	0.1718	0.5036	1.7014	0.0020	0.0622	180.1452	8	2.75	8.06	27.22	0.03	0.99	2882.32	111	305.07	894.45	3021.71	3.52	110.41	319,938
Compactor	80	2	0.1161	0.3533	0.4553	0.0005	0.0421	40.1284	6	1.39	4.24	5.46	0.01	0.51	481.54	111	154.60	470.56	606.44	0.65	56.06	53,451
										7.95	23.99	70.61	0.08	2.88	7513.97		882.22	2662.50	7837.42	9.11	319.65	834,051

Civil Element

Segment 8 - New Switchyard			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
14 ton Crane	180	1	0.1150	0.4752	0.8960	0.0009	0.0509	82.4655	4	0.46	1.90	3.58	0.00	0.20	329.86	123	56.59	233.80	440.82	0.46	25.03	40,573
Driller	305	2	0.1008	0.3906	1.1181	0.0023	0.0366	215.2074	8	1.61	6.25	17.89	0.04	0.59	3443.32	123	198.36	768.73	2200.39	4.57	72.12	423,528
Ditch Digger	75	2	0.1633	0.4453	0.5397	0.0005	0.0517	44.3383	6	1.96	5.34	6.48	0.01	0.62	532.06	123	241.08	657.32	796.55	0.81	76.27	65,443
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	20.5837	4	0.23	0.77	0.85	0.00	0.08	82.33	123	28.16	94.31	104.98	0.12	10.21	10,127
Tractors	85	2	0.0980	0.3505	0.4179	0.0005	0.0383	41.0376	6	1.18	4.21	5.01	0.01	0.46	492.45	123	144.64	517.35	616.80	0.74	56.60	60,571
										5.44	18.47	33.82	0.05	1.95	4880.03		668.83	2271.52	4159.54	6.70	240.23	600,243

Electrical Element

Segment 8 - New Switchyard			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
14 ton Crane	180	2	0.1150	0.4752	0.8960	0.0009	0.0509	82.4655	6	1.38	5.70	10.75	0.01	0.61	989.59	23	31.75	131.15	247.29	0.26	14.04	22,760
Crane, Hydraulic, 150 Ton (150 ton crane)	350	2	0.1393	0.4421	1.3511	0.0015	0.0508	139.3358	6	1.67	5.30	16.21	0.02	0.61	1672.03	23	38.44	122.01	372.89	0.40	14.01	38,457
Forklift	75	1	0.0572	0.1917	0.2134	0.0003	0.0208	20.5837	6	0.34	1.15	1.28	0.00	0.12	123.50	23	7.90	26.45	29.45	0.03	2.86	2,841
Manlifts	75	4	0.0572	0.1917	0.2134	0.0003	0.0208	20.5837	6	1.37	4.60	5.12	0.01	0.50	494.01	23	31.59	105.81	117.79	0.14	11.46	11,362
										4.77	16.76	33.37	0.04	1.84	3279.13		109.68	385.43	767.41	0.83	42.37	75,420

2012 Emission Calculations

Marshalling Yards

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.1050	0.4406	0.7381	0.0008	0.0499	69.3640	3	0.26	1.10	1.85	0.00	0.12	173.41	79	20.73	87.02	145.77	0.16	9.86	13,699
Forklift, 5 ton	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	20.5837	5	0.25	0.93	1.02	0.00	0.09	102.92	79	19.94	73.69	80.34	0.10	7.37	8,131
Forklift, 10 ton	85	1	0.0501	0.1939	0.2252	0.0003	0.0207	22.9484	5	0.25	0.97	1.13	0.00	0.10	114.74	79	19.80	76.59	88.97	0.11	8.16	9,065
										0.77	3.00	3.99	0.00	0.32	391.07		60.48	237.30	315.08	0.37	25.39	30,895

Road Maintenance

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	92.7673	2	0.28	1.22	1.91	0.00	0.14	185.53	75	21.34	91.28	143.57	0.16	10.82	13,915
Crawler, Track Type, w/ blade (D6 Type)	185	1	0.1771	0.7189	1.3752	0.0014	0.0752	127.1802	2	0.35	1.44	2.75	0.00	0.15	254.36	75	26.57	107.83	206.27	0.21	11.28	19,077
										0.64	2.65	4.66	0.00	0.29	439.90		47.91	199.11	349.84	0.37	22.10	32,992

Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Crane, Hydraulic, 150/300 Ton	450	1	0.1529	0.5173	1.4404	0.0017	0.0534	166.5128	8	1.22	4.14	11.52	0.01	0.43	1332.10	10	12.23	41.39	115.23	0.13	4.28	13,321
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	69.3640	8	2.52	10.57	17.71	0.02	1.20	1664.74	10	25.19	105.75	177.14	0.19	11.98	16,647
Compressor, Air	75	5	0.0967	0.2875	0.3390	0.0004	0.0329	31.0852	7.5	3.63	10.78	12.71	0.01	1.23	1165.69	10	36.28	107.81	127.11	0.14	12.35	11,657
Motor, Auxilary Power	5	2	0.0052	0.0233	0.0354	0.0001	0.0020	3.4026	2	0.02	0.09	0.14	0.00	0.01	13.61	10	0.21	0.93	1.42	0.00	0.08	136
										7.39	25.59	42.09	0.05	2.87	4176.14		73.91	255.87	420.90	0.47	28.68	41,761

Conductor & OHGW Installation

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	41.0376	3	0.26	1.03	1.19	0.00	0.10	123.11	75	19.87	77.20	89.33	0.11	7.86	9,233
Crane, Hydraulic, Rough Terrain 35 ton	155	3	0.1050	0.4406	0.7381	0.0008	0.0499	69.3640	3	0.94	3.97	6.64	0.01	0.45	624.28	75	70.86	297.41	498.22	0.53	33.68	46,821
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	186.6131	2	0.41	1.26	3.71	0.00	0.15	373.23	75	30.47	94.84	278.33	0.30	10.92	27,992
Crawler, Track Type, Sagging (D8 type)	305	2	0.2031	0.6323	1.8555	0.0020	0.0728	186.6131	2	0.81	2.53	7.42	0.01	0.29	746.45	75	60.94	189.69	556.66	0.61	21.84	55,984
Motor, Auxilary Power	5	4	0.0052	0.0233	0.0354	0.0001	0.0020	3.4026	2	0.04	0.19	0.28	0.00	0.02	27.22	75	3.13	13.96	21.26	0.03	1.23	2,042
Tension machine, conductor	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	87.8561	3	0.65	3.28	4.70	0.01	0.35	527.14	75	48.50	246.28	352.28	0.46	26.46	39,535
Tension machine, static	135	1	0.1078	0.5473	0.7829	0.0010	0.0588	87.8561	2	0.22	1.09	1.57	0.00	0.12	175.71	75	16.17	82.09	117.43	0.15	8.82	13,178
										3.33	13.35	25.51	0.03	1.48	2597.14		249.94	1001.48	1913.51	2.19	110.80	194,785

Restoration & Guard Poles

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Backhoe	85	1	0.0883	0.3431	0.3970	0.0005	0.0349	41.0376	5	0.44	1.72	1.99	0.00	0.17	205.19	75	33.11	128.66	148.89	0.19	13.10	15,389
Motor Grader	140	1	0.1423	0.6085	0.9571	0.0011	0.0721	92.7673	8	1.14	4.87	7.66	0.01	0.58	742.14	75	85.38	365.11	574.26	0.64	43.26	55,660
										1.58	6.58	9.64	0.01	0.75	947.33		118.49	493.77	723.15	0.83	56.36	71,049

Wreck-Out (conductors, structures, & Foundations)

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
Tension Machine, Conductor or Static	135	2	0.1078	0.5473	0.7829	0.0010	0.0588	87.8561	3	0.65	3.28	4.70	0.01	0.35	527.14	65	42.04	213.44	305.31	0.40	22.93	34,264
Crawler, Track Type, w/ blade (D8 type)	305	1	0.2031	0.6323	1.8555	0.0020	0.0728	186.6131	8	1.62	5.06	14.84	0.02	0.58	1492.90	65	105.62	328.79	964.88	1.05	37.85	97,039
Backhoe w/ Bucket; backhoe w/ concrete hammer	85	4	0.0883	0.3431	0.3970	0.0005	0.0349	41.0376	8	2.83	10.98	12.70	0.02	1.12	1313.20	65	183.66	713.63	825.82	1.04	72.67	85,358
Crane, Hydraulic, Rough Terrain 35 ton	155	2	0.1050	0.4406	0.7381	0.0008	0.0499	69.3640	4	0.84	3.52	5.90	0.01	0.40	554.91	65	54.59	229.12	383.81	0.41	25.95	36,069
Motor, Auxilary Power	5	3	0.0052	0.0233	0.0354	0.0001	0.0020	3.4026	2	0.03	0.14	0.21	0.00	0.01	20.42	65	2.04	9.08	13.82	0.02	0.80	1,327
										5.97	22.99	38.36	0.04	2.46	3908.57		387.95	1494.06	2493.64	2.92	160.19	254,057

New Switchyard Construction

Civil Element

Segment 8 - New Switchyard			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
14 ton Crane	180	1	0.1089	0.4722	0.8423	0.0009	0.0473	82.4655	4	0.44	1.89	3.37	0.00	0.19	329.86	15	6.54	28.33	50.54	0.06	2.84	4,948
Driller	305	2	0.0951	0.3895	0.9697	0.0023	0.0305	215.2073	8	1.52	6.23	15.51	0.04	0.49	3443.32	15	22.83	93.47	232.72	0.56	7.33	51,650
Ditch Digger	75	2	0.1548	0.4374	0.5222	0.0005	0.0493	44.3383	6	1.86	5.25	6.27	0.01	0.59	532.06	15	27.86	78.74	94.00	0.10	8.88	7,981
Forklift	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	20.5837	4	0.20	0.75	0.81	0.00	0.07	82.33	15	3.03	11.19	12.20	0.02	1.12	1,235
Tractors	85	2	0.0883	0.3431	0.3970	0.0005	0.0349	41.0376	6	1.06	4.12	4.76	0.01	0.42	492.45	51	54.04	209.97	242.98	0.31	21.38	25,115
										5.08	18.23	30.73	0.05	1.76	4880.02		114.30	421.71	632.44	1.03	41.55	90,929

Electrical Element

Segment 8 Alt 4C			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs							Annual Emissions lbs					
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	CO2	Days	ROG	CO	NOX	SOX	PM	CO2
14 ton Crane	180	2	0.1089	0.4722	0.8423	0.0009	0.0473	82.4655	6	1.31	5.67	10.11	0.01	0.57	989.59	143	186.95	810.34	1445.34	1.59	81.24	141,511
Crane, Hydraulic, 150 Ton (150 ton crane)	350	2	0.1316	0.4138	1.2558	0.0015	0.0461	139.3358	6	1.58	4.97	15.07	0.02	0.55	1672.03	143	225.78	710.10	2154.97	2.51	79.17	239,100
Forklift	75	1	0.0505	0.1866	0.2034	0.0003	0.0187	20.5837	6	0.30	1.12	1.22	0.00	0.11	123.50	143	43.31	160.07	174.51	0.22	16.01	17,661
Manlifts	75	4	0.0505	0.1866	0.2034	0.0003	0.0187	20.5837	6	1.21	4.48	4.88	0.01	0.45	494.01	143	173.26	640.28	698.03	0.87	64.05	70,643
										4.40	16.23	31.28	0.04	1.68	3279.13		629.31	2320.79	4472.84	5.19	240.48	468,915

Total

	Project Emissions					
	ROG	CO	NOX	SOX	PM	CO2
Total	2.98	11.00	22.71	0.03	1.22	2396.97
2011	2.14	7.79	17.05	0.02	0.88	1804.28
2012	0.84	3.21	5.66	0.01	0.34	592.69

Switchyard

	Project Emissions					
	ROG	CO	NOX	SOX	PM	CO2
Total	1.20	4.03	8.93	0.01	0.44	1034.78
2011	0.83	2.66	6.38	0.01	0.30	754.86
2012	0.37	1.37	2.55	0.00	0.14	279.92

Addition

	Project Emissions					
	ROG	CO	NOX	SOX	PM	CO2
Total	1.78	6.97	13.78	0.02	0.78	1362.19
2011	1.31	5.13	10.67	0.01	0.58	1049.42
2012	0.47	1.84	3.11	0.00	0.20	312.77

Alternative 4C
Helicopter Emissions

2011

Approach/Climbout	Hours/day	Days	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	5	45	0.05	0.11	0.22	0.00	0.01

2012

Approach/Climbout	Hours/day	Days	Emissions lbs/hour				
			HC	CO	NOx	SOx	PM
Hughes 500	5	75	0.08	0.18	0.36	0.00	0.02

Fugitive Dust Emissions - Segment 8 Alternative 4C

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved
3) Disturbed Area Windblown Emissions

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling
D) Disturbed Area Windblown Emissions

A) Dozing (AP-42 Section 11.9 for overburden)

E = k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
1.241175323 lb/hr

PM2.5 Emission Factor
0.591672862 lb/hr

Total Dozer Use

	Hrs/year
2011	3617
2012	820

Dozer Emissions

Tons/year	PM10	PM2.5
2011	2.24	1.07
2012	0.51	0.24

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Annual Grader VMT

	Hrs/year	VMT/year
2011	2432	7296
2012	750	2250

Grading Emissions

Tons/year	PM10	PM2.5
2011	1.00	0.07
2012	0.31	0.02

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = (k)(0.0032)[$(U/5)^{1.3}$]/[$(M/2)^{1.4}$]
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Four separate drops are assumed

2011	1,890,000	Annual tons
2012	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions tons/year

	PM10	PM2.5
2011	1.10	0.34
2012	0.00	0.00

Fugitive Dust Emissions - Segment 8 Alternative 4C

2) Road Dust
Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2011	748,920	561,320	137,470	1,447,710	7.0
2012	411,480	135,680	66,710	613,870	6.4

	PM10 Annual	PM2.5 Annual
2011	0.0053	0.0011
2012	0.0046	0.0009

Emissions tons/year

	PM10	PM2.5
2011	3.87	0.79
2012	1.41	0.28

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2011	2,583	14,355	4,847	21,785	12.2
2012	1,085	5,261	2,463	8,809	13.4

	PM10 Annual	PM2.5 Annual
2011	2.82	0.43
2012	2.94	0.45

Emissions tons/year

	PM10	PM2.5
2011	30.70	4.71
2012	12.96	1.99

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2011	4.91	0.75
2012	2.07	0.32

Fugitive Dust Emissions - Segment 8 Alternative 4C

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

Disturbed Acres (acre-years)		Emissions (tons/year)	
		PM10	PM2.5
2011	70	2.12	0.43
2012	28	0.84	0.17

Fugitive Dust Emission Totals	2011		2012	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer	2.24	1.07	0.51	0.24
Grading	1.00	0.07	0.31	0.02
Soil Handling	1.10	0.34	0.00	0.00
Paved Road Dust	3.87	0.79	1.41	0.28
Unpaved Road Dust	4.91	0.75	2.07	0.32
Disturbed Area Dust	2.12	0.43	0.84	0.17
Totals	15.25	3.46	5.14	1.03

Incremental Change for Alternative 4C Modified, Compared to Alternative 4C.

Increase

Construction Schedule - Alternative 5 Underground

6) Soil waste truck are assumed to be double trailers with 20 cubic yard capacity. Grout loads are 10 cubic yards.
4 trucks are assumed to be used per day

Waste

	2011							
	Total Soil (cy)	Total Trips	Unpaved RT	Paved RT	Total RT	Total Unpaved	Total Paved	Total
Soil	701000	35050	0.25	40	40.25	8762.5	1402000	1410762.5

Onroad Emissions

Scenario Year: 2011 -- Model Years: 1966-2011

Passenger Vehicles	
lb/mile	
CO	0.008262757
Nox	0.000844604
ROG	0.000852333
Sox	1.07747E-05
PM10	8.87929E-05
PM2.5	5.65251E-05
CO2	1.102351544

Delivery Trucks	
lb/mile	
CO	0.016932424
NOx	0.018933664
ROG	0.002418682
SOx	2.72784E-05
PM10	0.000700971
PM2.5	0.000596818
CO2	2.751808225

Heavy-Heavy Duty Trucks	
lb/mile	
CO	0.011124628
NOx	0.034558093
ROG	0.002795432
SOx	3.97219E-05
PM10	0.001660874
PM2.5	0.001444886
CO2	4.220456802

2011

		Emissions lbs/year-2011						
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Passenger	0							
Delivery	1,410,763	3,412.19	23,887.63	26,710.90	38.48	988.90	841.97	3,882,147.85
Heavy-Heavy Duty	0							
	Totals	3,412.19	23,887.63	26,710.90	38.48	988.90	841.97	3,882,147.85
	Tons/year	1.71	11.94	13.36	0.02	0.49	0.42	1,941.07

Fugitive Dust Emissions

2) Road Dust

Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2011		1,402,000		1,402,000	8.0

	PM10 Annual	PM2.5 Annual
2011	0.0067	0.0014

Emissions tons/year

	PM10	PM2.5
2011	4.67	1.00

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 12% - SCAQMD Handbook for Mountain Roads)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2011		8,763		8,763	8.0

	PM10 Annual	PM2.5 Annual
2011	2.33	0.36

Emissions tons/year

	PM10	PM2.5
2011	10.22	1.57

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2011	1.63	0.25

Reduction

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling
D) Disturbed Area Windblown Emissions

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

$E = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 25 MPH worst day, 8 MPH avg daytime (engineering assumption)
M = moisture content = 10% (mitigated)
Four separate drops are assumed

2011	1,050,000	Annual tons
2012	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00029	0.00009

Emissions tons/year

	PM10	PM2.5
2011	0.00	0.19
2012	0.00	0.00

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
There are permanent and temporary disturbed acres that make up the total acre-years of disturbed area for each Segment
Disturbed areas are controlled by dust suppressants 84% control

Disturbed Acres (acre-years)

2011	14
2012	

Emissions (tons/year)

PM10	PM2.5
0.42	0.09
0.00	0.00

Fugitive Dust Emission Totals	2011		2012	
	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer				
Grading				
Soil Handling	0.00	0.19	0.00	0.00
Paved Road Dust				
Unpaved Road Dust				
Disturbed Area Dust	0.42	0.09	0.00	0.00
Totals	0.42	0.28	0.00	0.00

Total Increamental (compared to 4D)

Onroad

2011

		Emissions lbs/year-2011						
Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5	CO2
Delivery	1,410,763	1.71	11.94	13.36	0.02	0.49	0.42	1,941.07

Fugitive

	PM10	PM2.5
2011	5.88	0.78

Alternative 5 Underground Construction
Emission Calculation Assumptions

Proposed Project General Assumptions

1) Work occurs 6 days a week, 8 hours a day, excepting major holidays, except for tunneling which has two shifts working and one shift for maintenance (24 hour construction)
2) Project schedule is 24 months and ends at the same time as the proposed project' Segment 8 Mesa to Chino su

Offroad Equipment Emission Calculation Assumptions

1) Emission factors are the latest available from the SCAQMD website, where the nearest horsepower sized equipment given in the SCAQMD emission factor database are used with a ratio of actual assumed equipment
2) This work subtasks will be done by one contractor so equipment for each will be used throughout, so subtasks starting in 2010 would use 2010 EFs for all years for that subtask, etc.
3) Construction subtasks, durations, equipment type, number, and usage estimates are used are engineering estimates by Aspen Environment Group using very limited equipment information provided by SCE.
4) The following vehicle types, which could be offroad vehicles are assumed to be onroad vehicles considering the project description, needs and location: water trucks and dump trucks.
5) Generators to power lights and forced air through the confined spaces (access shafts, ventilation shafts, and tunnel) in the total amount of 1,000 hp (~750 kW) will be required 24 hours per day/7 days per week after the initiation of construction of elements with confined space.
6) Diesel powered water pumps, which could be additional generator power, will be needed 24 hours per day/7 days per week to remove water in the access shafts, ventilation shafts, and tunnel until the final tunnel grouting is

Onroad Equipment Emission Calculations Assumptions

1) Emission factors are the latest available from the SCAQMD website, where the vehicles have been assigned three classes, passenger (i.e. employee vehicles and pickups), delivery (all nonpassenger vehicles smaller than
2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.
3) Trip estimates are based on engineering estimates of import/export quantities, equipment and worker trips.
4) All onroad traffic for the project is assumed to occur within SCAQMD jurisdiction.
5) Grout (i.e. concrete) for lining the access shafts, tunnel, ventilation shafts is assumed to be imported by truck
6) Soil waste truck are assumed to be double trailers with 20 cubic yard capacity. Grout loads are 10 cubic yards.
7) A ten percent contingency is added to the grout and soil waste trips. This contingency considers excavated soil expansion and grout wastage.

Fugitive Dust Emission Calculations Assumptions

1) Unpaved road travel is minimized to the extent feasible and shall be no more than one-half mile per round trip for all employee trips and for equipment that must access the access shafts sites and no more than one mile per round trip for equipment to access the ventilation shaft sites.
2) Unpaved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt content is assumed to be 6% on average (SCAQMD level for sand and and 2) average vehicle weight based on VMT estimate for unpaved roads
3) Paved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt loading is average for 5000-10000 ADT road; 2) average vehicle weight
4) Earthmoving emission factors are calculated using the recent version of USEPA AP-42 Section 11.9 for Dozing and Grading, and Section 13.2.4 for soil handling (drop emissions).
5) Due to the work areas primarily being in pits and SCAQMD fugitive dust measure requirement for any waste piles the wind erosion potential is considered negligible for most of the project.

TRTP Alternative 5 Project Construction Emission Totals
SCAQMD Juridiction

Worst-Case Day	Emissions (lbs/day)					
(Year 2010)	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	40.37	275.40	274.53	0.48	12.78	10.75
Offroad Vehicles/Equipment	104.44	348.73	953.55	1.04	42.49	39.09
Helicopter	275.95	1,004.12	1,092.23	9.14	60.30	55.47
Fugitive Dust	---	---	---	---	590.78	136.82
Totals	**420.77**	**1,628.25**	**2,320.31**	**10.66**	**706.35**	**242.14**

Incremental Annual Emissions

2010 Emissions

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.551	3.396	4.251	0.007	0.210	0.179
Offroad Vehicles/Equipment	5.625	18.682	56.026	0.062	2.290	2.107
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	5.222	0.984
Totals	**6.18**	**22.08**	**60.28**	**0.07**	**7.72**	**3.27**

2011 Emissions

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.526	3.181	4.327	0.007	0.219	0.186
Offroad Vehicles/Equipment	6.264	20.855	64.549	0.073	2.519	2.317
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	6.498	1.229
Totals	**6.79**	**24.04**	**68.88**	**0.08**	**9.24**	**3.73**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.085	0.471	0.800	0.001	0.039	0.034
Offroad Vehicles/Equipment	1.086	3.598	12.391	0.016	0.413	0.380
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	1.326	0.272
Totals	**1.17**	**4.07**	**13.19**	**0.02**	**1.78**	**0.69**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

TRTP Alternative 5 Project Construction Emission Totals
Incremental Tower Construction Reduction Emission Totals
SCAQMD Juridiction

Worst-Case Day	Emissions (lbs/day)					
(Year 2010)	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	31.91	224.03	207.46	0.38	9.48	7.94
Offroad Vehicles/Equipment	25.54	86.57	165.52	0.17	10.25	9.43
Helicopter	275.95	1,004.12	1,092.23	9.14	60.30	55.47
Fugitive Dust	---	---	---	---	494.30	115.44
Totals	**333.41**	**1,314.72**	**1,465.21**	**9.68**	**574.33**	**188.29**

Incremental Annual Emissions

2010 Emissions

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.026	-0.169	-0.201	0.000	-0.009	-0.008
Offroad Vehicles/Equipment	-0.053	-0.184	-0.329	0.000	-0.022	-0.020
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---		
Totals	**-0.08**	**-0.35**	**-0.53**	**0.00**	**-0.03**	**-0.03**

2011 Emissions

	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.159	-1.208	-0.918	-0.002	-0.042	-0.035
Offroad Vehicles/Equipment	-0.067	-0.258	-0.515	-0.001	-0.030	-0.028
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---		
Totals	**-0.23**	**-1.47**	**-1.43**	**0.00**	**-0.07**	**-0.06**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.016	-0.101	-0.128	0.000	-0.006	-0.005
Offroad Vehicles/Equipment	-0.003	-0.012	-0.017	0.000	-0.001	-0.001
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust						
Totals	**-0.02**	**-0.11**	**-0.14**	**0.00**	**-0.01**	**-0.01**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

TRTP Alternative 5 Project Construction Emission Totals
Underground Construction Emission Totals
SCAQMD Juridiction

Worst-Case Day 2010	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	8.46	51.37	67.07	0.11	3.30	2.81
Offroad Vehicles/Equipment	78.90	262.16	788.03	0.87	32.24	29.66
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	96.48	21.38
Totals	**87.36**	**313.53**	**855.10**	**0.98**	**132.01**	**53.85**

Worst-Case Day 2011	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	6.66	44.34	47.73	0.09	2.40	2.01
Offroad Vehicles/Equipment	59.48	201.64	597.79	0.66	24.26	22.32
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	70.94	14.60
Totals	**66.14**	**245.97**	**645.52**	**0.75**	**97.60**	**38.94**

Worst-Case Day 2012	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	4.40	23.35	43.12	0.07	2.11	1.80
Offroad Vehicles/Equipment	35.91	117.86	410.10	0.52	13.54	12.46
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	66.23	14.60
Totals	**40.31**	**141.21**	**453.22**	**0.58**	**81.88**	**28.86**

Incremental Annual Emissions

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.58	3.56	4.45	0.01	0.22	0.19
Offroad Vehicles/Equipment	5.68	18.87	56.36	0.06	2.31	2.13
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	5.22	0.98
Totals	**6.26**	**22.43**	**60.81**	**0.07**	**7.75**	**3.30**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.68	4.39	5.24	0.01	0.26	0.22
Offroad Vehicles/Equipment	6.33	21.11	65.06	0.07	2.55	2.34
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	6.50	1.23
Totals	**7.02**	**25.50**	**70.31**	**0.08**	**9.31**	**3.79**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.10	0.57	0.93	0.00	0.05	0.04
Offroad Vehicles/Equipment	1.09	3.61	12.41	0.02	0.41	0.38
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	1.33	0.27
Totals	**1.19**	**4.18**	**13.34**	**0.02**	**1.79**	**0.69**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

Construction Schedule - Alternative 5 Underground																		
Major Elements																		
# Days in Full Month (6 days/week)																		
Onsite Construction Elements Begin in 2009							**Employee Vehicel**			**Total**	**Delivery Truck**			**Total**	**Heavy Heavy Duty Truck**			**Total**
Segment 8	**Crew Size**	**Total Days**	**Start Date**	**End Date**	**Hrs/day**		**no. of vehicle**	**Paved**	**Unpaved**	**VMT/day**	**no. of vehicle**	**Paved**	**Unpaved**	**VMT/day**	**no. of vehicle**	**Paved**	**Unpaved**	**VMT/day**
500 kV Undergrounding																		
Clear, Grub, Stage	6	**25**	**24-Apr-10**	**24-May-10**	8		6	29.5	0.50	180.00	2	19.50	0.50	40.00	2	24.50	0.50	60.00
Marshalling Yard	4	**590**	**18-May-10**	**28-Apr-12**	8		4	29.5	0.50	120.00	2	19.50	0.50	40.00	0	0.00	0.00	0.00
Access Shaft Excavation	20	**91**	**25-May-10**	**9-Sep-10**	8		20	29.5	0.50	600.00	4	19.50	0.50	80.00	26	20.01	0.50	526.95
Tunneling	90	**322**	**1-Jul-10**	**25-Jul-11**	24		90	29.5	0.50	2700.00	7	19.50	0.50	140.00	50	19.65	0.50	1005.45
Ventilation Shaft Excavation	15	**91**	**1-Jul-11**	**24-Oct-11**	8		15	29.5	0.50	450.00	4	19.50	1.00	82.00	7	20.43	1.00	152.30
Tunnel Grouting	20	**60**	**16-Sep-11**	**28-Nov-11**	8		20	29.5	0.50	600.00	4	19.50	0.50	80.00	10	20.49	0.50	212.33
Cable Installation	20	**90**	**28-Nov-11**	**18-Feb-12**	8		20	29.5	0.50	600.00	4	19.50	0.50	80.00	11	109.20	0.50	1231.11
Access Features and Cleanup	10	**75**	**27-Jan-12**	**23-Apr-12**	8		10	29.5	0.50	300.00	2	19.50	0.50	40.00	2	21.32	0.50	48.00

	PAVED																	
	2009			**2010**			**2011**			**2012**			**2013**			**2014**		
Segment 8	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**
500 kV Undergrounding																		
Clear, Grub, Stage	0.0	0.0	0.0	4425.0	975.0	1470.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Marshalling Yard	0.0	0.0	0.0	22066.0	7293.0	0.0	35754.0	11817.0	0.0	11800.0	3900.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Access Shaft Excavation	0.0	0.0	0.0	53690.0	7098.0	46783.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Tunneling	0.0	0.0	0.0	400905.0	20611.5	148056.0	454005.0	23341.5	167666.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Ventilation Shaft Excavation	0.0	0.0	0.0	0.0	0.0	0.0	40267.5	7098.0	13212.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Tunnel Grouting	0.0	0.0	0.0	0.0	0.0	0.0	35400.0	4680.0	12436.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00
Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	29500.0	3900.0	61275.0	23600.0	3120.0	49020.0	0.0	0.0	0.0	0.0	0.00	0.00
Access Features and Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22125.0	2925.0	3517.5	0.0	0.0	0.0	0.0	0.00	0.00

	UNPAVED																	
	2009			**2010**			**2011**			**2012**			**2013**			**2014**		
Segment 8	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**
500 kV Undergrounding																		
Clear, Grub, Stage	0.0	0.0	0.0	75.0	25.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Marshalling Yard	0.0	0.0	0.0	374.0	187.0	0.0	606.0	303.0	0.0	200.0	100.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Access Shaft Excavation	0.0	0.0	0.0	910.0	182.0	1168.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Tunneling	0.0	0.0	0.0	6795.0	528.5	3767.5	7695.0	598.5	4266.5	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Ventilation Shaft Excavation	0.0	0.0	0.0	0.0	0.0	0.0	682.5	364.0	646.8	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Tunnel Grouting	0.0	0.0	0.0	0.0	0.0	0.0	600.0	120.0	303.5	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	500.0	100.0	280.6	400.0	80.0	224.4	0.0	0.0	0.0	0.00	0.00	0.00
Access Features and Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	375.0	75.0	82.5	0.0	0.0	0.0	0.00	0.00	0.00

	TOTAL																	
	2009			**2010**			**2011**			**2012**			**2013**			**2014**		
Segment 8	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT**
500 kV Undergrounding																		
Clear, Grub, Stage	0.0	0.0	0.0	4500.0	1000.0	1500.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Marshalling Yard	0.0	0.0	0.0	22440.0	7480.0	0.0	36360.0	12120.0	0.0	12000.0	4000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Access Shaft Excavation	0.0	0.0	0.0	54600.0	7280.0	47952.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Tunneling	0.0	0.0	0.0	407700.0	21140.0	151823.5	461700.0	23940.0	171932.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Ventilation Shaft Excavation	0.0	0.0	0.0	0.0	0.0	0.0	40950.0	7462.0	13859.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Tunnel Grouting	0.0	0.0	0.0	0.0	0.0	0.0	36000.0	4800.0	12740.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
Cable Installation	0.0	0.0	0.0	0.0	0.0	0.0	30000.0	4000.0	61555.6	24000.0	3200.0	49244.4	0.0	0.0	0.0	0.0	0.0	0.00
Access Features and Cleanup	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22500.0	3000.0	3600.0	0.0	0.0	0.0	0.0	0.0	0.00

Alternative 5 - Segment 8

Onroad Equipment Maximum Daily Emissions

			Emissions lbs/day-2010					
2010	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	3,420	3.13	28.26	3.14	0.04	0.30	0.19
	Delivery	260	0.67	4.79	5.36	0.01	0.20	0.17
	Heavy-Heavy Duty	1,532	4.66	18.32	58.57	0.06	2.81	2.45
		Totals	8.46	51.37	67.07	0.11	3.30	2.81

			Emissions lbs/day-2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	3,270	2.79	27.02	2.76	0.04	0.29	0.18
	Delivery	262	0.63	4.44	4.96	0.01	0.18	0.16
	Heavy-Heavy Duty	1,158	3.24	12.88	40.01	0.05	1.92	1.67
		Totals	6.66	44.34	47.73	0.09	2.40	2.01

			Emissions lbs/day-2012					
2012	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	1,020	0.81	7.81	0.79	0.01	0.09	0.06
	Delivery	160	0.36	2.47	2.77	0.00	0.10	0.09
	Heavy-Heavy Duty	1,279	3.23	13.07	39.55	0.05	1.91	1.65
		Totals	4.40	23.35	43.12	0.07	2.11	1.80

Annual Emissions

2010 Vehicle Type	Total	Emissions lbs/year VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	489,240	447.16	4,042.47	449.19	5.27	42.55	26.80
Delivery	36,900	95.56	680.35	761.05	1.00	27.72	23.70
Heavy-Heavy Duty	201,275	612.19	2,406.16	7,692.95	8.32	368.46	322.21
	Totals	1,154.91	7,128.98	8,903.19	14.58	438.73	372.71

2011 Vehicle Type	Total	Emissions lbs/year VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	605,010	515.67	4,999.05	510.99	6.52	53.72	34.20
Delivery	52,322	126.55	885.94	990.65	1.43	36.68	31.23
Heavy-Heavy Duty	260,087	727.06	2,893.38	8,988.13	10.33	431.97	375.80
	Totals	1,369.28	8,778.37	10,489.77	18.28	522.37	441.22

2012 Vehicle Type	Total	Emissions lbs/year VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	58,500	46.58	447.80	45.39	0.63	5.25	3.36
Delivery	10,200	22.83	157.67	176.71	0.27	6.63	5.61
Heavy-Heavy Duty	52,844	133.57	539.82	1,634.15	2.14	79.04	68.36
	Totals	202.98	1,145.28	1,856.24	3.04	90.92	77.33

Offroad Equipment Emission Calculations - Alternative 5 Underground

2010 Emission Calculations

Clear, Grub, Stage

			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Dozer, D7	240	1	0.203678	0.599044	1.882011	0.001802	0.07939	160.13907	8	1.63	4.79	15.06	0.01	0.64	25	40.74	119.81	376.40	0.36	15.88
Forklift - 10 ton	85	1	0.063371	0.203333	0.251387	0.000278	0.025245	22.948429	2	0.13	0.41	0.50	0.00	0.05	25	3.17	10.17	12.57	0.01	1.26
Motor Grader - 120H	125	1	0.157016	0.563609	0.965544	0.000926	0.084288	79.415466	4	0.63	2.25	3.86	0.00	0.34	25	15.70	56.36	96.55	0.09	8.43
Loader - 928	143	1	0.131872	0.512856	0.901921	0.000902	0.066203	78.736034	4	0.53	2.05	3.61	0.00	0.26	25	13.19	51.29	90.19	0.09	6.62
Chippers - WC 342G	100	1	0.190591	0.585192	0.875843	0.000859	0.083418	71.962395	2	0.38	1.17	1.75	0.00	0.17	10	3.81	11.70	17.52	0.02	1.67
Chainsaws Stihl MS 460	6	1	0.794048	2.973942	0.026455	2.27E-05	0.050926	0.0509259	4	3.18	11.90	0.11	0.00	0.20	10	31.76	118.96	1.06	0.00	2.04
										6.47	22.57	24.89	0.02	1.66		108.37	368.28	594.29	0.58	35.89

Marshalling Yard

			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane Rough Terrain 35 Ton	155	1	0.117658	0.445914	0.829817	0.000789	0.056161	69.363991	2	0.24	0.89	1.66	0.00	0.11	187	44.00	166.77	310.35	0.30	21.00
Forklift, 5 ton	75	1	0.064297	0.197346	0.223286	0.000253	0.022681	20.58372	6	0.39	1.18	1.34	0.00	0.14	187	72.14	221.42	250.53	0.28	25.45
Forklift, 10 ton	85	1	0.063371	0.203333	0.251387	0.000278	0.025245	22.948429	6	0.38	1.22	1.51	0.00	0.15	187	71.10	228.14	282.06	0.31	28.32
Motor, Auxilary Power	5	1	0.005748	0.024187	0.038469	5.29E-05	0.002293	3.4025532	1	0.01	0.02	0.04	0.00	0.00	187	1.07	4.52	7.19	0.01	0.43
										1.01	3.32	4.55	0.00	0.40		188.32	620.86	850.13	0.90	75.21

Access Shaft Excavation

			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator Cat 345	345	1	0.165371	0.478034	1.658845	0.001979	0.059221	187.20277	8	1.32	3.82	13.27	0.02	0.47	91	120.39	348.01	1,207.64	1.44	43.11
Excavator/Rock Drill Cat 320	138	2	0.142017	0.577073	0.929879	0.000994	0.074214	86.255316	8	2.27	9.23	14.88	0.02	1.19	91	206.78	840.22	1,353.90	1.45	108.06
Pile Driver Crane	240	1	0.123862	0.365245	1.19629	0.001214	0.047899	107.91695	8	0.99	2.92	9.57	0.01	0.38	91	90.17	265.90	870.90	0.88	34.87
Loader - 928	143	1	0.131872	0.512856	0.901921	0.000902	0.066203	78.736034	8	1.05	4.10	7.22	0.01	0.53	91	96.00	373.36	656.60	0.66	48.20
Crane 250 Ton	390	1	0.156683	0.523384	1.536838	0.001545	0.059032	150.2066	2	0.31	1.05	3.07	0.00	0.12	91	28.52	95.26	279.70	0.28	10.74
Generator - 250 hp	250	4	0.161826	0.501826	2.072047	0.002391	0.061794	212.50495	24	15.54	48.18	198.92	0.23	5.93	106	1,646.74	5,106.58	21,085.16	24.33	628.82
Grout Pump	100	1	0.141219	0.464783	0.757681	0.00078	0.06268	65.48811	8	1.13	3.72	6.06	0.01	0.50	91	102.81	338.36	551.59	0.57	45.63
Water Pumps - 100 hp	100	2	0.141219	0.464783	0.757681	0.00078	0.06268	65.48811	24	6.78	22.31	36.37	0.04	3.01	106	718.52	2,364.82	3,855.08	3.97	318.92
										29.40	95.33	289.35	0.32	12.13		3,009.92	9,732.50	29,860.57	33.58	1,238.34

Tunneling

			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Generator - TBM	1500	1	0.767505	2.859928	9.929255	0.010935	0.300315	1087.5797	16	12.28	45.76	158.87	0.17	4.81	151	1,854.29	6,909.58	23,989.08	26.42	725.56
Loader - 928	143	1	0.131872	0.512856	0.901921	0.000902	0.066203	78.736034	16	2.11	8.21	14.43	0.01	1.06	151	318.60	1,239.06	2,179.04	2.18	159.95
Crane 250 Ton	390	2	0.156683	0.523384	1.536838	0.001545	0.059032	150.2066	16	5.01	16.75	49.18	0.05	1.89	151	757.09	2,528.99	7,426.00	7.47	285.24
Generator - 250 hp	250	4	0.161826	0.501826	2.072047	0.002391	0.061794	212.50495	24	15.54	48.18	198.92	0.23	5.93	176	2,734.20	8,478.85	35,009.31	40.40	1,044.08
Water Pump - 100 hp	100	4	0.141219	0.464783	0.757681	0.00078	0.06268	65.48811	24	13.56	44.62	72.74	0.07	6.02	176	2,386.03	7,852.97	12,801.77	13.18	1,059.04
										48.50	163.51	494.13	0.54	19.70		8,050.23	27,009.45	81,405.21	89.64	3,273.87

2011 Emission Calculations

Marshalling Yard

			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.117658	0.445914	0.829817	0.000789	0.056161	69.363991	2	0.24	0.89	1.66	0.00	0.11	303	38.59	146.26	272.18	0.26	18.42
Forklift, 5 ton	75	1	0.064297	0.197346	0.223286	0.000253	0.022681	20.58372	6	0.39	1.18	1.34	0.00	0.14	303	63.27	194.19	219.71	0.25	22.32
Forklift, 10 ton	85	1	0.063371	0.203333	0.251387	0.000278	0.025245	22.948429	6	0.38	1.22	1.51	0.00	0.15	303	62.36	200.08	247.36	0.27	24.84
Motor, Auxilary Power	5	1	0.005748	0.024187	0.038469	5.29E-05	0.002293	3.4025532	1	0.05	0.18	0.38	0.00	0.02	303	8.44	29.32	62.73	0.07	3.45
										1.05	3.47	4.89	0.01	0.42		172.66	569.85	801.99	0.86	69.03

Tunneling

			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Generator - TBM	1500	1	0.767505	2.859928	9.929255	0.010935	0.300315	1087.5797	16	12.28	45.76	158.87	0.17	4.81	171	2,099.89	7,824.76	27,166.44	29.92	821.66
Loader - 928	143	1	0.131872	0.512856	0.901921	0.000902	0.066203	78.736034	16	2.11	8.21	14.43	0.01	1.06	171	360.80	1,403.17	2,467.66	2.47	181.13
Crane 250 Ton	390	2	0.156683	0.523384	1.536838	0.001545	0.059032	150.2066	16	5.01	16.75	49.18	0.05	1.89	171	857.37	2,863.96	8,409.58	8.46	323.02
Generator - 250 hp	250	4	0.161826	0.501826	2.072047	0.002391	0.061794	212.50495	24	15.54	48.18	198.92	0.23	5.93	200	3,107.05	9,635.05	39,783.31	45.91	1,186.45
Water Pump - 100 hp	100	4	0.141219	0.464783	0.757681	0.00078	0.06268	65.48811	24	13.56	44.62	72.74	0.07	6.02	200	2,711.40	8,923.83	14,547.47	14.98	1,203.46
										48.50	163.51	494.13	0.54	19.70		9,136.52	30,650.78	92,374.45	101.73	3,715.72

Ventilation Shaft Excavation			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Vertical Shaft Machine	550	1	0.239063	0.913326	3.158838	0.003739	0.093607	378.24026	8	1.91	7.31	25.27	0.03	0.75	91	174.04	664.90	2,299.63	2.72	68.15
Loader - 928	143	1	0.123605	0.509538	0.848985	0.000902	0.062686	78.736013	8	0.99	4.08	6.79	0.01	0.50	91	89.98	370.94	618.06	0.66	45.64
Crane 250 Ton	390	1	0.148156	0.487839	1.430589	0.001545	0.053941	150.20664	2	0.30	0.98	2.86	0.00	0.11	91	26.96	88.79	260.37	0.28	9.82
Generator - 250 hp	250	1	0.148282	0.470218	1.937316	0.002391	0.055788	212.50499	24	3.56	11.29	46.50	0.06	1.34	106	377.23	1,196.23	4,928.53	6.08	141.92
Water Pump - 100 hp	100	1	0.132263	0.458792	0.722904	0.00078	0.060041	65.488108	24	3.17	11.01	17.35	0.02	1.44	106	336.48	1,167.17	1,839.07	1.98	152.74
										9.93	34.65	98.77	0.12	4.14		1,004.70	3,488.03	9,945.66	11.73	418.27

Tunnel Grouting			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane 250 Ton	390	1	0.148156	0.487839	1.430589	0.001545	0.053941	150.20664	6	0.89	2.93	8.58	0.01	0.32	60	53.34	175.62	515.01	0.56	19.42
Grout Pump	100	1	0.132263	0.458792	0.722904	0.00078	0.060041	65.488108	6	0.79	2.75	4.34	0.00	0.36	60	47.61	165.17	260.25	0.28	21.61
Generator - 250 hp	250	4	0.148282	0.470218	1.937316	0.002391	0.055788	212.50499	24	14.24	45.14	185.98	0.23	5.36	70	996.46	3,159.87	13,018.76	16.07	374.90
Water Pump - 100 hp	100	1	0.132263	0.458792	0.722904	0.00078	0.060041	65.488108	24	3.17	11.01	17.35	0.02	1.44	70	222.20	770.77	1,214.48	1.31	100.87
										19.09	61.83	216.25	0.26	7.48		1,319.61	4,271.42	15,008.50	18.22	516.80

Cable Installation			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Welder	50	2	0.115728	0.294932	0.268298	0.000336	0.02746	25.958061	6	1.39	3.54	3.22	0.00	0.33	50	69.44	176.96	160.98	0.20	16.48
Generator - 250 hp	250	4	0.148282	0.470218	1.937316	0.002391	0.055788	212.50499	24	14.24	45.14	185.98	0.23	5.36	58	825.64	2,618.17	10,786.98	13.31	310.63
Forklift, 5 ton	75	2	0.056618	0.198383	0.238449	0.000278	0.02308	22.948431	8	0.91	3.17	3.82	0.00	0.37	50	45.29	158.71	190.76	0.22	18.46
Crane 250 Ton	240	2	0.148156	0.487839	1.430589	0.001545	0.053941	150.20664	6	1.78	5.85	17.17	0.02	0.65	50	88.89	292.70	858.35	0.93	32.36
										18.31	57.71	210.18	0.26	6.70		1,029.26	3,246.54	11,997.07	14.66	377.93

2012 Emission Calculations

Marshalling Yard			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Crane, Hydraulic, Rough Terrain 35 ton	155	1	0.117658	0.445914	0.829817	0.000789	0.056161	69.363991	2	0.24	0.89	1.66	0.00	0.11	100	23.53	89.18	165.96	0.16	11.23
Forklift, 5 ton	75	1	0.064297	0.197346	0.223286	0.000253	0.022681	20.58372	6	0.39	1.18	1.34	0.00	0.14	100	38.58	118.41	133.97	0.15	13.61
Forklift, 10 ton	85	1	0.063371	0.203333	0.251387	0.000278	0.025245	22.948429	6	0.38	1.22	1.51	0.00	0.15	100	38.02	122.00	150.83	0.17	15.15
Motor, Auxilary Power	5	1	0.005748	0.024187	0.038469	5.29E-05	0.002293	3.4025532	1	0.01	0.02	0.04	0.00	0.00	100	0.57	2.42	3.85	0.01	0.23
										1.01	3.32	4.55	0.00	0.40		100.71	332.01	454.61	0.48	40.22

Cable Installation			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Welder	50	2	0.115728	0.294932	0.268298	0.000336	0.02746	25.958061	6	1.39	3.54	3.22	0.00	0.33	40	55.55	141.57	128.78	0.16	13.18
Generator - 250 hp	250	4	0.148282	0.470218	1.937316	0.002391	0.055788	212.50499	24	14.24	45.14	185.98	0.23	5.36	47	669.05	2,121.62	8,741.17	10.79	251.72
Forklift, 5 ton	75	2	0.056618	0.198383	0.238449	0.000278	0.02308	22.948431	8	0.91	3.17	3.82	0.00	0.37	40	36.24	126.97	152.61	0.18	14.77
Crane 250 Ton	240	2	0.148156	0.487839	1.430589	0.001545	0.053941	150.20664	6	1.78	5.85	17.17	0.02	0.65	40	71.11	234.16	686.68	0.74	25.89
										18.31	57.71	210.18	0.26	6.70		831.95	2,624.32	9,709.24	11.87	305.56

Access Features and Cleanup			SCAQMD Emission Factor lbs/hour							Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	CO2	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator - 320	188	1	0.121734	0.569689	0.805673	0.000994	0.062845	86.255326	4	0.49	2.28	3.22	0.00	0.25	75	36.52	170.91	241.70	0.30	18.85
Backhoe	85	2	0.0883	0.343093	0.397029	0.0005	0.034936	41.037556	4	0.71	2.74	3.18	0.00	0.28	75	52.98	205.86	238.22	0.30	20.96
Crane 250 Ton	390	1	0.140086	0.455224	1.329652	0.001545	0.04906	150.20663	4	0.56	1.82	5.32	0.01	0.20	75	42.03	136.57	398.90	0.46	14.72
Loader - 928	143	1	0.115666	0.506574	0.796398	0.000902	0.057874	78.736032	6	0.69	3.04	4.78	0.01	0.35	75	52.05	227.96	358.38	0.41	26.04
Motor Grader - 120H	125	1	0.136682	0.553776	0.855964	0.000926	0.073543	79.415452	4	0.55	2.22	3.42	0.00	0.29	75	41.00	166.13	256.79	0.28	22.06
Vib. Compactor CS-433E	100	1	0.106876	0.378283	0.549308	0.00059	0.048546	49.558577	4	0.43	1.51	2.20	0.00	0.19	75	32.06	113.48	164.79	0.18	14.56
Generator - 250 hp	250	4	0.137226	0.450226	1.804742	0.002391	0.05078	212.50499	24	13.17	43.22	173.26	0.23	4.87	75	988.02	3,241.63	12,994.14	17.22	365.62
										16.60	56.83	195.37	0.26	6.44		1,244.67	4,262.53	14,652.92	19.14	482.82

Maximum Day - Lbs/Day						Annual - Tons/Year					
Year	ROG	CO	NOX	SOX	PM	Year	ROG	CO	NOX	SOX	PM
2010	78.90	262.16	788.03	0.87	32.24	2010	5.68	18.87	56.36	0.06	2.31
2011	59.48	201.64	597.79	0.66	24.26	2011	6.33	21.11	65.06	0.07	2.55
2012	35.91	117.86	410.10	0.52	13.54	2012	1.09	3.61	12.41	0.02	0.41
						Total Tons	13.10	43.59	133.83	0.15	5.27

Incremental Worst Case Day SCAQMD					
Year	ROG	CO	NOX	SOX	PM
2010	49.50	166.83	498.68	0.55	20.11

Fugitive Dust Emissions - Alternative 5 Underground

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved
3) Disturbed Area Windblown Emissions

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Material Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

E = k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)
s = Silt Content (assumed to be 6% - SCAQMD Handbook for Sand and Gravel Plant Road)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
0.438821744 lb/hr

PM2.5 Emission Factor
0.257540572 lb/hr

Maximum Daily Dozer Use

	Hrs/day
2010	8
2011	0
2012	0

Total Dozer Use

	Hrs/year
2010	200
2011	0
2012	0

Dozer Emissions

Lbs/Day	PM10	PM2.5
2010	3.51	2.06
2011	0.00	0.00
2012	0.00	0.00

Tons/year	PM10	PM2.5
2010	0.04	0.03
2011	0.00	0.00
2012	0.00	0.00

B) Grading

E = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor
0.2754 lb/VMT

PM2.5 Emission Factor
0.019329687 lb/VMT

Maximum Daily Grader VMT

	Hrs/day	VMT/day
2010	4	12
2011	0	0
2012	4	12

Annual Grader VMT

	Hrs/year	VMT/year
2010	100	300
2011	0	0
2012	300	900

Grading Emissions

Lbs/Day	PM10	PM2.5
2010	3.30	0.23
2011	0.00	0.00
2012	3.30	0.23

Tons/year	PM10	PM2.5
2010	0.04	0.00
2011	0.00	0.00
2012	0.12	0.01

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

E = (k)(0.0032)$[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 26.5 MPH worst day, 6.4 MPH avg from Norco Met File
M = moisture content = 10% (mitigated)
Max daily productivity is assume to be two times average
Three separate drops are assumed

2010	2646	Maximum daily tons
2011	1882	Maximum daily tons
2012	0	Maximum daily tons
2010	170400	Annual tons
2011	152730	Annual tons
2012	0	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00016	0.00005

Emissions lbs/day

	PM10	PM2.5
2010	8.16	2.57
2011	5.81	1.83
2012	0.00	0.00

Emissions tons/year

	PM10	PM2.5
2010	0.04	0.01
2011	0.04	0.01
2012	0.00	0.00

2) Road Dust

Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2010	3,363	254	1,495	5111	10.5
2011	3,216	254	1,126	4595	9.2
2012	1,003	156	1,272	2431	17.0

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2010	481,086	35,978	196,309	713373	10.0
2011	594,927	50,837	254,590	900353	10.3
2012	57,525	9,945	52,538	120008	14.8

Emission Factors and Emissions
Emission Factors

Daily Efs	PM10 Daily	PM2.5 Daily
2010	0.0102	0.0023
2011	0.0083	0.0018
2012	0.0217	0.0052

Emissions lbs/day

	PM10	PM2.5
2010	52.29	11.83
2011	38.19	8.43
2012	52.75	12.60

Annual Efs	PM10 Annual	PM2.5 Annual
2010	0.0095	0.0021
2011	0.0099	0.0022
2012	0.0174	0.0041

Emissions tons/year

	PM10	PM2.5
2010	3.39	0.76
2011	4.45	1.00
2012	1.04	0.25

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365-P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 6% - SCAQMD Handbook for Sand and Gravel Plant Road)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unpaved VMT	Average Weight (Tons)
2010	57	7	38	101	12.8
2011	55	9	32	95	12.0
2012	17	4	7	28	9.6

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unpaved VMT	Average Weight (Tons)
2010	8,154	923	4,966	14043	12.3
2011	10,084	1,486	5,497	17066	11.5
2012	975	255	307	1537	8.6

Uncontrolled Emission Factors and Emissions
Emission Factors (lb/VMT)

Annual Efs	PM10 Daily	PM2.5 Daily
2010	1.55	0.24
2011	1.50	0.23
2012	1.36	0.21

Emissions lbs/day

	PM10	PM2.5
2010	156.59	24.01
2011	142.48	21.85
2012	37.68	5.78

Annual Efs	PM10 Annual	PM2.5 Annual
2010	1.52	0.16
2011	1.47	0.16
2012	1.29	0.14

Emissions tons/year

	PM10	PM2.5
2010	10.65	1.13
2011	12.58	1.34
2012	0.99	0.11

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

Emission Control
84%

	PM10	PM2.5
2010	25.06	3.84
2011	22.80	3.50
2012	6.03	0.92

Emissions tons/year

	PM10	PM2.5
2010	1.70	0.18
2011	2.01	0.21
2012	0.16	0.02

3) Disturbed Area Windblown Emissions

Assumptions
Emission Factor is 0.38 tons/disturbed acres/year of Total Suspended Particulate (AP-42 Section 11.9)
PM10 and PM2.5 fractions of TSP are 0.489 and 0.102 respectively per CEIDARS factors from SCAQMD CEQA Website
Disturbed areas are controlled by dust suppressants 84% control

	Disturbed Acres		Emissions (lbs/day)		Emissions (tons/year)	
	Acres	Acre-years	PM10	PM2.5	PM10	PM2.5
2010	25	15	4.15	0.85	0.45	0.09
2011	25	25	4.15	0.85	0.76	0.16
2012	25	8	4.15	0.85	0.24	0.05

Fugitive Dust Emission Totals		2010		2011		2012	
Maximum Daily Emissions		PM10 lb/day	PM2.5 lb/day	PM10 lb/day	PM2.5 lb/day	PM10 lb/day	PM2.5 lb/day
Dozer		3.51	2.06	0.00	0.00	0.00	0.00
Grading		3.30	0.23	0.00	0.00	3.30	0.23
Soil Handling		8.16	2.57	5.81	1.83	0.00	0.00
Paved Road Dust		52.29	11.83	38.19	8.43	52.75	12.60
Unpaved Road Dust		25.06	3.84	22.80	3.50	6.03	0.92
Disturbed Area Dust		4.15	0.85	4.15	0.85	4.15	0.85
	Totals	96.48	21.38	70.94	14.60	66.23	14.60

Annual Emissions		2010		2011		2012	
		PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr	PM10 t/yr	PM2.5 t/yr
Dozer		0.04	0.03	0.00	0.00	0.00	0.00
Grading		0.04	0.00	0.00	0.00	0.12	0.01
Soil Handling		0.04	0.01	0.04	0.01	0.00	0.00
Paved Road Dust		3.39	0.76	4.45	1.00	1.04	0.25
Unpaved Road Dust		1.70	0.18	2.01	0.21	0.16	0.02
Disturbed Area Dust		0.45	0.09	0.76	0.16	0.24	0.05
	Totals	5.22	0.98	6.50	1.23	1.33	0.27

TRTP Alternative 6 Project Construction Emission Totals
All Jurisdictions

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0012	-0.0075	-0.0112	0.0000	-0.0005	-0.0004
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fugitive Dust	---	---	---	---	-0.5884	-0.3824
Totals	**0.00**	**-0.01**	**-0.01**	**0.00**	**-0.59**	**-0.38**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.0015	0.0090	0.0151	0.0000	0.0006	0.0006
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	7.9803	24.4616	24.2866	0.2038	1.3401	1.2329
Fugitive Dust	---	---	---	---	0.2848	0.0437
Totals	**7.98**	**24.47**	**24.30**	**0.20**	**1.63**	**1.28**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.0002	0.0033	-0.0017	0.0000	-0.0002	-0.0001
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	3.5942	17.5913	21.9893	0.1831	1.2152	1.1180
Fugitive Dust	---	---	---	---	-0.0309	-0.0047
Totals	**3.59**	**17.59**	**21.99**	**0.18**	**1.18**	**1.11**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0183	-0.1070	-0.1723	-0.0002	-0.0074	-0.0063
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	6.9786	27.4759	30.2986	0.2533	1.6742	1.5403
Fugitive Dust	---	---	---	---	-3.9454	-0.6050
Totals	**6.96**	**27.37**	**30.13**	**0.25**	**-2.28**	**0.93**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0007	-0.0043	-0.0070	0.0000	-0.0003	-0.0003
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	45.9333	40.8336	0.3434	2.2637	0.0000	0.0000
Fugitive Dust	---	---	---	---	-0.1774	0.3129
Totals	**45.93**	**40.83**	**0.34**	**2.26**	**-0.18**	**0.31**

Note: This alternative does not significantly impact the KCAPCD.

TRTP Alternative 6 Project Construction Emission Totals
SCAQMD Jurisdiction

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0012	-0.0075	-0.0112	0.0000	-0.0005	-0.0004
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fugitive Dust	---	---	---	---	-0.1942	-0.0298
Totals	**0.00**	**-0.01**	**-0.01**	**0.00**	**-0.19**	**-0.03**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.0009	0.0055	0.0092	0.0000	0.0004	0.0003
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	5.5640	16.5516	15.6177	0.1313	0.8625	0.7935
Fugitive Dust	---	---	---	---	0.1766	0.0271
Totals	**5.56**	**16.56**	**15.63**	**0.13**	**1.04**	**0.82**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0005	-0.0009	-0.0080	0.0000	-0.0004	-0.0004
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	3.2871	15.6756	19.5228	0.1626	1.0787	0.9924
Fugitive Dust	---	---	---	---	-0.1546	-0.0237
Totals	**3.29**	**15.67**	**19.51**	**0.16**	**0.92**	**0.97**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0107	-0.0632	-0.1000	-0.0001	-0.0043	-0.0036
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	4.1113	16.1284	17.8785	0.1494	0.9877	0.9087
Fugitive Dust	---	---	---	---	-2.3724	-0.3638
Totals	**4.10**	**16.07**	**17.78**	**0.15**	**-1.39**	**0.54**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0001	-0.0003	-0.0005	0.0000	0.0000	0.0000
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fugitive Dust	---	---	---	---	-0.0106	-0.0016
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**-0.01**	**0.00**

TRTP Alternative 6 Project Construction Emission Totals
AVAQMD Jurisdiction

Incremental Annual Emissions

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fugitive Dust	---	---	---	---	0.0000	0.0000
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.0006	0.0035	0.0059	0.0000	0.0003	0.0002
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	2.4163	7.9100	8.6690	0.0726	0.4776	0.4394
Fugitive Dust	---	---	---	---	0.1082	0.0166
Totals	**2.42**	**7.91**	**8.67**	**0.07**	**0.59**	**0.46**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.0007	0.0042	0.0063	0.0000	0.0003	0.0002
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	0.3071	1.9157	2.4665	0.0205	0.1365	0.1256
Fugitive Dust	---	---	---	---	0.1236	0.0190
Totals	**0.31**	**1.92**	**2.47**	**0.02**	**0.26**	**0.14**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0076	-0.0438	-0.0722	-0.0001	-0.0031	-0.0027
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	2.8673	11.3476	12.4202	0.1038	0.6864	0.6315
Fugitive Dust	---	---	---	---	-1.5730	-0.2412
Totals	**2.86**	**11.30**	**12.35**	**0.10**	**-0.89**	**0.39**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	-0.0007	-0.0040	-0.0064	0.0000	-0.0003	-0.0002
Offroad Vehicles/Equipment	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Helicopter	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fugitive Dust	---	---	---	---	-0.1667	-0.0256
Totals	**0.00**	**0.00**	**-0.01**	**0.00**	**-0.17**	**-0.03**

TRTP Alternative 6 Project Construction Emission Totals
All Jurisdictions - ANF Total

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.123	0.916	0.807	0.001	0.035	0.029
Offroad Vehicles/Equipment	0.128	0.391	0.550	0.001	0.050	0.046
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	2.068	0.425
Totals	**0.25**	**1.31**	**1.36**	**0.00**	**2.15**	**0.50**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.828	5.382	6.353	0.010	0.288	0.245
Offroad Vehicles/Equipment	1.314	4.613	8.864	0.009	0.542	0.498
Helicopter	9.476	32.186	32.960	0.276	1.820	1.674
Fugitive Dust	---	---	---	---	21.013	4.735
Totals	**11.62**	**42.18**	**48.18**	**0.30**	**23.66**	**7.15**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	1.099	8.095	6.807	0.014	0.315	0.261
Offroad Vehicles/Equipment	1.466	5.166	9.078	0.010	0.601	0.553
Helicopter	4.647	22.361	27.989	0.233	1.546	1.423
Fugitive Dust	---	---	---	---	22.733	4.640
Totals	**7.21**	**35.62**	**43.87**	**0.26**	**25.20**	**6.88**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.899	6.428	5.787	0.012	0.274	0.227
Offroad Vehicles/Equipment	1.350	5.033	8.598	0.010	0.550	0.506
Helicopter	9.333	36.597	40.634	0.340	2.245	2.065
Fugitive Dust	---	---	---	---	16.984	3.854
Totals	**11.58**	**48.06**	**55.02**	**0.36**	**20.05**	**6.65**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.007	0.049	0.055	0.000	0.003	0.002
Offroad Vehicles/Equipment	0.008	0.033	0.049	0.000	0.003	0.003
Helicopter	0.001	0.002	0.003	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.016**	**0.084**	**0.108**	**0.000**	**0.006**	**0.005**

TRTP Alternative 6 Project Construction Emission Totals
ANF - SCAQMD Jurisdiction

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.067	0.502	0.444	0.001	0.019	0.016
Offroad Vehicles/Equipment	0.070	0.213	0.300	0.000	0.027	0.025
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	1.402	0.285
Totals	**0.14**	**0.72**	**0.74**	**0.00**	**1.45**	**0.33**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.610	3.986	4.661	0.007	0.211	0.179
Offroad Vehicles/Equipment	0.979	3.439	6.656	0.007	0.403	0.371
Helicopter	7.059	24.276	24.292	0.204	1.342	1.235
Fugitive Dust	---	---	---	---	13.229	2.989
Totals	**8.65**	**31.70**	**35.61**	**0.22**	**15.19**	**4.77**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.865	6.347	5.388	0.011	0.250	0.207
Offroad Vehicles/Equipment	1.176	4.152	7.326	0.008	0.482	0.443
Helicopter	4.320	20.399	25.429	0.212	1.405	1.292
Fugitive Dust	---	---	---	---	18.521	3.829
Totals	**6.36**	**30.90**	**38.14**	**0.23**	**20.66**	**5.77**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.454	3.250	2.898	0.006	0.138	0.114
Offroad Vehicles/Equipment	0.645	2.409	4.039	0.005	0.264	0.243
Helicopter	4.982	19.496	21.701	0.181	1.199	1.103
Fugitive Dust	---	---	---	---	10.045	2.282
Totals	**6.08**	**25.15**	**28.64**	**0.19**	**11.65**	**3.74**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.004	0.025	0.033	0.000	0.002	0.001
Offroad Vehicles/Equipment	0.005	0.021	0.030	0.000	0.002	0.002
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.009**	**0.046**	**0.063**	**0.000**	**0.004**	**0.003**

TRTP Alternative 6 Project Construction Emission Totals
ANF - AVAQMD/MDAB Jurisdiction

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.056	0.414	0.363	0.001	0.016	0.013
Offroad Vehicles/Equipment	0.058	0.178	0.250	0.000	0.023	0.021
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.666	0.140
Totals	**0.11**	**0.59**	**0.61**	**0.00**	**0.70**	**0.17**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.217	1.397	1.692	0.003	0.077	0.066
Offroad Vehicles/Equipment	0.336	1.174	2.208	0.002	0.138	0.127
Helicopter	2.416	7.910	8.669	0.073	0.478	0.439
Fugitive Dust	---	---	---	---	7.784	1.746
Totals	**2.97**	**10.48**	**12.57**	**0.08**	**8.48**	**2.38**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.235	1.748	1.419	0.003	0.065	0.054
Offroad Vehicles/Equipment	0.290	1.015	1.753	0.002	0.119	0.110
Helicopter	0.328	1.962	2.561	0.021	0.142	0.130
Fugitive Dust	---	---	---	---	4.212	0.811
Totals	**0.85**	**4.72**	**5.73**	**0.03**	**4.54**	**1.10**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.446	3.178	2.889	0.006	0.136	0.113
Offroad Vehicles/Equipment	0.705	2.624	4.559	0.005	0.286	0.263
Helicopter	4.351	17.101	18.932	0.158	1.046	0.962
Fugitive Dust	---	---	---	---	6.940	1.572
Totals	**5.50**	**22.90**	**26.38**	**0.17**	**8.41**	**2.91**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.003	0.025	0.022	0.000	0.001	0.001
Offroad Vehicles/Equipment	0.003	0.012	0.020	0.000	0.001	0.001
Helicopter	0.001	0.002	0.003	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	0.000	0.000
Totals	**0.007**	**0.038**	**0.045**	**0.000**	**0.002**	**0.002**

Alternative 6. Onroad Emissions - Reduction

Segment 6

2009	VMT	VMT	Emissions lbs -2009					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	60,220	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	0	30,110	0.00	0.00	0.00	0.00	0.00	0.00
Heavy-Heavy Duty	0	10,037	0.00	0.00	0.00	0.00	0.00	0.00
		Totals	0.00	0.00	0.00	0.00	0.00	0.00

2010	VMT	VMT	Emissions lbs -2010					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	652,566	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	831	276,601	2.15	15.32	17.14	0.02	0.62	0.53
Heavy-Heavy Duty	447	242,272	1.36	5.34	17.09	0.02	0.82	0.72
		Totals	3.51	20.66	34.22	0.04	1.44	1.25

2011	VMT	VMT	Emissions lbs -2011					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	1,049,767	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	1,377	363,802	3.33	23.31	26.07	0.04	0.97	0.82
Heavy-Heavy Duty	481	160,156	1.34	5.35	16.62	0.02	0.80	0.70
		Totals	4.67	28.66	42.69	0.06	1.76	1.52

2012	VMT	VMT	Emissions lbs -2012					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	294,310	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	29	127,729	0.06	0.45	0.50	0.00	0.02	0.02
Heavy-Heavy Duty	32	70,846	0.08	0.33	0.99	0.00	0.05	0.04
		Totals	0.15	0.78	1.49	0.00	0.07	0.06

Segment 11

2009	VMT	VMT	Emissions lbs -2009					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	56,975	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-617	29,328	-1.72	-12.43	-13.79	-0.02	-0.50	-0.43
Heavy-Heavy Duty	-206	9,776	-0.68	-2.64	-8.60	-0.01	-0.41	-0.36
		Totals	-2.40	-15.07	-22.40	-0.02	-0.91	-0.79

2010	VMT	VMT	Emissions lbs -2010					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	11,179	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-121	5,754	-0.31	-2.23	-2.50	0.00	-0.09	-0.08
Heavy-Heavy Duty	-40	1,918	-0.12	-0.48	-1.54	0.00	-0.07	-0.06
		Totals	-0.44	-2.71	-4.04	0.00	-0.16	-0.14

2011	VMT	VMT	Emissions lbs -2011					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	165,035	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-665	55,629	-1.61	-11.25	-12.58	-0.02	-0.47	-0.40
Heavy-Heavy Duty	-970	55,075	-2.71	-10.79	-33.52	-0.04	-1.61	-1.40
		Totals	-4.32	-22.05	-46.11	-0.06	-2.08	-1.80

2012	VMT	VMT	Emissions lbs -2012					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	1,019,597	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-10,315	349,552	-23.08	-159.44	-178.69	-0.28	-6.70	-5.67
Heavy-Heavy Duty	-5,413	203,699	-13.68	-55.29	-167.38	-0.22	-8.10	-7.00
		Totals	-36.76	-214.73	-346.07	-0.49	-14.80	-12.67

2013	VMT	VMT	Emissions lbs -2013					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	31,132	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-442	12,534	-0.91	-6.22	-6.96	-0.01	-0.26	-0.22
Heavy-Heavy Duty	-254	8,634	-0.57	-2.36	-6.96	-0.01	-0.34	-0.29
		Totals	-1.48	-8.58	-13.92	-0.02	-0.60	-0.51

TOTALS

2009

	VMT	VMT	Emissions lbs -2011					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	117,195	0	0	0	0	0	0
Delivery	-617	59,438	-2	-12	-14	0	0	0
Heavy-Heavy Duty	-206	19,813	-1	-3	-9	0	0	0
		Totals	-2.40	-15.07	-22.40	-0.02	-0.91	-0.79

2010

	VMT	VMT	Emissions lbs -2011					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	663,744	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	710	282,356	1.84	13.09	14.64	0.02	0.53	0.46
Heavy-Heavy Duty	407	244,191	1.24	4.86	15.54	0.02	0.74	0.65
		Totals	3.08	17.95	30.19	0.04	1.28	1.11

2011

	VMT	VMT	Emissions lbs -2011					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	1,214,801	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	712	419,431	1.72	12.06	13.48	0.02	0.50	0.43
Heavy-Heavy Duty	-489	215,232	-1.37	-5.44	-16.90	-0.02	-0.81	-0.71
		Totals	0.36	6.62	-3.41	0.00	-0.31	-0.28

2012

	VMT	VMT	Emissions lbs -2012					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	1,313,906	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-10,286	477,281	-23.02	-158.99	-178.19	-0.27	-6.68	-5.65
Heavy-Heavy Duty	-5,381	274,545	-13.60	-54.96	-166.39	-0.22	-8.05	-6.96
		Totals	-36.62	-213.95	-344.58	-0.49	-14.73	-12.61

2013

	VMT	VMT	Emissions lbs -2012					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	31,132	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-442	12,534	-0.91	-6.22	-6.96	-0.01	-0.26	-0.22
Heavy-Heavy Duty	-254	8,634	-0.57	-2.36	-6.96	-0.01	-0.34	-0.29
		Totals	-1.48	-8.58	-13.92	-0.02	-0.60	-0.51

Total

	VMT	VMT	Emissions lbs -2012					
Vehicle Type	Incremental Change	Total	VOC	CO	NOx	SOx	PM10	PM2.5
Passenger	0	3,223,584	0.00	0.00	0.00	0.00	0.00	0.00
Delivery	-9,305	1,191,601	-20.37	-140.06	-157.03	-0.25	-5.92	-4.99
Heavy-Heavy Duty	-5,717	742,601	-14.30	-57.91	-174.70	-0.23	-8.45	-7.31
		Totals	-34.67	-197.96	-331.73	-0.48	-14.37	-12.30

Alternative 6

Helicopter Trip Emissions for Alternative 6 (Segment 6)

Summary of Total Number of Helicopter Trips for Entire Tower Sites

	220 kV Construction	500 kV Construction
Hughes 500		
Eurocopter	7372	10714
Skyking	1044	7052
Skycrane	30	1512

220 kV	Suspension	7921
	Dead End	525
500 kV	Suspension	16878
	Dead End	2400

230kV Wreckout - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	1,985.07	4,447.28	9,080.78	75.29	494.12
	2012	91.44	204.86	418.30	3.47	22.76
Skyking	2010	2,475.23	8,962.38	7,967.35	67.01	441.68
	2012	114.02	412.85	367.01	3.09	20.35
Skycrane	2010	80.27	569.00	733.61	6.10	40.64
	2012	3.70	26.21	33.79	0.28	1.87

500kV Construction - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	1,293.38	2,897.63	5,916.59	49.05	321.94
	2011	1,612.03	3,611.53	7,374.30	61.14	401.26
	2012	112.47	251.97	514.49	4.27	28.00
Skyking	2010	13,117.39	47,495.80	42,222.67	355.11	2,340.69
	2011	3,231.82	11,701.86	10,402.69	87.49	576.69
	2012	1,140.64	4,130.07	3,671.54	30.88	203.54
Skycrane	2010	0.00	0.00	0.00	0.00	0.00
	2011	3,955.97	28,042.30	36,154.54	300.50	2,003.02
	2012	276.00	1,956.44	2,522.41	20.97	139.75

Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	3,278.45	7,344.90	14,997.37	124.34	816.07
	2011	1,612.03	3,611.53	7,374.30	61.14	401.26
	2012	203.91	456.83	932.79	7.73	50.76
Skyking	2010	15,592.62	56,458.18	50,190.02	422.12	2,782.37
	2011	3,231.82	11,701.86	10,402.69	87.49	576.69
	2012	1,254.66	4,542.92	4,038.55	33.97	223.88
Skycrane	2010	80.27	569.00	733.61	6.10	40.64
	2011	3,955.97	28,042.30	36,154.54	300.50	2,003.02
	2012	279.70	1,982.65	2,556.20	21.25	141.62

Total Emissions (ton)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2010	1.64	3.67	7.50	0.06	0.41
	2011	0.81	1.81	3.69	0.03	0.20
	2012	0.10	0.23	0.47	0.00	0.03
Skyking	2010	7.80	28.23	25.10	0.21	1.39
	2011	1.62	5.85	5.20	0.04	0.29
	2012	0.63	2.27	2.02	0.02	0.11
Skycrane	2010	0.04	0.28	0.37	0.00	0.02
	2011	1.98	14.02	18.08	0.15	1.00
	2012	0.14	0.99	1.28	0.01	0.07

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500					
Eurocopter	2.55	5.71	11.65	0.10	0.63
Skyking	10.04	36.35	32.32	0.27	1.79
Skycrane	2.16	15.30	19.72	0.16	1.09

Helicopter Trip Emissions for Alternative 6 (Segment 11)

Summary of Total Number of Helicopter Trips for Entire Tower Sites

	220 kV Construction	500 kV Construction
Hughes 500		
Eurocopter	4150	6436
Skyking	587	4088
Skycrane	12	912

220 kV	Suspension	4539
	Dead End	210
500 kV	Suspension	10476
	Dead End	960

230kV Wreckout - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2011	138.69	310.71	634.44	5.26	34.52
	2012	1,030.27	2,308.17	4,712.98	39.07	256.45
Skyking	2011	172.73	625.41	555.98	4.68	30.82
	2012	1,283.11	4,645.91	4,130.11	34.74	228.96
Skycrane	2011	3.98	28.25	36.42	0.30	2.02
	2012	29.60	209.84	270.54	2.25	14.99

500kV Construction - Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2012	1,812.87	4,061.47	8,293.02	68.76	451.26
Skyking	2012	10,138.75	36,710.69	32,634.95	274.47	1,809.18
Skycrane	2012	2,552.61	18,094.48	23,328.95	193.90	1,292.46

Total Emissions (lbs)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2011	138.69	310.71	634.44	5.26	34.52
	2012	2,843.13	6,369.64	13,006.00	107.83	707.71
Skyking	2011	172.73	625.41	555.98	4.68	30.82
	2012	11,421.86	41,356.60	36,765.06	309.21	2,038.14
Skycrane	2011	3.98	28.25	36.42	0.30	2.02
	2012	2,582.22	18,304.32	23,599.49	196.15	1,307.45

Total Emissions (tons)

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Eurocopter	2011	0.07	0.16	0.32	0.00	0.02
	2012	1.42	3.18	6.50	0.05	0.35
Skyking	2011	0.09	0.31	0.28	0.00	0.02
	2012	5.71	20.68	18.38	0.15	1.02
Skycrane	2011	0.00	0.01	0.02	0.00	0.00
	2012	1.29	9.15	11.80	0.10	0.65

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500					
Eurocopter	1.49	3.34	6.82	0.06	0.37
Skyking	5.80	20.99	18.66	0.16	1.03
Skycrane	1.29	9.17	11.82	0.10	0.65

Alt. 6 Segment 6 + Segment 11

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500	1.03	2.31	4.71	0.04	0.26
Eurocopter	4.04	9.05	18.47	0.15	1.01
Skyking	15.84	57.34	50.98	0.43	2.83
Skycrane	3.45	24.46	31.54	0.26	1.75
Totals	24.36	93.16	105.70	0.88	5.83

Total Helipcopter Emissions - Alternative 6

Helicopter Type	Year	HC	CO	NOx	SOx	PM
Hughes 500	2010	0.205	0.460	0.939	0.008	0.051
	2011	0.473	1.061	2.166	0.018	0.118
	2012	0.346	0.776	1.584	0.013	0.086
	2013	0.005	0.011	0.022	0.000	0.001
Eurocopter	2010	1.64	3.67	7.50	0.06	0.41
	2011	0.88	1.96	4.00	0.03	0.22
	2012	1.52	3.41	6.97	0.06	0.38
Skyking	2010	7.80	28.23	25.10	0.21	1.39
	2011	1.70	6.16	5.48	0.05	0.30
	2012	6.34	22.95	20.40	0.17	1.13
Skycrane	2010	0.04	0.28	0.37	0.00	0.02
	2011	1.98	14.04	18.10	0.15	1.00
	2012	1.43	10.14	13.08	0.11	0.72

Total Emissions (ton)

Year	HC	CO	NOx	SOx	PM
2010	9.68	32.65	33.90	0.28	1.87
2011	5.03	23.22	29.74	0.25	1.64
2012	9.64	37.28	42.03	0.35	2.32
2013	0.00	0.01	0.02	0.00	0.00

Total Emissions (ton)

Helicopter Type	HC	CO	NOx	SOx	PM
Hughes 500	1.03	2.31	4.71	0.04	0.26
Eurocopter	4.04	9.05	18.47	0.15	1.01
Skyking	15.84	57.34	50.98	0.43	2.83
Skycrane	3.45	24.46	31.54	0.26	1.75
Totals	24.36	93.16	105.70	0.88	5.83

Alternative 6 By Jurisdiction

Helicopter Trip Emissions for SCE's Alternative 6 (Segment 6)

AVAQMD/MDAB (lbs)

		Helicopter Type	Year	HC	CO	NOx	SOx	PM
Segment 6	Wreckout	Eurocopter	2010	358.75	803.74	1,641.13	13.61	89.30
			2012	91.44	204.86	418.30	3.47	22.76
		Skyking	2010	447.34	1,619.74	1,439.91	12.11	79.82
			2012	114.02	412.85	367.01	3.09	20.35
		Skycrane	2010	14.51	102.83	132.58	1.10	7.35
			2012	3.70	26.21	33.79	0.28	1.87
Segment 6	Construction	Eurocopter	2010	893.00	2,000.65	4,085.07	33.87	222.28
			2011	0.00	0.00	0.00	0.00	0.00
			2012	112.47	251.97	514.49	4.27	28.00
		Skyking	2010	3,118.90	11,293.01	10,039.23	84.43	556.54
			2011	0.00	0.00	0.00	0.00	0.00
			2012	1,140.64	4,130.07	3,671.54	30.88	203.54
		Skycrane	2010	0.00	0.00	0.00	0.00	0.00
			2011	484.63	3,435.38	4,429.19	36.81	245.38
			2012	276.00	1,956.44	2,522.41	20.97	139.75

	Year	HC	CO	NOx	SOx	PM
Segment 6 Totals (ton)	2010	2.42	7.91	8.67	0.07	0.48
	2011	0.24	1.72	2.21	0.02	0.12
	2012	0.87	3.49	3.76	0.03	0.21

SCAQMD (lbs)

		Helicopter Type	Year	HC	CO	NOx	SOx	PM
Segment 6	Wreckout	Eurocopter	2010	1,626.32	3,643.54	7,439.65	61.68	404.82
			2012	0.00	0.00	0.00	0.00	0.00
		Skyking	2010	2,027.89	7,342.65	6,527.44	54.90	361.86
			2012	0.00	0.00	0.00	0.00	0.00
		Skycrane	2010	65.76	466.17	601.02	5.00	33.30
			2012	0.00	0.00	0.00	0.00	0.00
Segment 6	Construction	Eurocopter	2010	400.37	896.98	1,831.52	15.18	99.66
			2011	1,612.03	3,611.53	7,374.30	61.14	401.26
			2012	0.00	0.00	0.00	0.00	0.00
		Skyking	2010	9,998.48	36,202.79	32,183.44	270.68	1,784.15
			2011	3,231.82	11,701.86	10,402.69	87.49	576.69
			2012	0.00	0.00	0.00	0.00	0.00
		Skycrane	2010	0.00	0.00	0.00	0.00	0.00
			2011	3,471.33	24,606.92	31,725.35	263.69	1,757.64
			2012	0.00	0.00	0.00	0.00	0.00

	Year	HC	CO	NOx	SOx	PM
Segment 6 Totals (ton)	2010	7.06	24.28	24.29	0.20	1.34
	2011	4.16	19.96	24.75	0.21	1.37
	2012	0.00	0.00	0.00	0.00	0.00

Helicopter Trip Emissions for SCE's Alternative 6 (Segment 11)

SCAQMD

		Helicopter Type	Year	HC	CO	NOx	SOx	PM
Segment 11	Wreckout	Eurocopter	2011	81.73	183.10	373.87	3.10	20.34
			2012	607.12	1,360.17	2,777.29	23.03	151.12
		Skyking	2011	101.78	368.55	327.63	2.76	18.16
			2012	756.12	2,737.77	2,433.81	20.47	134.92
		Skycrane	2011	2.35	16.65	21.46	0.18	1.19
			2012	17.44	123.65	159.43	1.33	8.83
Segment 11	Construction	Eurocopter	2012	1,068.30	2,393.37	4,886.96	40.52	265.92
		Skyking	2012	5,974.62	21,633.08	19,231.31	161.74	1,066.12
		Skycrane	2012	1,504.22	10,662.82	13,747.42	114.26	761.63

Segment 11 Totals (ton)	Year	HC	CO	NOx	SOx	PM
	2011	0.09	0.28	0.36	0.00	0.02
	2012	4.96	19.46	21.62	0.18	1.19

AVAQMD/MDAB

		Helicopter Type	Year	HC	CO	NOx	SOx	PM
Segment 11	Wreckout	Eurocopter	2011	56.96	127.61	260.57	2.16	14.18
			2012	423.14	948.00	1,935.69	16.05	105.33
		Skyking	2011	70.94	256.87	228.35	1.92	12.66
			2012	526.99	1,908.14	1,696.29	14.27	94.04
		Skycrane	2011	1.64	11.60	14.96	0.12	0.83
			2012	12.16	86.18	111.12	0.92	6.16
Segment 11	Construction	Eurocopter	2012	744.57	1,668.10	3,406.06	28.24	185.34
		Skyking	2012	4,164.13	15,077.60	13,403.64	112.73	743.05
		Skycrane	2012	1,048.40	7,431.66	9,581.53	79.64	530.83

Segment 11 Totals (ton)	Year	HC	CO	NOx	SOx	PM
	2011	0.06	0.20	0.25	0.00	0.01
	2012	3.46	13.56	15.07	0.13	0.83

Total Helicopter Trip Emissions for SCE's Alternative 6 by Jurisdiction

KCAPCD

Year	HC	CO	NOx	SOx	PM
2010	0.09	0.21	0.42	0.00	0.02
2011	0.03	0.07	0.15	0.00	0.01

SCAQMD

Year	HC	CO	NOx	SOx	PM
2010	7.13	24.43	24.61	0.21	1.36
2011	4.58	20.99	26.63	0.22	1.47
2012	5.27	20.14	23.01	0.19	1.27

AVAQMD/MDAB

Year	HC	CO	NOx	SOx	PM
2010	2.46	8.01	8.87	0.07	0.49
2011	0.42	2.16	2.97	0.02	0.16
2012	4.37	17.14	19.02	0.16	1.05
2013	0.00	0.01	0.02	0.00	0.00

Alternative 7 Underground Construction
Emission Calculation Assumptions

Proposed Project General Assumptions
1) Work occurs 6 days a week, 8 hours a day, excepting major holidays
2) Project schedule mirrors existing 66kV schedules.

Offroad Equipment Emission Calculation Assumptions
1) Emission factors are the latest available from the SCAQMD website, where the nearest horsepower sized equipment given in the SCAQMD emission factor database are used with a ratio of actual assumed equipment horsepower to derive hourly emission factors.
2) Construction subtasks, durations, equipment type, number, and usage estimates are used are engineering estimates by Aspen Environment Group using very limited equipment information provided by SCE.
3) The following vehicle types, which could be offroad vehicles are assumed to be onroad vehicles considering the project description, needs and location: water trucks and dump trucks.

Onroad Equipment Emission Calculations Assumptions
1) Emission factors are the latest available from the SCAQMD website, where the vehicles have been assigned three classes, passenger (i.e. employee vehicles and pickups), delivery (all nonpassenger vehicles smaller than Heavy-Heavy Duty), and heavy-heavy duty vehicles.
2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.
3) Trip estimates are based on engineering estimates of import/export quantities, equipment and worker trips.
4) All onroad traffic for the project is assumed to occur within SCAQMD jurisdiction.
6) Soil waste truck are assumed to be single trailers with 10 cubic yard capacity. Concrete loads are 10 cubic yards.
7) A ten percent contingency is added to the concrete and soil waste trips. This contingency considers excavated soil expansion and concrete wastage.

Fugitive Dust Emission Calculations Assumptions
1) Unpaved road travel is minimized to the extent feasible and shall be no more than one-half mile per round trip.
2) Unpaved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt content is assumed to be 6% on average (SCAQMD level for sand and gravel plant roads);
and 2) average vehicle weight based on VMT estimate for unpaved roads
3) Paved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt loading is average for 5000-10000 ADT road; 2) average vehicle weight is calculated on VMT average basis.

4) Earthmoving emission factors are calculated, as necessary, using the recent version of USEPA AP-42 Section 11.9 for Dozing and Grading, and Section 13.2.4 for soil handling (drop emissions).
5) Due to SCAQMD fugitive dust measure requirements, limited overall disturbed acreage, and short construction duration the wind erosion potential is considered negligible.

TRTP Alternative 7 Project Construction Emission Totals
Incremental Underground Construction Emission Totals
SCAQMD Juridiction

Worst-Case Day 2011	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	2.50	12.00	26.98	0.03	1.31	1.13
Offroad Vehicles/Equipment	2.69	10.65	15.85	0.02	1.29	1.19
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	39.02	8.95
Totals	**5.19**	**22.65**	**42.83**	**0.05**	**41.61**	**11.26**

Incremental Annual Emissions

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.04	0.18	0.38	0.00	0.02	0.02
Offroad Vehicles/Equipment	0.04	0.16	0.25	0.00	0.02	0.02
Helicopter	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive Dust	---	---	---	---	0.53	0.12
Totals	**0.08**	**0.34**	**0.63**	**0.00**	**0.57**	**0.15**

Note: This alternative does not significantly impact the AVAQMD, KCAPCD, or the ANF.

Construction Schedule - Alternative 7 66kV Underground				Daily VMT								
				Employee Vehicle			Delivery Truck			Heavy Heavy Duty Truck		
				Paved	Unpaved	Total	Paved	Unpaved	Total	Paved	Unpaved	Total
Segment 7	**Crew Size**	**Total Days**	**Date**	**VMT/day**	**VMT/day**	**VMT/day**	**VMT/day**	**VMT/day**	**VMT/day**	**VMT/day**	**VMT/day**	**VMT/day**
66kV Undergrounding at Duck Farm												
Construction	12	20	Mar 2011	354	6.00	360.00	39	1.00	40.00	737.5	12.50	750.00
66kV Undergrounding at Whittier Narrows												
Construction	12	13	Apr 2011	354	6.00	360.00	39	1.00	40.00	737.5	12.50	750.00
				Totals - Max Day								
				354	6	360	39	1	40	738	13	750
				Annual VMT								
				PAVED			**UNPAVED**			**TOTAL**		
				2011			**2011**			**2011**		
Segment 7				**Employee Vehicle**	**Delivery Truck**	**HHDT HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT HHDT**	**Employee Vehicle**	**Delivery Truck**	**HHDT HHDT**
66kV Undergrounding at Duck Farm												
Construction				7080	780	12537.5	120.00	20.00	212.50	7200.00	800.00	12750.00
66kV Undergrounding at Whittier Narrows												
Construction				4602	507	7994.5	78.00	13.00	135.50	4680.00	520.00	8130.00
				Totals - Annual								
				11,682	1,287	20,532	198	33	348	11,880	1,320	20,880

Construction Schedule - Alternative 7 66kV Underground

Delivery Size Vehicles	**Trips**	**Mi/Trip**	**Miles**
Duck Farm	40	20	800
Whitter Narrows	26	20	520
HHDT Vehicles			
Duck Farm	**Total Days**	**Max Veh/day**	**Total Veh**
Trench	14	25	350
Vault	3	21	63
Boring	1	4	4
End Structure	2	4	8
			425
Whittier Narrows			
Trench	8	25	200
Vault	3	21	63
Boring	0	4	0
End Structure	2	4	8
			271

Alternative 7 - Segment 7

Onroad Equipment Maximum Daily Emissions

			Emissions lbs/day-2011					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	360	0.31	2.97	0.30	0.00	0.03	0.02
	Delivery	40	0.10	0.68	0.76	0.00	0.03	0.02
	Heavy-Heavy Duty	750	2.10	8.34	25.92	0.03	1.25	1.08
		Totals	2.50	12.00	26.98	0.03	1.31	1.13

Annual Emissions

			Emissions lbs/year					
2011	Vehicle Type	Total	VOC	CO	NOx	SOx	PM10	PM2.5
	Passenger	11,880	10.13	98.16	10.03	0.13	1.05	0.67
	Delivery	1,320	3.19	22.35	24.99	0.04	0.93	0.79
	Heavy-Heavy Duty	20,880	58.37	232.28	721.57	0.83	34.68	30.17
		Totals	71.69	352.79	756.60	0.99	36.66	31.63

Offroad Equipment Emission Calculations - Alternative 7 66 kV Underground

SCAQMD Offroad Emission Factors

Equipment Item	HP	2011 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM
Backhoe	85	0.097992	0.35051	0.417886	0.0005	0.038348
Boring Machine/Drill Rig	250	0.089241	0.344486	1.012856	0.002116	0.032285
Excavator Cat 320	138	0.131576	0.573202	0.86731	0.000994	0.069265
Forklift - 10 ton	85	0.056618	0.198383	0.238449	0.000278	0.02308
Loader - 928	143	0.123605	0.509538	0.848985	0.000902	0.062686
Water Pump - 100 hp	100	0.132263	0.458792	0.722904	0.00078	0.060041

SCAQMD emission factors are linearly interpolated as necessary for the specific hp size of the assumed equipment

2011 Emission Calculations

Trenching			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator Cat 320	138	1	0.131576	0.573202	0.86731	0.000994	0.069265	8	1.05	4.59	6.94	0.01	0.55	25	26.32	114.64	173.46	0.20	13.85
Forklift - 10 ton	85	1	0.056618	0.198383	0.238449	0.000278	0.02308	4	0.23	0.79	0.95	0.00	0.09	25	5.66	19.84	23.84	0.03	2.31
Backhoe	85	1	0.097992	0.35051	0.417886	0.0005	0.038348	4	0.39	1.40	1.67	0.00	0.15	25	9.80	35.05	41.79	0.05	3.83
Water Pumps - 100 hp	100	1	0.132263	0.458792	0.722904	0.00078	0.060041	4	0.53	1.84	2.89	0.00	0.24	25	13.23	45.88	72.29	0.08	6.00
Loader - 928	143	1	0.123605	0.509538	0.848985	0.000902	0.062686	4	0.49	2.04	3.40	0.00	0.25	25	12.36	50.95	84.90	0.09	6.27
									2.69	10.65	15.85	0.02	1.29		67.36	266.36	396.28	0.44	32.27

Vault Construction			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator Cat 320	138	1	0.131576	0.573202	0.86731	0.000994	0.069265	6	0.79	3.44	5.20	0.01	0.42	6	4.74	20.64	31.22	0.04	2.49
Water Pumps - 100 hp	100	1	0.132263	0.458792	0.722904	0.00078	0.060041	6	0.79	2.75	4.34	0.00	0.36	6	4.76	16.52	26.02	0.03	2.16
Forklift, 10 ton	85	1	0.056618	0.198383	0.238449	0.000278	0.02308	2	0.11	0.40	0.48	0.00	0.05	6	0.68	2.38	2.86	0.00	0.28
Loader - 928	143	1	0.123605	0.509538	0.848985	0.000902	0.062686	1	0.12	0.51	0.85	0.00	0.06	6	0.74	3.06	5.09	0.01	0.38
									1.82	7.10	10.87	0.01	0.88		10.92	42.59	65.20	0.07	5.31

Boring			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Boring Machine	250	1	0.089241	0.344486	1.012856	0.002116	0.032285	6	0.54	2.07	6.08	0.01	0.19	1	0.54	2.07	6.08	0.01	0.19
Water Pumps - 100 hp	100	1	0.132263	0.458792	0.722904	0.00078	0.060041	4	0.53	1.84	2.89	0.00	0.24	1	0.53	1.84	2.89	0.00	0.24
Forklift, 10 ton	85	1	0.056618	0.198383	0.238449	0.000278	0.02308	2	0.11	0.40	0.48	0.00	0.05	1	0.11	0.40	0.48	0.00	0.05
Loader - 928	143	1	0.123605	0.509538	0.848985	0.000902	0.062686	2	0.25	1.02	1.70	0.00	0.13	1	0.25	1.02	1.70	0.00	0.13
									1.42	5.32	11.14	0.02	0.61		1.42	5.32	11.14	0.02	0.61

End Structures			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Drill Rig	250	1	0.089241	0.344486	1.012856	0.002116	0.032285	4	0.36	1.38	4.05	0.01	0.13	4	1.43	5.51	16.21	0.03	0.52
Loader - 928	143	1	0.123605	0.509538	0.848985	0.000902	0.062686	2	0.25	1.02	1.70	0.00	0.13	4	0.99	4.08	6.79	0.01	0.50
Backhoe	85	1	0.097992	0.35051	0.417886	0.0005	0.038348	2	0.20	0.70	0.84	0.00	0.08	4	0.78	2.80	3.34	0.00	0.31
									0.80	3.10	6.59	0.01	0.33		3.20	12.39	26.34	0.05	1.32

	Maximum Day - Lbs/Day						Annual - Tons/Year				
Year	ROG	CO	NOX	SOX	PM	Year	ROG	CO	NOX	SOX	PM
2011	2.69	10.65	15.85	0.02	1.29	2011	0.04	0.16	0.25	0.00	0.02

Fugitive Dust Emissions - Alternative 7 66kV Underground

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Material Loading/Handling (AP-42, p. 13.2.4-3)

$E = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 26.5 MPH worst day, 6.4 MPH avg from Norco Met File
M = moisture content = 10% (mitigated)
Max daily productivity is assume to be two times average
Three separate drops are assumed

2011	200	Maximum daily tons
2011	5800	Annual tons

Emission Factors and Emissions
Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual
0.00103	0.00032	0.00016	0.00005

Emissions lbs/day

	PM10	PM2.5
2011	0.62	0.19

Emissions tons/year

	PM10	PM2.5
2011	0.00	0.00

2) Road Dust

Emission Types
A) Paved Road Dust
B) Unpaved Road Dust

A) Paved Road Dust

E = [k x (sL/2)0.65 x (W/3)1.5 -C] x (1-P/4N)
E = lb/VMT
k = Constant (0.016 for PM10 and 0.0040 for PM2.5)
sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)
W = Average weight of vehicles in tons (calculated below)
C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Passenger Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2011	354	39	738	1131	20.5

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Paved VMT	Average Weight (Tons)
2011	11,682	1,287	20,532	33501	19.4

Emission Factors and Emissions
Emission Factors

Daily Efs	PM10 Daily	PM2.5 Daily
2011	0.0287	0.0069

Emissions lbs/day

	PM10	PM2.5
2011	32.48	7.84

Annual Efs	PM10 Annual	PM2.5 Annual
2011	0.0264	0.0064

Emissions tons/year

	PM10	PM2.5
2011	0.44	0.11

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365\text{-}P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 6% - SCAQMD Handbook for Sand and Gravel Plant Road)
W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unpaved VMT	Average Weight (Tons)
2011	6	1	13	20	20.3

Annual Case VMT	Passenger Vehicles	Delivery/Work Vehicles	Heavy-Heavy Duty Vehicles	Total Unpaved VMT	Average Weight (Tons)
2011	198	33	348	579	19.2

Uncontrolled Emission Factors and Emissions
Emission Factors (lb/VMT)

Annual Efs	PM10 Daily	PM2.5 Daily
2011	1.90	0.29

Emissions lbs/day

	PM10	PM2.5
2011	37.02	5.68

Annual Efs	PM10 Annual	PM2.5 Annual
2011	1.85	0.20

Emissions tons/year

	PM10	PM2.5
2011	0.54	0.06

Controlled Emissions (assumes 84% efficiency with use of soil binder)

Emissions lbs/day

	PM10	PM2.5
2011	5.92	0.91

Emission Control
84%

Emissions tons/year

	PM10	PM2.5
2011	0.09	0.01

Fugitive Dust Emission Totals

Maximum Daily Emissions	2011	
	PM10 lb/day	PM2.5 lb/day
Soil Handling	0.62	0.19
Paved Road Dust	32.48	7.84
Unpaved Road Dust	5.92	0.91
Totals	39.02	8.95

Annual Emissions	2011	
	PM10 t/yr	PM2.5 t/yr
Soil Handling	0.00	0.00
Paved Road Dust	0.44	0.11
Unpaved Road Dust	0.09	0.01
Totals	0.53	0.12

TRTP Alternative 7 Project Construction Emission Totals
USACE Land Total - All SCAQMD Jurisdiction

2009 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles						
Offroad Vehicles/Equipment						
Helicopter						
Fugitive Dust	---	---	---	---		
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2010 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.204	1.378	1.446	0.002	0.066	0.056
Offroad Vehicles/Equipment	0.361	1.246	2.323	0.003	0.148	0.136
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	2.244	0.526
Totals	**0.57**	**2.62**	**3.77**	**0.00**	**2.46**	**0.72**

2011 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.274	2.044	1.631	0.003	0.076	0.063
Offroad Vehicles/Equipment	0.521	1.790	3.121	0.003	0.207	0.191
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	2.431	0.488
Totals	**0.80**	**3.83**	**4.75**	**0.01**	**2.71**	**0.74**

2012 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.142	1.065	0.809	0.002	0.038	0.031
Offroad Vehicles/Equipment	0.216	0.806	1.379	0.002	0.089	0.082
Helicopter	0.000	0.000	0.000	0.000	0.000	0.000
Fugitive Dust	---	---	---	---	1.090	0.213
Totals	**0.36**	**1.87**	**2.19**	**0.00**	**1.22**	**0.33**

2013 Emissions	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles						
Offroad Vehicles/Equipment						
Helicopter						
Fugitive Dust	---	---	---	---		
Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Appendix D.
Project Road Crossings

TABLE D-1
ROADWAY CROSSINGS (ALL) – SEGMENT 4

Roadway	Description	Segment 4 Route Milepost	Jurisdiction
Minor Road	2 lane Undivided Unpaved	0.9	Kern County
Minor Road	2 lane Undivided Unpaved	1.0	Kern County
Minor Road	2 lane Undivided Unpaved	2.7	Kern County
Minor Road	2 lane Undivided Unpaved	3.0	Kern County
Minor Road	2 lane Undivided Unpaved	3.1	Kern County
Rosamond Boulevard	2 lane Undivided Paved	3.3	Kern County
General Petroleum Road	2 lane Undivided Paved	3.8	Kern County
Mojave Avenue	2 lane Undivided Paved	4.2	Kern County
Minor Road	2 lane Undivided Unpaved	4.4	Kern County
Astoria Avenue	2 lane Undivided Paved	4.5	Kern County
170th Street	2 lane Undivided Paved	4.7	Kern County
Gaskell Road	2 lane Undivided Paved	5.7	Kern County
160th Street	2 lane Undivided Paved	6.6	Kern County
A Avenue	2 lane Undivided Paved	6.9	Kern County
155th Street	2 lane Undivided Paved	7.4	Los Angeles County
A-8 Avenue	2 lane Undivided Paved	7.5	Los Angeles County
B Avenue	2 lane Undivided Paved	8.1	Los Angeles County
150th Street	2 lane Undivided Paved	8.3	Los Angeles County
B-8 Avenue	2 lane Undivided Unpaved	8.7	Los Angeles County
145th Street	2 lane Undivided Paved	9.2	Los Angeles County
C Avenue	2 lane Undivided Paved	9.3	Los Angeles County
C-8 Avenue	2 lane Undivided Unpaved	9.9	Los Angeles County
140th Street	2 lane Undivided Paved	10.2	Los Angeles County
State Route 138 (SR-138)	2 lane undivided, paved	10.5	Los Angeles County
135th Street	2 lane Undivided Unpaved	11.1	Los Angeles County
D-8 Avenue	2 lane Undivided Unpaved	11.1	Los Angeles County
E Avenue	2 lane Undivided Paved	11.7	Los Angeles County
W Avenue	2 lane Undivided Unpaved	11.7	Los Angeles County
130th Street	2 lane Undivided Unpaved	12.0	Los Angeles County
E-8 Avenue	2 lane Undivided Unpaved	12.3	Los Angeles County
F Avenue	2 lane Undivided Unpaved	12.9	Los Angeles County
125th Street	2 lane Undivided Unpaved	12.9	Los Angeles County
G Avenue	2 lane Undivided Unpaved	13.9	Los Angeles County

Roadway	Description	Segment 4 Route Milepost	Jurisdiction
120th Street	2 lane Undivided Unpaved	14.2	Los Angeles County
G-8 Avenue	2 lane Undivided Unpaved	14.8	Los Angeles County
115th Street	2 lane Undivided Unpaved	14.9	Los Angeles County
H Avenue	2 lane Undivided Paved	15.3	Los Angeles County
110th Street	2 lane Undivided Paved	15.8	Los Angeles County
I Avenue	2 lane Undivided Paved	16.4	Los Angeles County
Lancaster Boulevard	2 lane Undivided Unpaved	16.9	Los Angeles County
J Avenue	2 lane Undivided Paved	17.4	Los Angeles County
105th Street	2 lane Undivided Unpaved	18.4	City of Lancaster
100th Street	2 lane Undivided Unpaved	18.9	City of Lancaster
98th Street	2 lane Undivided Unpaved	19.0	City of Lancaster
97th Street	2 lane Undivided Unpaved	19.1	City of Lancaster

TABLE D-2
ROADWAY CROSSINGS (ALL) – SEGMENT 5

Roadway	Description	Segment 5 Route Milepost	Jurisdiction
J-8 Avenue	2 lane Undivided Unpaved	0.4	City of Lancaster
95th Street	2 lane Undivided Unpaved	0.4	City of Lancaster
K Avenue	2 lane Undivided Paved	1.0	City of Lancaster
90th Street	2 lane Undivided Paved	1.3	City of Lancaster
K-8 Avenue	2 lane Undivided Unpaved	1.6	City of Lancaster
K-12 Avenue	2 lane Undivided Unpaved	1.9	City of Lancaster
L Avenue	2 lane Undivided Paved	2.2	City of Lancaster
80th Street	2 lane Undivided Unpaved	3.2	City of Lancaster
Columbia Way	2 lane Undivided Paved	3.4	City of Lancaster
75th Street	2 lane Undivided Paved	4.0	City of Palmdale
Minor Road	2 lane Undivided Unpaved	5.4	City of Palmdale
Minor Road	2 lane Undivided Unpaved	5.6	City of Palmdale
Minor Road	2 lane Undivided Unpaved	5.7	City of Palmdale
Minor Road	2 lane Undivided Unpaved	5.8	City of Palmdale
Minor Road	2 lane Undivided Unpaved	6.1	City of Palmdale
Godde Hill Road	2 lane Undivided Paved	6.3	City of Palmdale
Minor Road	2 lane Undivided Unpaved	6.7	City of Palmdale
Elizabeth Lake Rd	2 lane Undivided Paved	7.8	City of Palmdale

Roadway	Description	Segment 5 Route Milepost	Jurisdiction
Minor Road	2 lane Undivided Unpaved	8.5	City of Palmdale
Minor Road	2 lane Undivided Unpaved	8.7	City of Palmdale
Ediscon Road	2 lane Undivided Unpaved	9.2	City of Palmdale
Ediscon Road	2 lane Undivided Unpaved	9.3	City of Palmdale
Ediscon Road	2 lane Undivided Unpaved	9.4	City of Palmdale
Ediscon Road	2 lane Undivided Unpaved	9.5	City of Palmdale
Ana Verde Mountainway	2 lane Undivided Unpaved	9.6	City of Palmdale
40th Street	2 lane Undivided Unpaved	9.7	City of Palmdale
Minor Road	2 lane Undivided Unpaved	10.2	City of Palmdale
Minor Road	2 lane Undivided Unpaved	11.3	Los Angeles County
Minor Road	2 lane Undivided Unpaved	11.6	Los Angeles County
Minor Road	2 lane Undivided Unpaved	11.8	Los Angeles County
Peaceful Valley Road	2 lane Undivided Unpaved	13.2	Los Angeles County
Tuckerway Ranch Road	2 lane Undivided Unpaved	14.8	Los Angeles County
Peaceful Valley Road	2 lane Undivided Paved	16.0	Los Angeles County
State Route 14 (SR-14)	4 lanes, mainline + carpool	16.5	Los Angeles County
Forest View Road	2 lane Undivided Paved	16.5	Los Angeles County
Sierra Highway	2 lane Undivided Paved	16.6	Los Angeles County
Union Pacific Railroad	Rail	16.8	Los Angeles County
Carson Mesa Road	2 lane Undivided Paved	16.9	Los Angeles County
Minor Road	2 lane Undivided Unpaved	17.0	Los Angeles County
Foreston Road	2 lane Undivided Paved	17.4	Los Angeles County

TABLE D-3
ROADWAY CROSSINGS (ALL) – SEGMENT 6

Roadway	Description	Segment 6 Route Milepost	Jurisdiction
Minor Road	2 lanes Unpaved	0.0 – 0.2	Los Angeles County
Kentucky Springs Road	2 lanes Unpaved	0.2	Los Angeles County
Nina Road	2 lanes Unpaved	0.7 – 0.9	Los Angeles County
Juniper Ridge Lane	2 lanes Unpaved	0.9	Los Angeles County
Aliso Canyon Road	2 lanes Unpaved	5.3	Los Angeles County
Angeles Forest Highway	2 lanes Paved	7.3	Los Angeles County
Pacifico Mountain Road	2 lanes Unpaved	7.4	Los Angeles County
Lynx Gulch Road	2 lanes Unpaved	11.1 - 12.0	Los Angeles County
Alder Road	2 lanes Unpaved	13.0 - 13.1	Los Angeles County

Edison Loop Road	2 lanes Unpaved	13.8 -14.8	Los Angeles County
Upper Big Tujunga Canyon Road	2 lanes Paved	15.5	Los Angeles County
Upper Big Tujunga Canyon Road	2 lanes Paved	16.7	Los Angeles County
State Route 2 (SR-2)	2 lane undivided, paved	16.8	Los Angeles County
Rincon Red Box	2 lanes Unpaved	20.2 – 20.3	Los Angeles County
Devils Canyon Dam Road	2 lanes Unpaved	20.3 - 20.5	Los Angeles County
Rincon Red Box	2 lanes Unpaved	20.6 - 23.1	Los Angeles County
Monrovia Canyon	2 lanes Unpaved	23.4 - 24.2	Los Angeles County
Van Tessel Mountainway	2 lanes Unpaved	24.7	Los Angeles County
Van Tessel Mountainway	2 lanes Unpaved	25.6	City of Duarte
Minor Road	2 lanes Unpaved	25.8	City of Duarte
Minor Road	2 lanes Unpaved	26.4	City of Monrovia

TABLE D-4
FREEWAYS AND STATE HIGHWAY CROSSINGS – SEGMENT 7

Roadway	Description	Segment 7 Route Milepost	Jurisdiction
I-210 Freeway	10 lanes, mainline + carpool	2.4	City of Irwindale
I-605 Freeway	8 lanes, mainline	3.2	City of Irwindale
I-605 South (Exit 26)	1 lane	4.3	City of Irwindale
I-605 Freeway	8 lanes, mainline	4.3 - 4.4	City of Irwindale
I-605 Freeway	8 lanes, mainline	4.4 - 4.8	City of Irwindale
I-605 North (Exit 25)	1 lane	4.8 - 4.9	City of Irwindale
I-605 Freeway	8 lanes, mainline + carpool	5.3	City of Irwindale
I-605 Freeway	8 lanes, mainline	6.2	City of Irwindale
I-10 Freeway	8 lanes, mainline + carpool	8.2	City of Baldwin Park
I-10 East (Exit 31a)	8 lanes, mainline + carpool	8.2	City of Baldwin Park
SR-60	8 lanes, mainline	11.1-11.2	City of South El Monte
State Highway 19	4 lanes	13.0	Los Angeles County
SR-60	8 lanes, mainline	14.7	City of Montebello

TABLE D-5
LOCAL ROAD CROSSINGS – SEGMENT 7

Roadway	Description	Segment 7 Route Milepost	Jurisdiction
Van Tassel Mountainway	2 lane, unpaved	0.1 – 0.4	City of Azusa
Royal Oaks Drive	2 lane, paved	1.4	City of Duarte
Hacienda Drive	2 lane, paved	1.6	City of Duarte
Huntington Drive	4 lane, paved	1.9	City of Duarte
Metro Railroad	Rail	2.5	City of Irwindale
Arrow Highway	4 lane paved	4.4	City of Irwindale
Live Oak Avenue	4 lane paved	4.8	City of Irwindale
Graham Access Road	2 lane paved	5.0	City of Irwindale
Lower Azusa Road	4 lane paved	6.2	City of Irwindale
Ramona Boulevard	4 lane paved	7.3	City of Baldwin Park
Union Pacific Railroad	Rail	8.8	City of Industry
Valley Boulevard	4 lane paved	8.9	City of Industry
Peck Road	4 lane paved	11.4	City of South El Monte
Durfee Avenue	2 lane paved	12.0	City of South El Monte
Lexington-Gallatin Road	2 lane paved	12.4	Los Angeles County
Santa Anita Avenue	4 lane paved	12.4	City of South El Monte
San Gabriel Boulevard	4 lane paved	13.8	Los Angeles County
Plaza Drive	4 lane paved	14.0	City of Montebello
Montebello Boulevard	4 lane paved	14.5	City of Montebello
Town Center Drive	4 lane paved	14.7	City of Montebello
Paramount Boulevard	5 lane paved	14.8	City of Montebello
Greenwood Avenue	2 lane paved	15.6	City of Monterey Park

TABLE D-6
FREEWAYS AND STATE HIGHWAY CROSSINGS – SEGMENT 8A

Roadway	Description	Segment 8A Route Milepost	Jurisdiction
State Route 60 (SR-60)	10 lanes, mainline	1.1	City of Montebello
State Route 60 (SR-60)	10 lanes, mainline	1.2	City of Montebello
State Highway 19 (Rosemead Boulevard)	4 lanes	2.8	Los Angeles County
State Route 605 (SR-605)	8 lanes, mainline + carpool lane	4.4	City of Pico Rivera
State Route 57 (SR-57)	8 lanes, mainline + carpool lane	17.0	City of Diamond Bar, Los Angeles County
State Route 71 (SR-71)	6 lanes, mainline + carpool lane	25.6	City of Chino Hills
State Route 71 (SR-71)	6 lanes, mainline + carpool lane	25.7	City of Chino
State Route 83 (SR-83)	4 lanes	29.9	City of Ontario

TABLE D-7
LOCAL ROAD CROSSINGS – SEGMENT 8A

Roadway	Description	Segment 8A Route Milepost	Jurisdiction
Greenwood Avenue	2 lane paved	0.2	Monterey Park
Paramount Boulevard	5 lane paved	1.1	City of Montebello
Town Center Drive	4 lane paved	1.2	City of Montebello
Montebello Boulevard	4 lane paved	1.3	City of Montebello
Plaza Drive	4 lane paved	1.8	City of Montebello
San Gabriel Boulevard	4 lane paved	2.1	Los Angeles County
Durfee Avenue	2 lane paved	3.2	Los Angeles County
Minor Road	2 lane paved	4.1	City of Pico Rivera
Bicentennial Park Road	2 lane paved	4.3	City of Pico Rivera
Union Pacific Railroad	Rail	4.6	City of Industry
Peck Road	4 lane paved	4.7	Los Angeles County
Workman Mill Road	4 lane paved	4.8	Los Angeles County
Police Academy Road	Paved	4.8	Los Angeles County
Minor Road	Paved	5.0 – 6.3	Los Angeles County
Skyline Fire Road	2 lane paved	6.9 – 7.1	Los Angeles County
Rose Hills No. 1 Fire Road	2 lane paved	7.1	Los Angeles County

TABLE D-7 (CONTINUED)
LOCAL ROAD CROSSINGS – SEGMENT 8A

Roadway	Description	Segment 8A Route Milepost	Jurisdiction
Skyline Drive	2 lane paved	7.2	Los Angeles County
Turnbull Canyon Road	2 lane paved	7.8	Los Angeles County
Skyline Fire Road	2 lane unpaved	7.9	Los Angeles County
Skyline No. 2 Fire Road	2 lane unpaved	8.0	Los Angeles County
Cow Fire Road	Unpaved	8.2	Los Angeles County
Skyline No. 2 Fire Road	2 lane unpaved	8.0	Los Angeles County
Skyline No. 2 Fire Road	2 lane unpaved	8.6	Los Angeles County
Skyline Fire Road	2 lane unpaved	8.9	Los Angeles County
Frame Avenue	2 lane paved	9.0	Los Angeles County
Holmes Circle	2 lane paved	9.2	Los Angeles County
Colima Road	4 lane paved	9.5	Los Angeles County
Minor Road	Unpaved	9.6	Los Angeles County
Jones Road	2 lane unpaved	9.8	Los Angeles County
Draper Drive	2 lane unpaved	10.1	Los Angeles County
Hacienda Boulevard	6 lane paved	10.5	Los Angeles County
Skyline Trail	2 lane unpaved	11.2 – 11.4	La Habra Heights
Gotera Drive	2 lane paved	11.5	La Habra Heights
Bixby Drive	2 lane unpaved	11.6	La Habra Heights
Marble Road	2 lane unpaved	12.1	La Habra Heights
Powder Canyon Motorway	Unpaved	12.6	Los Angeles County
Minor Road	Unpaved	12.7 – 12.9	La Habra Heights
Fullerton Road	4 lane paved	13.5	Los Angeles County
Pathfinder Road	4 lane paved	13.6	Los Angeles County
Minor Road	Paved	15.6 – 16.9	Los Angeles County
Brea Canyon Road	2 lane paved	17.1	City of Diamond Bar
Minor Road	Unpaved	17.2 – 17.7	Los Angeles County
Brea Ridge Mountainway	2 lane unpaved	17.9	Los Angeles County
Minor Road	2 lane unpaved	18.3	
Tonner Canyon Road	2 lane paved	18.5	Los Angeles County
Minor Road	Unpaved	18.6	Los Angeles County
Tonner Fire Road	2 lane unpaved	18.9	Los Angeles County
Sanome Mountainway	2 lane unpaved	19.8	Los Angeles County
State Road	2 lane unpaved	20.0 – 21.0	Los Angeles County

TABLE D-7 (CONTINUED)
LOCAL ROAD CROSSINGS – SEGMENT 8A

Roadway	Description	Segment 8A Route Milepost	Jurisdiction
Esquilime Drive	2 lane paved	21.2	City of Chino Hills
Canyon Hills Road	2 lane paved	21.3	City of Chino Hills
Cabrillo (Avenida Cabrillo)	2 lane paved	23.1	City of Chino Hills
Madrid (Calle Madrid)	2 lane paved	23.4	City of Chino Hills
Chino Hills Parkway	4 lane paved	23.8	City of Chino Hills
Little Bend Road	2 lane paved	23.9	City of Chino Hills
Maplewood Drive	2 lane paved	24.0	City of Chino Hills
Foxwood Road	2 lane paved	24.1	City of Chino Hills
Morningfield Drive	2 lane paved	24.2	City of Chino Hills
Lost Trail Drive	2 lane paved	24.5	City of Chino Hills
Peyton Drive	2 lane paved	24.5	City of Chino Hills
Cork Drive	2 lane paved	24.9	City of Chino Hills
Lobelia Drive	2 lane paved	25.0	City of Chino Hills
Pipeline Avenue	2 lane paved	25.5	City of Chino
Corporate Center Drive	2 lane paved	25.8	City of Chino
Hope Street	4 lane paved	25.9	City of Chino
Ramona Avenue	4 lane paved	26.0	City of Chino
Monte Vista Avenue	4 lane paved	26.5	City of Chino
Eucalyptus Avenue	4 lane paved	27.1	City of Chino
Central Avenue	4 lane paved	27.7	City of Chino
Minor Road	2 lane paved	27.9	City of Chino
Edison Avenue	4 lane paved	28.6	City of Chino
Magnolia Avenue	2 lane paved	28.7	City of Chino
Mountain Avenue	4 lane paved	29.0	City of Chino
Cypress Avenue	2 lane paved	29.2	City of Chino
San Antonio Avenue	2 lane paved	29.5	City of Chino
Fern Avenue	2 lane paved	29.7	City of Chino
Sultana Avenue	2 lane unpaved	30.2	City of Ontario
Campus Avenue	2 lane unpaved	30.5	City of Ontario
Minor Road	2 lane paved	30.6	City of Ontario
Bon View Avenue	2 lane paved	30.7	City of Ontario
Cucamonga Avenue	2 lane unpaved	31.0	City of Ontario
Grove Avenue	2 lane paved	31.2	City of Ontario

TABLE D-7 (CONTINUED)
LOCAL ROAD CROSSINGS – SEGMENT 8A

Roadway	Description	Segment 8A Route Milepost	Jurisdiction
Comet Avenue	2 lane unpaved	31.5	City of Ontario
Walker Avenue	2 lane paved	31.7	City of Ontario
Minor Road	2 lane unpaved	32.5	City of Ontario
Ontario Avenue	2 lane unpaved	32.8	City of Ontario
Schaefer Avenue	2 lane paved	33.2	City of Ontario
Archibald Avenue	2 lane paved	33.3	City of Ontario
Haven Avenue	2 lane paved	34.7	City of Ontario
Mill Creek Avenue	2 lane paved	35.2	City of Ontario

TABLE D-8
ROADWAY CROSSINGS (ALL)– SEGMENT 8B

Roadway	Description	Segment 8B Route Milepost	Jurisdiction
Magnolia Avenue	2 lane, paved	0.3	City of Chino
Mountain Avenue	4 lane paved	0.5	City of Chino
Cypress Avenue	2 lane, paved	0.8	City of Chino
San Antonio Avenue	2 lane, paved	1.0	City of Chino
Fern Avenue	2 lane, paved	1.3	City of Chino
State Route 83 (SR-83)	4 lanes, paved	1.5	City of Ontario
Sultana Avenue	2 lane, unpaved	1.8	City of Ontario
Campus Avenue	2 lane, unpaved	2.1	City of Ontario
Minor Road	2 lane, paved	2.2	City of Ontario
Bon View Avenue	2 lane, paved	2.3	City of Ontario
Schaefer Avenue	2 lane, paved	2.3	City of Ontario
Cucamonga Avenue	2 lane, unpaved	2.6	City of Ontario
Grove Avenue	2 lane, paved	2.8	City of Ontario
Comet Avenue	2 lane, unpaved	3.1	City of Ontario
Walker Avenue	2 lane, paved	3.4	City of Ontario
Baker Avenue	2 lane, unpaved	3.6	City of Ontario
Vineyard Avenue	2 lane, paved	3.9	City of Ontario
Minor Road	2 lane, unpaved	4.1	City of Ontario
Ontario Avenue	2 lane, paved	4.4	City of Ontario
Archibald Avenue	2 lane, paved	4.9	City of Ontario
Old Archibald Ranch Road	2 lane, paved	5.2	City of Ontario
Turner Avenue	2 lane, paved	5.4	City of Ontario
Haven Avenue	2 lane, paved	6.3	City of Ontario

TABLE D-9
ROADWAY CROSSINGS (ALL) – SEGMENT 8C

Roadway	Description	Segment 8C Route Milepost	Jurisdiction
Magnolia Avenue	2 lane paved	0.3	City of Chino
Mountain Avenue	4 lane paved	0.5	City of Chino
Cypress Avenue	2 lane paved	0.8	City of Chino
San Antonio Avenue	2 lane paved	1.0	City of Chino
Fern Avenue	2 lane paved	1.3	City of Chino
State Route 83 (SR-83)	4 lane, paved	1.5	City of Ontario
Sultana Avenue	2 lane unpaved	1.8	City of Ontario
Campus Avenue	2 lane unpaved	2.0	City of Ontario
Minor Road	2 lane unpaved	2.1	City of Ontario
Bon View Avenue	2 lane paved	2.3	City of Ontario
Cucamonga Avenue	2 lane unpaved	2.5	City of Ontario
Grove Avenue	2 lane paved	2.8	City of Ontario
Comet Avenue	2 lane unpaved	3.0	City of Ontario
Walker Avenue	2 lane paved	3.3	City of Ontario
Minor Road	2 lane unpaved	4.0	City of Ontario
Ontario Avenue	2 lane unpaved	4.3	City of Ontario
Schaefer Avenue	2 lane paved	4.7	City of Ontario
Archibald Avenue	2 lane paved	4.9	City of Ontario
Haven Avenue	2 lane paved	5.8	City of Ontario

TABLE D-10
LOCAL ROAD CROSSINGS – SEGMENT 10

Roadway	Description	Segment 10 Route Milepost	Jurisdiction
90th Street	Local Road	1.1	Kern County
100th Street	Local Road	2.5	Kern County
Sunset Avenue	Local Road	2.6	Kern County
Europe Avenue	Local Road	3.3	Kern County
Tehachapi Willow Spring Road	Collector	4.3	Kern County
Trotter Avenue	Local Road	6.2	Kern County
Aqueduct Road	Local Road	6.8	Kern County
Backus Road	Local Road	7.2	Kern County
110th Street	Local Road	7.5	Kern County
120th Street	Local Road	8.9	Kern County
125th Street	Local Road	9.6	Kern County
127th Street	Local Road	10.0	Kern County
129th Street	Local Road	10.2	Kern County
130th Street	Local Road	10.3	Kern County
McConnell Avenue	Local Road	10.6	Kern County
132nd Street	Local Road	10.7	Kern County
135th Street	Local Road	11.1	Kern County
Dawn Road	Local Road	11.3	Kern County
140th Street	Local Road	11.7	Kern County
145th Street	Local Road	12.4	Kern County
Hamilton Road	Local Road	12.7	Kern County
150th Street	Local Road	13.2	Kern County
Avenue of the Stars	Local Road	13.5	Kern County
155th Street	Local Road	13.8	Kern County
Irone Avenue	Local Road	14.2	Kern County
160th Street	Local Road	14.5	Kern County
Truman Road	Local Road	14.7	Kern County
Fisher Avenue	Local Road	15.0	Kern County
165th Street	Local Road	15.3	Kern County
168th Street	Local Road	15.5	Kern County
Darcy Street	Local Road	15.7	Kern County
Rosamond Boulevard	Collector	15.8	Kern County
Holiday Avenue	Local Road	16.8	Kern County

TABLE D-11
FREEWAYS AND STATE HIGHWAY CROSSINGS – SEGMENT 11

Roadway	Description	Segment 11 Route Milepost	Jurisdiction
State Route 2 (SR-2)	2 lanes, paved	15.9, 17.6, 18.4	USDA FS
Interstate 210 (I-210)	10 lanes, mainline + carpool	27.5	City of Pasadena
Interstate 10 (I-10)	8 lanes, mainline + carpool	33.0	City of Rosemead

TABLE D-12
LOCAL ROAD CROSSINGS – SEGMENT 11

Roadway	Description	Segment 11 Route Milepost	Jurisdiction
Kentucky Springs Road	2 lanes, unpaved	0.3	Los Angeles County
Minor Road	Unpaved	0.4	Los Angeles County
Nina Road	2 lanes, unpaved	0.5	Los Angeles County
Minor Road	Unpaved	1.3	Los Angeles County
Minor Road	Unpaved	1.7	USDA FS
BP and L Road	2 lanes, unpaved	2.5	USDA FS
Edison Road	2 lanes, unpaved	2.7	USDA FS
Edison Road	2 lanes, unpaved	2.9	USDA FS
Edison Road	2 lanes, unpaved	3.4	USDA FS
Alison Canyon Road	2 lanes, paved	3.6	USDA FS
Minor Road	Unpaved	3.7	USDA FS
Minor Road	Unpaved	3.9	USDA FS
Edison Road	2 lanes, unpaved	4.9	USDA FS
Gleason Road	2 lanes, unpaved	7.8	USDA FS
Minor Road	Unpaved	8.2	USDA FS
Minor Road	Unpaved	8.5	USDA FS
Minor Road	Unpaved	8.6	USDA FS
Minor Road	Unpaved	8.7	USDA FS
Minor Road	Unpaved	10.1	USDA FS
Minor Road	Unpaved	10.4	USDA FS
Minor Road	Unpaved	10.5	USDA FS
Minor Road	Unpaved	10.6	USDA FS
Minor Road	Unpaved	10.7	USDA FS
Minor Road	Unpaved	11.9	USDA FS
Minor Road	Unpaved	12.1	USDA FS
Minor Road	Unpaved	12.6	USDA FS
Minor Road	Unpaved	12.8	USDA FS
Big Tujunga Canyon Road	2 lanes, paved	13.5	USDA FS
Angeles Forest Highway	2 lanes, paved	14.1	USDA FS
Angeles Forest Highway	2 lanes, paved	14.5	USDA FS
Clear Creek Truck Trail	2 lanes, unpaved	14.6	USDA FS
Edison Road	2 lanes, unpaved	15.5	USDA FS
Edison Road	2 lanes, unpaved	15.7	USDA FS

TABLE D-12 (CONTINUED)
LOCAL ROAD CROSSINGS – SEGMENT 11

Roadway	Description	Segment 11 Route Milepost	Jurisdiction
Edison Road	2 lanes, unpaved	15.8	USDA FS
Dark Canyon Truck Trail	2 lanes, unpaved	16.7	USDA FS
Lukens Truck Trail	2 lanes, unpaved	17.9	USDA FS
Lukens Truck Trail	2 lanes, unpaved	18.1	USDA FS
Gould Motorway	2 lanes, unpaved	18.8	City of Pasadena
Arroyo Seco Road	2 lanes, paved	19.3	USDA FS
Lower Brown Mountain Road	2 lanes, unpaved	20.0	USDA FS
El Prieto Fire Road	2 lanes, unpaved	20.3	USDA FS
Rising Hill Road	2 lanes, unpaved	20.5	USDA FS
Chaney Trail	2 lanes, paved	21.1	USDA FS
Lowe Motorway	2 lanes, unpaved	21.3	USDA FS
Minor Road	Unpaved	23.2	USDA FS
Wilson Road	2 lanes, unpaved	24.5	USDA FS
Eaton Canyon Drive	2 lanes, paved	25.7	City of Pasadena
New York Drive	4 lanes, paved	25.8	City of Pasadena
Woodlyn Road	2 lanes, paved	26.1	City of Pasadena
Bradley Street	2 lanes, paved	26.3	City of Pasadena
Sierra Madre Boulevard	3 lanes, paved	26.7	City of Pasadena
Paloma Street	2 lanes, paved	26.8	City of Pasadena
Orange Grove Boulevard	4 lanes, paved	26.9	City of Pasadena
Foothill Boulevard	4 lanes, paved	27.5	City of Pasadena
Metro Gold Line	Rail	27.5	City of Pasadena
Colorado Boulevard	4 lanes, paved	27.7	City of Pasadena
Kinneloa Avenue	2 lanes, paved	27.9	City of Pasadena
Brandon Street	2 lanes, paved	27.9	City of Pasadena
Milton Street	2 lanes, paved	27.9	City of Pasadena
Del Mar Boulevard	4 lanes, paved	28.0	Los Angeles County
San Pasqual Street	2 lanes, paved	28.4	City of Pasadena
California Boulevard	2 lanes, paved	28.5	Los Angeles County
Lombardy Road	2 lanes, paved	28.7	City of Pasadena
Huntington Drive	8 lanes, paved	28.99	Los Angeles County
Rancho Mangana Road	2 lanes, paved	29.2	Los Angeles County
Duarte Road	2 lanes, paved	29.6	Los Angeles County

TABLE D-12 (CONTINUED)
LOCAL ROAD CROSSINGS – SEGMENT 11

Roadway	Description	Segment 11 Route Milepost	Jurisdiction
Ardendale Avenue	2 lanes, paved	29.8	Los Angeles County
Longden Avenue	2 lanes, paved	30.1	Los Angeles County
Garibaldi Avenue	2 lanes, paved	30.4	City of San Gabriel
Hermosa Drive	2 lanes, paved	30.6	City of San Gabriel
Elm Avenue	2 lanes, paved	30.7	City of San Gabriel
Las Tunas	6 lanes, paved	30.8	City of San Gabriel
Broadway	2 lanes, paved	31.1	City of San Gabriel
Union Pacific Railroad	Rail	31.5	Los Angeles County
Grand Avenue	2 lanes, paved	31.6	City of Rosemead
Walnut Grove Avenue	4 lanes, paved	31.9	City of Rosemead
Mission Drive	4 lanes, paved	31.9	City of Rosemead
Well Street	2 lanes, paved	32.2	City of Rosemead
Valley Boulevard	4 lanes, paved	32.4	City of San Gabriel
Marshall Street	2 lanes, paved	32.8	City of Rosemead
Olney Street	2 lanes, paved	32.9	City of Rosemead
Union Pacific Railroad	Rail	33.0	City of Rosemead
I-10 E Exist 26A	1 lane, paved	33.0	City of Rosemead
Artson Street	2 lanes, paved	33.1	City of Rosemead
Hellman Avenue	2 lanes, paved	33.2	City of Rosemead
Dorothy Street	2 lanes, paved	33.3	City of Rosemead
Delta Place / Earle Avenue	2 lanes, paved	33.5	City of Rosemead
Garvey Avenue	4 lanes, paved	33.7	City of Rosemead
San Gabriel Boulevard	4 lanes, paved	34.2	City of Rosemead
Pine Street	2 lanes, paved	34.3	City of Rosemead
Falling Leaf Avenue	2 lanes, paved	34.4	City of Rosemead
Kelburn Avenue	2 lanes, paved	34.5	City of Rosemead
Graves Avenue	4 lanes, paved	34.5	City of Rosemead
La Merced Road	2 lanes, paved	34.6	Los Angeles County
Del Mar Avenue	4 lanes, paved	34.8	Los Angeles County
Mooney Drive	2 lanes, paved	34.9	Los Angeles County
Arroyo Drive	2 lanes, paved	35.3	City of Monterey Park
Saturn Street	2 lanes, paved	35.8	City of Monterey Park
Potrero Grande Drive	4 lanes, paved	36.1	City of Monterey Park

Appendix E.
Summary of PdV Wind Energy Project EIR

1.0 PdV Wind Energy Project

1.1 Project Description

The PdV project (proposed project) would be located along the southeastern foothills of the Tehachapi Mountains in the Willow Springs area of eastern Kern County. The proposed project is located about 15 miles west of State Highway 14 (Antelope Valley Freeway) and 12.5 miles south of Highway 58. Figure A-1 shows the location of the proposed project. The proposed project site is generally bounded to the north and west by the Tehachapi Mountains; to the south by the Los Angeles Aqueduct and beyond that, Rosamond Boulevard; and to the east by Tehachapi Willow Springs Road. The Pacific Crest Trail temporary alignment bisects the proposed project site. Tejon Ranch is situated directly west of the proposed project site, while Willow Springs International Motorsports Park, a recreational racetrack, is located approximately 10 miles to the east. Northrop Grumman Corporation maintains its Tejon Test Site approximately 3 miles to the west. The unincorporated community of Rosamond and Edwards Air Force Base are located about 15 miles to the southeast.

The PdV project would include construction and operation of the following:

- Up to 300 wind turbines, not to exceed 400 feet in height from ground elevation, with associated generators, towers, foundations, and pad-mounted transformers. Each turbine could range from 1 to 3 MW;
- On-site roads and off-site project access roads, control cables, subsurface electrical feederline corridors, and power collection cables (transmission lines) necessary to serve the project;
- A new PdV substation to step up the voltage generated by the turbines to meet the electrical transmission system's 220-kV voltage (both 220-kV and 500-kV lines cross the site);
- A 20-acre interconnection yard/switching station near the existing SCE 220-kV Antelope-Magunden power line to interconnect the facility with that line or the adjacent 500-kV transmission line;
- An O&M building of about 4,800 square feet; and
- Temporary construction yards and concrete batch plants.

As discussed in the PdV Environmental Impact Report (EIR), published in September 2007 (Lead Agency: Kern County Planning Department), Power Partners Southwest, LLC (applicant) is considering a range of turbine models for this wind project to address market and manufacturer constraints that may ultimately dictate the type of turbine available once the proposed project has been permitted. To provide flexibility in selecting a turbine model for the proposed project, based on availability and other market constraints, the EIR evaluated a range of turbines from 1 to 3 MW.

The smallest turbine that may be used would be the Mitsubishi MWT-1000A at 1 MW, and the largest turbine would be the Vestas V90, at 3 MW. Therefore, the proposed project could consist of as many as 300 turbines or as few as 100 turbines. The EIR evaluates the impacts associated with implementation of the range of turbines that could be used. Each EIR section discusses the range of impacts that could occur, with an emphasis on the maximum impact that would be expected. For example, with respect to land impacts, the greatest area of impact would occur if 300 1-MW turbines were installed. Therefore, the assessment of land impacts in this EIR is based on the worst-case scenario of the installation of 300 1-MW wind turbines. Under this worst-case scenario, the proposed project would disturb up to 394 acres of land (or 7 percent of the total site); 276.8 acres would be permanently disturbed and 117.2 acres would be disturbed temporarily during construction. The main access road would require 15.5 acres of off-site disturbance.

Construction and operation of the proposed project could affect up to 643.5 acres within the overall 5,820-acre proposed project site. All areas of temporary disturbance would be restored in accordance with the Kern County General Plan and Zoning Ordinance. Each of these components is discussed in detail in Chapter 3, “Project Description” (PdV Draft EIR, Chapter 3, September 2007).

1.2 Alternatives

Information in this section was derived from *Chapter 6 Alternatives* of the PdV EIR. The PdV EIR discussed and analyzed 4 alternatives to the proposed project and provided a comparison of the impacts of these alternatives and of the proposed project. The alternatives analyzed in the PdV EIR are:

- Alternative A: No Project Alternative;
- Alternative B: Build Out of General Plan;
- Alternative C: Relocate to Tehachapi Wind Resource Area; and
- Alternative D: Reduce Project Size.

Alternative A: No Project Alternative

According to the PdV EIR, under Alternative A, the proposed project would not be constructed and existing conditions at the proposed project site would remain unchanged. Land uses on the proposed project site would remain as rural residential, recreational, and agricultural use as well as electrical power transmission use. Under Alternative A, the significant visual, air quality, biological resources, and public services impacts of the proposed project would be avoided, as discussed below. With respect to energy demand and energy sources, this alternative would undercut California’s aggressive goal of meeting 20 percent of the state’s electricity from renewable sources by 2010. Specifically, this alternative would not produce the 300 MW of wind energy for the consumer market in southern California. The 300 MW per day of wind energy capacity that the PdV Wind Project would provide would not be available to help investor-owned utilities, such as Southern California Edison (SCE), meet the renewable portfolio standard required under state law. Further, available wind energy in the Tehachapi Mountain area, which has been identified as one of California’s largest areas for wind energy development and is currently responsible for about 40 percent of the state’s total wind-generated power, would not be accessible to customers. This would force utilities to make alternate arrangements in order to supply the market with competitively priced fuel. In addition, the need for energy in the project region is likely to increase because of projected population and economic growth in Kern County and other southern California counties.

Alternative A would limit the contribution of the renewable wind energy to fulfill projected energy demands and could result in the construction of wind plants at other locations or the substitution of fossil fuels, each of which could create additional environmental impacts. With respect to the preservation of agricultural land in Kern County, which is a high priority in the Kern County General Plan, this alternative may indirectly lead to the future conversion of agricultural lands in the proposed project site to non-agricultural use. Specifically, the proposed project would preserve the base zoning district of agricultural use for the lifetime of the proposed project and would provide additional income to the landowners. Unlike other forms of development, such as residential development, agricultural operations in the proposed project site could continue throughout operation of the proposed project. With the exception of the limited amount of land that would be converted to non-agricultural use for the installation of aboveground facilities, landowners are expected to continue current agricultural operations (primarily grazing) on the remaining areas of the project site. Therefore, the proposed project would prevent other potential development with uses not compatible with agricultural operations.

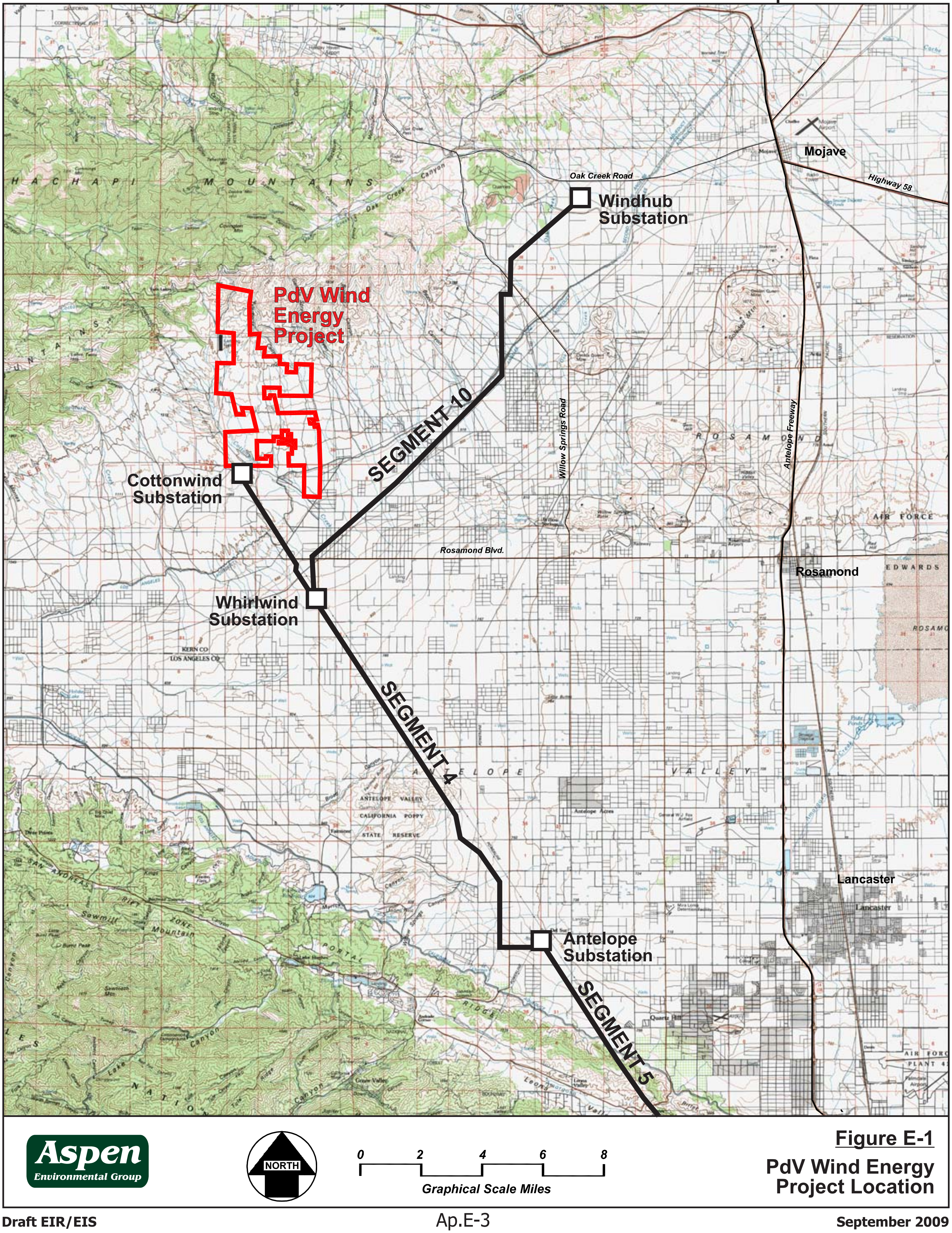

Figure E-1
PdV Wind Energy
Project Location

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Alternative B: Build Out of General Plan

Under Alternative B, it has been assumed that the population of Kern County will continue to grow at its current rate of less than 2 percent annually over the next 20 years, with increments generated both by a continuing influx of new residents from outside the County and by the natural increase of the population in the area (Kern County, 2004a). This alternative explores the potential impacts if the current General Plan were carried through full implementation without any changes and if potential development were maximized. The introduction of homes and processing and mining facilities would introduce structures where none presently exist.

Aesthetics. Visual impacts would be significant, as development would replace untouched land. As a result, this alternative would not lessen aesthetic impacts to a less-than-significant level. The Build Out alternative would not reduce the significance of the impacts on the visual character of the proposed project site.

Air Quality. The development of homes and mining and processing facilities would significantly impact air quality, as emissions of NO_X and PM_{10} would increase during construction. Emissions of Greenhouse gases (GHGs) would also increase due to the increased need for additional electricity generated from fossil fuels associated with the growing development and vehicle traffic. The long-term impacts on air quality would also not be reduced by this alternative. Not only would the reductions in emissions as a result of the proposed project be lost, but an increase in emissions would result from the development. As a result, this alternative would not lessen the significant impacts on air quality.

Biological Resources. Under this alternative, impacts on existing natural conditions, including plant communities and habitat used by common wildlife and sensitive species, would be significant. One single-family dwelling unit per 20 acres or 80 Williamson Act acres is low density, yet could result in habitat loss. Natural resource extraction could result in habitat loss and disruption of plant communities. Although the absence of wind turbines would eliminate the threat of migratory avian loss, the loss of habitat as a result of development would remain a significant impact on biological resources.

Recreation. Under this alternative, visual impacts on the Pacific Crest Trail would be lessened compared to the proposed project but not to a less-than-significant level. This alternative, like the No Project alternative, assumes no construction of the three hundred 1-MW turbines. This Build Out alternative does include the possible construction of one dwelling per 20 acres (or one dwelling per 80 Williamson Act acres) and the accompanying agricultural structures for grazing and dry-land farming. Visual impacts would be significant as development would replace untouched land. This alternative substitutes wind turbines for agricultural structures and homes, which, despite their inherent inequalities, is still development on untouched land. In conjunction with the high viewshed expectations of hikers and equestrians on the Pacific Crest Trail, this alternative would still result in a significant and unavoidable impact on public parks.

This alternative would not reduce any significant and unavoidable impacts associated with the proposed project to less-than-significant levels. Moreover, this alternative would not meet the proposed project objectives, including: Provide up to 300 MW of installed electrical capacity; Result in an economically feasible wind energy project that would be developed through commercially available financing; Realize the full potential of the wind resource on the lands under lease; and Offset the need for additional electricity generated from fossil fuels and assist the state in meeting its air quality goals and reduce GHGs.

Alternative C: Relocate to Tehachapi Wind Resource Area

Alternative C would place the proposed project in an area closer to existing wind developments. In the Tehachapi/Mojave area, most of the existing 3,444 wind turbines that produce about 710 MW of power are located in the TWRA (California Energy Commission, 2005). While this alternative would reduce visual impacts there is not enough acreage to construct the proposed wind plant, which as currently designed requires a contiguous 5,638 acres. The owners of the other wind projects in the TWRA may be considering improving their own projects under existing power contracts, and such improvements or expansion of existing wind facilities could preclude the use of space in the TWRA for new projects. In addition, there are other wind energy projects being planned in Kern County. Although applications have not yet been submitted to permitting agencies, presumably some of these projects will be in the TWRA. Given that wind plants already exist or are planned in the TWRA, siting the proposed project in the TWRA would only replace other proposed wind plants. By locating the proposed project, which is a large development, out of the TWRA, other projects could also be implemented in the TWRA. In the long-term, therefore, siting the proposed project outside of the TWRA may lead to approval of more wind energy projects.

As a result of housing growth, large areas of land that are required for the proposed project are increasingly difficult to find and are expensive. Increased costs could result in wind development projects being economically unfeasible. With a growing population in the Tehachapi area and in California as a whole, wind resources in areas of Kern County other than the TWRA would be necessary in order to facilitate achievement of the state's renewable energy goals.

Aesthetics. Under this alternative, visual impacts would be reduced from those of the proposed project. However, most of the projects in the TWRA are located on ridgetops and use shorter, older turbines (around the 200-foot-tall level). The introduction of the proposed 400-foot-tall towers on ridgetops may in fact be more visually prominent than the existing turbines, creating a visual impact in the TWRA.

Air Quality. The TWRA is located in the part of the Mojave Desert Air Basin under the jurisdiction of the Kern County Air Pollution Control District (KCAPCD). Air emissions associated with the construction and operation of a 300-MW wind plant at this location would theoretically be the same as for the proposed project. Emissions of NOx and PM_{10} would also be significant and impact air quality in the basin. Therefore, this alternative would not reduce impacts on air quality.

Biological Resources. Impacts on biological resources within the TWRA would vary based on the specific location. If the development occurs within a previously disturbed area, then impacts would be less significant. If impacts occur in a more undeveloped area, depending on the quality of habitat available, impacts may be equal or greater. Because there are other wind plants and development in the immediate area, wildlife may already use this area less than the proposed, more remote proposed project site. This alternative would also be expected to result in the loss of suitable habitat for sensitive species. However, it is expected that, similar to the proposed project, impacts on habitat and associated biological resources could be reduced to less than significant through avoidance of sensitive habitat and mitigation. As with the proposed project, impacts on certain sensitive avian species during operation of wind turbines are uncertain. Therefore, regardless of whether the turbines are installed at the proposed project site or in the TWRA, impacts are considered to be potentially significant and unavoidable. As a result, relocating the project to the TWRA would not result in fewer impacts on biological resources.

Recreation. Under this alternative, impacts on public parks would be avoided when compared to the proposed project. Relocating the project to the TWRA would avoid construction of the proposed project along the Pacific Crest Trail, which would be significantly impacted by the proposed project. This alternative would not reduce all significant and unavoidable impacts associated with the proposed project to less-than-significant levels. However, Alternative C: Relocate Project to the TWRA, would meet all of the proposed project's objectives.

Alternative D: Reduce Project Size

Alternative D would reduce the proposed project site and components dramatically to a size level where the construction would not cause an exceedance of the PM_{10} threshold. In order to prevent an exceedance of the PM_{10} threshold during construction, the project site would have to be reduced from 3,573 acres to approximately 37 acres. Energy generated from the proposed project would be reduced 88.6 percent from 300 MW to 34 MW. Only thirty-four 1-MW turbines would be constructed on 37 acres of land. The primary benefit of this alternative would be the short-term reduction of air quality impacts. Alternative D would meet the daily emission threshold of NOx and PM_{10} during construction. This alternative would not, however, meet Kern County's goal to maximize wind energy production as stated in the Kern County General Plan (Energy Element, Section 5.4.2, Wind Energy Development). Specifically, Policy 4 states: The County will work with the wind energy industry to maximize electricity potential while assuring that military flight operations, communications facilities, and visual conflicts for neighboring property owners are addressed. Furthermore, reducing the proposed project would significantly affect the economic terms of the proposed project, driving up the cost of renewable energy. Reducing the proposed project size could impact the economics to a level that the applicant would choose to withdraw the proposed project and it would not be built.

Aesthetics. Under this alternative, the visual character of the proposed project site would still be significantly affected. Even the introduction of a fraction of the number of turbines and associated facilities would still introduce structures into a relatively undeveloped area that would be visually noticeable. As described above, views of the turbines and associated facilities would be most prominent from nearby residences and for individuals recreating in the area, including using the Pacific Crest Trail and off-road vehicle trails. Reduction of the proposed project size would not significantly decrease remote views because they would already be fairly limited, even with the proposed project, because of the distance of nearby communities and major highways and roads in the proposed project vicinity. While the reduced project could relocate turbines away from the Pacific Crest Trail, visual impacts would still likely occur, as discussed above under "Alternatives Eliminated." Therefore, aesthetic impacts of the reduced project would be significant and unavoidable.

Air Quality. Reducing the number of turbines to 34 (88.6 percent decrease) would bring the impacts on air quality during construction to less-than-significant levels. Levels of NOx and PM_{10} would meet the Kern County and KCAPCD significance thresholds of 25 and 15 tons per year, respectively. Therefore, this alternative would have less-than-significant impacts on air quality during construction, unlike the proposed project. While the reduction of the proposed project size would reduce temporary short-term air quality impacts, the long-term offsets to overall reduction of GHGs and other particulates associated with the burning of fossil fuels gained by operation of the 300-MW proposed project would be negligible. Hence, the decrease in short-term emissions could indirectly result in greater long-term emissions in the Mojave Desert Air Basin. Therefore, impacts associated with this alternative could be greater than the proposed project in the long-term.

Biological Resources. Alternative D would reduce the loss of suitable habitat for sensitive species, as it would impact less area. It could also be designed to avoid impacts on the state-designated species in the site. Nevertheless, even with a reduced area of impact, habitat and associated biological resources would be disturbed by construction. Similar to the proposed project, however, it is anticipated that these impacts would be reduced to less than significant.

Alternative D would also reduce impacts on raptors because there would be fewer turbines that might be encountered. It would, however, not reduce the impacts to a less-than-significant level. Because there is potential for protected species, including mammals, birds, and bats, to use the area, there is still the potential for a significant impact if the proposed project were to result in a substantial reduction in the numbers of an endangered or threatened species. As such, even with the installation of fewer turbines and associated equipment, construction and operation of a reduced project would have a potentially significant impact on raptors and other sensitive species, similar to the proposed project. In addition, impacts on certain sensitive avian species during operation are uncertain and, therefore, are considered to be potentially significant and unavoidable.

Recreation. Under this alternative, impacts on public parks would be lessened compared to the proposed project but not to a less-than-significant level. The reduction in the number of turbines to 34 would still provide an aesthetic impact on the Pacific Crest Trail, given the high viewshed expectations of hikers and equestrians on this National Scenic Trail. Visual impacts would remain significant despite the reduction in turbines, because the introduction of 400-foot-tall turbines where no development currently exists would be a significant impact. The Reduce Project Size alternative would not reduce all significant and unavoidable impacts associated with the proposed project to less-than-significant levels. Despite a much smaller number of turbines, thirty-four 1-MW turbines would still have a significant aesthetic impact on undeveloped land. Although the levels of emissions during construction would meet the acceptable Kern County threshold, the long-term impacts of eliminating 266 MW of wind energy on air quality could be more harmful than the short-term benefit of reduced construction emissions. Moreover, this alternative would not work toward the 20 percent renewable energy production for California by 2010. Under this alternative, biological impacts would be reduced, yet not to less-than-significant levels. Finally, reducing the size of the proposed project site and energy produced could have economic impacts that render the alternative unfeasible. The construction of a commercial wind farm operates within an economy of scale, which would be reduced to an infeasible level with only 34 wind turbines.

1.3 Impacts and Mitigation Measures

Information in this section was derived from the PdV EIR document prepared by the Kern County Planning Department. For a more detailed discussion on impacts for each issue area, refer to Chapter 4 of the PdV EIR. Additionally, references cited in the mitigation measures correspond to the PdV EIR. All figures listed below can be found in the PdV EIR.

Less than Significant with Mitigation. The PdV EIR addressed all potentially significant environmental impacts identified during the Initial Study/Notice of Preparation and public scoping. The EIR found that environmental impacts on the following issue areas would be reduced to less-than-significant levels with the incorporation of mitigation measures:

- Agricultural resources;
- Cultural resources;
- Geology and soils;
- Hazards and hazardous materials;
- Hydrology and water quality;
- Land use and planning;
- Mineral resources;
- Noise;
- Public services;
- Transportation; and
- Utilities and services.

The mitigation measures identified to reduce significant impacts to less-than-significant levels are summarized in Table 1 below.

Unavoidable Significant Adverse Impacts. The PdV EIR found that the proposed project would result in significant and unavoidable impacts for the following resources, even with the incorporation of feasible mitigation measures:

- Aesthetics;
- Air quality;
- Biological resources; and
- Recreation.

The proposed project has the potential to have significant adverse effects on aesthetics, air quality, biological resources, and recreation at the project site and/or in the regional project area, even with mitigation, as identified in Table 1.

1.3.1 Aesthetics

Setting

The proposed project site is in an undeveloped, rural area located in the Tehachapi Mountains and is part of the Cottonwood Creek watershed, draining generally west and south toward the creek. Landforms in the project area consist of valleys and mountains. Two single-circuit 220-kV and one large, single-circuit 500-kV transmission lines occur in a corridor that trends NW from SE at the bottom of the proposed project site near Cottonwood Creek. Views of the proposed project would vary from significantly noticeable for individuals using the proposed project site or nearby area for recreation to less noticeable for those driving on the roads surrounding the proposed project. Views for individuals recreating in the area, such as hiking on the Pacific Crest Trail (which bisects the proposed project site) or using off-road vehicles, would be substantially affected. Surrounding areas to the north, south, and west do not currently generate light. Since no glare-producing structures currently exist on the proposed project site, glare is not generated.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

- **Adversely Affect a Scenic Vista**

  The proposed project would transform the relatively natural condition of the proposed project site (although it is currently used for grazing) to a commercial-scale wind farm consisting of wind turbines approximately 400 feet tall. Therefore, the existing visual character of the proposed project site would be altered.

  No feasible mitigation measures can be implemented to preserve the natural condition of the proposed project site. With implementation of the proposed project, impacts would be significant and unavoidable.

- **Alter or Degrade the Existing Visual Character or Quality of the Proposed Project Site and Its Surroundings**

  No wind projects currently exist in the area and the surroundings are primarily agricultural with scattered rural residences. The surroundings of the proposed project site would be changed from open space view to a view of 300 wind turbines.

No feasible mitigation measures can be implemented to preserve the existing visual character of the proposed project site. With implementation of the proposed project, impacts would be significant and unavoidable.

- **Result in Light or Glare that Adversely Affects Day or Nighttime Views in the Area**

  Lighting at night in the area includes visible light from nearby houses and headlights from motorists traveling along Tehachapi Willow Springs Road. Due to the height of wind turbines, flashing white or red lights would be required by the Federal Aviation Administration (FAA) for safety. Continuous lighting atop the wind turbines and security lighting for the Office and Maintenance Building would change the night sky view. Impacted viewers include nearby residences and Pacific Crest Trail users.

  Impacts would be significant and unavoidable after implementation of the following mitigation measures:

  Mitigation Measure (MM) 4.1-1: The applicant shall file a Notice of Construction with the FAA for the project. The applicant shall install lighting on turbines for aviation warning in accordance with FAA requirements only. The turbines shall not be lighted for other reasons.

  MM 4.1-2: All exterior lighting on the O&M building and on site fencing shall be shielded to minimize the impacts on the night sky.

Other Impacts

- **Alter or Damage a Major Landform or Scenic Resource**

  No impacts on state scenic highways would occur. Impacts would be less than significant.

- **Result in Aesthetics Impacts as a Result of SCE Facility Improvements**

  Aesthetic impacts to SCE Facility improvements would be less than significant due to shorter transmission pole lengths, similar pole design and material, low viewer expectation, and very low average daily traffic levels. A new source of substantial light or glare would not be created. Impacts would be less than significant.

1.3.2 Agricultural Resources

Setting

The proposed project site does not have a developed water source, therefore agricultural activity is limited. The proposed project site has always been used for agriculture, including grazing, pasture use, and minimal dry-land farming. Williamson Act Land Use contracts apply to approximately 2,367 acres within the proposed project site's 5,820 acres.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Covert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Non-agricultural Use**

  No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance exists at the proposed project site. Therefore, Important Farmland would not be converted to nonagricultural uses by the proposed project. The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan and the Wind Energy (WE) Combining District. Impacts would be less than significant.

- **Conflict with Existing Agricultural Zoning or Williamson Act Contracts**

  Under the Williamson Act (Gov. Code Section 51238(a)(1)), "electrical facilities" are designated as compatible uses on agricultural land. The exact number and location of the turbines has not been made, therefore *MM 4.2*-1, stated below, requires that a determination of compatibility be made on a site-specific basis in conjunction with the required turbine plot plan. Implementation of this mitigation measure would ensure that the requirements of compatible use with the Williamson Act are conformed with and that commercial agriculture operations can continue as required.

  MM 4.2-1: Prior to construction of any wind turbine on a parcel of land subject to a Williamson Act Land Use contract, the applicant shall submit a written site description, along with a plot plan, for review and approval to the Kern County Planning Department. This submittal is in addition to the required WE plot plan review. The site-specific description shall include the qualifying agricultural use and quantification of the amount of land that would no longer be available for that use.

- **Involve Other Changes in the Existing Environment which, Because of their Location or Nature, Could Result in Conversion of Farmland to Nonagricultural Use**

  Approximately 4 percent of agricultural land would be permanently disturbed and converted to nonagricultural use. Therefore, approximately 96 percent of the proposed project site could continue agricultural and grazing activities. Since only a limited area of the proposed project site would be converted to nonagricultural use and the fact that the land being converted is not Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, this impact is considered less than significant. The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan.

- **Result in the Cancellation of an Open-Space Contract, Williamson Act Contract, or Farmland Security Zone**

  The proposed project is in conformance with the California Land Conservation Act of 1965 and is not covered by any open space contract or Farmland Security Zone. This impact would be less than significant.

  MM 4.2-1 should be implemented.

- **Result in Agricultural Impacts as a Result of SCE Facility Improvements**

  The proposed SCE facilities and adjacent lands consist entirely of lands classified as "other land" and "grazing land". The proposed project would not convert Important Farmland to nonagricultural uses. No impacts would occur.

1.3.3 Air Quality

Setting

The proposed project site is located within the Mojave Desert Air Basin (MDAB) in Kern County and is regulated by the Kern County Air Pollution Control District (KCAPCD). The primary pollutants of concern in the proposed project area are particulate matter (PM) less than 10 microns (PM_{10}) and ozone.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

- **Violate any Air Quality Standards or Contribute Substantially to an Existing or Projected Air Quality Violation**

The Kern County Planning Department and KCAPCD thresholds of significance were used. Emissions of Nitrogen Oxide (NOx) and PM10 during construction would exceed the KCAPCD thresholds. Project emissions during operation would not exceed the same thresholds. The mitigation measures listed below have been identified to reduce emissions of PM10, PM2.5, and NOx during construction. However, even with mitigation, emissions would continue to exceed KCAPCD thresholds. Thus, the proposed project would have a temporary but significant and unavoidable impact on air quality during construction.

MM 4.3-1: The applicant shall develop a Fugitive Dust Control Plan in compliance with KCAPCD Rule 402 to reduce PM10 and PM2.5 emissions during construction. The Fugitive Dust Control Plan shall include:

a. Name(s), address(es), and phone number(s) of person(s) responsible for the preparation, submission, and implementation of the plan;

b. Description and location of operation(s);

c. Listing of all fugitive dust emissions sources included in the operation; and

d. Implementation of the following dust control measures shall be implemented:

i. All material excavated or graded will be sufficiently watered to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. Watering will occur a minimum of twice daily on unpaved/untreated roads and on disturbed areas with active operations.

ii. All clearing, grading, earth moving, and excavation activities will cease during periods when dust plumes of 20 percent or greater opacity affect public roads or occupied structures.

iii. All material transported off-site will be either sufficiently watered or securely covered to prevent excessive dust.

iv. If more than 5,000 cubic yards of fill material will be imported or exported from the site, then all haul trucks will be required to exit the site via an access point where a gravel pad or grizzly has been installed.

v. Areas disturbed by clearing, earth moving, or excavation activities will be minimized at all times.

vi. Stockpiles of dirt or other fine loose material will be stabilized by watering or other appropriate method to prevent wind-blown fugitive dust.

vii. Where acceptable to the fire department, weed control will be accomplished by mowing instead of discing, thereby leaving the ground undisturbed and with a mulch covering.

viii. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

ix. Traffic speeds on unpaved roads shall be limited to 25 mph.

MM 4.3-2: The applicant shall reduce exhaust emissions during construction and, in particular, emissions of NOX, when using construction equipment and vehicles by implementing the following measures:

a. Prohibit the use of heavy-equipment during first- or second-stage smog alerts and suspend all construction activities during second-stage smog alerts;

b. Maintain equipment engines in proper working order;

c. Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use to the extent feasible;

d. During all grading and construction activities at least 10 percent of diesel engine–driven construction equipment on site shall be equipped with Tier 1 or Tier 2 as certified by the CARB or with engines certified by the KCAPCD to provide equivalent benefits. At least 40 percent of the remaining diesel engine–driven construction equipment shall have diesel particulate filters and lean-NOX catalysts (or equivalent control devices);

e. The owner/operator will require that all diesel engines be shut off when not in use to reduce emissions from idling;

f. Require that trucks and vehicles in loading or unloading queues have their engines turned-off when not in use; and

g. Equip any generators, compressors, or other stationary sources of emissions located within 100 feet of a residence or other sensitive receptor with a control system to reduce normal exhaust emissions.

- **Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Region is Nonattainment for Federal or State Standards**

  Since proposed project construction results in significant emissions of NOx and PM10, construction emissions would also result in a cumulatively considerable net increase. However, since proposed project operation would not result in significant emissions, a long-term cumulative increase in criteria pollutants would not be attributed to the proposed project.

  See *MM 4.3-1* and *4.3-3*; Conform with the goals, policies, and implementation measures of the Kern County General Plan and the WE Combining District.

- **Result in Impacts on Air Quality Resources as a result of SCE Facility Improvements**

  Exceedance of the thresholds by the proposed project alone is the same as the construction of the proposed project and the transmission lines together. NOx and PM10 are exceeded in both cases. Impacts from the construction of the transmission lines alone are less than significant. When air impacts from proposed project construction and transmission line construction are grouped together, they are considered significant and unavoidable with respect to NOx and PM10.

  Impacts to climate change from the transmission line construction alone are considered less than significant. When these impacts are grouped together with construction impacts from the proposed project, impacts are still considered less than significant with respect to Greenhouse Gas (GHG) emissions.

Other Impacts

- **Conflict with or Obstruct Implementation of the Applicable Air Quality Plan**

  Operation of the proposed project would not result in significant emissions and conflict with applicable air quality plans. The proposed project would exceed the KCAPCD significance thresholds during construction. Thus, proposed project construction would conflict with applicable air quality plans. The proposed project would conform to the goals, policies, and implementation measures of the Kern County General Plan WE Combining District and future KCAPCD air quality plans, including the revised SIP that will be submitted to the EPA in 2007. Implementation of the following mitigation measures would reduce construction impacts to less than significant.

See *MM 4.3-1* through *MM 4.3-5*; Conform to the goals, policies, and implementation measures of the Kern County General Plan WE Combining District and future KCAPCD air quality plans, including the revised SIP that will be submitted to the EPA in 2007.

- **Expose Sensitive Receptors to Substantial Pollutant Concentration**

Non-project related sensitive receptors would not be exposed to substantial pollutant concentrations from the proposed project. However, construction workers would be exposed to criteria pollutants. Implementation of the mitigation measures below would reduce the exposure to workers from concentrations of pollutants and spores.

MM 4.3-4: The applicant shall educate construction personnel on the health effects of exposure to criteria pollutant emissions.

MM 4.3-5: The applicant shall provide construction workers with personal protective equipment such as respiratory equipment (masks), if requested by the worker to reduce exposure to pollutants and Valley Fever.

MM 4.3-6: The applicant shall provide all construction personnel and visitors to the project site with information regarding Valley Fever. This would facilitate recognition of symptoms of Valley Fever and earlier treatment.

- **Create Objectionable Odors Affecting a Substantial Number of People**

Odor emissions associated with vehicle and engine exhaust and fueling are the only types that would be produced from the proposed project. Due to the large area of the proposed project and strong prevailing winds at the proposed project site, the odors would most likely disperse and not create significant objectionable odors. Therefore, the proposed project is not expected to create significant impacts to air quality related to objectionable odors.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan and WE Combining District.

1.3.4 Biological Resources

Setting

The proposed project site supports 12 habitat types containing native and non-native species typical of the Mojave Desert and Tehachapi Mountains. Of these habitats, the Joshua Tree Woodland, the Desert Native Grassland, and the Southern Willow Scrub are designated by the California Department of Fish and Game (CDFG) as sensitive plant communities. Visual observations of the site show historical uses have resulted in moderate to substantial habitat disturbance.

Along the western area of the proposed project site, 5.6 acres of National Wetland Inventory (NWI)-mapped wetlands were identified. Approximately 24.5 miles of blue-line drainages are located within the proposed project site. Wildlife species on the proposed project site include those that are adapted to arid transitional, scrub habitats. Common wildlife species include raptors and other birds, small mammals, lizards, rabbits, deer, and coyotes. The greatest threats to connectivity and migration on the proposed project site are roads, off-road vehicles, and grazing.

Literature review and field surveys resulted in the identification of 39 special-status species has having the potential to occur within the proposed project site. These include three plant species, 20 avian species, eight bat species, four species of herptofauna, and four mammal species. For a complete list of species identified, please refer to Table 4.4-2 of the PdV EIR.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

- **Have a substantial adverse impact on Special-Status Species**

  The proposed project could potentially impact 33 special-status species comprised of avian, bat, mammal, and herptofauna species. No individual sensitive plant species would be impacted. Approximately 96 percent of the proposed project site would provide habitat for special-status species during operation. Construction activities could potentially injure or kill individuals at the onset of construction when animals may not have relocated yet. During operation of the proposed project, potential exists for injury or mortality to raptors, other birds, and bats if collision with wind turbines occurs. The displacement of sensitive resident avian species may occur as the area impacted by the moving rotors extends for several meters and could potentially disturb and displace nesting and foraging birds. Although unlikely, the proposed project has the potential to impact the coast horned lizard, American badger, and San Joaquin pocket mouse, since suitable habitat exists on the proposed project site. Implementation of mitigation measures would ensure that impacts to these and other sensitive species are less than significant.

  Sensitive bat and bird species that migrate at elevations less than 500 feet above the ground surface are not expected to be impacted significantly by the proposed project since these species migrate through the proposed project area over a very limited time period. However, uncertainty exists regarding the level of incidences of injury and mortality due to collisions with turbines and other structures. This impact is considered potentially significant and unavoidable.

  Mitigation Applicable to all Special Status Species

  MM 4.4-1: The applicant shall minimize to the greatest extent feasible the area required for project construction and operation.

  MM 4.4-2: Prior to the issuance of building or grading permits, the applicant shall develop and submit to the Kern County Planning Department for review and approval a plan for restoring all areas of temporary impact to their previous condition. The Restoration Plan shall identify success criteria for each habitat type and develop monitoring measures to ensure that success criteria will be met.

  MM 4.4-3: The applicant shall retain a biological firm as an on-call service provider to recover and relocate ground-dwelling special-status species as encountered during construction.

  MM 4.4-4: The applicant shall provide environmental training to all personnel working on the site during project construction and operation. The training shall include a review of special-status species known to occur in the project site to promote their awareness, and implementation measures if a species is encountered or killed. If a species is encountered or killed, the appropriate employee will be required to contact the on-call biological services provider. In addition, all personnel shall be trained in the following California condor-specific measures, which shall be required of the project: construction and operations personnel shall be required to observe a "microtrash-free" policy of keeping the project clear of all debris that may constitute an attractive nuisance for California condors (e.g., cans, bottle caps, nails, small pieces of metal, etc.), including collection of any trash left behind at the end of each day. The placing of "anti-debris" signs in areas where personnel congregate shall also be required. All on-site trash repositories shall be securely closed at all times.

MM 4.4-5: If an injured or dead special-status species is encountered during construction, the applicant shall stop work within the immediate vicinity. The applicant shall notify the Kern County Planning Department, the on-call biologist, and the appropriate resources agency (e.g., USFWS or CDFG) before construction is allowed to proceed.

Mitigation Applicable to Sensitive Wildlife Species

MM 4.4-6: Prior to issuance of building or grading permits, the applicant shall provide the Kern County Planning Department with documentation that a qualified biologist has reviewed the final siting plan (including conducting a GIS spatial analysis) and verified that the 10 acres of suitable habitat for the San Joaquin pocket mouse has been avoided. A copy of the final report shall be submitted to the CDFG and USFWS.

MM 4.4-7: Prior to initial ground-disturbing activities (e.g., mechanized clearing or rough grading) for all project-related construction activities, a qualified biologist shall conduct a preconstruction sweep of the project site for special-status wildlife species. During these surveys the biologist will:

a. Ensure that potential habitats become inaccessible to wildlife (e.g., burrows are removed that would otherwise provide temporary refuge);
b. In the event of an unanticipated discovery of a specials-status ground-dwelling animal, recover and relocate the animal to adjacent suitable habitat within the project site at least 200 feet from the limits of grading; and
c. For sites requiring the relocation of American badger, install and maintain exclusion fencing throughout all construction activities that involve the use of heavy equipment in the vicinity of burrows occupied by American badger.

MM 4.4-8: Prior to the issuance of building permits, the applicant shall implement the following siting constraint measures and provide documentation that these design measures have been met on the final siting plan:

a. All wind turbines shall be sited at least 500 feet from known nest sites or sites that may provide suitable nesting habitat for raptors.
b. All ground-disturbing work and any work involving hazardous materials shall be conducted at least 100 feet from wetlands.
c. Specifications for wind tower foundations shall provide at least a 2,500-square-foot (50 feet by 50 feet) clear zone.
d. Specifications for wind tower foundations shall prevent under-burrowing by small mammals to the maximum extent practicable.
e. Turbine specifications shall ensure that the lower reach of rotor blades is no lower than approximately 85 feet above the ground surface.

Mitigations Applicable to Sensitive Bird and Bat Species

MM 4.4-9: To reduce collisions of avian and bat species with turbines, the applicant shall coordinate with the FAA to minimize the number of wind turbines that require night lighting, and use low-frequency red strobe lights, as allowed.

MM 4.4-10: To reduce collisions of avian and bat species with other appurtenant structures, the applicant shall coordinate with the FAA to minimize lighting to the extent feasible by using minimal-intensity, directional, low-sodium lights.

MM 4.4-11: The applicant or its representative shall perform Post-construction Avian/Bat Mortality Monitoring in the first and second years following the initial operation of the project to demonstrate to the Kern County Planning Department that migration is compatible with operation of wind turbines and that the level of incidental injury and mortality does not result in an unanticipated long-term decline in migratory raptor species in the vicinity of the project site. Post-construction Avian/Bat Mortality Monitoring shall include a Mortality Analysis, which shall be conducted as follows:

a. The applicant shall provide the Kern County Planning Department with the results of a mortality study for migratory raptors and bats on an annual basis. A qualified wildlife biologist shall conduct mortality monitoring using a statistically significant sample size of operational turbine sites within the wind energy development project.

b. The Mortality Analysis shall note species number, location, and distance from the turbine for each recovered migratory raptor and bat, availability of raptor and bat prey species, and apparent cause of avian or bat mortality. The applicant shall provide all results to the Wildlife Response and Reporting System database within 90 days of completion of the annual study.

c. The mortality monitoring shall follow standardized guidelines outlined by the National Wind Coordinating Committee, and shall include carcass scavenging and searcher efficiency trials.

d. The results of the Mortality Analysis shall be provided to the Kern County Planning Department and regional entities involved in the conservation of migratory species, including the USFWS, the CDFG, and the Audubon Society. At a minimum, the Mortality Analysis shall consider three factors:

    i. Number of annual avian and bat mortalities per turbine,

    ii. Disproportionate representation of a particular species, and

    iii. Comparison to existing data on wind farm mortality.

MM 4.4-12: If after two years of Post-construction Avian/Bat Mortality Monitoring, the Kern County Planning Department, in consultation with the CDFG and the USFWS, determines that the project is resulting in unanticipated significant adverse impacts on the population of a migratory species or is substantially interfering with any migratory corridor, the applicant shall provide supplemental mitigation. A net reduction of 10 percent shall be uses as a threshold of significance for evaluating project impacts to migratory species at the project site. Supplemental measures to be considered could include:

a. Additional migration count surveys, conducted using a methodology that allows comparison with the surveys conducted in autumn 2004.

b. Provision of additional nesting structure or platforms shall be erected in suitable habitats within the region at off-site locations approved by the USFW and CDFG.

c. Contribution to research that addresses the sources of mortality and population impacts on the species of concern; and

d. Funding of regional conservation measures with the intention of enhancing and preserving existing foraging/nesting habitat. Enhanced off-site habitat may encourage existing avian populations to relocate to regional locations, therefore reducing mortality rates in the project site. Similarly, preserved off-site habitat could prevent avian populations from relocating to the project site, which could increase mortality rates.

MM 4.4-13: The applicant or its representative shall conduct Post-construction Breeding Monitoring in the first and second years following the initial operation of the project to demonstrate to the Kern County Planning Department that sensitive resident birds are compatible with operation of wind turbines, and that the level of incidental injury and mortality does not result in a long-term decline in sensitive resident bird species in the region. Post-construction Breeding Monitoring shall include a Nesting Analysis and a Wintering Analysis that shall be conducted as follows:

a. Nesting Analysis:

i. The applicant shall provide the Kern County Planning Department with the results of a study and comparative data analysis, using the same methods used in the summer 2005 methods of nesting raptors. Qualified ornithologists shall conduct the study of nesting raptors.

ii. Nesting raptor surveys shall be conducted throughout the project site between February 15 and August 15.

iii. Directed field surveys for nesting raptors shall be conducted during the breeding season by vehicle and on foot to determine the presence or absence of raptor nests, especially mid-sized to large raptor nests within suitable habitat areas.

iv. If at the end of the second year of monitoring, the operation of wind turbines has been determined to result in a level of incidental injury and mortality to nesting birds that constitutes a significant adverse impact on a breeding population, the applicant shall undertake supplemental compensatory measures to support regional conservation of migratory birds.

The results of the Nesting Analysis shall be made available to regional entities involved in research related to the conservation of nesting birds such as the Audubon Society.

b. Wintering Analysis:

i. Qualified ornithologists shall conduct a wintering raptors study showing the presence/absence of winter raptors at the project site using either telemetry or counts from late November to early February in the two years following initiation of operation of the wind energy development project.

ii. The applicant shall provide the Kern County Planning Department with the results of the study and comparative data analysis using the same methods used in winter 2004–2005 methods for wintering raptors.

If after two years of Post-construction Breeding Monitoring, the Kern County Planning Department, in consultation with the CDFG and the USFWS, determines that the project is resulting in unanticipated significant adverse impacts to the population of a breeding species, the applicant shall provide supplemental mitigation. Supplemental measures to be considered could include:

c. Provision of additional nesting structure or platforms.

d. Contribution to research that addresses the sources of mortality and population impacts on the species of concern.

e. Funding of regional conservation measures with the intention of enhancing and preserving existing breeding habitat.

MM 4.4-14: Prior to any grading and grubbing activities undertaken during the breeding season of nesting birds, a qualified biologist shall conduct preconstruction nesting surveys for nests occurring in the project site to prevent injury or mortality of these species. The approximate breeding seasons for nesting birds observed in the project site are as follows, but may vary and should be evaluated by a qualified biologist at the time of construction:

- Burrowing owls - February 15 and August 15
- Loggerhead shrike - February 1 and July 31
- Le Conte's thrasher - February 15 and June 30
- Sage sparrow - March 1 and July 31
- Lawrence's goldfinch - March 1 and September 15

<u>*MM 4.4-15*</u>: If nesting birds are encountered during preconstruction nesting surveys during the breeding season, the applicant shall consult with the appropriate resources agencies (e.g., CDFG and USFWS) to identify appropriate measures to prevent impacts on the species, such as establishing a buffer around occupied nests.

<u>*MM 4.4-16*</u>: A qualified biologist provided by the applicant shall conduct preconstruction passive relocation of burrowing owls for burrows occupied by burrowing owls encountered within 500 feet of areas scheduled for grubbing or grading between August 16 and February 14 as follows:

a. Identified burrows shall be closed, and individuals shall be passively relocated. Passive relocation shall occur outside of the breeding season (February 15 to August 15). Passive relocation shall be performed as prescribed in CDFG burrowing owl mitigation guidelines.

b. Once it has been determined that the burrow is no longer active, the burrow shall be removed.

Other Impacts

- **Have a Substantial Adverse Impact on Any Riparian Habitat or Other Sensitive Natural Community**

The proposed project would impact riparian habitat and sensitive natural communities, including Desert Native Grassland (state-designated), Joshua Tree Woodland (state-designated), and Oak Woodlands, which are identified as a sensitive community by Kern County. The permanent footprint of the proposed project in addition to clearing and grading activities would result in direct impacts to plant communities. They can also be impacted indirectly by fugitive dust during construction, the accidental release of hazardous materials, and the introduction of invasive species.

Access roads for project construction and operation would intersect with drainage at 38 locations resulting in permanent impact on approximately 0.1 acre of riparian habitat. Access roads, wind turbines, and other aboveground facilities would impact over 30 acres of Desert Native Grassland habitat. Between 11 to 13 acres of Joshua Tree Woodland habitat would be disturbed by the proposed project.

A total of 67 oak trees are located within the northwestern area of the proposed project site. Implementation of the proposed project would not result in impacts on these oak trees. However, since the final siting of proposed project facilities could change, potential impacts to these oak trees may occur. Implementation of these mitigation measures would reduce impacts on riparian habitat, sensitive plant communities, and oak trees to less than significant.

<u>*MM 4.4-17*</u>: Prior to the issuance of building or grading permits, the applicant shall provide the Kern County Planning Department with a report from a certified botanist demonstrating that the final extent of the impact of the siting of project facilities in riparian habitat associated with Cottonwood Creek is limited to approximately 0.1 acre.

<u>*MM 4.4-18*</u>: The applicant shall compensate for the permanent impacts on riparian habitat along Cottonwood Creek subject to CDFG jurisdiction by on-site restoration of affected Mojave Desert Scrub at a 1:1 ratio. This shall be accomplished by the preparation of a Mojave Desert Scrub Replacement Plan along Cottonwood Creek as follows:

a. A qualified botanist shall prepare the replacement plan;

b. The replacement plan shall be submitted to the Kern County Planning Department prior to issuance of the building or grading permits for the project;

c. The replacement plan shall include details on site preparation, propagation and planting of species characteristic to each crossing, and maintenance and monitoring activities and shall include those measures outlined in Section 5.3.2.3 of the technical biological report provided in Appendix C.

d. Plantings shall be installed within five business days of the first wetting during the rainy season (October 15 to April 15) or, if no rain occurs by February 15, planting shall be installed and irrigated to meet the average rainfall for the region.

<u>*MM 4.4-19*</u>: The applicant shall obtain a Streambed Alteration Agreement from the CDFG if one is required.

<u>*MM 4.4-20*</u>: The applicant shall mitigate impacts on Joshua Tree Woodland by preparing and submitting a Joshua Tree Impact Plan to the Kern County Planning Department detailing the amount of acres of Joshua Tree Woodlands and/or individual Joshua trees removed. The applicant shall contribute funding to the City of Lancaster Prime Desert Woodlands Preserve managed by the City of Lancaster Parks, Recreation & Arts Department to compensate for the loss at a ratio of 1:1 prior to the issuance of a building permit in the area affected.

<u>*MM 4.4-21*</u>: The applicant shall realign access roads in areas with Desert Native Grassland to conform to the alignment of existing roads to the maximum extent practicable. This realignment is anticipated to reduce permanent impacts on Desert Native Grassland by five acres through alignment with the existing 12-foot-wide road that crosses the Desert Native Grassland. The applicant shall revegetate the 10-foot-wide area on either side of the roadway realignment following construction.

<u>*MM 4.4-22*</u>: The applicant shall compensate for permanent impacts on Class 3 and 4 Desert Native Grasslands through on-site restoration of Class 2 grasslands within the project site at a 1:1 ratio such that the percent of native cover on restored Class 2 grasslands will be higher than 30 percent. To achieve this, the applicant shall develop a Desert Native Grassland Replacement Plan as follows:

a. A qualified botanist shall prepare the replacement plan;

b. The replacement plan shall be submitted to the Kern County Planning Department prior to issuance of building or grading permits;

c. The replacement plan shall include details on site preparation, propagation and planting of characteristic species, and maintenance and monitoring activities and shall include those measures outlined in Section 5.3.1.3 of the technical biological report provided in Appendix C.

d. Performance criteria shall include the attainment of at least a 10 percent cover of native grass species in the first year and 15, 20, 25, and 30 percent cover, in each subsequent year respectively, of native grass species over a five-year period as determined by the point-intercept transect method.

<u>*MM 4.4-23*</u>: The applicant shall ensure that the final siting design avoids significant impacts on Southern Willow Scrub habitat, as shown on Figure 3-1, the constraints map. If this measure is

not met, the applicant shall be required to compensate for the loss on a 1:1 basis prior to issuance of the project Building Permit.

MM 4.4-24: The applicant shall ensure that the final siting design avoids any impact on individual mature oak trees and oak canopy areas.

MM 4.4-25: The applicant shall implement the following best management practices to reduce indirect impacts on all of the plant communities within the project site:

a. To reduce the transport of fugitive dust particles related to construction activities, soil stabilization and/or watering shall be implemented. Construction materials and stockpiled soil shall be covered if they are a source of fugitive dust.

b. Erosion controls that comply with County, state, and federal standards shall be applied, including the implementation of best management practices. Practices such as use silt fences and check dams shall be applied near disturbed areas to minimize and control erosion.

c. To minimize potential impacts on existing plant communities from accidental fuel spills, all refueling shall occur in a designated fueling area that includes a temporary berm to limit the spread of any spill. Drip pans shall be used during refueling to contain accidental releases, and drip pans shall be used under fuel pump and valve mechanisms of any bulk fueling vehicles parked at the construction site. Spills shall be immediately addressed per the appropriate spill management plan, and soil cleanup and soil removal shall be initiated if needed.

d. To minimize the potential establishment of invasive weed species during project implementation, tires and surfaces of all trucks and construction equipment shall be washed when they enter and exit the project site to minimize the transport of seeds from weedy species; certified weed-free mulch shall be used when stabilizing areas of disturbed soil; and on-site soil shall be used to the maximum extent practicable for fill, avoiding the top 10 inches of soil used for banking.

MM 4.4-26: A 100-foot setback from NWI-mapped wetlands shall be required to avoid indirect impacts during construction.

- **Have a Substantial Adverse Impact on Federally Protected Wetlands**

The proposed project in its current configuration would not impact federally protected wetlands. To ensure that impacts remain less than significant, the following mitigation measures should be implemented.

MM 4.4-27: The applicant shall demonstrate on the final siting plan that final locations of project facilities will not impact the 5.6 acres of NWI-mapped wetlands in the project site, as shown on the constraints map provided as Figure 3-1.

MM 4.4-28: To avoid any impacts on the federally protected wetlands on site, the applicant shall establish a 100-foot setback from these wetlands for all construction activities, including refueling of equipment.

- **Interfere with Wildlife Movement or with Migration Corridors**

Some disruption of movement is caused by Highway 138, from the San Gabriel Mountains north into the Tehachapi Mountains. Sufficient wildlife movement exists at the corridors located south from the Tehachapi Mountains into the proposed project area since there is a lack of extensive roads and development. Temporary impacts during construction would result from the proposed project on the drainages located within the proposed project area that could be used as wildlife movement corridors. Studies show that the proposed project site receives little use by migrating, wintering, or nesting birds, including raptors. Nevertheless, all bird species would be at an increased risk of individual mortalities. Despite individual mortalities, the proposed project would not cause a significant impact to wildlife movement. No mitigation measures would be required.

- **Conflict with Any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance**

The proposed project would be constructed in compliance with the requirements of the Kern County General Plan and would not conflict with local policies or ordinances protecting biological resources.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan and no additional mitigation would be required.

- **Conflict with an Adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other Approved Local, Regional, or State Habitat Conservation Plan**

The proposed project is located within the far western area of the West Mojave Plan, which is comprised of a pending habitat conservation plan and an approved amendment to the California Desert Conservation Area Plan for the desert tortoise and Mohave ground squirrel. Both of these species were determined to be absent from the proposed project site. The proposed project would not conflict with the pending habitat conservation plan, or Natural Communities Conservation Plan, or any other applicable local, regional, or state habitat conservation plan.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan and no additional mitigation would be required.

- **Result in Biological Resource Impacts due to SCE Facility Improvements**

The proposed project vicinity lacks riparian areas and sensitive natural communities, and no wetlands or other waters of the United States have been observed in the proposed project area. Trees or sensitive habitats would not be affected by the SCE facilities portion of the proposed project and other plans or protections would not be conflicted with. The proposed project would have no adverse effect on sensitive or special-status species, and no mitigation would be necessary.

- **Remove and/or Disturb a Habitat as a Result of Special Protection Scheme Construction Activities**

The replacement of any existing structures would not be required by proposed project construction. A preconstruction survey would be conducted by SCE to confirm that no special-status species or their habitats are present within the work area.

> *MM 4.4-29*: SCE shall conduct a preconstruction survey to document that no special status species or their habitats are present within the work area. If special status species or their habitats are identified, all work shall be conducted in areas where impacts to the species and their habitats will be avoided. If avoidance is not feasible, the qualified biologist will confer with the appropriate agencies (USFWS and/or CDFG) to address potential relocation measures or direct impacts to special status species or their habitat.

1.3.5 Cultural Resources

Setting

A records search for archaeological sites did not identify any previously recorded historic archaeological resources on the proposed project site. Field surveys identified one prehistoric site on the proposed project site, which has been heavily disturbed. Activities such as camping, off-road vehicle traffic, and road maintenance have greatly altered the landscape and suggest that unauthorized collection of artifacts may have occurred. Field surveys also identified seven historic sites on the proposed project site. Historic evidence indicated temporary and semi-permanent periods of occupation between the 1930s and 1940s.

Thirteen areas of high significance were identified for paleontological resources. These deposits have the potential to contain vertebrate fossils of the Pleistocene age.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Cause a Substantial Adverse Change in the Significance of a Historical or Archaeological Resource**

  Construction activities for the proposed project would occur within 60 feet of identified historic archaeological resources. Since these areas are located outside the area to be graded, they would not be impacted by the proposed project. However, since the final siting of turbines and associated facilities may vary from the planned locations, prehistoric and historic archaeological sites may potentially be affected. There is also a potential to encounter buried significant historical archaeological resources (including human remains) that were not previously identified during construction activities. This impact is considered potentially significant and mitigation is required.

  MM 4.5-1: The applicant shall inform and train all construction personnel on the awareness of cultural resources, exclusion zones, and the procedures to follow in the event of an unanticipated discovery.

  MM 4.5-2: Prior to issuance of the grading or building permit the applicant shall provide Kern County Planning Department with documentation that a qualified archeologist has reviewed the final siting of project facilities and planned work areas and that:

  a. All facilities and planned ground-disturbing activities would occur within the area surveyed for this EIR (see Figure 4.5-1; if the revised location would occur outside of this area, implementation of *MM 4.5-6* shall be required); and
  b. Known prehistoric and historic archeological sites would be avoided.
  c. The evaluation by a qualified historian may be done via spatial analysis of existing data using GIS relative to final location of project facilities.

  MM 4.5-3: The final location of all project facilities shall be located such that all ground-disturbing activities would occur at least 60 feet way from known prehistoric and historic archeological sites. This shall be documented and verified by a qualified archeologist with a written report submitted to the Kern County Planning Department.

  MM 4.5-4: The applicant shall install exclusion fencing around the historic archeological sites located within 60 feet of project facilities and planned ground-disturbing activities. Verification of completion shall be submitted to the Kern County Planning Department.

  MM 4.5-5: The applicant shall provide for a qualified archeologist to monitor initial ground-disturbing activities where they occur within 60 feet of the historic archeological sites, namely at

PdV 11, PdV 16, PdV 61, PdV 66, PdV 67, PdV 77, PdV 82, and PdV 88. The monitor shall maintain a daily log of activities and shall submit a final monitoring report to Kern County Planning Department on findings upon the completion of construction monitoring for the project.

MM 4.5-6: If the applicant revises the location of proposed facilities and ground-disturbing activities that affect areas beyond the area surveyed for this EIR (see Figure 4.5-1), the applicant shall:

a. Not conduct work in those areas until approval has been received from Kern County Planning Department;

b. Provide for a qualified archaeologist to conduct a supplemental Phase I evaluation (records search and pedestrian surveys) of all new areas that would be affected (i.e., within the revised area of impact);

c. Provide a supplemental technical report to Kern County Planning Department discussing the supplement Phase I evaluation and potential impacts and avoidance and minimization measures;

d. Based on the results of the supplemental Phase I evaluation, ensure that the qualified archeologist provides documentation to Kern County Planning Department verifying that all newly identified sites would be avoided and that all ground-disturbing activities would occur at least 60 feet away;

e. If the revised location of facilities avoids newly identified sites but ground-disturbing activities are located within 60 feet of the sites, provide for a qualified archeologist during initial ground-disturbing activities (as with *MM 4.5-4*); and

f. If the revised location of facilities impacts newly identified sites (e.g., sites could not be avoided), consult with the Kern County Planning Department regarding further requirements, possibly including a Phase II and Phase III evaluation, and additional mitigation to reduce potential impacts to a less than significant level.

MM 4.5-7: The applicant shall minimize or avoid impacts on potentially significant prehistoric and historic resources discovered during construction by developing and implementing an Unanticipated Discovery Protocol. The Unanticipated Discovery Protocol shall be submitted to the Kern County Planning Department for review and approval prior to the start of grading or construction and shall include discussion of the following:

a. Specific wording that if evidence of archeological resources (e.g., chipped or ground stone, historic debris, building foundations, or human bone) is identified during excavation, all work within 100 feet of the discovery site shall stop until a qualified archaeologist can assess the significance of the find;

b. Notification requirements, including immediate notification by the applicant to a qualified archeologist and to Kern County Planning Department;

c. Consultation with the Kern County Planning Department, the qualified archaeologist, and the applicant to determine whether the discovered resource can be avoided and, if impacts have not occurred, work can continue. If it is determined that the resource has been impacted and an assessment of its significance is required:

    i. A qualified archaeologist shall develop appropriate treatment measures for the discovered and impacted resource in consultation with Kern County Planning Department, the Office of Historic Preservation, and other appropriate agencies; and

    ii. Work will not resume until permission is received from Kern County.

MM 4.5-8: Southern California Edison will conduct a literature review, review of maps and aerial photographs and a reconnaissance survey of any portion of the Special Protection Scheme right-of-way that does not have current documentation. Any significant resources shall be avoided during ground-disturbing work.

- **Directly or Indirectly Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature**

During the grubbing, grading, and excavation phases of ground-disturbing construction activities, potential exists for encountering unique paleontological resources within the proposed project site. The paleontological resources can be impacted and destroyed by construction equipment, project-related vehicles, exposure of alluvium during construction, unauthorized collection of fossils by project personnel, and vandalism. This impact is considered potentially significant and mitigation is required.

MM 4.5-9: The applicant shall retain a qualified paleontologist to prepare a Paleontological Resource Mitigation Plan for implementation during construction. The Paleontological Resource Mitigation Plan shall be submitted to Kern County Planning Department for review and approval prior to the start of grading or construction and shall include the following:

a. Procedures for the discovery, recovery, and salvage of paleontological resources encountered during construction, if any, in accordance with standards for recovery established by the Society of Vertebrate Paleontology;

b. Verification that the applicant has an agreement with a recognized museum repository (e.g., the Buena Vista Museum), for the disposition of recovered fossils and that the fossils shall be prepared prior to submittal to the repository as required by the repository (e.g., prepared, analyzed at a laboratory, curated, or cataloged); and

c. Description of monitoring reports that will be prepared, which shall include daily logs and a final monitoring report with an itemized list of specimens found to be submitted to Kern County Planning Department , the Buena Vista Museum of Natural History, and the Natural History Museum of Los Angeles County within 90 days of the completion of monitoring.

MM 4.5-10: The applicant shall provide for a qualified paleontologist to provide construction personnel with training on implementation of the Paleontological Resource Mitigation Plan and specifically procedures to be followed in the event that a fossil site or fossil occurrence is encountered during construction. An information package shall be provided for construction personnel not present at the initial preconstruction briefing.

MM 4.5-11: The applicant shall provide for a qualified paleontologist to monitor initial ground-disturbing construction activities in Sections 15, 16, 20 through 23, 25 through 28, and 32 through 34 in Township 10 North, Range 15 West and portions of Sections 2 and 4 in Township 9 North, Range 15 West of the USGS 7.5-minute series Tylerhorse Canyon topographic quadrangle. If a resource is encountered, the monitor will implement the procedures of the Paleontological Resource Mitigation Plan. If recovery of a large or unusually productive fossil occurrence is necessary, the following actions shall be taken:

a. The paleontological monitor shall immediately notify the applicant who shall contact the Kern County Planning Department; and

b. Construction activities in the immediate vicinity of the site shall stop until authorization for work to continue is provided by the Kern County Planning Department.

- **Disturb any Human Remains, including Those Interred Outside of Formal Cemeteries**

During excavation activities, human remains that were not previously identified during field surveys could be inadvertently unearthed. This impact is considered potentially significant and mitigation is required.

MM 4.5-12: If human remains are discovered, work in the immediate vicinity shall stop until the Kern County coroner can determine whether the remains are those of a Native American. If they are those of a Native American, the following would apply:

d. The coroner shall contact the NAHC.

e. If discovered human remains are determined to be Native American remains, and are released by the coroner, these remains shall be left in situ and covered by fabric or other temporary barriers.

f. The human remains shall be protected until Kern County and the NAHC come to a decision on the final disposition of the remains.

According to the California Health and Safety Code, six or more human burials at one location constitute a cemetery (Section 8100), and willful disturbance of human remains is a felony (Section 7052).

- **Result in Impacts on Cultural Resources due to SCE Facility Improvements**

Subsurface resources would be detected during proposed project excavation, if present. A preconstruction cultural resources survey would be conducted to identify any resources on the proposed project site. "Impact Avoidance Protocols for the SCE Regional Special Protection Scheme" would be followed if resources are detected.

- The contractor will be required to immediately cease ground-disturbing activities within 100 feet of a cultural resources discovery and immediately notify SCE.
- In the instance of a possible discovery, the contractor will flag the area for easily visible identification while also protecting the discovery from vandalism, looting, or further disturbance of any kind.
- SCE will contact a qualified archeologist to evaluate the find, and will coordinate with applicable agencies, including the CPUC.
- The qualified archeologist will determine whether:
  – The resource can be avoided with avoidance measures and impacts on cultural resources have not occurred, in which case the PdV Wind Energy Project could proceed with implementation of avoidance measures and only after approval by the CPUC; or
  – The resource cannot be avoided or it has already been impacted by construction, in which case an assessment of its significance will be conducted in compliance with state law.
- If the discovery includes human remains, the qualified archeologist will notify the CPUC and the County coroner to assist in determining the significance of the remains.
- If the human remains are determined to be Native American, the most likely descendant will be contacted within 24 hours and provided the opportunity to visit the site and participate in determining appropriate treatment, which may include:
  – Preserving the remains in place and avoiding further impact (preferred method); or
  – Developing a plan for the recovery and documentation of the remains and any associated grave goods.

Impact would be less than significant and no mitigation would be necessary.

1.3.6 Geology and Soils

Setting

The geology of the proposed project site is classified into three groups: late Paleozoic metamorphic rocks, Mesozoic crystalline rocks, and Quaternary age sedimentary deposits. Soil types, geology, and the average groundwater level at the proposed project site indicate a low potential for liquefaction. The soil at the proposed project site is composed of sand, gravel, and cobbles with very little to no fine-grained soil indicating a low probability of impact due to shrink-well soil behavior.

The proposed project site is not located within the boundaries of an Alquist-Priolo Special Studies Zone. The closest active fault to the proposed project site is located approximately 800 feet northwest. There is potential for ground surface rupture to occur within the proposed project site due to the presence of faults that have displaced recent alluvial deposits that cross the proposed project site. The proposed project site can be expected to experience strong ground shaking caused by moderate to strong earthquakes during the life of the proposed project. It is not located within a State California Seismic Hazard Zone for landslides.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Expose People or Structures to Substantial Adverse Effects Involving the Rupture of a Known Earthquake Fault**

  The proposed project is not located within an Alquist-Priolo Special Study Zone. It also would not involve the construction of structures for human occupancy. However, potential damage to wind turbines and associated facilities could occur from direct rupture along the closest faults (Garlock and Cottonwood Faults) to the proposed project site. This impact is considered potentially significant and mitigation is required.

  MM 4.6-1: Prior to the issuance of building or grading permits, the applicant shall conduct a full geotechnical study to evaluate soil conditions and geologic hazards on the project site and submit it to the Kern County Engineering and Survey Services Department for review and approval. The geotechnical study must be signed by a California-registered professional engineer and must identify the following:

  g. Location of fault traces and potential for surface rupture;

  h. Potential for seismically induced ground shaking, liquefaction, landslides, differential settlement, and mudflows;

  i. Stability of existing cut-and-fill slopes;

  j. Collapsible or expansive soils;

  k. Foundation material type;

  l. Potential for wind erosion, water erosion, sedimentation, and flooding;

  m. Location and description of unprotected drainage that could be impacted by the proposed development; and

n. Recommendations for placement and design of facilities, foundations, and remediation of unstable ground.

MM 4.6-2: The applicant shall determine the final siting of project facilities based on the results of the geotechnical study and implement recommended measures to minimize geologic hazards. The applicant shall not locate project facilities on or immediately adjacent to a fault trace as depicted on Figures 4.6-2, 4-9.2, and 3-4. Kern County Engineering and Survey Services Department will evaluate the applicant's final facility siting design prior to the issuance of any building or grading permits to verify that geological constraints have been avoided.

MM 4.6-3: Utility lines crossing potentially active faults shall be designed to withstand vertical and horizontal displacement. If determined necessary by the findings of the site-specific geotechnical study, the applicant shall remove and replace shrink-swell soils with a non-expansive or non-collapsible soil material.

- **Expose People or Structures to Substantial Adverse Effects Involving Strong Seismic Ground Shaking**

Damage to structures and individuals in or near the proposed project facilities could occur during strong seismic shaking. The proposed project site is located in a seismically active area. Impact is considered potentially significant and mitigation would be required.

Implement *MM 4.6-1* through *MM 4.6-3*.

MM 4.6-4: The applicant shall design wind turbines and all associated infrastructure to withstand substantial ground shaking. All project facilities shall be designed to in accordance with applicable UBC seismic design standards, Kern County Building Code, Chapter 17, and as recommended by a California registered professional engineer in the site-specific geotechnical review.

- **Expose People or Structures to Substantial Adverse Effects Involving Seismic-Related Ground Failure, Including Liquefaction**

The potential for liquefaction at the proposed project site is low due to deep groundwater levels and the make-up of the alluvial deposits (dense and coarse-grained) and crystalline bedrock (very dense and hard). Furthermore, an in-depth geotechnical evaluation would be conducted to determine recommended siting locations for proposed project facilities. This impact is considered less than significant and no mitigation is required.

- **Expose People or Structures to Substantial Adverse Effects Involving Landslides**

The crystalline bedrock underlying the proposed project site reduces the potential for landslides or other forms of natural slope instability to occur. Furthermore, an in-depth geotechnical evaluation would be conducted to determine recommended siting locations for proposed project facilities. However, potential exists for local landslides, debris flows, or rock fall that could affect individuals on the proposed project site. This impact is considered potentially significant and mitigation is required.

MM 4.6-5: The applicant shall design cut/fill slopes for an adequate factor of safety, considering material type and compaction, identified during the site-specific geotechnical study. The slope of cut surfaces shall be no steeper than 2:1 (horizontal to vertical units), unless the applicant furnishes a soils engineering or an engineering geology report, or both, stating that the site has been investigated and giving an opinion that a cut at a steeper slope will be stable and will not create a hazard to public or private property.

MM 4.6-6: The applicant shall cut slopes with a slope ratio compatible with the known geologic conditions and/or shall stabilize the slope by using stabilizing methods such as a buttressed fill.

MM 4.6-7: Wind turbine sites where slopes exceed 4:1 shall require specific consultation and approval by the Kern County Engineering and Survey Services Department, with additional site-specific mitigation.

MM 4.6-8: The applicant shall avoid locating roads and structures near landslide and mudflow areas. Where avoidance of landslide areas is not feasible, the applicant shall construct relatively flat cut-and-fill at slopes not to exceed 2:1, or 26 percent, or flatter.

MM 4.6-9: The applicant shall avoid locating turbine locations, transmission lines, and associated structures astride faults, lineaments, or unstable areas.

- **Result in Substantial Soil Erosion or Loss of Topsoil**

Soil surface could be destabilized and the potential for soil erosion could be increased by construction activities at the proposed project site, including clearing vegetation, grading, cut-and-fill activities, and construction of access roads. Impact is potentially significant and mitigation is required.

MM 4.6-10: The applicant shall limit grading to the minimum area necessary for construction and operation of the project, and the applicant will retain a California registered professional engineer to review the final grading earthwork and foundation plans prior to construction.

MM 4.6-11: As required by Chapter 19.64 (WE Combining District) of the Kern County Zoning Ordinance, the applicant shall prepare a Soil Erosion and Sedimentation Control Plan to mitigate potential loss of soil and erosion. The plan will be prepared by a California registered civil engineer or other professional and submitted for review and approval by the Kern County Engineering and Survey Services Department. The plan will include the following:

o. BMPs will be implemented to minimize soil erosion and will be consistent with the requirements of the Kern County grading requirements and the California Regional Water Quality Control Board pertaining to the preparation and approval of Storm Water Pollution Prevention Plans (BMPs recommended by the Kern County Engineering and Survey Department will be reviewed for applicability).

p. Measures to be implemented where access roads cross washes to minimize erosion and sedimentation.

q. Provisions to maintain flow in washes, should it occur, throughout construction.

r. Provisions for site revegetation using native plants.

s. Sediment collection facilities as may be required by the Kern County Engineering and Survey Services Department.

t. A timetable for full implementation, estimated costs, and a surety bond or other security as approved by the County.

u. Other measures required by the County during permitting, including long-term monitoring (post-construction) of erosion control measures until site stabilization is achieved.

The applicant shall regularly inspect all erosion control measures throughout construction and particularly before and after major storm events. The applicant shall promptly replace damaged or ineffective materials or structures.

MM 4.6-12: The applicant shall conduct grading activities pursuant to Kern County Grading Codes, Chapter 17.28, and as follows:

a. Grade sites near slopes and embankments in a way that would prevent or minimize erosion damage to the slope.

b. Seed or otherwise revegetate completed slopes.

c. On steeper slopes, including on wash embankments, as necessary, use mulching or biodegradable erosion control blankets as appropriate to stabilize the topsoil until vegetation can be re-established.

d. On slopes where unusual flow conditions (e.g., flooding) are expected, employ more substantial erosion protection measures such as grouted cobble slope facings or manufactured slope protection.

MM 4.6-13: The applicant shall frequently water disturbed areas during construction to reduce dust and minimize loss of soils from wind (see Section 4.3, "Air Quality," for additional discussion).

MM 4.6-14: In all areas disturbed by the project, the applicant shall salvage topsoil and reuse during restoration.

MM 4.6-15: The applicant shall use existing roads to the greatest extent feasible to minimize increased erosion.

- **Be Located on Soil that is Unstable**

The proposed project is located on stable crystalline bedrock that is not likely to become unstable due to limited grading and excavation required for the proposed project. This impact is considered less than significant and no mitigation is required.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan.

- **Be Located on Expansive Soils**

Soil found on the proposed project site are considered to have low to moderate shrink-swell potential and do not include expansive soils. Furthermore, a geotechnical analysis would be conducted as required under *MM 4.6-1* and include an assessment of expansive soils at the proposed project site. Facilities would also be designed to withstand variations in soil density. Impact is less than significant.

Implement *MM 4.6-2*.

- **Have Soils Incapable of Adequately Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems**

A 500- to 1,000-gallon septic system is planned by the proposed project and it is anticipated to impact up to 4 acres at the site of the Office and Maintenance Building. The septic system and leach line would be located away from surface waters to prevent sewage runoff into these features. If designed incorrectly, the septic system could cause health impacts, affect natural habitat, and pollute groundwater. This impact is considered potentially significant and mitigation is required.

MM 4.6-16: The applicant shall obtain required permits from the Kern County Environmental Health Services Department and implement all required conditions.

- **Result in Impacts on Geological Resources due to SCE Facility Improvements**

The Impact Avoidance Protocols for the SCE Regional Special Protection Scheme would be implemented. The proposed project would identify all seismic risks and would not result in added exposure of people or structures to rupture of a known earthquake fault, ground shaking or failure, or landslides. Impacts on soils through the use of septic tanks or wastewater disposal systems would not occur. Impacts would be less than significant.

1.3.7 Hazards and Hazardous Materials

Setting

The proposed project site is located in an area highly susceptible to wildfires and includes vegetation such as juniper woodland and Mojave Desert scrub, with extensive introduced annual grasses, native needle grass grassland, exotic annual grasses, and pine oak woodlands. The area is also known for high-velocity wind conditions and is occasionally subjected to Santa Ana-like wind conditions.

According to Kern County, the fire hazard rating for the proposed project site ranges from high to very high. Hazardous materials on surface or buried at the proposed project site could be encountered during construction excavation, and earthmoving activities. Land uses at the proposed project site, including open space use, recreation by off-road motorists and Pacific Trail hikers, and low density residential uses, would have a low probability of resulting in significant contamination from hazardous material use at the proposed project site.

The proposed project would be located within potential military flight test pathways and would have to comply with height restrictions. New technologies have improved wind turbine design to reduce the chances of tower collapse or blade dislocation. Setbacks for wind turbines and associated facilities have been developed by Kern County to prevent potential hazards to proposed project personnel or individuals in the vicinity of the proposed project.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Create a Significant Hazard for the Public or the Environment through the Routine Transport, Use, or Disposal of Hazardous Materials**

  Various petrochemicals would be used by the proposed project during construction and operation of the proposed project. The proposed project would not require the use, treatment, disposal, or transport of significant quantities of hazardous materials, but presence and use of any quantity could expose and create health impacts to public and proposed project workers. Although blasting during proposed project construction is not anticipated, potential injury to proposed project personnel could occur if blasting is required. Implementation of the following mitigation measure would reduce the impact to less than significant.

  MM 4.7-1: In accordance with the California Health and Safety Code and Kern County regulations, the applicant shall prepare a Hazardous Materials Business Plan and submit it to the Kern County Environmental Health Services Department for review and approval.

The Hazardous Materials Business Plan will delineate hazardous material and hazardous waste storage areas; describe proper handling, storage, and disposal techniques; describe methods to be used to avoid spills and minimize impacts in the event of a spill; describe procedures for handling and disposing unanticipated hazardous materials encountered during construction; and establish notification procedures for spills. The applicant will provide the Hazardous Materials Business Plan to all contractors working on the project and will ensure that one copy is available at the project site at all times.

MM 4.7-2: If blasting is required, the applicant shall contract with a blasting contractor with experience conducting blasting activities, licensed to use Class A explosives, and licensed as a contractor in the State of California. The blasting contractor shall prepare a blasting plan for the proposed blasting activities to prevent endangering worker safety. The blasting plan shall be submitted for review to the Kern County Planning Department, in consultation with the Kern County Engineering and Survey Services Department, the Kern County Fire Department, and the Kern County Air Pollution Control District. The blasting plan shall be approved prior to commencement of any blasting activities. A copy of the blasting plan shall be provided to Edwards Air Force Base. The blasting plan shall:

v. Describe procedures to be implemented to protect workers during blasting, such as using a signaling system to alert workers of an impending blast and using blasting mats to prevent or reduce the number of rock particles thrown into the air;

w. Describe procedures for proper storage and transportation of explosive materials, including protecting explosives from wildfires;

x. Prohibit blasting during extreme fire danger periods; and

y. Comply with the U.S. Bureau of Mines and the Office of Surface Mining Reclamation and Enforcement guidelines for minimizing damage to structures from blasting and various mining operations.

- **Create a Hazard for the Public or the Environment through Reasonably Foreseeable Upset and Accident Conditions Involving the Release of Hazardous Materials into the Environment**

Hazardous materials used on-site and in equipment could be accidentally released to the environment during construction and operation of the proposed project. The likelihood of encountering buried hazardous materials is low based on the proposed project site's historical use and the identification of no known contaminated sites from the government database search. Impacts would be less than significant with implementation of the following mitigation measures.

Implement *MM 4.7-1*.

MM 4.7-3: The applicant shall site all fueling, hazardous materials storage areas, and operation and maintenance (O&M) activities involving hazardous materials at least 100 feet away from blue-line drainages as identified on U.S. Geological Survey topography maps and wetlands (see Figure 3-4, 4.8-1, and 4.8-2).

MM 4.7-4: The applicant shall construct a concrete containment berm around the main transformer storage area and propane tanks to prevent hazards associated with the release of transformer oil.

- **Result in a Safety Hazard for People Residing or Working in the Project Area for a Project Located within the Kern County ALUCP**

The proposed project site is located approximately 15 miles west of Edwards Air Force Base. It is also located within an area with height restrictions implemented to protect military operations. Since the proposed project is located several miles from the nearest airport, there are no potential hazards with air traffic. No safety impacts result from Electromagnetic Field (EMF) emissions of the proposed project. Implementation of the following mitigation measures would ensure that impacts due to the location of the proposed project site in proximity to military aviation operations are less than significant.

MM 4.7-5: The applicant shall limit all turbines to a height not to exceed 400 feet above ground level.

MM 4.7-6: The applicant shall comply with all requirements to maintain the FAA's Determination of No Hazard to Air Navigation during construction and operation of the turbines. The applicant shall work with the FAA to resolve any adverse effects on aeronautical operations prior to issuance of grading or building permits for the affected turbines or area where those disputed turbines will be constructed.

- **Expose People or Structures to a Significant Risk of Loss, Injury, or Death Involving Wildland Fires**

Fire potential at the proposed project site would be reduced with manned operations, which would reduce traffic associated with non-property owners and decrease unauthorized use of the proposed project area to non-property owner off-road vehicle use, camping with open fires, and hunting. A network of fire breaks would be introduced by the new road, thus reducing the opportunity for fires to become out of control. Danger of fire will however increase during proposed project construction due to the use of heated mufflers, explosives, and possible disposal of cigarettes. Lightning strikes on wind turbines and fire sparks from the wind turbine generator during operation could result in a fire. This impact would be less than significant with the implementation of the following mitigation measures.

MM 4.7-7: The applicant shall develop and implement a Fire Safety Plan for use during construction and operation. The applicant shall submit the plan, along with maps of the project site and access roads, to the Kern County Fire Department for review and approval prior to issuance of the building permit. The plan shall contain notification procedures and emergency fire precautions, including the following:

Construction

a. All internal combustion engines, stationary and mobile, shall be equipped with spark arresters.

b. Spark arresters shall be in good working order.

c. Light trucks and cars with factory-installed (type) mufflers, in good condition, may be used on roads where the roadway is cleared of vegetation.

d. Smoking signs and fire rules shall be posted on the project bulletin board at the contractor's field office and areas visible to employees during the fire season.

e. Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials.

Operation

a. Warning signs for high-voltage equipment shall be erected.

b. Brush and other dried vegetation around pad-mount transformers, riser poles, and the O&M building shall be cleared annually.

c. Fire extinguishers at the O&M building shall be installed.

d. Employees shall be trained in the implementation of the Fire Safety Plan.

- **Result in Other Potential Project-Related Hazards for Project Personnel or the Public**

Wind turbines have the potential for rotor and tower failure which could affect proposed project personnel or the public. The WE Combining District of the Kern County Ordinance requires the design of the proposed project to include required setbacks to prevent impacts to the public. Injury from work-related accidents may occur as well as risk of electrical shock from energized facilities. The following mitigation measures would be implemented to ensure impacts are less than significant.

MM 4.7-8: To prevent rotor and tower failure and avoid potential impacts, the applicant shall design the project to:

a. Conform to international standards for wind turbine generating systems, including the International Electrotechnical Commission's 61400-1: Wind Turbine Generator Systems – Part I: Safety Requirements (1999)—also, the project shall be certified according to these requirements to help assure that the static, dynamic, and defined life fatigue stresses of the blade would not be exceeded under the combined load expected at the project site;

b. Adhere to state and local building codes during turbine installation on the foundations, which would also minimize the risk of rotor and tower failure;

c. Prevent safety hazards from over-speed by installing a comprehensive protection system on each turbine, such as a redundant pitch control system and a backup disk brake system;

d. Prevent safety hazards from tower failure by designing the turbine towers and foundation to withstand wind speeds of 100 mph at the standard height of 30 feet; engineering the turbines according to the applicable seismic zone of the Uniform Building Code Earthquake Standards; and ensuring that all installed equipment shall meet the standards of the National Electrical Manufacturers Association (NEMA), the American National Standards Institute (ANSI), and California Occupational Safety and Health Act (Cal-OSHA);

e. Prevent safety hazards from electrical failure by using a California-registered electrical engineer to design all electrical systems and ensure that electrical systems meet national electrical safety codes and other national standards, including NEMA, ANSI, and Cal-OSHA standards; and

f. Provide the Kern County Planning Department with manufacturer's specifications for the wind turbines, specifying that all turbines be equipped with a braking system, blade pitch control, and/or other mechanism for rotor control and shall have both manual and automatic over-speed controls.

MM 4.7-9: To protect workers from electrical shock and other work-related accidents during the project, the applicant shall implement the following measures:

a. Grounding shall be designed and implemented to the standards of the Institute of Electrical and Electronics Engineers;

b. All turbines and utility lines shall be equipped with automatic and manual disconnect mechanisms;

c. Three circuit breakers that can be both manually and automatically operated shall be provided between each turbine and the connection to the electrical grid;

d. The electrical systems and substations shall be designed by California-registered electrical engineers and shall meet national electrical safety codes and other national standards, including NEMA, ANSI, and Cal-OSHA standards; and

e. These mechanisms shall be installed and tested before interconnection.

MM 4.7-10: To prevent accidents involving the public, the applicant shall implement the following measures:

a. Fence the project site or project infrastructure in accordance with Section 19.64.160 (Development Standards and Conditions) of the Kern County Zoning Ordinance;
b. Limit access to properly trained personnel only;
c. Lock all turbine towers;
d. Lock each down-tower electrical/communication cabinet and install a sign with high-voltage warning;
e. Secure all access road entry points with locking gates; and
f. Post signs at entrance gates that note the existence of on-site high-voltage and underground cables and warn people of electrocution hazards.

MM 4.7-11: The applicant shall establish a sampling protocol for all fly ash the site receives and will maintain electronic records detailing the source, quantity and analytical data for the fly ash. This information will be made available to the Environmental Health Services Department's Hazardous Materials Program, as requested.

- **Result in Hazards and Hazardous Materials Impacts as a Result of SCE Facility Improvements**

The SCE facility improvements would not require the use, treatment, disposal, or transport of significant quantities of hazardous materials. The proposed project Hazardous Materials Business Plan/SPCC Plan and SWPP would be implemented by SCE in anticipation of accident conditions, hazardous emissions, and handling of hazardous materials. SCE would also comply with all safety standards listed in the "Impact Avoidance Protocols for the SCE Regional Protection Scheme". No impacts would result from the SCE facilities and no mitigation is required.

1.3.8 Hydrology and Water Quality

Setting

The proposed project site slopes gradually from the northwest to the southeast and elevation is between 3,100 and 5,800 feet above mean sea level (amsl). It is underlain by the Mojave Groundwater Basin, an area that encompasses the Mojave Desert. The Mojave Groundwater Basin is subdivided into many subunits, and the proposed project site is located within the Antelope Valley groundwater sub-basin, which consists of unconsolidated to moderately indurated, poorly sorted gravels, sands, silts, and clays.

Approximately 24.5 miles of blue-line drainages cross the proposed project site and the only named drainage, Cottonwood Creek, a jurisdictional water of the state, is located in the southwestern corner. It is a non-navigable stream that terminates approximately 2.4 miles southeast of the proposed project site at Rosamond Lake, which has no outlet. No aquatic vertebrates were observed at Cottonwood Creek or any of the other drainages within the proposed project site, and no state or federally listed species reside within the proposed project site. Swainson's hawk (*Buteo swainsoni*), a state-listed species, was observed as a migrant in the proposed project site during field surveys, although it was determined to be a non-resident species. The Los Angeles Aqueduct, a channelized water feature, also crosses the southwestern portion of the proposed project site. The National Wetland Inventory (NWI) maps identify only a very small area of wetlands located in the northwest corner of the proposed project site. Based on field surveys and literature reviews, no other wetlands were identified in the proposed project site.

Groundwater in the proposed project area is extracted from local wells and imported water from the Antelope Valley East Kern Water Agency. Water wells in the region derive potable water from a depth of about 200 to 300 feet. The proposed project may require the installation of a well to provide a potable water source for operations staff working at the proposed project site.

The Kern County map indicates that approximately 378 acres (6.5 percent of the proposed project site) along the low-lying areas of Cottonwood Creek are subject to flooding. These areas are located in a 100-year flood zone. The rest of the proposed project site lies within an area characterized as areas that have a less than 1 percent chance of flooding each year; areas that have a less than 1 percent chance of sheet flow flooding with an average depth of less than 1 foot; areas that have a less than 1 percent chance of stream flooding where the contributing drainage area is less than 1 square mile; or areas protected from floods by levees.

As currently designed, the proposed project site would locate several turbines and associated facilities within a 100-year flood zone.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Violate any Water Quality Standards or Waste Discharge Requirements**

  Construction activities at the proposed project site would disturb soils, making them more susceptible to erosion and more likely to be transported by stormwater runoff into nearby drainages, potentially affecting local and downstream water quality. Sedimentation in surface waters and wetlands can reduce water-carrying capacity, potentially leading to flooding; degrade water quality; increase turbidity (concentration of suspended particles), thereby reducing light penetration and inhibiting photosynthesis; and introduce fertilizers and other nutrients, which can lead to eutrophication.

  The amount of erosion and runoff into drainages at and in the vicinity of the proposed project site is expected to be limited as only approximately 6 percent of the proposed project site would be graded. Construction impacts from erosion and runoff are expected to be localized and temporary, and the applicant would implement measures to minimize and contain erosion and sedimentation in accordance with the Kern County Grading Code and project NPDES permit.

  No turbines or other aboveground buildings would be sited within surface waters. However, the applicant has identified locations where access roads would cross drainages. Three of these crossings occur at Cottonwood Creek.

  Since the proposed project would disturb more than 1 acre, the applicant would be required to obtain and comply with the NPDES regulations for surface discharge by acquiring a general construction stormwater discharge permit. In order to prevent hazardous materials from entering drainages and affecting water quality, the applicant would be required to implement a Hazardous Materials Business Plan and submit it to the Kern County Environmental Health Services Department for review.

  The proposed project would not cause a new point discharge source. To ensure that impacts on water quality are less than significant, the following mitigation measures would be implemented.

MM 4.8-1: The applicant shall provide environmental training to all construction personnel. The training shall emphasize the importance of protecting water quality and shall review the requirements of the project NPDES permit and Hazardous Materials Business Plan.

MM 4.8-2: The applicant shall complete the installation of the box culverts at the two crossings of the Los Angeles Aqueduct in as short a time period as practicable to minimize any temporary construction effects associated with the use of equipment containing hazardous materials that could be released into the aqueduct.

MM 4.8-3: Prior to the issuance of a grading permit for any work on the access road and drainage crossings, the applicant shall submit an appropriate drainage and/or flood hazard study to the Kern County Engineering and Survey Services Department for review and approval. The study shall include, but not be limited to, the following provisions at the location of access road and drainage crossings:

a. Ensure that soils do not accumulate in drainage beds at the gravel and dirt road crossing locations during construction and throughout operation of the project;

b. Use fill ramps rather than bank cutting to minimize impact on water quality affected by increased erosion;

c. Design access road and drainage crossings to accommodate the runoff of a 10-year storm system; and

d. Periodically check access road crossing locations during construction and throughout operation for spills of hazardous materials, and clean up all spills.

MM 4.8-4: The applicant shall site all storage of hazardous materials and conduct any refueling at least 100 feet away from the NWI-mapped wetlands and Cottonwood Creek.

MM 4.8-5: The applicant shall set back all soil stockpiles at least 10 feet from the NWI-mapped wetlands and drainages.

MM 4.8-6: If required, the applicant shall obtain a streamlined alteration agreement from the California Department of Fish and Game.

- **Deplete Groundwater Supplies or Interfere with Groundwater Recharge**

The proposed project may include the construction of a water well to supply water during construction and operation, but would not be expected to require a large quantity. Since the proposed project would not involve a substantial increase in impervious surfaces, the proposed project would have a less than significant impact on groundwater recharge.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in Impacts on the Existing Drainage Patterns**

Short-term increases in erosion (including sedimentation build-up caused by access roads) as a result of ground disturbance would be minimized via implementation of the proposed project-specific Soil Erosion and Sedimentation Control Plan and/or SWPPP in accordance with NPDES requirements. Construction and operation of the proposed project would not require permanently altering the course of any of the blue-line drainages.

Implementation of *MM 4.8-3*, *MM 4.6-11*, and *MM 4.6-12* would ensure that impacts are less than significant.

- **Alter Existing Drainage Patterns of the Site or Area, Causing Flooding**

  Drainages at the proposed project site would be impacted at access road crossings, but the applicant would prevent the build-up of soils in the drainages, which would reduce the potential for local flooding. The applicant would also implement erosion and sediment control measures to reduce runoff. The proposed project is not anticipated to involve altering the course of drainages at the proposed project site.

  Implementation of *MM 4.8-3, MM 4.8-7, MM 4.6-11,* and *MM 4.6-12* would ensure that impacts are less than significant.

- **Result in Impacts on Runoff Water and Drainage Capacity**

  The proposed project would increase impervious surfaces by approximately 13 acres, which is only 0.2 percent of the entire proposed project site. Road construction or expansion can also increase water runoff rates, resulting in accelerated soil erosion. The applicant would implement applicable building codes during road construction to ensure appropriate drainage. In addition, the soils at the proposed project site are all classified by the Natural Resources Conservation System as having a moderate infiltration rate when thoroughly wet, and runoff is relatively low. Impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures would be required.

- **Place Within a 100-Year Hazard Area Structures that Would Impede or Redirect Flood Flows**

  The proposed project would involve the installation of turbines and associated facilities, within a Flood Zone. The proposed designated yard in the southwestern corner of the proposed project site is located immediately adjacent of Cottonwood Creek and the associated flood hazard zone overlying this feature. Depending on final facility siting, a permanent building may or may not be located at this yard. Kern County may require that additional conditions be applied to the building permit, such as requiring the installation of structures with electrical equipment to be above natural grade or setting a foundation depth for underground equipment. This impact would be potentially significant and mitigation is required.

  > *MM 4.8-7*: As required by Section 19.70.070 (Kern County Floodplain Combining District – Yards and Setbacks) of the Kern County Zoning Ordinance, the applicant shall locate all structures and facilities a minimum of 10 feet back from all waterways to avoid impediment or redirection of flood flow.

- **Result in Impacts Caused by Seiche, Tsunami, or Mudflow**

  Since the proposed project site is located inland, the potential for tsunami-related damage or a seismic seiche is low. Due to the dense, relatively hard, and massive nature of the crystalline bedrock underlying the mountainous portion of the proposed project site, lands within and surrounding the proposed project site are not subject to mudflows or other forms of natural slope instability. No impacts would occur.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Expose People or Structures to a Significant Risk of Loss, Injury, or Death involving Flooding**

  Only a limited area of the proposed project site would be located within the 100-year flood zone. Construction of the proposed project would increase impervious areas by less than 1 percent of the site area. In addition, the natural soil conditions at the proposed project site include moderate infiltration rates and relatively low runoff rates, which naturally mitigate flooding potential. Therefore, this impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in Impacts on Hydrology and Water Quality as a Result of SCE Facility Improvements**

  The SCE facilities improvement area gradually slopes, but is generally flat, and features no rivers, creeks, or watercourses. The proposed project would occur almost entirely along existing roads and mostly in areas already altered for agricultural and other land uses, and would not involve actions that alter storm runoff drainage patterns. In addition, the water quality measures under "Impact Avoidance Protocols for the SCE Regional Special Protection Scheme" would be enacted as part of the proposed project to ensure against violating water quality standards or waste discharge requirements. Impacts are less than significant and no mitigation would be necessary.

1.3.9 Land Use and Planning

Setting

The proposed project site is currently owned by 43 private landowners. It is undeveloped and mostly used for grazing. Approximately 2,367 acres of the proposed project site is subject to Williamson Act Land Use contracts. The Pacific Crest Trail bisects and dirt roads crisscross the proposed project site. Land surrounding the proposed project site is rural, undeveloped desert scrub. Eight residences are scattered directly outside the proposed project boundary. The nearest residence, a limestone mining operation, is adjacent to and west of the proposed project site. Northrop Grumman Corporation operates a test facility located approximately 3 miles west of the proposed project. This facility is potentially impacted by the proposed project with respect to EMF emissions and interference with radar frequencies.

The existing land use designations for the proposed project site include Flood Hazard, Seismic Hazard, and Steep Slopes. The proposed project site is subject to Zoning Ordinance Section 19.08.160, Height of Structures, which limits the height of structures to 400 feet or less. A zoning change would need to be approved to combine the following districts with the WE Combining District: Exclusive Agriculture, Exclusive Agriculture and Geologic Hazard, and Exclusive Agriculture and Flood Plane Hazard. After approval, wind turbine development would be permitted in these zones.

A conditional use permit is being requested by the applicant to allow the temporary (during construction only) use of concrete batch plants to provide concrete and materials for turbine, substation, and operations and maintenance building foundations.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Physically Divide an Established Community**

  The proposed project site is located in a rural area with about eight residences scattered outside the proposed project boundary. No established community exists within several miles of the proposed project site. Impacts are less than significant.

- **Conflict with any Applicable Land Use Plan, Policy, or Regulation**

  The proposed project would be consistent with relevant policies of the Kern County General Plan and the Zoning Ordinance. For a detailed discussion, please refer to Table 4.9-3 of the PdV EIR. Impacts would be less than significant with implementation of the following mitigation measure.

  MM 4.9-1: The applicant shall submit the final project design in plot plans for review and approval by the Kern County Planning Department. The Planning Department will confirm that final facility locations avoid sensitive resources and hazard zones as depicted on the constraints map (see Figure 3-4) and/or as described throughout this EIR, unless otherwise approved by the Kern County Planning Director. In its final review, the Planning Department must confirm that project facilities are installed only within the area surveyed for environmental resources as described in the methodology section for each resource section throughout this EIR and in the technical reports provided in the appendices. The Planning Department must also confirm that all facilities are installed such that the area of impact and extent of impacts to sensitive resources is no greater than that evaluated in this EIR.

- **Cause Substantial Interference with Radar and Other Testing as to Cause an Incompatible Land Use**

  The proposed project's wind turbines may potentially impact the Northrop Grumman site by cluttering radar frequencies. The military test facility, as an existing use, maintains that allowing the construction of 400-foot wind turbines within three miles of its facility would threaten its test capability and introduce man-made electromagnetic noise that would raise the overall background noise floor and prevent them from measuring very low power levels. The following mitigation measure would ensure that impacts are less than significant.

  MM 4.9-2: The applicant shall reduce project radar clutter impacts to the Tejon Test Facility by implementing the following measures:

  a. Deactivate the turbines during low wind conditions based upon a published schedule which shall be reviewed by the Kern County Planning Department and provided to the Northrop Grumman Corporation.

  b. Array wind turbines in certain agreed bands where turbines would avoid cluttering a specific frequency of transmissions emanating from Tejon Test Facility radar antennas; and

  c. Micro-site wind turbines within bands to minimize RCS values.

  All site plans for development shall conform with these restrictions.

- **Conflict with any Applicable Habitat Conservation Plan or Natural Community Conservation Plan**

  The proposed project site is covered by the West Mojave Habitat Conservation Plan. The desert tortoise and Mohave ground squirrel are protected under the plan, but neither species was present on the proposed project site. The proposed project is not expected to impact these species and conflict with the habitat conservation plan. Impacts would be less than significant.

The proposed project would be in conformance with the goals, policies, and plans for the Kern County General Plan.

- **Result in Land Use Impacts due to SCE Facility Improvements**

  The SCE facilities would comply with the goals, policies, and implementation measures of the Kern County General Plan and would not physically divide an established community or conflict with the Kern County General Plan, habitat conservation plan, or natural community conservation plan. No impacts on land use resources would result and no mitigation is required. Impacts would be less than significant.

1.3.10 Mineral Resources

Setting

Kern County contains the following mineral resources: petroleum, boron, clay, gold, gypsum, and limestone. The proposed project site is not located in an area known for mineral resources of statewide or regional importance. Limestone is the mineral resource located closest to the proposed project site.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Result in the Loss of Availability of a Known Mineral Resource that Would Be of Value to the Region and the Residents of the State**

  The proposed project site does not contain significant aggregate resources and is not located within an identified mineral resource area. Since the lifespan of the proposed project is limited to 30 years, if minerals are determined to be present, they can be extracted at a later date. Impact is short-term and would not cause the loss of mineral resources. Therefore, impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in the Loss of Availability of a Locally Important Mineral Resource Recovery Site Delineated on a Local General Plan, Specific Plan, or Other Land Use Plan**

  The proposed project site does not contain significant aggregate resources and is not located within an identified mineral resource area. Since the lifespan of the proposed project is limited to 30 years, if minerals are determined to be present, they can be extracted at a later date. Impact is short-term and would not cause the loss of mineral resources. Therefore, impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in Mineral Impacts as a Result of SCE Facility Improvements**

  Significant aggregate resources do not lie within the locations of the SCE facilities, nor within an identified mineral resource area. Impact would be less than significant and no mitigation is required.

1.3.11 Noise

Setting

The proposed project site is located in an undeveloped, open region of eastern Kern County. Eight residential structures are located adjacent to the proposed project site. No major human-made noise sources exist in the proposed project area, with the exception of occasional aircraft flyovers. No paved roads exist in the vicinity of the proposed project site and the nearest state highway is more than 7 miles away.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Expose Persons to Noise in Excess of Standards Established in the Kern County General Plan or Noise Ordinances, or Other Applicable Standards**

  The wind turbines (Vestas V90 and Mitsubishi MWT-1000A) may exceed the following limits: the County's WE Combining District outdoor limit of 50 dBA within 50 feet of a residence; the WE Combining District outdoor limit of 45 dBA for more than 5 minutes per hour; and the General Plan indoor limit of 45 dBA. The Mitsubishi turbine's low frequency impacts are not expected to be significant, while the Vestas turbine's low frequency impacts would be potentially significant. Implementation of the following mitigation measures would ensure that impacts are less than significant.

  MM 4.11-1: Prior to building permit approval and prior to final plot plan approval, the applicant shall submit a final noise report for residences located within one mile in a prevailing wind direction, or within one-half mile in any other direction, of the project's boundary. The report shall demonstrate compliance with County Code Section 19.64.140.J WE Combining District performance standards as well as the County General Plan Noise Element policies regarding outdoor and interior noise levels.

  MM 4.11-2: If the Vestas V90 wind turbines are selected for use in the project, the applicant shall implement one of the following methods to reduce low frequency noise impacts to a less than significant level:

  a. Submit a final noise report showing that by limiting the cut-on speed of these units to 9 m/s the noise impacts will be reduced to less than significant levels (Table 4.11-1);

  b. Submit a final noise report showing that a revised plot plan provides more distance between the turbines and the residences as described above and reduces noise levels to a less than significant level (to be confirmed during the final review of the Plot Plan); or

  c. Submit a final noise report showing that using a mix of Mitsubishi and Vestas V90 turbine models will reduce noise levels to a less than significant level (to be confirmed during the final review of the Plot Plan).

  MM 4.11-3: If the Vestas V90 wind turbines are selected for use in the project, the applicant shall implement the following, in addition to any other mitigation: Prior to issuance of a building permit for the project, the applicant shall submit an Operational Noise Complaint Plan to Kern

County for approval. The plan shall detail how the applicant will respond to operational noise complaints, keep the County apprised of all complaints, and document the resolution of those complaints.

- **Expose Persons to or Generate Excessive Groundborne Vibration or Groundborne Noise Levels**

Earth movement during the construction phase as well as ongoing activities and operation of the proposed project could cause groundborne vibration or noise levels. The proposed project site is located in a rural area with very few scattered residences in the vicinity. One residential unit would be located in close proximity to a turbine generator, but this unit is currently unoccupied and far enough that it would not be subjected to excessive vibration. This impact would be less than significant.

The proposed project would conform to the goals, policies, and implementation measures of the Kern County General Plan. No additional measures are proposed.

- **Cause a Substantial Permanent Increase in Ambient Noise Levels in the Project Vicinity above Levels Existing without the Project**

The wind turbines (Vestas V90 and Mitsubishi MWT-1000A) may exceed the following limits: the County's WE Combining District outdoor limit of 50 dBA within 50 feet of a residence; the WE Combining District outdoor limit of 45 dBA for more than 5 minutes per hour; and the General Plan indoor limit of 45 dBA. The Mitsubishi turbine's low frequency impacts are not expected to be significant, while the Vestas turbine's low frequency impacts would be potentially significant. Implementation of the following mitigation measures would ensure that impacts are less than significant.

Implement *MM 4.11-1* through *MM 4.11-3*.

- **Cause a Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity above Existing Levels**

Noise levels at residences near the proposed project site would increase temporarily during site preparation and construction activities at the proposed project site. During scraping, grading, and crane pad development and excavation for the turbine foundation, construction noise would be at its greatest level. No residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, or churches are located within the vicinity of the proposed project. The closest residential unit to the proposed project site is unoccupied and boarded up. There are no noise ordinances that apply directly to temporary construction noise. The following mitigation measures would ensure that impacts are less than significant.

MM 4.11-4: The applicant shall limit noise-generating construction activities to the following hours: between 5:30 a.m. and as late as 9:00 p.m. Monday through Saturday. If required to meet critical schedule milestones, construction may also occur between 7:00 a.m. and 6:00 p.m. on Sundays.

MM 4.11-5: The applicant shall cover equipment engines and ensure that mufflers are in good working condition. This measure can reduce equipment noise by 5 to 10 dBA (U.S. Environmental Protection Agency 1971).

MM 4.11-6: The applicant shall locate all stationary equipment such as compressors and welding machines away from noise receptors to the extent practicable.

- **Expose People Residing or Working in the Project Area to Excessive Noise Levels for a Project Located within the Kern County Airport Land Use Compatibility Plan**

  No public use airports are located within or within 2 miles of the proposed project site. However, portions of the proposed project site may be located near existing military flight corridors, where noise levels usually exceed county standards. The proposed project is not expected to expose people to significant noise impacts.

  The proposed project would conform to the goals, policies, and plans of the Kern County General Plan. No additional measures are proposed.

- **Expose People Residing or Working in the Project Area to Excessive Noise Levels for a Project within the Vicinity of a Private Airstrip**

  No private airstrips are located within or within an 8-mile radius of the proposed project site. This impact would be less than significant.

  The proposed project would conform to the goals, policies, and plans of the Kern County General Plan. No additional measures are proposed.

- **Result in Noise Impacts as a Result of SCE Facility Improvements**

  SCE would implement all of the avoidance and minimization measures that are listed under the "Impact Avoidance Protocols for the SCE Regional Special Protection Scheme". The proposed transmission route options would not create significant noise impacts during construction. Impacts are less than significant.

1.3.12 Population and Housing

Setting

Eight residences are located adjacent to the proposed project site, with the closest located approximately 13 feet to the east. According to United States Census Bureau data, housing units in Kern County grew by 16.4 percent from 1990 to 2000. Nearly 305,000 persons make up the year-round labor force in Kern County. Industries that provide the greatest amount of employment opportunities in Kern County include educational, health, and social services; agriculture, forestry, fishing, hunting, and mining; and retail trade. A significant portion of Kern County residents are employed by the government. These jobs include teachers; local, state, and federal government employees; and correctional facility employees. The Central California Economic Development Corporation states Kern County's unemployment rate at 7.3 percent in 2006. As of 2003, 18.2 percent of individuals in Kern County live below poverty level.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Induce Substantial Population Growth**

  The number of jobs created by the proposed project would be minimal and would not induce substantial population growth. A portion of the construction work force is expected to come from the proposed project area which would negate an increase in population from individuals relocating to

Kern County. Additional energy availability alone would not cause an increase in population growth. The proposed project would not include road extensions or the development of other infrastructures, beyond the proposed project site that would indirectly cause population growth.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Displace Substantial Numbers of Existing Housing**

No residences are located within the proposed project site. Thus, no residences would be displaced by the proposed project. There would be no impact.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Displace Substantial Numbers of People**

The proposed project would not displace residents or remove existing housing. There would be no impact.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in Impacts on Population and Housing as a Result of SCE Facility Improvements**

The addition of a fiber optic cable to existing transmission poles and a microwave telecommunication tower would not create new permanent jobs, housing, or businesses that would induce growth. No residences or residents would be displaced by the SCE facilities. Impacts would be less than significant.

1.3.13 Public Services

Setting

The proposed project site is located within Battalion 1 of the Kern County Fire Department (KCFD). Three fire stations (Rosamond, Tehachapi, and Mojave) are located within approximately 20 miles of the proposed project site. The Mojave Office of the California Highway Patrol would provide emergency response and traffic regulation to the proposed project site. The Rosamond substation of the Kern County Sheriff's Department would provide police protection services to the proposed project site. The Kern County Emergency Medical Services Department would be responsible for coordinating the public, emergency service providers, and hospitals throughout the county.

The proposed project site is located in the Southern Kern Unified School District. Three public elementary schools, one public middle school, a public high school, and a public adult school serve the proposed project area. Five colleges are also located within the proposed project area.

The Tehachapi Mountain Park is the only regional park in close proximity to the proposed project. Several city and recreation district parks exist throughout Kern County.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Adversely Affect Fire Protection Services**

  Danger of fire would increase during proposed project construction due to the use of heated mufflers, explosives, and possible disposal of cigarettes. Lightning strikes on wind turbines and fire sparks from the wind turbine generator during operation could result in a fire. The proposed project has the potential to increase demand on the KCFD when a fire occurs. It is anticipated, however, that personnel and equipment between the three stations located near the proposed project would be sufficient to respond to a fire at the proposed project site, should one occur. The proposed project would not be expected to exceed existing fire services capacity and would not require additional, permanent fire protection services, equipment, facilities, or personnel. This impact is considered to be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures would be required.

- **Adversely Affect Protection/Law Enforcement Services**

  The proposed project is not expected to induce population growth in the area that would affect the ratio of one sworn officer per 1,000 residents and is not expected to result in the need to construct new, or to physically alter existing, police protection facilities to maintain an acceptable service level. During construction, the volume of traffic associated with the commute of temporary construction workers is not expected to exceed the California Highway Patrol's ability to patrol the highways. This impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures would be required.

- **Adversely Affect Medical Services**

  A temporary influx of 100 to 200 people during a construction emergency may require the need for emergency medical services. A small number of accidents may occur during the entire construction period, but the small number in addition to other non-project related accidents is not expected to exceed the capacity of existing medical services. The applicant would prepare and implement a Health and Safety Plan to minimize emergency incidents at the proposed project site. This impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures would be required.

- **Adversely Affect School Capacity**

  The potential exists for the children of temporary construction workers from out of the area, to be placed in local schools. It is expected that a portion of the construction workers would be local to the proposed project area and the addition of children for relocating workers would be minimal. The proposed project would require 10 to 16 permanent employees for operation. It is anticipated that these employees would be local to the proposed project area. In the event that permanent employees relocate from another area, the Southern Kern Unified School District would be able to accommodate an increase in the number of students. This impact would be less than significant.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures would be required.

- **Adversely Affect Parks**

  Since personnel at the proposed project site would be limited, the construction period would be limited, and there are numerous parks in the proposed project area, exceeding the capacity of existing parks would not be expected. The population increase would not exceed Kern County's standard of 2.5 acres of parkland per 1,000 residents. This impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures would be required.

- **Result in Public Services Impacts as a Result of SCE Facility Improvements**

  Under the "Impact Avoidance Protocols for the SCE Regional Special Protection Scheme," SCE would develop and implement a Grass Fire Control Plan for using during construction that would minimize fire risk. A barbed wire perimeter fence and motion sensitive lights would surround the Cottonwind Substation and increase security as well as mitigate impacts to local police protection. The applicant would prepare and implement a Health and Safety Plan to minimize emergency incidents at the proposed project site. In the event that permanent employees relocate from another area, the Southern Kern Unified School District would be able to accommodate an increase in the number of students. Since personnel at the proposed project site would be limited, the construction period would be limited, and there are numerous parks in the proposed project area, exceeding the capacity of existing parks would not be expected. Impacts would be less than significant.

1.3.14 Recreation

Setting

The Tehachapi Mountain Park is the primary park that would service the proposed project area. It is also the only regional park in close proximity to the proposed project. The Pacific Crest Trail, located in Kern County traverses the center of the proposed project area.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

- **Result in Increased Use of Parks**

  The limited addition of people to the area and the short-term duration of construction is not expected to cause a significant impact on park use or result in a detectable physical deterioration of parks because of additional use. The proposed project would affect the recreational experience for hikers using the Pacific Crest Trail because the proposed project would substantially alter the viewshed, increase noise, and potentially pose safety concerns. Relocation of the Pacific Crest Trail is not currently feasible and no mitigation measures exist to reduce its impact from the proposed project. Impacts would significant and unavoidable.

  > *MM 4.14-1*: The applicant shall site all turbines and associated infrastructure other than roads or collector cable lines with a minimum setback of 150 feet from both edges of the Pacific Crest Trail. The setback shall be clearly delineated on all applicable site plans submitted prior to issuance of grading or building permits.

Other Impacts

- **Result in Construction or Expansion of New Parks**

  The construction or expansion of recreational facilities would not occur as a result of the proposed project. No impact would occur.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in Impacts on Recreational Resources as a Result of SCE Facility Improvements**

  The limited addition of people to the area and the short-term duration of construction is not expected to cause a significant impact on park use or result in a detectable physical deterioration of parks because of additional use. The SCE facilities would not significantly contribute to the proposed project's significant adverse impact to the Pacific Crest Trail. The Cottonwind Substation would cause a minor change in the viewshed with respect to the proposed project as a whole. Impacts would be less than significant.

1.3.15 Traffic and Transportation

Setting

The local circulation system in Kern County is comprised of a network of public surface streets. Near the proposed project site, the local circulation system consists of Rosamond Boulevard, 170th West Street, Tehachapi-Willow Springs Road, Backus Road, Mojave Tropico Road, Oak Creek Road, and Silver Queen Road. All of these roads connect with smaller paved and dirt access roads. Rosamond Boulevard is the only area with heavy traffic.

Access to the proposed project site would be from the corner of Rosamond Boulevard and north along 170th Street West to its terminus. From the terminus of 170th Street West, the applicant is proposing to construct a new, permanent public access road. Within the proposed project site, up to 37.5 miles of new unpaved roads would be constructed.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Cause an Increase in Traffic that is Substantial in Relation to the Existing Traffic Load and Capacity of the Street System**

  During construction, the proposed project would cause temporary, short-term increases in local traffic. There would only be 10 to 16 full-time staff during operation of the proposed project which would contribute a small amount of traffic to the local area. There would not be any long-term impacts on existing traffic in the proposed project area. Impacts would be less than significant with the following mitigation measure.

  MM 4.15-1: The applicant shall schedule construction equipment transport and deliveries to occur during the day to limit additional traffic during commuter hours and shall work with the Kern

County Roads Department to distribute construction traffic flow from State Highway 14 across alternative County routes.

- **Exceed Level of Service Standards on County Roads or State Highways**

Level of service (LOS) on existing County roads is now at or above the acceptable LOS D as specified by the County of Kern General Plan Transportation/Circulation Element. Since a low volume of traffic currently exists on roads in the proposed project vicinity, additional traffic during proposed project construction and operation would not result in an exceedance of LOS C on County roads. Impacts would be less than significant with the following mitigation measure.

Implement *MM 4.15-1*.

- **Change in Air Traffic Patterns that Results in Substantial Safety Risks**

The proposed project is located in an area that requires a height limit to structures for the protection of military operations. Implementation of *MM 4.7-5* would limit turbine height to ensure that hazards resulting from the location of the proposed project in proximity to military aviation operations are less than significant. Because the turbines would be more than 200 feet tall, *MM 4.7-6* requires the applicant to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, requesting that the FAA issue a Determination of No Hazard to Air Navigation. Impacts would be less than significant with the following mitigation measures.

Implement *MM 4.7-5* and *MM 4.7-6*.

- **Substantially Increase Hazards caused by a Design Feature (such as Sharp Curves or Dangerous Intersections) or Incompatible Uses (such as Agricultural Equipment)**

The applicant has committed to designing new proposed project access roads using standard engineering practices and design measures. During construction, the proposed project would use heavy construction equipment on roadways which can result in damage to roads and may increase hazards for the public and proposed project personnel. Potential hazards also exist from tracking dust, soils, and other materials from graded construction sites onto public roads. Impacts are considered potentially significant and mitigation would be required.

MM 4.15-2: Prior to construction, the applicant shall submit engineering drawings of proposed access road design for the review and approval of the Kern County Roads Department.

MM 4.15-3: To minimize damage to existing roads that could increase hazards for the public and project personnel, the applicant shall:

a. Use regulation-sized vehicles, except for specific construction equipment, which may haul oversized loads;

b. Obtain local hauling permits from appropriate agencies prior to construction and adhere to any conditions in these permits;

c. Enter into a secured agreement with Kern County to ensure that any County roads that are demonstrably damaged by project-related activities are promptly repaired and, if necessary, paved, slurry-sealed, or reconstructed as per requirements of the state and or Kern County; and

d. Post a security bond to cover the costs of road maintenance during construction.

<u>*MM 4.15-4*</u>: Prior to construction, the applicant shall obtain an encroachment permit from the Kern County Roads Department for applicable roads in the Kern County road maintenance system.

- **Result in Inadequate Emergency Access**

The proposed project would not alter any existing emergency access routes or change existing patterns of emergency access. It also would not require closures of public roads, which could inhibit access by emergency vehicles. There would not be a significant increase in proposed project-related traffic that would affect the existing LOS on roads, which could indirectly affect emergency access. Therefore, this impact would be less than significant.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in Inadequate Parking**

The proposed project would not result in the physical displacement of existing parking. During construction and operation, a limited increase in demand for parking for construction equipment and personnel vehicles would exist. All parking would be accommodated within the proposed project site. Impacts are less than significant.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Conflict with Adopted Policies or Programs Supporting Alternative Transportation**

Construction and operation of the proposed project would not conflict with implementation of existing programs supporting alternative transportation. On a project-specific basis, during construction, the applicant would promote ride-sharing and limit mid-day trips off-site for lunch by providing food on-site. The low volume of traffic to the proposed project site during operation would not warrant a project-specific alternative transportation program. Impacts would be less than significant.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.

- **Result in Transportation Impacts as a Result of SCE Facility Improvements**

SCE would incorporate the avoidance measures listed under “Impact Avoidance Protocols for the SCE Regional Special Protection Scheme” to minimize transportation impacts.

Construction of the SCE facilities would result in temporary, short-term increases in local traffic as a result of construction-related workforce traffic. Implementation of the SCE facility improvements would not exceed LOS standards established by Kern County.

Air traffic patterns would not be impacted by the SCE facilities because all proposed structures are within the 200-foot height restrictions necessitated by the proximity to Edwards Air Force Base.

During construction, the proposed project would use heavy construction equipment on roadways which can result in damage to roads and may increase hazards for the public and proposed project personnel. Potential hazards also exist from tracking dust, soils, and other materials from graded construction sites onto public roads. The proposed project would not alter any existing emergency access routes or change existing patterns of emergency access.

During construction and operation, a limited increase in demand for parking for construction equipment and personnel vehicles would exist. All parking would be accommodated within the proposed project site. Construction and operation of SCE facility improvements would not conflict with implementation of existing programs supporting alternative transportation.

Impacts would be less than significant.

1.3.16 Utilities

Setting

Due to the rural nature of the proposed project area, the existing water well near the O&M building or the use of trucked water would be used to provide water to the employees at the proposed project site. If there is a lack of sufficient water during construction, water would be purchased from another source and trucked in. Electricity generated by the proposed project would be sufficient to provide power to the on-site O&M building and other facilities, as needed. The proposed project would not require natural gas for construction or operation, and would use propane for heating or other support of the O&M building. Portable waste facilities would be used during construction of the proposed project, and a septic system and leach line would need to be installed for operation. A stormwater drainage system is not planned for the proposed project site given the limited amount of land area that would be converted to impervious surface. No fixed radio facilities were identified within the proposed project site, but 67 land mobile sites were identified in the proposed project vicinity. The frequency-based signal of four land mobile sites could possibly be affected by operation of the proposed project.

Impacts and Mitigation Measures

Unavoidable Significant Adverse Impacts

There are no unavoidable significant adverse impacts.

Other Impacts

- **Exceed Wastewater Treatment Requirements of the Applicable Regional Water Quality Control Board**

  Project-generated wastewater would be minimal. Wastewater generated during construction would be contained within portable toilet facilities and disposed of at an approved site. The proposed project would not generate a significant amount of wastewater during operation since there would only be 10 to 16 permanent employees. A septic system and leach line would be constructed and conform to the permit requirements of the Kern County Environmental Health Services Department. This impact would be less than significant.

  The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan, Kern County Environmental Health Services Department, and the Lahontan Regional Water Quality Control Board. No additional mitigation measures are proposed.

- **Require or Result in the Construction of New Water or Wastewater Treatment Facilities or Expansion of Existing Facilities, the Construction of Which Could Cause Significant Environmental Effects**

  To meet the proposed project's water needs during operation, a water well would be constructed on the proposed project site or agreements would be made with private water sources. Sewage would be managed at the proposed project site by a septic system. Thus, new wastewater treatment facilities would not be required. Depending on the location of the septic system, this could potentially impact surface waters, groundwater, and vegetation. Implementation of the following mitigation measure would ensure impacts are less than significant.

> *MM 4.16-1*: The applicant shall receive permits for and construct a septic system that meets all requirements of the Kern County Engineering and Survey Services Department prior to occupancy of the O&M building. The septic system shall be located a minimum of 100 feet from the banks of any watercourse, per the Floodplain Combining District, and shall not be located where it would impact wetlands or any of the three state designated sensitive plant communities identified in the Final EIR.

- **Require or Result in the Construction of New Stormwater Drainage Facilities or Expansion of Existing Facilities, the Construction of Which Could Cause Significant Environmental Effects**

Implementation of the project SWPPP would be sufficient to manage stormwater runoff during construction. Stormwater runoff from the proposed project site during operation is expected to be low since a limited amount of the proposed project area would be converted to impervious surfaces. No new stormwater drainage or treatment facilities would be required. Impact would be less than significant.

Implement *MM 4.16-1*.

- **Have Insufficient Water Supplies Available to Serve the Project from Existing Entitlements and Resources, or Require New or Expanded Entitlements**

To meet the proposed project's water needs during operation, a water well would be constructed on the proposed project site or agreements would be made with private water sources. During operations, it is anticipated that well water would be sufficient to meet the needs of 10 to 16 employees. Since the proposed project would provide its own water source, it would not impact existing water supply systems. This impact would be less than significant.

> *MM 4.16-2*: The applicant shall demonstrate sufficient water supply for the project with a well report, including a permit for potable water use of the existing well or other reliable documentation or enter in to a water supply contract with a private trucked water purveyor prior to the issuance of a grading or building permit to the satisfaction of the Kern County Environmental Health Services Department.

- **Result in a Determination by the Wastewater Treatment Provider which Serves or May Serve the Project that it Has Inadequate Capacity to Serve the Project's Projected Demand in Addition to the Provider's Existing Commitments**

A septic system with leach line is proposed by the proposed project and no services from a wastewater treatment provider would be required. Impacts would be less than significant.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures are proposed.

- **Be Served by a Landfill with Insufficient Permitted Capacity to Accommodate the Project's Solid Waste Disposal Needs**

The proposed project is not expected to generate a significant amount of waste that would exceed the capacity of local landfills. Non-hazardous construction refuse and solid waste would be stored at the temporary staging area and periodically disposed of at the Mojave-Rosamond Landfill. Hazardous waste would be disposed of at an approved location. This impact would be less than significant.

The proposed project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional measures are proposed.

- **Conflict with Federal, State, and Local Statutes and Regulations Related to Solid Waste**

All relevant solid waste handling regulations would be complied with by the proposed project. To ensure compliance with policies to reduce waste sent to landfills, the following mitigation measures should be implemented.

> *MM 4.16-3*: The applicant shall make an effort to reduce construction waste transported to landfills by recycling solid waste construction materials to the extent feasible, such as taking materials to recycling and reuse locations listed in the brochure on recycling construction and demolition materials available on the Kern County Waste Management Department Web site.

> *MM 4.16-4*: The applicant shall provide a fenced recycling storage area identified for recycling on the site during construction and as part of the O&M building. A site plan showing the recycling storage area shall be submitted prior to the issuance of any grading or building permit for the site to the Kern County Planning Department and Kern County Waste Management Department.

- **Cause Substantial Interference with Frequency-Based Communications**

Operation of the wind turbines at the proposed project site has the potential to affect VHF and UHF frequencies from land mobile towers within 2 miles of the proposed project site. This impact is potentially significant and mitigation is required.

> *MM 4.16-5*: Prior to issuance of building permits, the applicant shall micro-site the turbines in accordance with the Evans Report dated February 5, 2007, and attached as Appendix H. Specifically, to avoid interference with the known FCC-licensed RF facilities within 2 miles of the project site, the applicant shall not place turbines in any of the black-out zones identified in Figures 3 and 5 of the Evans Report. In addition, prior to issuance of building permits, the applicant shall notify the licensee(s) of the land mobile station identified as WPTS384 (Air France) regarding the project and provide them with contact information and a proposed turbine layout. If Air France notifies the County that any turbine will result in interference to its RF facility, the applicant shall relocate turbine(s) to avoid the interference.

> *MM 4.16-6*: Prior to the issuance of the project building permit, the applicant shall notify the National Telecommunications and Information Administration (NTIA) and the Joint Program Office regarding the project and provide them with a proposed turbine layout. If the NTIA or the Joint Program Office notifies the County that any unlisted RF facilities will experience interference, the applicant shall consult with the affected facility operator and Kern County to relocate turbines to avoid such interference. In addition to the notification provided above, the applicant shall perform a physical inspection of the project site to determine whether there are any other unlisted or undocumented non-broadcast transmitters within the area or within a half-mile of project boundaries. If such facilities are located where interference is likely to occur, the applicant

shall make reasonable attempts to contact the facility operators and to relocate turbines to avoid interference.

- **Result in Impacts on Utilities as a Result of SCE Facility Improvements**

  During construction and operation, SCE facilities would have minimal wastewater. Wastewater would be contained within portable toilet facilities and disposed of at an approved site during construction activities. During operation, the proposed Cottonwind substation and telecommunication channels would not generate any wastewater because they would be unmanned. The SCE facilities would not require new wastewater treatment facilities or the expansion of existing facilities because sewage would be managed at the proposed project site.

  The SCE facilities would use water from private sources during construction. During operation, no water would be required because facilities would be unmanned.

  The proposed project would not require new stormwater drainage or treatment facilities or the expansion of existing stormwater facilities.

  The proposed project is not expected to generate a significant amount of solid waste that would exceed the capacity of local landfills. Non-hazardous construction refuse and solid waste generated would be stored at the temporary staging area and periodically disposed of at the Mojave-Rosamond Landfill. Hazardous waste generated during proposed project construction would be disposed of at an approved location. The SCE facilities would comply with all relevant solid waste handling regulations.

  Impacts would be less than significant.

References

Power Partners Southwest, LLC. 2007. PdV Draft Environmental Impact Report (EIR). September.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.1 Aesthetics			
4.1-1: Adversely Affect a Scenic Vista	Significant	There are no feasible mitigation measures that can be implemented to preserve the natural open space character.	Impacts would be significant and unavoidable for the view contained in Viewpoint 5 (Figure 4.1-7).
4.1-2: Alter or Damage a Major Landform or Scenic Resource	Less than significant	The project would conform to the goals, policies, and implementation measures of the Kern County General Plan and Wind Energy (WE) Combining District.	Impacts would be less than significant.
4.1-3: Alter or Degrade the Existing Visual Character or Quality of the Proposed Project Site and its Surroundings	Significant	There are no feasible mitigation measures that can be implemented to preserve the existing visual character.	Impacts would be significant and unavoidable.
4.1-4: Result in Light or Glare that Adversely Affects Day or Nighttime Views in the Area	Significant	MM 4.1-1 and MM 4.1-2.	Impacts would be significant and unavoidable.
4.1-5: Result in Aesthetics Impacts due to SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.2 Agricultural Resources			
4.2-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to Nonagricultural Use	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan and the WE Combining District. No additional mitigation would be required.	Impacts would be less than significant.
4.2-2: Conflict with Existing Agricultural Zoning or Williamson Act Contracts	Less than significant	MM 4.2-1.	Impacts would be less than significant.
4.2-3: Involve Other Changes in the Existing Environment which, Because of their Location or Nature, Could Result in Conversion of Farmland to Nonagricultural Use	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation would be required.	Impacts would be less than significant.
4.2-4: Result in the Cancellation of an Open- Space Contract, Williamson Act Contract, or Farmland Security Zone	Less than significant	MM 4.2-1.	Impacts would be less than significant.
4.2-5: Result in Agricultural Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.3 Air Quality			
4.3-1: Conflict with or Obstruct Implementation of the Applicable Air Quality Plan	Significant	MM 4.3-1 through MM 4.3-5.	Impacts would be less than significant.
4.3-2: Violate Any Air Quality Standards or Contribute Substantially to an Existing or Projected Air Quality Violation	Significant	MM 4.3-1 and MM 4.3-2.	Impacts during construction would be significant and unavoidable.
4.3-3: Result in a Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Region is Nonattainment for Federal or State Standards	Significant	MM 4.3-1 and MM 4.3-3.	Impacts would be cumulatively significant and unavoidable during construction.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.3-4: Expose Sensitive Receptors to Substantial Pollutant Concentration	Significant	MM 4.3-4, MM 4.3-5, and MM 4.3-6.	Impacts would be less than significant.
4.3-5: Create Objectionable Odors Affecting a Substantial Number of People	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan and WE Combining District.	Impacts would be less than significant.
4.3-6: Result in Air Quality Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.4 Biological Resources			
4.4-1: Have a Substantial Adverse Impact on Special-Status Species	Significant	MM 4.4-1 through MM 4.4-16.	Impacts would be less than significant. However, because of the uncertainty of the level of impact of operation of the project on avian and sensitive bat species as a result of collisions with turbines or other structures, impacts on these species would remain potentially significant and unavoidable, pending the results of the required Post-construction Avian/Bat Mortality Monitoring.
4.4-2: Have a Substantial Adverse Impact on Any Riparian Habitat or Other Sensitive Natural Community	Significant	MM 4.4-17, MM 4.4-18, MM 4.4-19, MM 4.4-20, MM 4.4-21, MM 4.4-22, MM 4.4-23, MM 4.4-24, MM 4.4-25, and MM 4.4-26.	Implementation of these mitigation measures would reduce impacts on riparian habitat, sensitive plant communities, and oaks to a less-than-significant level.
4.4-3: Have a Substantial Adverse Impact on Federally Protected Wetlands	Less than significant	MM 4.4-27 and MM 4.4-28.	Impacts would be less than significant.
4.4-4: Interfere with Wildlife Movement or with Migration Corridors	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.4-5: Conflict with Any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.4-6: Conflict with an Adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other Approved Local, Regional, or State Habitat Conservation Plan	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.4-7: Remove and/or Disturb a Habitat as a Result of Special Protection Scheme Construction Activities	Significant	MM 4.4-29.	Impacts would be less than significant.
4.4-8: Result in Biological Resource Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.5 Cultural Resources			
4.5-1: Cause a Substantial Adverse Change in the Significance of a Historical or Archaeological Resource	Significant	MM 4.5-1, MM 4.5-2, MM 4.5-3, MM 4.5-4, MM 4.5-5, MM 4.5-6, MM 4.5-7, MM 4.5-8 , and MM 4.5-9.	Impacts would be less than significant.
4.5-2: Directly or Indirectly Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature	Significant	MM 4.5-10, and MM 4.5-11.	Impacts would be less than significant.
4.5-3: Disturb any Human Remains, including Those Interred Outside of Formal Cemeteries	Significant	MM 4.5-12.	Impacts would be less than significant.
4.5-4: Result in Impacts on Cultural Resources as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.6 Geology and Soils			
4.6-1: Expose People or Structures to Substantial Adverse Effects Involving the Rupture of a Known Earthquake Fault	Significant	MM 4.6-1, MM 4.6-2, and MM 4.6-3.	Impacts would be less than significant by avoiding fault traces during construction and implementing design measures to minimize horizontal and vertical displacement.
4.6-2: Expose People or Structures to Substantial Adverse Effects Involving Strong Seismic Ground Shaking	Significant	MM 4.6-1 through MM 4.6-4.	Impacts would be less than significant.
4.6-3: Expose People or Structures to Substantial Adverse Effects Involving Seismic-Related Ground Failure, including Liquefaction	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.6-4: Expose People or Structures to Substantial Adverse Effects Involving landslides	Significant	MM 4.6-5, MM 4.6-6, MM 4.6-7, MM 4.6-8, and MM 4.6-9.	Impact would be less than significant.
4.6-5: Result in Substantial Soil Erosion or Loss of Topsoil	Significant	MM 4.6-10, MM 4.6-11, MM 4.6-12, MM 4.6-13, MM 4.6-14, and MM 4.6-15.	Impacts would be less than significant.
4.6-6: Be Located on Unstable Soil	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.6-7: Be Located on Expansive Soils	Less than significant	MM 4.6-2.	Impacts would be less than significant.
4.6-8: Have Soils Incapable of Adequately Supporting the Use of Septic Tanks or Alternative Wastewater Disposal Systems	Significant	MM 4.6-16.	Impacts would be less than significant.
4.6-9: Result in Impacts on Geological Resources as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.7 Hazards and Hazardous Materials			
4.7-1: Create a Significant Hazard for the Public or the Environment through the Routine Transport, Use, or Disposal of Hazardous Materials or the Environment through the Routine Transport, Use, or Disposal of Hazardous Materials	Significant	MM 4.7-1 MM 4.7-2.	Impacts would be less than significant.
4.7-2: Create a Hazard for the Public or the Environment through Reasonably Foreseeable Upset and Accident Conditions Involving the Release of Hazardous Materials into the Environment	Significant	MM 4.7-1, MM 4.7-3, and MM 4.7-4.	Impacts would be less than significant.
4.7-3. Result in a Safety Hazard for People Residing or Working in the Project Area for a Project Located within the Kern County Airport Land Use Compatibility Plan	Less than significant	MM 4.7-5.	Impacts would be less than significant.
4.7-4: Expose People or Structures to a Significant Risk of Loss, Injury, or Death Involving Wildland Fires	Significant	MM 4.7-7.	Impacts would be less than significant.
4.7-5: Result in Other Potential Project-Related Hazards for Project Personnel or the Public	Significant	MM 4.7-8, MM 4.7-9, MM 4.7-10, and MM 4.7-11.	Impacts would be less than significant.
4.7-6: Result in Hazards and Hazardous Materials Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.8 Hydrology and Water Quality			
4.8-1: Violate Any Water Quality Standards or Waste Discharge Requirements	Significant	MM 4.8-1, MM 4.8-2, MM 4.8-3, MM 4.8-4, MM 4.8-5, and MM 4.8-6.	Impacts would be less than significant.
4.8-2: Deplete Groundwater Supplies or Interfere with Groundwater Recharge	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.8-3: Result in Impacts on the Existing Drainage Patterns	Less than significant	MM 4.8-3, MM 4.6-11, and MM 4.6-12.	Impacts would be less than significant.
4.8-4: Alter Existing Drainage Patterns of the Site or Area, Causing Flooding	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.8-5: Result in Impacts on Runoff Water and Drainage Capacity	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.8-6: Place Within a 100-Year Hazard Area Structures that would Impede or Redirect Flood Flows	Significant	MM 4.8-7.	Impacts would be less than significant.
4.8-7: Result in Impacts from Seiche, Tsunami, or Mudflow	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.8-8: Expose People or Structures to a Significant Risk of Loss, Injury, or Death, including Flooding	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.8-9: Result in Impacts on Hydrology and Water Quality as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.9 Land Use and Planning			
4.9-1: Physically divide an established community	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.9-2: Conflict with any Applicable Land Use Plan, Policy, or Regulation	Less than significant	MM 4.9-1.	Impacts would be less than significant.
4.9-3: Cause Substantial Interference with Radar Testing	Potentially significant	MM 4.9-2.	Impacts would be less than significant.
4.9-4: Conflict with any Applicable Habitat Conservation Plan or Natural Community Conservation Plan	Less than significant	The project would be in conformance with the goals, policies, and plans for the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.9-5: Result in Land Use Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.10 Minerals			
4.10-1: Result in the Loss of Availability of a Known Mineral Resource that would be of Value to the Region and the Residents of the State	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.10-2: Result in the Loss of Availability of a Locally Important Mineral Resource Recovery Site Delineated on a Local General Plan, Specific Plan, or Other Land Use Plan	Short-term and Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.10-3: Result in Mineral Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.11 Noise			
4.11-1: Expose Persons to Noise in Excess of Standards Established in the Kern County General Plan or Noise Ordinances, or Other Applicable Standards	Potentially significant	MM 4.11-1, MM 4.11-2, and MM 4.11-3.	Impacts would be less than significant.
4.11-2: Expose Persons to or Generate Excessive Groundborne Vibration or Groundborne Noise Levels	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.11-3: Cause a Substantial Permanent Increase in Ambient Noise Levels in the Project Vicinity above Levels Existing without the Project	Potentially significant	MM 4.11-1 through MM 4.11-3.	Impacts would be less than significant.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.11-4: Cause a Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity above Existing Levels	Potentially significant	MM 4.11-4, MM 4.11-5, and MM 4.11-6.	Impacts would be less than significant.
4.11-5: Expose People Residing or Working in the Project Area to Excessive Noise Levels for a Project Located within the Kern County Airport Land Use Compatibility Plan	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.11-6: Expose People Residing or Working in the Project Area to Excessive Noise Levels for a Project within the Vicinity of a Private Airstrip	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.11-7: Result in Noise Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.12 Population and Housing			
4.12-1: Induce Substantial Population Growth	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan. No additional mitigation measures are proposed.	Impacts would be less than significant.
4.12-2: Displace Substantial Numbers of Existing Housing	No Impact	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	There would be no impact.
4.12-3: Displace Substantial Numbers of People	No Impact	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	There would be no impact.
4.12-4: Result in Impacts on Population and Housing as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.13 Public Services			
4.13-1: Adversely Affect Fire Protection Services	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.13-2: Adversely Affect Protection/Law Enforcement Services	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.13-3: Adversely Affect Medical Services	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.13-4: Adversely Affect School Capacity	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.13-5: Adversely Affect Parks	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.13-6: Result in Public Services Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.14 Recreation			
4.14-1: Result in Increased Use of Parks	Significant	MM 4.14-1.	Impacts would be significant and unavoidable.
4.14-2: Result in Construction or Expansion of New Parks	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.14-3: Result in Impacts on Recreational Resources as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.
4.15 Transportation and Traffic			
4.15-1: Cause an Increase in Traffic that is Substantial in Relation to the Existing Traffic Load and Capacity of the Street System	Less than significant	MM 4.15-1.	Impacts would be less than significant.
4.15-2: Exceed Level of Service Standards on County Roads or State Highways	Less than significant	MM 4.15-1.	Impacts would be less than significant.
4.15-3: Result in a Change in Air Traffic Patterns that Results in Substantial Safety Risks	Less than significant	MM 4.7-5 and MM 4.7-6.	Impacts would be less than significant.
4.15-4: Substantially Increase Hazards Because of a Design Feature (such as Sharp Curves or Dangerous Intersections) or Incompatible Uses (such as Agricultural Equipment)	Potentially significant	MM 4.15-2, MM 4.15-3, and MM 4. 15-4.	Impacts would be less than significant.
4.15-5: Result in Inadequate Emergency Access	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.15-6: Result in Inadequate Parking	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.15-7: Conflict with Adopted Policies or Programs Supporting Alternative Transportation	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.15-8: Result in Transportation Impacts as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.

Table 1. Summary of Environmental Impacts and Mitigations for the Proposed PdV Project

Environmental Impact	Impact Significance Before Mitigation	Mitigation Measures	Impact Significance After Mitigation
4.16 Utilities			
4.16-1: Exceed Wastewater Treatment Requirements of the Applicable Regional Water Quality Control Board	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, Kern County Environmental Health Services Department, and the Lahontan Regional Water Quality Control Board. No additional mitigation measures are proposed.	Impacts would be less than significant.
4.16-2: Require or Result in the Construction of New Water or Wastewater Treatment Facilities or Expansion of Existing Facilities, the Construction of Which Could Cause Significant Environmental Effects	Potentially significant	MM 4.16-1.	Impacts would be less than significant.
4.16-3: Require or Result in the Construction of New Stormwater Drainage Facilities or Expansion of Existing Facilities, the Construction of Which Could Cause Significant Environmental Effects	Less than significant	MM 4.16-1.	Impacts would be less than significant.
4.16-4: Have Insufficient Water Supplies Available to Serve the Project from Existing Entitlements and Resources, or Require New or Expanded Entitlements	Less than significant	MM 4.16-2.	Impacts would be less than significant.
4.16-5: Result in a Determination by the Wastewater Treatment Provider which Serves or May Serve the Project that It Has Inadequate Capacity to Serve the Project's Projected Demand in Addition to the Provider's Existing Commitments	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.16-6: Be Served by a Landfill with Insufficient Permitted Capacity to Accommodate the Project's Solid Waste Disposal Needs	Less than significant	The project would comply with the goals, policies, and implementation measures of the Kern County General Plan, and no additional mitigation would be required.	Impacts would be less than significant.
4.16-7: Conflict with Federal, State, and Local Statutes and Regulations Related to Solid Waste	Less than significant	MM 4.16-3 and MM 4.16-4.	Impacts would be less than significant.
4.16-8: Cause Substantial Interference with Frequency-Based Communications	Significant	MM 4.16-5 and MM 4.16-6.	Impacts would be less than significant.
4.16-9: Result in Impacts on Utilities as a result of SCE Facility Improvements	Less than significant	No mitigation would be required.	Impacts would be less than significant.

Appendix F.
Management Indicator Species Report

MANAGEMENT INDICATOR SPECIES REPORT

TEHACHAPI RENEWABLE TRANSMISSION PROJECT

ANGELES NATIONAL FOREST

August 2009

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I. Introduction

The purpose of this report is to evaluate and disclose the impacts of the Tehachapi Renewable Transmission Project to the 12 Management Indicator Species (MIS) identified in the Angeles National Forest (ANF) Land and Resource Management Plan (LRMP) (USDA, 2005). This report documents the effects of three alternatives that occur within the ANF: No Action Alternative (Alternative 1); Proposed Action to replace 220-kV transmission line with 500-kV transmission line within 42.25 miles of ROW, utilizing aerial and ground-based construction within the ANF (Alternative 2); and the Maximum Helicopter Construction on the ANF Alternative utilizing the maximum amount of aerial construction within the ANF (Alternative 6). The entire project proposal is to construct and operate a 173-mile 500-kV transmission line between the Tehachapi Wind Resource Area and various substations located in the San Gabriel Valley.

MIS are animal or plant species identified in the ANF LRMP (USDA 2005, Volume 2, Appendix B, Pages 77-79), which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the ANF LRMP directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitats of each MIS affected by such projects, and (2) at the national forest (forest) scale, monitor populations and/or habitat trends of forest MIS, as identified by the LRMP.

I. 1 Direction Regarding the Analysis of Project-Level Effects on MIS

Project-level effects on MIS are analyzed and disclosed as part of the environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of habitat in the analysis area.

These project-level impacts to habitat are then related to national forest population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the terms in the LRMP.

Hence, where the ANF LRMP requires population monitoring or population surveys for an MIS, the project-level effects analysis for that MIS may be informed by available population monitoring data, which are gathered at the forest scale. For certain MIS, the ANF LRMP does not require population monitoring or surveys; for these MIS, project-level MIS effects analysis can be informed by forest-scale habitat monitoring and analysis alone. The ANF LRMP requirements for MIS analyzed for the Tehachapi Renewable Resource Project on National Forest Lands are summarized in Section 3 of this report.

Therefore, adequately analyzing Project effects to MIS, including those Threatened, Endangered, and Sensitive (TES) species that are also MIS, involves the following steps:

- Identifying which MIS have habitat that would be either directly or indirectly affected by the project alternatives, these MIS are potentially affected by the Project;
- Identifying the LRMP forest-level monitoring requirements for this sub-set of forest MIS;
- Analyzing project-level effects on MIS habitats or habitat components for this subset of forest MIS;
- Discussing forest scale habitat and/or population trends for this subset of forest MIS; and
- Relating project-level impacts on MIS habitat to habitat and/or population trends for these MIS at the forest.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (USDA, 2006). This Management

Indicator Species (MIS) Report documents application of the above steps to select and analyze MIS for the Tehachapi Renewable Transmission Project.

I.2 Direction Regarding Monitoring of MIS Population and Habitat Trends at the Forest Scale

Forest scale monitoring requirements for the ANF's MIS are found in the Monitoring Plan of the LRMP (USDA 2005, Volume 2, Appendix B, pages 76-81) and are shown in Table 1.

Habitat Status and Trend

The ANF LRMP (USDA 2005) requires forest scale monitoring of habitat status and trend for select MIS on the ANF; for MIS with habitat potentially affected by the TRTP on NFS lands, these habitat monitoring requirements are summarized in Table 1 of this report. Habitat status is the current amount of habitat for a given MIS on the ANF. Habitat trend is the direction of change in the amount of this habitat between the time the Forest LRMP was approved and the present. The methodology for assessing habitat status and trend is described in detail in the ANF MIS Report (USDA, 2009).

Habitats are the vegetation types (for example, mixed conifer forest) and/or ecosystem components (for example, cliffs or lakes) and any special habitat elements (for example, snags) required by a MIS for breeding, cover, and/or feeding. Required habitat is identified using habitat relationships data or models. For each terrestrial wildlife MIS on the ANF, the habitat relationship models are from the California Wildlife Habitat Relationship (CWHR) System (CDFG, 2005). The CWHR System is considered "a state-of-the-art information system for California's wildlife" and provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid). In the case of MIS that are also federally threatened or endangered or Forest Service sensitive species that have been studied in detail, additional habitat relationships information may be used to augment the CWHR system. Habitat relationships for fish and plant MIS are identified individually. Detailed information on the habitat relationship for MIS on the ANF and on the CWHR System can be found in the ANF MIS Report (USDA, 2009).

MIS habitat trend is monitored using ecological and vegetation data for the ANF. These data include spatial ecological and vegetation layers created from remote-sensing imagery obtained at various points in time, which are verified using photo-imagery, on-the-ground measurements, and tracking of vegetation-changing actions or events (for example, wildland fires).

Population Status and Trend

Population monitoring requirements for the MIS of the ANF are identified in the Monitoring Plan of the LRMP (USDA 2005, Volume 2, Appendix B, pages 76-81). This document requires monitoring of population status and trend for select MIS on the ANF. There are many types of population data, and LRMP identifies the type of population monitoring data required for each MIS. All population monitoring data are collected and/or compiled at the forest scale, consistent with the LRMP. The population monitoring requirements for the MIS with habitat potentially affected by the Tehachapi Renewable Transmission Project are summarized in Table 1 of this report.

Population status is the current condition of the MIS related to the type of population monitoring data (population measure) required in the LRMP for that MIS. Population trend is the direction of change in that population measure over time.

Population data for MIS are collected and consolidated by the ANF in cooperation with State and Federal agency partners (including the California Department of Fish and Game, U.S. Geological Survey, and USDI Fish and Wildlife Service) or conservation partners (including Partners in Flight and various avian joint ventures). Population data includes presence data, which is collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The ANF's MIS monitoring program for species typically hunted, fished, or trapped was designed to be implemented in cooperation with California Department of Fish and Game (CDFG), consistent with direction in the 1982 Planning Rule to monitor forest-level MIS population trends in cooperation with state fish and wildlife agencies to the extent practicable (36 CFR 219.19(a)(6)). To be biologically meaningful for a wide-ranging MIS, presence data are collected and tracked not only at the forest scale, but also at larger scales, such as range wide, state, southern California province, or important species management units such as Deer Assessment Units. Population data at various scales are important to both assess and provide meaningful context for population status and trend at the Forest scale.

II. Selection of Project Level Management Indicator Species

Management Indicator Species (MIS) for the ANF are identified in the ANF LRMP (USDA 2005, Appendix 2, pages 77-78). The MIS analyzed for the TRTP were selected from this list of 12 MIS identified in the ANF LRMP, as indicated below in Table 1. In addition, Table 1 identifies the associated habitat types (1st column), the reason each MIS was identified in the LRMP (2rd column), the measure of analysis (3rd column), the monitoring method stated (4th column), and discloses whether or not the MIS is potentially affected by the TRTP (5th column).

Table 1. Management Indicator Species for the ANF and Selection of MIS for the Project-Level Analysis for the Tehachapi Renewable Transmission Project

Species and Associated Habitat Type	Issue	Measure	Monitoring Method	Category and Relevance to Project
Mule Deer (All habitat types)	Vegetation diversity and age class mosaics; roads and recreation effects	Trend in abundance and/or habitat condition	Herd composition in cooperation with CDFG; habitat condition	Category 3
Mountain Lion (All habitat types)	Landscape linkages; habitat fragmentation	Trend in distribution, movement, and/or habitat conditions	Studies in cooperation with CDFG, USGS	Category 3
Arroyo Toad (Aquatic and riparian habitats)	Ground disturbance including trampling and compaction; spread of invasive nonnative species; mortality from collision; altered stream flow regimes	Trends in abundance, distribution, and/or habitat conditions	Population abundance and/or habitat condition in selected locations	Category 3
Song Sparrow (Aquatic and riparian habitats)	Ground disturbance including trampling and compaction; spread of invasive nonnative species; mortality from collision; altered stream flow regimes	Trend in abundance and/or habitat condition	Riparian bird species point counts and/or habitat condition	Category 3
Blue Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Valley Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Englemann Oak (Oak woodlands and savannas)	Oak regeneration	Trend in sapling abundance	FIA data	Category 1
Coulter Pine (Chaparral and conifer ecotone)	Drought/beetle related mortality and lack of fire	Trend in age/size class distribution	FIA data/ aerial photo monitoring	Category 3

Table 1. Management Indicator Species for the ANF and Selection of MIS for the Project-Level Analysis for the Tehachapi Renewable Transmission Project

Species and Associated Habitat Type	Issue	Measure	Monitoring Method	Category and Relevance to Project
Bigcone Douglas Fir (Chaparral and conifer ecotone)	Altered fire regimes (fire severity and/or fire return interval)	Trend in extent of vegetation type	FIA data/ aerial photo monitoring	Category 3
California Spotted Owl (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Occupied territories and/or habitat condition	FS Region 5protocol	Category 3
Black Oak (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Trend in abundance, size class distribution	FIA data	Category 1
White Fir (Mixed conifer forests)	Altered fire regimes (fire severity and/or fire return interval)	Trend in size class distribution	FIA data	Category 1

Category 1: MIS whose habitat is not in or adjacent to the Project area and would not be affected by the Project

Category 2: MIS whose habitat is in or adjacent to the Project area, but would not be either directly or indirectly affected by the Project

Category 3: MIS whose habitat would be either directly or indirectly affected by the Project

Blue oak, valley oak, Englemann oak, black oak, and white fir, identified as Category 1 above, will not be further discussed because habitat factors for these species are not in or adjacent to the project area; therefore, the project will not directly or indirectly affect the habitat for these species and will, therefore, have no impact on forest-level blue oak, valley oak, Englemann oak, black oak, and white fir habitat or population trends.

The MIS whose habitat would be either directly or indirectly affected by the TRTP, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for Project-Level MIS analysis for TRTP are: mule deer, mountain lion, song sparrow, arroyo toad, spotted owl, Coulter pine, and bigcone Douglas fir.

III. LRMP Monitoring Requirements for MIS Selected for Project-Level Analysis

III.1. MIS Monitoring Requirements

The ANF LRMP FEIS, Volume 2, Appendix B (USDA 2005, pgs 72-81) identifies forest scale habitat and population monitoring requirements for the ANF MIS. Habitat and population monitoring requirements for the ANF MIS are described in the ANF MIS Report (USDA 2009) and are summarized in Table 2 for the MIS being analyzed for the TRTP.

Table 2. Forest Scale Habitat and Population Monitoring for Project-Level Selected MIS

Species	Method of habitat and population monitoring
Mule Deer	Trends in mule deer populations are monitored in cooperation with the California Department of Fish and Game as part of their on-going surveys. Information gathered for Deer Assessment Unit (DAU)-7 and Deer Zone D-11 is used to determine trends in deer populations on the ANF.
Mountain Lion	Trends in mountain lion populations are monitored in cooperation with the California Department of Fish and Game. Information gathered by CDFG is used to determine trends in mountain lion populations on the ANF.
Song Sparrow	Summaries of Breeding Bird Survey (BBS) data are used to identify trends for southern California. Results of riparian bird count surveys are also used to identify trends at the Forest level.

Table 2. Forest Scale Habitat and Population Monitoring for Project-Level Selected MIS

Species	Method of habitat and population monitoring
Arroyo Toad	Population abundance and/or habitat condition in selected locations.
California Spotted Owl	FS Region 5 protocol surveys are used to identify distribution, habitat occupancy, and reproductive success.
Coulter Pine	FIA and aerial photo monitoring
Bigcone Douglas Fir	FIA and GIS

III.2 How MIS Monitoring Requirements are Being Met

Mule Deer. Consistent with LRMP direction, mule deer population status and trend are tracked and monitored in cooperation with the CDFG, the agency responsible for deer herd management within the State of California. The ANF works closely with CDFG to periodically review deer population status on the forest. Population distribution monitoring for mule deer is conducted at a variety of scales: (1) statewide, hunting zone, and herd population monitoring is managed by CDFG using a variety of methods (CDFG 2004) (2) forest-level presence data are collected through tracking actual sightings of deer and through documenting signs of deer occupancy, including pellet groups (scat), tracks, antlers, tree rubs, and beds. The ANF MIS Report (USDA 2009) provides additional information about the methodology for collecting deer data and the results relative to monitoring population trends for mule deer.

Mountain Lion. Consistent with LRMP direction, mountain lion population status and trend are tracked and monitored in cooperation with the CDFG, the agency responsible for management of the mountain lion population in California. The ANF works closely with CDFG to periodically review mountain lion population status on the forest. Population distribution monitoring for mountain lion is conducted at a variety of scales: (1) statewide and county depredation permits monitoring is managed by CDFG using a variety of methods (2) forest-level presence data are collected through tracking actual sightings of mountain lion and through documenting signs of mountain lion occupancy, including scat, tracks, gut piles, and beds. The ANF MIS Report (USDA 2009) provides additional information about the methodology for collecting mountain lion data and the results relative to monitoring population trends for mountain lion.

Song Sparrow. Riparian bird count surveys were conducted on the ANF from 1988-1997. These surveys provided information regarding past trends and baseline information for song sparrow populations that can be used for comparison with future riparian bird count survey results. Riparian bird count surveys on the ANF and the three other southern California National Forests will continue to provide a means for identifying trends in song sparrow populations. The riparian bird count surveys, which span the four southern California National Forests, provide meaningful and scientifically sound data that fulfills the requirements for monitoring song sparrow population trends. Population monitoring for song sparrow is accomplished on a limited scale using (1) population monitoring conducted at many scales in cooperation with the U.S. Geological Survey (USGS), through the Breeding Bird Survey (BBS) Program, including data collected on the ANF, and (2) presence data collected across the forest. The USGS BBS Program provides excellent, standardized data to track status and trend (changes) in the distribution of diurnal avian species, such as the song sparrow, at biologically meaningful scales. The BBS data set, which spans more than 20 years, however, provides meaningful and scientifically sound, spatially explicit presence data that, in combination with presence data collected across the Forest fulfills the required population monitoring. The ANF MIS Report (USDA 2009) provides additional information about the methodology for collecting the BBS data and the results relative to monitoring population trends for the song sparrow.

Arroyo Toad. On the ANF, arroyo toad populations occur along Castaic Creek; along Big Tujunga Creek, including associated lower reaches of Mill, Lynx, and Alder Creeks; and on the desert side of the San Gabriel Mountains along Little Rock Creek. At this time, no estimates exist for the ANF populations. Telemetry studies have been conducted on the population along Little Rock Creek. Yearly surveys are conducted at each of these three locations to attempt to detect any noticeable changes in toad activity. Specific project related surveys have been and will be conducted as part of this project in appropriate habitat. No additional populations of arroyo toads have been found.

California Spotted Owl. Project level and Forest wide FS R5 protocol surveys are used to monitor California spotted owls on the ANF. These surveys provide information regarding presence/absence and reproductive status. Surveys for spotted owls were initiated on the ANF in the 1990s. Previous survey efforts provide baseline information regarding historic occupancy. Future survey results can be used to identify trends for occupied territories. Specific project related surveys have been and will be conducted as part of this project in appropriate habitat. No additional known locations of spotted owls have been found.

Coulter Pine. Forest Inventory and Analysis (FIA) data provides a measure of the Coulter pine acreage on the ANF. FIA collects information on mortality, growth rates, stand density, and other factors which can be used to identify future stand conditions over the next 10 to 50 years.

Bigcone Douglas Fir. Forest Inventory and Analysis (FIA) data provides a measure of the bigcone Douglas fir acreage on the ANF. FIA collects information on mortality, growth rates, stand density and other factors which can be used to identify future stand conditions over the next 10 to 50 years. For photo-monitoring, the ANF has aerial photos dating back to the 1930s.

IV. Description of the Proposed Project

The Proposed Action and Action Alternatives of the TRTP are to implement an upgrade of a 220kV transmission line to a 500kV transmission line across the ANF (see Figure 1). The total distance of ROW containing transmission lines to be replaced is 42.25 miles. The proposed project (Alternative 2), the Maximum Helicopter Construction on the ANF Alterative (Alternative 6), and the No Action Alternative (Alternative 1) within the ANF, would be located within existing SCE rights-of-way (ROWs) (Figure 1). For analysis purposes, the project is defined as the existing SCE ROWs (between 200 and 500-feet wide) and a 1,000-foot buffer along the proposed transmission line (T/L) route centerlines (C/L), as well as proposed access roads that fall outside of that buffer. In order to construct the project, new towers, lines, and related infrastructure (i.e., access roads, pulling stations, marshalling yards, and helicopter sites) will need to be created. For a detailed project description see Section 2 of the EIS/EIR for the Tehachapi Renewable Transmission Project (Aspen, 2009).

For the purposes of this project analysis, the ground disturbance area that will be impacted by the implementation of this project includes the construction and maintenance activities. These include construction of approximately 164 new towers and removal of the 181 existing 220-kV towers, improvements to existing access roads, construction of spur roads, and work at conductor tensioning/splicing, staging/laydown areas, and helicopter landing pads. The Project is currently expected to require approximately 27 pulling/tensioning/ splicing stations, 33 helicopter landing pads, 3 staging areas, 16 helicopter support yards, and 8 helicopter staging areas, and 87 miles of road improvements and 4 miles of new spur roads on NFS lands (see Table 3).

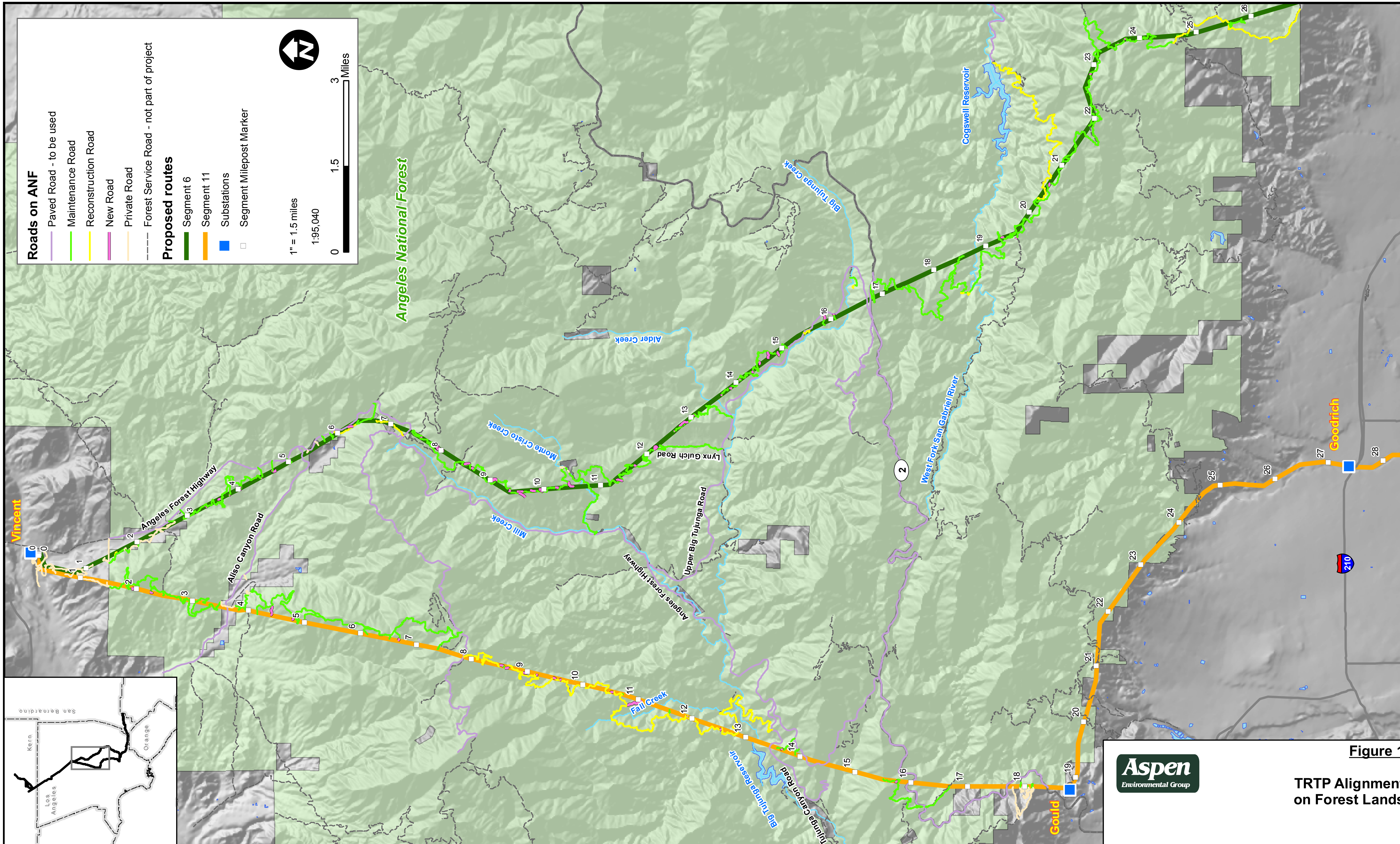


Figure 1

TRTP Alignment on Forest Lands

August 2009

Table 3. Summary of Implementation Activities and Overall Acreage Impacts on the ANF

Activity	No Action; Alternative 1	Proposed Action; Alternative 2	Maximum Helicopter Construction on the ANF; Alternative 6
Towers Constructed by Helicopter	0	33	143
Tower Sites (Acres of disturbance)	0	164 (60.1)	164 (48.1)
Wire Stringing Areas - pulling/tensioning/splicing [1] (Acres of disturbance)	0	27 (25.4)	27 (25.4)
Roads, New Access/Spur - qty miles[2] (Acres of disturbance)	0	4.2 (8.1)	0.66 (1.3)
Roads, Reconstruction - qty miles [2] (Acres of disturbance)	0	23.0 (44.6)	12.8 (24.9)
Roads, Maintenance - qty miles [2] - Impacted area of roads only (Acres of disturbance)	78 miles. Acreage of upgrades needed unknown	63.8 (38.7)	35.1 (21.3)
Roads, Private - qty miles [2] - Impacted area of roads only (Acres of disturbance)	0	0.15 (0.09)	0.04 (0.03)
Staging Areas, Material and Equipment [3] (Acres of disturbance)	0	3 (20.0)	3 (20.0)
Helicopter Staging/Support Areas (Acres of disturbance)	0	8 (32.0)	10 (40.0)
Landing Pads [4] (Acres of disturbance)	0	33 (1.2)	143 (5.3)
Support Yards [5] (Acres of disturbance)	0	16 (3.7)	20 (4.6)
Misc. Acres of Disturbance [6] – Acres of disturbance	0	37.8	11.7
Total Estimated	Unknown	271.7	202.6
LAND DISTURBANCE RANGE (±15%)	-	230.9 – 312.5	172.2 – 233.0

1 Assume average wire stringing site area of 150'x300' per GIS data
2 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.
3 Assume material and equipment distributed along the ROW as the work progresses.
4 Assume typical landing pad (40'x40') for every tower constructed by helicopter.
5 Assume 2 small support yards for personnel drop-off/pick-up, emergency landing, etc. per large helicopter staging/support area.
6 Includes guard structures, radius from access road to spur road, etc.

V. Effects of the Proposed Project on Selected MIS

V.1 Mule Deer (*Odocoileus hemionus*)

V.1.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

The ANF LRMP (2005) identifies mule deer as an MIS associated with all habitat types. Habitat management is based upon standards and guidelines in the ANF LRMP (USDA 2005) and the deer herd management plans developed by California Department of Fish and Game and U.S. Forest Service (CDFG 1986 for the Los Angeles Deer Herd). According to the ANF LRMP (USDA, 2005), the objective for mule deer on the ANF is to have well distributed and stable or increasing populations.

Statewide goals for California deer herds are to restore and maintain healthy deer populations, and to provide for high quality diversified use of the deer resource (CDFG 1986). Habitat objectives described in these plans include maintain the quality of deer habitat throughout the herd unit. Management objectives for deer on the ANF are to maintain current estimated deer densities (10 deer/sq. mile), buck:doe ratios (15:100) and fawn recruitment rates (45:100) throughout the herd management unit (CDFG, 1986).

The deer in the Los Angeles herd are non-migratory with relatively small home ranges of less than one square mile (CDFG, 1986). Wilson and Ruff (1999) found home range size of mule deer is 1,236 acres for males and 618 acres for females.

Mule deer are widespread on the ANF and require landscapes with a diverse array of habitat types suitable for providing forage, protective cover, and refuge from predators. Hiding and thermal cover is typically close to the ground and thick enough to camouflage the outline of the deer, without being so dense as to obscure the approach of potential predators. Thermal cover is similar and generally thought to be denser, with the additional property of sheltering deer from the elements. Mule deer prefer habitats within 0.6 mile of a free water source (e.g., creek, pond, river), and habitat manipulations within 0.6 mile from summer water sources may affect the abundance of mule deer populations (Bowyer, 1986).

Mule deer prefer to browse new growth of shrubs, which provides a more easily digestible nutrient source, in addition to forbs and some grasses. Acorns (mast) are an important part of the fall and winter diet. Foraging habitat includes brush, shrubs, forbs, grasses, and trees where deer feed most actively at dawn and dusk.

Ranges of fawn and doe groups are small, varying from 0.4 to 1.9 miles depending upon water availability and topography. In addition to close proximity to water, fawning areas are characterized by low shrubs or small trees suitable for protection of the doe as she gives birth, and dense shrub thickets for sheltering the fawn. Fawning areas must be interspersed with forage, hiding cover, and thermal cover for the doe. Rutting season occurs in autumn, and 1-2 fawns (rarely 3) are born from early April to midsummer, varying geographically, with peak fawning from late April through mid-June.

V.1.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

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 and potentially impacted by the proposed action.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area on NFS lands is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on mule deer includes the entire 10,707 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The project area represents 1.5 percent of the ANF.

<u>No Action Alternative (Alternative 1)</u>

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to deer habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease both forage and cover habitat. An estimated total of 272 acres of mule deer habitat would be impacted by Alternative 2 within the ANF (Table 3), which constitutes approximately 2.5 percent of the analysis area and 0.04 percent of the total mule deer habitat on the ANF.

Cumulative Effects to Habitat

The spatial scale for the cumulative effects of the TRTP on deer habitat is the analysis area identified above. The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect deer habitat within the analysis area and for this time frame include: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. These activities will lead to an additional decrease of mule deer habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 272 acres of suitable deer habitat in the analysis area, equivalent to a 2.5 percent reduction in habitat across the analysis area. This is 0.04 percent of the current deer habitat in the ANF and is equivalent to 0.2 male deer home ranges or 0.4 female home ranges. Vegetation management activities would provide short-term benefits to habitat for deer and special use permitted activities would continue to be managed to retain sufficient deer habitat. Therefore, the cumulative effects under Alternative 2 would be small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction on the ANF (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV Towers with 164 500-kV Towers and the associated construction and maintenance areas will open up vegetation and decrease both forage and cover habitat. An estimated total of 203 acres of mule deer habitat would be impacted by Alternative 6 within the ANF (Table 3), which constitutes approximately 2 percent of the analysis area and 0.03 percent of the total mule deer habitat on the ANF.

Cumulative Effects to Habitat

The spatial scale for the cumulative effects of the TRTP on deer habitat is the analysis area identified above. The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect deer habitat within the analysis area and for this time frame include: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. These activities will lead to an additional decrease of mule deer habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 203 acres of suitable deer habitat in the analysis area , equivalent to a 2 percent reduction in habitat across the analysis area. This is 0.03 percent of the current deer habitat in the Los Angeles deer herd and is equivalent to 0.16 male deer home ranges and 0.34 female deer home ranges. Vegetation management activities would provide short-term benefits to habitat for deer and special use permitted activities would continue to be managed to retain sufficient deer habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

The ANF LRMP (USDA, 2005) identifies both habitat and population monitoring for mule deer. The sections below summarize the habitat and population status and trend data for mule deer. The information in the sections below is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*
  The population monitoring data collected by the ANF and our federal and state partners at the range-wide, State, bioregional, and Forest scales indicate that the distribution population trend on deer on the ANF is stable. These data are summarized below.

  Mule deer are “G5-Secure, N5-Secure, and S5-Secure” (“demonstratably widespread, abundant, and secure”) at the global and national scales, as well as in California (NatureServe 2008). Management and monitoring of deer on the ANF is accomplished in cooperation with the State fish and wildlife agency, the California Department of Fish and Game (CDFG), as directed in 26 CFR 219.19(a)(6). As part of the California Deer Management Program, CDFG tracks the status and trend of deer populations, including on the ANF. Deer numbers are monitored by Hunt Zones and Deer Assessment Unites (DAUs), (CDFG 1998, CDFG 2004). These population data indicate that deer populations in Zone D-11 are considered stable to slightly declining since the 1960s and 1970s (http://www.dfg.ca.gov/wildlife/hunting/deer/docs/cazonemaps/d11zoneinfo2008.pdf). However, the increase in deer in the 1960s and 1970s was during the period of a statewide predator control program (CDFG 1986). Hunting of deer has continued throughout this period; the number of deer tags allowed in the hunt zones is as follows for 2008: D-11 has 5,500 tags, J-13 has 40 tags, A-31 has 1000 tags, and A-32 has 250 tags. The number of tags allotted in 2008 is equivalent to the number of tags in 2007. From 1990-1996, CDFG determined that the population trend in DAU 10, which includes the ANF, is 16,000-24,000 deer and is considered stable (CDFG, 1998; -http://www.dfg.ca.gov/wildlife/hunting/deer/docs/habitatassessment/part4.pdf).

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Forest-wide deer population distribution is stable. The Action Alternatives (Alternative 2 and 6) of the TRTP would result in a slight decrease in forest-wide habitat (0.04 percent of forest-wide habitat for Alternative 2 and 0.03 percent of forest-wide habitat for Alternative 6) 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.

V.2 Mountain Lion (*Puma concolor*)

V.2.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Mountain lion are associated with all habitat types and are affected by changes in landscape linkages and habitat fragmentation. According to the ANF LRMP (USDA, 2005), the objective for mountain lion on the ANF is to have well distributed populations and functional landscape linkages. Due to California State law, mountain lion are only managed by CDFG if a nuisance animal or public threat occurs.

A concern for the long-term health of mountain lion populations on the National Forests of southern California is the loss of landscape connectivity between mountain ranges and large blocks of open space on private land (Dickson et al., 2005). Mountain lions have large home ranges and require extensive areas of riparian vegetation and brushy stages of various habitats, with interspersions of irregular terrain, rocky outcrops, and tree/brush edges. Fragmentation of habitats by the spread of human developments and associated roads, power transmission corridors, and other support facilities, restricts movement and increases associations with humans. These changes are detrimental to mountain lion populations (CDFG, 2005).

Mountain lions are widespread on the forest and are assumed to be present in all habitat types. Deer represent approximately 60 to 80 percent of mountain lion diet, thus mountain lions can be found wherever deer are present (CDFG, 2005).

The mountain lion is the largest carnivore in southern California and requires large core habitat areas, abundant prey, and habitat connectivity between sub-populations. Mountain lion studies over the last 30 years have estimated population densities for different habitat types around the state. These density estimates varied from zero to 10 lions per 100 square miles (CDFG, 2006b).

V.2.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

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 and potentially impacted by the proposed action.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on mountain lion includes the entire 10,707 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The project area represents 1.5 percent of the ANF.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to mountain lion habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease cover habitat and forage habitat for the mountain lion's main prey, mule deer. An estimated total of 272 acres of mountain lion habitat would be impacted by Alternative 2 within the ANF (Table 3). This is approximately 2.5 percent of the analysis area and 0.04 percent of the total amount of mountain lion habitat in the ANF. The average home range size of mountain lion is 69,189 and 34,595 acres for males and females, respectively (Wilson and Ruff, 1999).

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on mountain lion habitat is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect mountain lion habitat within the analysis area and for this time frame is: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of mountain lion habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 272 acres of suitable mountain lion habitat in the analysis area. This is equivalent to 0.004 male mountain lion home ranges and 0.008 female mountain lion home ranges. Vegetation management activities would provide short-term benefits to habitat for mountain lions and special use permitted activities would continue to be managed to retain sufficient mountain lion habitat. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction in the ANF (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease cover habitat and forage habitat for the mountain lion's main prey, mule deer. An estimated total of 203 acres of mountain lion habitat would be impacted by Alternative 6 within the ANF (Table 3). This is approximately 2 percent of the analysis area and 0.03 percent of the total mountain lion habitat on the ANF. The average home range size of mountain lion is 69,189 and 34,595 acres for males and females, respectively (Wilson and Ruff, 1999).

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on mountain lion habitat is the analysis area identified above (10,707). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect mountain lion habitat within the analysis area and for this time frame is: fuels reduction and special uses permits.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of mountain lion habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of no more than 203 acres (62 acres permanent) of suitable mountain lion habitat in the analysis area. This is equivalent to 0.003 male and 0.006 female mountain lion home ranges. Vegetation management activities would provide short-term benefits to habitat for mountain lions and special use permitted activities would continue to be managed to retain sufficient mountain lion habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the ANF LRMP (USDA, 2005) identifies studies in cooperation with CDFG and USGS. Trends would be measured in distribution movement and/or habitat conditions. The sections below summarize the habitat and population status and trend data for the mountain lion. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.
- *Population Status and Trend at the Forest Scale*
  The population monitoring data collected by the ANF and our federal and state partners at the range-wide, State, bioregional, and Forest scales indicate that the distribution population trend on mountain lion on the ANF is stable. These data are summarized below.

  Mountain lions are "G5-Secure, N5-Secure, and S5-Secure" ("demonstratably widespread, abundant, and secure") at the global and national scales, as well as in California (NatureServe 2008).

  CDFG is responsible for management of mountain lion populations. Based on records of depredation, attacks on people, and predation on prey populations, it is suspected that the statewide population peaked in 1996, and has been somewhat stable for the past several years (CDFG, 2006b). A total of 31 depredation permits were issued and 10 kills reported for mountain lions in Los Angeles County between 1990 and 2007 (CDFG, 2008). Between 2005 and 2007, there were only 2 depredation permits issued and no kills were reported. Between 2000 and 2005, there were only 7 depredation permits issued for mountain lions within Los Angeles County, in which 4 were killed. From 1990 to 1999, 6 mountain lions were depredated under the 57 depredation permits issued. When hunting for mountain lion was legal in California, 3 depredation permits were issued from 1980 to 1989 and zero mountain lions were taken. No depredation permits were issued from 1972 to 1979.

  CDFG has described the mountain lion population in California as stable and current estimates place this number at up to 6,000 individuals (CDFG, 2007). Further estimates are zero to 10 mountain lions per 100 square miles based on available habitat within the state (CDFG, 2006b). The ANF has some large areas of unfragmented habitat ideal for supporting mountain lion populations. Thus, mountain lion populations within the San Gabriel Mountains are considered stable. Detailed information on these population data is presented in the ANF MIS Report (USDA, 2009).

Mountain lion sign (i.e., tracks, scat, and a recent deer kill) was noted in many portions of the project area. Numerous tracks of multiple age-class cats were identified on many of the project access roads and were associated with many of the small drainages that flow down the steep mountainous terrain that occurs along the ROW. Mountain lion were detected south of Mount Gleason, near Grizzly Flat Road, adjacent to Big Tujunga Creek, and near Mount Wilson.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Forest-wide mountain lion population distribution is stable. The Action Alternatives (Alternative 2 and 6) of the TRTP would result in a slight decrease in forest-wide habitat (0.04 percent of forest-wide habitat for Alternative 2 and 0.03 percent of forest-wide habitat for Alternative 6) 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.

V.3 Song Sparrow (*Melospiza melodia*)

V.3.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Song sparrows are associated with aquatic and riparian habitats and are affected by ground disturbance including altered stream flow regimes. According to the Forest LRMP (2005), the objective for song sparrow on the ANF is to have stable or increasing populations and healthy riparian habitat.

The song sparrow is a permanent resident of coastal scrub and riparian brush over much of the lower elevation areas of the San Gabriel Mountains. Over 90 percent of song sparrow nests are found in riparian vegetation (Big Sur Ornithology Lab, 2000). Song sparrow distribution is defined by the presence of water through the breeding season, becoming less abundant or scarce where undergrowth is reduced along ephemeral streams (Roberson and Tenney, 1993). Marshall (1948) concluded that song sparrows main requirements are a source of water (which in the case of coastal or dune scrub may mean constant moisture from fog, dew, or seepage), moderately dense vegetation, plenty of light, and exposed ground or leaf litter for foraging. The importance of small red alder trees for song sparrows (significant positive correlation between nest success and number of trees within 11.3 m of the nest) within the Golden Gate NRA suggests the importance of early successional, non-willow riparian habitat for this species (Gardali and others, 1998). In San Diego County, they have been documented nesting in gardens, nurseries, and weedy areas, and may occupy territories as small as 0.05 acres (Unitt, 2005). Within forests, home range size varies between 0.2 and 0.6 acre, but averages 0.3 acre (Zeiner et al., 1990).

V.3.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

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 action and alternatives on song sparrow habitat.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on song sparrow includes only the riparian habitat of 154 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

Approximately 154 acres of the 10,707-acre analysis area (1.4 percent) are suitable habitat for song sparrow.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to song sparrow habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 0.67 acres of suitable song sparrow habitat would be impacted by Alternative 2 within the ANF, which constitutes 0.4 percent of suitable song sparrow habitat in the analysis area and 0.015 percent of total song sparrow habitat on the ANF. The average home range for song sparrow is 0.3 acre, but can vary between 0.2 and 0.6 acre (Zeiner et al., 1990).

Table 4. Alternative 2 Impacts to Song Sparrow Habitat

CalVeg Type		Amount Impacted by Alt. 2	Amount Available on Forest	Percent (%) Impacted
NR	Riparian Mixed Hardwood Alliance	0.03	2514	0.001
QB	California Bay Alliance	0.05	628	0.008
QE	White Alder Alliance	0.59	1000	0.059
QO	Willow Alliance	0	193	0
QP	California Sycamore Alliance	0	105	0
QX	Black Cottonwood Alliance	0	109	0
	TOTAL	0.67	4549	0.015
	Percent of Total Forest	9.5×10^{-5}	0.649	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on song sparrow habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect song sparrow habitat within the analysis area and for this time frame include: invasive species encroachment, water withdrawal, and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of song sparrow habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion:

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 0.67 acres of suitable song sparrow habitat in the analysis area, equivalent to a 0.4 percent reduction in habitat across the analysis area. This is 0.015 percent of the current song sparrow habitat on the ANF and is equivalent to approximately 2.2 song sparrow home ranges. Invasive species encroachment is a continuing threat to the species. Water withdrawals and increased recreation use within the riparian areas where song sparrows breed and forage would continue to be managed to retain sufficient song sparrow habitat. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction on the ANF Alternative (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 0.07 acres of suitable song sparrow habitat would be impacted by Alternative 6 within the ANF, which constitutes 0.05 percent of suitable song sparrow habitat in the analysis area and 0.002 percent of total song sparrow habitat on the ANF. The average home range for song sparrow is 0.3 acre, but can vary between 0.2 and 0.6 acre (Zeiner et al., 1990).

Table 5. Alternative 6 Impacts to Song Sparrow Habitat

CalVeg Type		Amount Impacted by Alt. 6	Amount Available on Forest	Percent (%) Impacted
NR	Riparian Mixed Hardwood Alliance	0	2514	0
QB	California Bay Alliance	0	628	0
QE	White Alder Alliance	0.07	1000	0.007
QO	Willow Alliance	0	193	0
QP	California Sycamore Alliance	0	105	0
QX	Black Cottonwood Alliance	0	109	0
	TOTAL	0.07	4549	0.002
	Percent of Total Forest	9.98×10^{-8}	0.6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on song sparrow habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect song sparrow habitat within the analysis area and for this time frame are: water withdrawal and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of suitable song sparrow nesting habitat in the analysis area, although the acreage of disturbance related to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 0.07 acres of suitable song sparrow habitat in the analysis area, equivalent to 0.05 percent reduction in habitat across the analysis area. This is 0.002 percent of the current song sparrow habitat and is equivalent to 0.2 song sparrow home ranges. Invasive species encroachment is a continuing threat to song sparrows. Water withdrawals and increased recreation use within the riparian areas where song sparrows breed and forage would continue to be managed to retain sufficient song sparrow habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

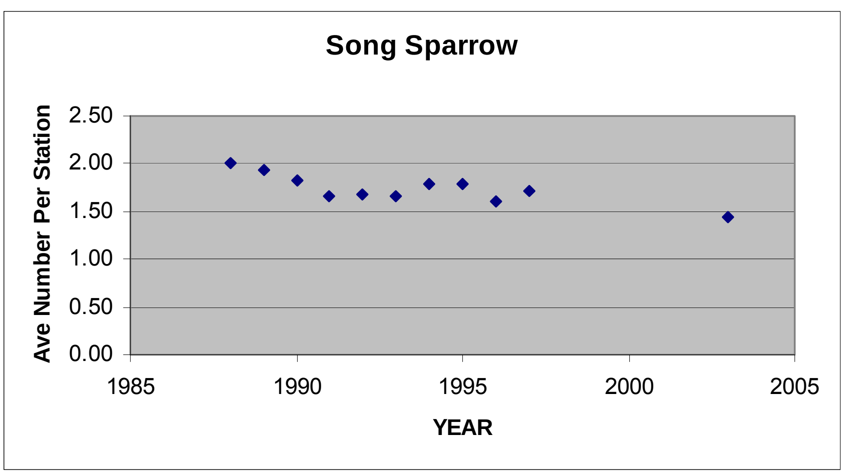
Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the ANF LRMP (USDA, 2005) identifies riparian bird species point counts and/or habitat conditions as acceptable methodologies. Trends would be measured according to abundance and/or habitat condition. The sections below summarize the habitat and population status and trend data for the song sparrow. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.
- *Population Status and Trend at the Forest Scale*
  Song sparrows are well represented on all four southern California National Forests; they were recorded at 197 out of 206 stations during the 1988-1997 and 2003 riparian bird count surveys. In any one year, song sparrows were detected at 46 percent of the survey stations. This species is one of a few that were numerous enough to estimate trends with good confidence.

  Negative trends in song sparrow abundance were determined from this monitoring. This negative trend was consistent with California BBS trends as well as trends for other species in the riparian bird count studies for southern California forests. Breeding Bird Survey (BBS) data indicate an average of 0.15 percent per year decline in song sparrow abundance in the state of California (1966 to 2005), although this trend was not significant (Saurer et al., 2006). Data from the national forest point count study in Southern California indicates that song sparrow abundance significantly declined by approximately 0.5 percent per year (during 1988 to 1996; Stephenson and Calcarone, 1999). The BBS data also indicates a decline of 0.8 percent per year in Southern California, although this trend was not statistically significant (Sauer et al., 2006). The following graph illustrates song sparrow detections on the ANF during the riparian bird count surveys conducted from 1988-1997. Detailed information on this population data is presented in the ANF MIS Report (USDA, 2009).

Song Sparrow Results for Angeles National Forest



Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The Action Alternatives (Alternative 2 and 6) of the TRTP would result in a slight decrease in forest-wide habitat (0.015 percent of forest-wide habitat for Alternative 2 and 0.002 percent of forest-wide habitat for Alternative 6) for song sparrow. This decrease is equivalent to 2.2 and 0.2 song sparrow home ranges, respectively; 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.

V.4 Arroyo Toad (*Bufo californicus*)

V.4.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Arroyo toad are associated with aquatic habitats for breeding and are affected by altered stream flow regimes, predatory nonnative species (e.g., bullfrogs, bluegill, largemouth bass, crayfish), reductions in native ant populations by Argentine ants, habitat alteration from tamarisk and arundo, increased siltation, and trampling by humans, vehicles, and livestock.

Arroyo toads are a low elevation species with occurrence below 4,400 feet (Stephenson and Calcarone, 1999). This species requires overflow pools adjacent to the inflow channel of streams that are generally third order or greater during the breeding season. Preferred breeding habitat consists of shallow pools with sandy to gravelly bottoms, surrounded by sparse woody vegetation. Regular disturbance in the form of flooding is required to maintain areas of sparsely vegetated, sandy stream channels and terraces, which are used by adults and subadults for foraging and burrowing (USFWS, 2005). Arroyo toads have been found in upland habitat up to 3,600 feet from the nearest suitable aquatic habitat (Holland and Sisk, 2001). Upland habitats used by arroyo toads include coastal sage scrub, chaparral, oak woodland, grassland, riparian, and agricultural habitats (Griffin, 1999; USFWS, 2005).

V.4.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

Acres of suitable aquatic and riparian habitats is used to assess the effects of the proposed action and alternatives on arroyo toad habitat.

Analysis Area for Project-level Effects Analysis

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on arroyo toad includes the entire 10,707 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area

Approximately 507 acres of the 10,707-acre analysis area (4.7 percent) are suitable habitat for arroyo toad.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat . Since there are no direct or indirect effects, there would be no cumulative effects to arroyo toad habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will compact soils and result in the loss of breeding, forage, and cover habitat. An estimated total of ~~7~~ 5 acres of suitable arroyo toad habitat would be impacted by Alternative 2 within the ANF, which constitutes ~~1.4~~0.99 percent of suitable arroyo toad habitat in the analysis area and ~~0.02~~0.01 percent of total arroyo toad habitat on the ANF. The average home range for arroyo toads can vary considerably depending on geographic location, resources, microhabitat conditions, and sex of the individual. For example, Sweet (1993) found that on the Los Padres NF, males tend to travel about 2–3 km along the stream edge but often become more sedentary as they reach large size. Adult female toads are highly sedentary, with an activity area usually 100 m in diameter. Therefore average home range size for this species would need to be determined based on ANF populations and cross-analyzed with demographic data to present a reasonable estimate.

There are a total of 3 populations of arroyo toad on the ANF. Alternative 2 would impact one population (See Table 6).

Table 6. Alternative 2 Impacts to Arroyo Toad Habitat

Arroyo Toad Habitat Model on Forest	Amount/Number Impacted by Alternative 2	Amount/Number Available on Forest	Percent (%) Impacted
Arroyo Toad Habitat	5~~7~~ acres (0.001% of total Forest)	29,464 acres (4% of total Forest)	0.~~02~~01
# of known populations (include current and historic)	1	3	33

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on arroyo toad habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect arroyo toad habitat within the analysis area and for this time frame include impacts such as: invasive species encroachment, water withdrawal, and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of arroyo toad habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion:

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately ~~7~~ 5 acres of suitable arroyo toad habitat in the analysis area, equivalent to ~~1.4~~0.99 percent reduction in habitat across the analysis area. This is 0.01~~2~~ percent of the current arroyo toad habitat on the ANF. Invasive species encroachment has not been studied for this species on the ANF. Water withdrawals and increased recreation use within the riparian areas where arroyo toads breed and forage would continue to be managed to retain sufficient arroyo toad habitat. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Maximum Helicopter Construction on the ANF Alternative (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will compact soils and result in the loss of breeding, forage, and cover habitat. An estimated total of ~~17~~ 16 acres of suitable arroyo toad habitat would be impacted by Alternative 6 within the ANF, which constitutes 3.24 percent of suitable arroyo toad habitat in the analysis area and 0.05~~6~~ percent of total arroyo toad habitat on the ANF. The average home range for arroyo toads can vary considerably depending on geographic location, resources, microhabitat conditions, and sex of the individual. For example, Sweet (1993) found that on the Los Padres NF, males tend to travel about 2–3 km along the stream edge but often become more sedentary as they reach large size. Adult female toads are highly sedentary, with an activity area usually 100 m in diameter. Therefore average home range size for this species would need to be determined based on ANF populations and cross-analyzed with demographic data to present a reasonable estimate.

There are a total of 3 populations of arroyo toad on the ANF. Alternative 2 would impact one population (see Table 7).

Table 7. Alternative 6 Impacts to Arroyo Toad Habitat

Arroyo Toad Habitat Model on Forest	Amount/Number Impacted by Alternative 6	Amount/Number Available on Forest	Percent (%) Impacted
Arroyo Toad Habitat	17 acres (0.002% of total Forest)	29,464 acres (4% of total Forest)	0.05~~6~~
Number of known populations	1	3	33

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on arroyo toad habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect arroyo toad habitat within the analysis area and for this time frame include impacts such as: invasive species encroachment, water withdrawal, and increased recreational use.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of arroyo toad habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion:

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of a minimum of 16~~7~~ acres of suitable arroyo toad habitat in the analysis area, equivalent to a 3.42 percent reduction in habitat across the analysis area. This is 0.05~~6~~ percent of the current arroyo toad habitat on the ANF. Invasive species encroachment has not been studied for this species on the ANF. Water withdrawals and increased recreation use within the riparian areas where arroyo toads breed and forage would continue to be managed to retain sufficient arroyo toad habitat. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest and Regional Scale

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*

  Approximately six percent of known occupied arroyo toad habitat occurs within the ANF, including Castaic Creek, Big Tujunga Creek, Arroyo Seco Creek, Little Rock Creek, and the lower reaches of Mill and Alder Creeks (Stephenson and Calcarone, 1999). No complete data set exists, nor is there an estimate of size of any of these populations. Detailed information on these populations' data is presented in the ANF MIS Report (USDA 2009).

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The effects of the Action Alternatives (Alternatives 2 and 6) of the TRTP will result in a small decrease in forest-wide habitat for arroyo toad (0.0~~2~~1 percent of the forest-wide habitat in Alternative 2 and 0.05~~6~~ percent of the forest-wide habitat in Alternative 6). The spatial arrangement of the habitat loss is such that no one home range would be expected to be made unsuitable. Therefore, the TRTP will not alter or contribute to the existing forest-wide habitat or population trend.

V.5 California Spotted Owl (*Strix occidentalis occidentalis*)

V.5.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

California spotted owls are associated with mixed conifer forests and are affected by altered fire regimes (fire severity and/or fire return interval). According to the Forest LRMP (2005), the objective for the California spotted owl on the ANF is maintain/increase numbers and distribution.

Spotted owls are found in mature forests, typically where there is a dense, multi-layered canopy and are frequently linked to riparian areas. They use a wide range of wooded and forested habitats and nest stands often have a well-developed hardwood understory. However, some high-elevation territories (above 6,500 feet) consist primarily or solely of conifers and some low-elevation territories (below 3,000 feet) are found in pure hardwood stands. At lower elevations, they occur in coast live oak, alder, and sycamore woodlands along riparian areas. At higher elevations, they occur in mixed conifer/hardwood forests, and are often associated with big cone Douglas fir and black oak.

Territory sizes vary widely depending on habitat type. Territories are typically largest in the high-elevation, conifer dominated sites. California spotted owls are a territorial species with large acreage requirements (at least 300 acres of mature forest per pair), spotted owls in southern California are clustered in disjunct mountain and foothill areas where suitable habitat exists. These clusters are often surrounded by large areas of unsuitable habitat (Stephenson and Calcarone, 1999).

California spotted owls are permanent residents. Nests may be 20-50 feet or more above the ground. Spotted owls rely on natural cavities or on nests built by other birds or squirrels. Breeding begins in February or March. Nestlings are seen by April or May, with fledging in June or July. Clutch size ranges from 1-4, usually 2 (Zeiner et al., 1990).

Roosting areas are generally in dense shade, near water (Zeiner et al., 1990). Any tree species may be used as a roost. Spotted owls typically roost on a horizontal branch throughout much of the day. They often roost in pairs, or an adult owl may roost near its young.

The California spotted owl breeds and roosts in forests and woodlands with mature trees and snags, dense canopies (≥70 percent canopy closure), multiple canopy layers, and downed woody debris (Verner et al., 1992a).

V.5.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

The greatest threat to this species on NFS lands is the loss of habitat and subsequent population loss due to large stand-replacement wildfires. Acres of suitable habitat are used to assess the effects of the proposed action and alternatives on California spotted owl habitat.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed Project on California spotted owl includes only the 1,849 acres of suitable habitat associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

Approximately 1,849 acres of the 10,707-acre analysis area (17 percent) are suitable habitat for California spotted owl.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to spotted owl habitat from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 43.1 acres of California spotted owl habitat would be impacted by Alternative 2 within the ANF, which constitutes 2.3 percent of spotted owl habitat in the analysis area and 0.03 percent of total California spotted owl habitat on the ANF (Tables 8 and 9).

Table 8. Alternative 2 Impacts to California Spotted Owls

Description	Number Impacted by Alternative 2	Total Known Available on Forest	Percent (%) Impacted
Number of Spotted Owls (current and historic)	5	60	8.3
PACs	14	9555	0.15

Table 9. Alternative 2 Impacts to California Spotted Owl Habitat				
CalVeg Type		Amount Impacted by Alternative 2	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	6.9	41370	0.02
EP	Eastside Pine Alliance	0	9817	0
MF	Mixed Conifer-Fir Alliance	0	20266	0
MP	Mixed Conifer – Pine Alliance	0	12761	0
PP	Ponderosa Pine Alliance	0	620	0
PD	Gray Pine Alliance	0	286	0
PC	Coulter Pine Alliance	7.7	4464	0.17
NX	Interior Mixed Hardwood Alliance	1.5	773	0.19
QC	Canyon Live Oak Alliance	26.3	49049	0.05
QE	White Alder Alliance	0.6	1000	0.06
QK	Black Oak Alliance	0	1166	0
QF	Fremont Cottonwood Alliance	0.06	456	0.01
QW	Interior Live Oak Alliance	0	72	0
QL	Valley Oak Alliance	0	116	0
QX	Black Cottonwood Alliance	0	109	0
QB	California Bay Alliance	0.05	628	0.008
	TOTAL	43.1	142,953	0.03
	Percent of Total Forest	0.006	20	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on California spotted owl habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect California spotted owl habitat within the analysis area and for this time frame include the following impacts: fuels reduction and disease/drought damage to trees.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of California spotted owl habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 43.1 acres of suitable California spotted owl nesting, roosting, and foraging habitat in the analysis area, equivalent to 2.3 percent reduction in habitat across the analysis area. This is 0.03 percent of the current California spotted owl habitat on the ANF. Vegetation management activities would provide short-term benefits to nesting, roosting, and foraging habitat for California spotted owls. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

Wildfire and past and planned vegetation treatments on the ANF have affected and will continue to affect California spotted owls. However, planned projects will include protective measures consistent with the Southern California National Forests California Spotted Owl Conservation Strategy (USDA 2004), thus effectively reducing the degree and duration of potential impacts to spotted owls within these areas.

Maximum Helicopter Construction on the ANF Alternative (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease forage, cover, and nesting habitat. An estimated total of 35.7 acres of California spotted owl habitat would be impacted by Alternative 6 within the ANF, which constitutes 1.9 percent of California spotted owl habitat in the analysis area and 0.02 percent of total California spotted owl habitat on the ANF (Tables 10 and 11).

Table 10. Alternative 6 Impacts to California Spotted Owls

Description	Number Impacted by Alternative 6	Total Known Available on Forest	Percent (%) Impacted
Spotted Owls (current and historic)	5	60	8.3
PACs	14	9555	0.15

Table 11. Alternative 6 Impacts to California Spotted Owl Habitat

CalVeg Type		Amount Impacted by Alternative 6	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	5.2	41370	0.01
EP	Eastside Pine Alliance	0	9817	0
MF	Mixed Conifer-Fir Alliance	0	20266	0
MP	Mixed Conifer – Pine Alliance	0	12761	0
PP	Ponderosa Pine Alliance	0.6	620	0.10
PD	Gray Pine Alliance	0	286	0
PC	Coulter Pine Alliance	10.1	4464	0.23
NX	Interior Mixed Hardwood Alliance	0.7	773	0.09
QC	Canyon Live Oak Alliance	19.1	49049	0.04
QE	White Alder Alliance	0.1	1000	0.01
QK	Black Oak Alliance	0	1166	0
QF	Fremont Cottonwood Alliance	0	456	0
QW	Interior Live Oak Alliance	0	72	0
QL	Valley Oak Alliance	0	116	0
QX	Black Cottonwood Alliance	0	109	0
QB	California Bay Alliance	0	628	0
	TOTAL	35.7	142,953	0.02
	Percent of Total Forest	0.005	20	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on California spotted owl habitat is the analysis area identified above. The temporal scale for the analysis area is the date of the ANF LRMP (2005) to 2014 (5 years from present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect California spotted owl habitat within the analysis area and for this time frame include the following impacts: fuels reduction and disease/drought damage to trees.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of California spotted owl habitat in the analysis area, although the acreage of this decrease is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 35.7 acres of suitable California spotted owl nesting, roosting, and foraging habitat in the analysis area, equivalent to a 1.9 percent reduction in habitat across the analysis area. This is 0.02 percent of the current California spotted owl habitat on the ANF. Vegetation management activities would provide short-term benefits to nesting, roosting, and foraging habitat for California spotted owls. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Wildfire and past and planned vegetation treatments on the ANF have affected and will continue to affect California spotted owls. However, planned projects will include protective measures consistent with the Southern California National Forests California Spotted Owl Conservation Strategy (USDA 2004), thus effectively reducing the degree and duration of potential impacts to spotted owls within these areas.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest LRMP (USDA, 2005) identifies use of the FS R5 protocol as the appropriate tool. Monitoring will provide information regarding occupied territories and/or habitat conditions. The California spotted owl and its habitat will be monitored to answer the question, "Are mature, large diameter, high canopy cover stands with densely-shaded understories being maintained in sufficient distribution, quantity and quality to provide habitat for the California spotted owl and other interior forest species?" The sections below summarize the habitat and population status and trend data for the California spotted owl. This information is drawn from the detailed information on habitat and population trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*
  On the Angeles National Forest, California spotted owl surveys have been conducted by two efforts, one for general presence/absence in suitable habitat, and the other for specific projects. Not all areas of the Forest have been surveyed to determine presence/absence of spotted owls. A cumulative total of 64 territories within the Angeles National Forest have been documented as historically occupied (USFWS, 2006). Since presence/absence surveys were predominant, and no estimation of nesting or nesting success was verified, population status could not be determined.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The action Alternatives (Alternatives 2 and 6) of the TRTP would result in little impact to the forest-wide habitat (0.03 percent of forest-wide habitat for Alternative 2 and 0.02 percent of forest-wide habitat for Alternative 6) 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.

V.6 Coulter Pine (*Pinus coulteri*)

V.6.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Coulter pine is associated with the chaparral/conifer ecotone and is affected by drought/beetle related mortality and fire suppression. According to the Forest LRMP (2005), the objective for Coulter pine on the ANF is to maintain Coulter pine stands.

Fire management is crucial to the maintenance of Coulter pine-dominated vegetation. Fire kills Coulter pine trees but stimulates their closed cones, held on the trees for years, to open up and release seeds. Long fire return intervals and drought-related mortality in some Coulter pine-chaparral stands have resulted in the death of overstory trees without subsequent fire to release seeds, creating concern for the ecological health of this ecosystem.

Coulter pine is a medium-sized evergreen tree that typically attains a height of 30 to 85 feet and diameter at breast height of 12 to 30 inches at maturity (Stuart and Sawyer, 2001). This species occurs on dry, rocky slopes and ridges between 500 to 7,000 feet elevation, and it is often intermixed with chaparral and lower montane woodlands and forests (Stuart and Sawyer, 2001). Mature trees prefer exposed environments on south-facing slopes and are highly drought tolerant (Barbour et al., 1993). Individual trees are relatively short-lived with an average life span of approximately 100 years (Stuart and Sawyer, 2001).

Coulter pines growing in chaparral or among canyon live oaks or Sargent cypress (*Cupressus sargentii*) have cones that are tightly sealed with resin. Heat from fire is required to break this seal and facilitate release of the seeds within the cone (serotiny; Stuart and Sawyer, 2001). In contrast, Coulter pines growing among coast live oak (*Quercus agrifolia*) typically bear cones that open at maturity and do not require fire for seed release (Borchert, 1985). Some individual trees may produce both closed (serotinous) and open cones (Barbour et al., 1993). On burned sites, Coulter pine readily establishes from seed, and seedling establishment is usually greatest during the first post-fire year (Borchert, 1985).

V.6.b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis

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.

Analysis Area for Project-level Effects Analysis

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on Coulter pine includes only the habitat of 176 acres associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The analysis area (176 acres) represents less than 4 percent of the total amount of Coulter pine habitat within the ANF.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat. Since there are no direct or indirect effects, there would be no cumulative effects to Coulter pine from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease Coulter pine habitat. An estimated total of 7.7 acres of Coulter pine would be impacted by Alternative 2 within the ANF, which constitutes 4.4 percent of Coulter pine in the analysis area and 0.17 percent of the total Coulter pine habitat on the ANF (Table 12).

Table 12. Alternative 2 Impacts to Coulter Pine Habitat

CalVeg Type		Amount Impacted by Alternative 2	Amount Available on Forest	Percent (%) Impacted
PC	Coulter Pine Alliance	7.7	4464	0.17
	Percent of Total Forest	0.001	0.6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on Coulter pine is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect Coulter pine within the analysis area and for this time frame include: altered fire regimes (fire severity and/or fire return interval) and drought-related mortality.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of Coulter pine habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 7.7 acres of Coulter pine in the analysis area. This is equivalent to 0.17 percent of all Coulter pine within the ANF. Vegetation management activities would provide short-term benefits to Coulter pine. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

FS Proposed Action (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease Coulter pine habitat. An estimated total of 10.1 acres of Coulter pine habitat would be impacted by Alternative 6 within the ANF, which constitutes 5.7 percent of Coulter pine in the analysis area and 0.23 percent of the total Coulter pine habitat on the ANF (Table 13).

Table 13. Alternative 6 Impacts to Coulter Pine Habitat

CalVeg Type		Amount Impacted by Alternative 6	Amount Available on Forest	Percent (%) Impacted
PC	Coulter Pine Alliance	10.1	4464	0.23
	Percent of Total Forest	0.001	0.6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on Coulter pine is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect Coulter pine within the analysis area and for this time frame include: altered fire regimes (fire severity and/or fire return interval) and drought-related mortality.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of Coulter pine habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 10.1 acres of Coulter pine in the analysis area. This is equivalent to 0.23 percent of all Coulter pine within the ANF. Vegetation management activities would provide short-term benefits to Coulter pine. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest LRMP (USDA, 2005) identifies analysis of FIA data and photo monitoring as acceptable methodologies. Trends would be measured in extent of vegetation type. More information on habitat and vegetation type trends can be found in the ANF MIS Report (USDA, 2009).

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*

  This species is primarily distributed from the Transverse and Peninsular Ranges of Southern California and Sierra San Pedro de Matir in northern Baja California through the Central Coast Range as far north as Mount Diablo.

  There are an estimated total of 840,473 Coulter pine trees greater than or equal to 5 inches in diameter at breast height in the Transverse and Peninsular Ranges (Walker et al., 2006). Approximately 44.7 percent of these (375,546 trees) died as a result of bark beetle mortality during the 1998 to 2003 drought. Coulter pine mortality was disproportionately greater in the larger diameter-size classes, with trees in the smallest classes (<9 inches in diameter) suffering the least mortality (21 percent) and those in the largest size class (≥17 inches in diameter) experiencing the greatest mortality (74 percent, Walker et al., 2006). There is concern that Coulter pine forests in the Transverse and Peninsular Ranges may be heavily impacted by recent droughts (Walker et al., 2006) and, along with other evergreen coniferous forests, subject to future declines with climate change (Lenihan et al., 2006).

  A total of 4,464 acres of Coulter pine forest occur within the ANF and 100,078 acres within California (CDFG, 2005).

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for Coulter Pine

The action Alternatives (Alternatives 2 and 6) of the TRTP would result in little impact to the forest-wide habitat (0.17 percent of forest-wide habitat for Alternative 2 and 0.23 percent of forest wide habitat for Alternative 6) for Coulter pine. Therefore, the project-level habitat impacts will not alter or contribute to the existing forest-wide trends for the Coulter pine.

V.7 Bigcone Douglas Fir (*Pseudotsuga macrocarpa*)

V.7.a Habitat/Species Relationship

Detailed information on MIS for the ANF is documented in the ANF MIS Report (USDA, 2009) which is hereby incorporated by reference.

Bigcone Douglas fir is associated with the chaparral/conifer ecotone and is affected by altered fire regimes (fire severity and/or fire return interval). According to the Forest LRMP (2005), the objective for bigcone Douglas fir on the ANF is to maintain bigcone Douglas fir stands.

Bigcone Douglas fir seeds germinate in mineral soil, and seedlings require canopy shade and small openings for successful establishment. Consequently, if a stand is lost to a crown fire, regeneration may first require the establishment of canyon live oak, after which viable bigcone Douglas fir seeds must disperse to the site from disjunct stands, existing seed banks, or from individuals surviving the fire (Stephenson and Calcarone, 1999).

Bigcone Douglas fir is a small to medium-sized evergreen tree, averaging approximately 60 feet tall and 30 inches in diameter (Stuart and Sawyer 2001). This species occurs in the Transverse and Peninsular ranges of Southern California, primarily between 2,000 and 6,000 feet elevation (USDA, 1990; Stuart and Sawyer, 2001). It is found on cool and moist north-facing slopes of canyon bottoms at lower elevations but switches to warmer, south-facing slopes at higher elevations (USDA, 1990), often on steep and variable topography (Bolton and Vogl, 1969). Bigcone Douglas fir is capable of becoming established on soils too dry for other conifers (USDA, 1990) and is commonly found intermixed with chaparral (Stuart and Sawyer, 2001). Suitable soils for the species include metasedimentary parent materials (sandstone and schist), granitics, and contact zones where the parent material was primarily granitic (McDonald and Littrell, 1976). The oldest recorded tree is over 600 years old (Stuart and Sawyer, 2001).

Fire frequency and intensity greatly influence the extent and composition of bigcone Douglas fir stands (McDonald and Littrell, 1976). In general, repeated fires kill bigcone Douglas fir, leaving only oaks or chaparral. Less frequent but more intensive fires eliminate bigcone Douglas fir regeneration, limiting survivorship to a few scattered, large trees. When fires are infrequent and lower in intensity, stands with several size and age classes develop, producing a mixed-age structure stand (McDonald and Littrell, 1976). In the absence of fires, multi-aged stands also develop but at the cost of increased fuel risk for future catastrophic fires that may eliminate stands of bigcone Douglas fir. Following large fires in the eastern Transverse Range, nearly 60 percent of trees escaped defoliation and 15 percent sprouted later, for a survival rate of 75 percent (Minnich, 1980).

4.74b Project-level Effects Analysis Based on Habitat

Key Habitat Factor(s) for the Analysis:

Acres of bigcone Douglas fir within the project area will be used to assess the effects of the proposed project.

Analysis Area for Project-level Effects Analysis:

For the purposes of this analysis, the project area is an estimated 10,707 acres. This estimate is based on the analysis area including the 1,000-foot wide and 42.25-mile long Project ROW and associated buffer as it traverses the ANF, as well as staging areas and access road locations. The analysis area for direct, indirect, and cumulative effects of the proposed project on bigcone Douglas fir includes only the 598 acres of habitat associated with implementation.

Current Condition of the Key Habitat Factor(s) in the Analysis Area:

The habitat in the analysis area (598 acres) represents less than 1.5 percent of the total amount of bigcone Douglas fir habitat within the ANF.

No Action Alternative (Alternative 1)

Direct and Indirect Effects to Habitat. Under Alternative 1, there would be no change in the project area.

Cumulative Effects to Habitat . Since there are no direct or indirect effects, there would be no cumulative effects to bigcone Douglas fir from this alternative.

Proposed Action (Alternative 2)

Direct and Indirect Effects to Bigcone Douglas Fir

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease bigcone Douglas fir habitat. An estimated total of 6.9 acres of bigcone Douglas fir would be impacted by Alternative 2 within the ANF, which constitutes 1.2 percent of bigcone Douglas fir in the analysis area and 0.02 percent of total bigcone Douglas fir on the ANF (Table 14).

Table 14. Alternative 2 Impacts to Bigcone Douglas Fir Habitat				
CalVeg Type		Amount Impacted by Alternative 2	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	6.9	41370	0.02
	Percent of Total Forest	0.001	6	

Cumulative Effects for Bigcone Douglas Fir

The spatial scale for the cumulative effects of the TRTP on bigcone Douglas fir is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect bigcone Douglas fir within the analysis area and for this time frame include: fuels management and shrub encroachment.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of bigcone Douglas fir habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 2, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 6.9 acres of bigcone Douglas fir in the analysis area. This is equivalent to 0.02 percent of all bigcone Douglas fir within the ANF. Vegetation management activities would provide short-term benefits to bigcone Douglas fir. Therefore, the cumulative effects under Alternative 2 would be relatively small compared to the existing habitat in the analysis area.

FS Proposed Action (Alternative 6)

Direct and Indirect Effects to Habitat

Implementing replacement of 188 220-kV towers with 164 500-kV towers and the associated construction and maintenance areas will open up vegetation and decrease bigcone Douglas fir habitat. An estimated total of 5.2 acres of bigcone Douglas fir would be impacted by Alternative 6 within the ANF, which constitutes 0.9 percent of bigcone Douglas fir in the analysis area and 0.01 percent of total bigcone Douglas fir on the ANF (Table 15).

Table 15. Alternative 6 Impacts to Bigcone Douglas Fir Habitat				
CalVeg Type		Amount Impacted by Alternative 6	Amount Available on Forest	Percent (%) Impacted
DM	Bigcone Douglas Fir Alliance	5.2	41370	0.01
	Percent of Total Forest	0.0007	6	

Cumulative Effects for Habitat

The spatial scale for the cumulative effects of the TRTP on bigcone Douglas fir is the analysis area identified above (10,707 acres). The temporal scale for the analysis is the date of the ANF LRMP (2005) to 2014 (5 years from the present), which is the period of time the direct effects of the project should occur and for which there is information on reasonably foreseeable future actions in the analysis area. A summary of all past, present, and reasonably foreseeable future actions is presented in Section 2 of the TRTP EIS/EIR (2009). The actions listed there which have affected or may affect bigcone Douglas fir within the analysis area and for this time frame is: fuels management and shrub encroachment.

The effects of the past and present actions, as described in the TRTP EIS/EIR (2009), are reflected in the existing condition of the analysis area. Reasonably foreseeable future actions within the next 5 years include development projects on private lands and fuels reduction projects on NFS lands. Federal projects on NFS lands include various fuels treatment and reduction projects, dam operation and maintenance plans, and special use permits for educational and recreational activities. These activities will lead to an additional decrease of bigcone Douglas fir habitat in the analysis area; however, the acreage of habitat lost due to these projects is unknown.

Cumulative Effects Conclusion

It is anticipated that implementation of Alternative 6, in combination with these past, present, and reasonably foreseeable future actions, would result in a short-term decrease of approximately 5.2 acres of bigcone Douglas fir in the analysis area. This is equivalent to 0.01 percent of all bigcone Douglas fir within the ANF. Vegetation management activities would provide short-term benefits to bigcone Douglas fir. Therefore, the cumulative effects under Alternative 6 would be relatively small compared to the existing habitat in the analysis area.

Summary of Habitat and Population Status and Trend at the Forest Scale

For monitoring, the Forest LRMP (USDA, 2005) identifies analysis of FIA data and photo monitoring as acceptable methodologies. Trends would be measured in extent of vegetation type. Aerial photos of the Forest were last obtained in 2004. The proposed schedule includes updating photos every five years. Photo interpretation makes it possible to track changes in stand size, shape and density. The sections below summarize the habitat and population status and trend data for bigcone Douglas fir. This information is drawn from the detailed information on habitat and vegetation type trends in the ANF MIS Report (USDA, 2009), which is hereby incorporated by reference.

- *Habitat Status and Trend*
  Current habitat status on the ANF was calculated using the vegetation data from the 2005 Satellite Imagery layer for the ANF (ANF GIS 2005). Since no new imagery has been completed, nor anticipated to be completed prior to 2010, no change in habitat has been detected.

- *Population Status and Trend at the Forest Scale*
  Not utilized as the primary monitoring tool for bigcone Douglas fir on the ANF.

There are an estimated total of 90,797 bigcone Douglas fir trees greater than or equal to 5 inches in diameter at breast height in the Transverse and Peninsular Ranges (Walker et al., 2006). Approximately 54.2 percent of these (49,243 trees) died as a result of bark beetle mortality during the 1998 to 2003 drought, making this one of the most highly impacted conifer species in the region. There is concern that bigcone Douglas fir trees in the Transverse and Peninsular Ranges may be heavily impacted by recent droughts (Walker et al., 2006) and, along with other evergreen coniferous forests, subject to future declines with climate change (Lenihan et al., 2006).

A total of 41,370 acres of Bigcone Douglas Fir-Canyon Oak Forest occur in the ANF.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for Bigcone Douglas Fir

The action Alternatives (Alternatives 2 and 6) of the TRTP would result in little impact to the forest-wide habitat (0.02 percent of forest-wide habitat for Alternative 2 and 0.01 percent of forest wide habitat for Alternative 6) for bigcone Douglas fir. Therefore, the project-level habitat impacts will not alter or contribute to the existing forest-wide trends for the bigcone Douglas fir.

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Appendix G.
Mitigation Monitoring Plan

G. Mitigation Monitoring Program

G.1 Purpose of Report

Southern California Edison (SCE) has proposed the Tehachapi Renewable Transmission Project (TRTP or proposed Project) to provide electric transmission capacity for wind energy resources that are expected to develop in Kern County. The proposed Project would consist of the following major components:

- 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 approximately 17.8 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.

An Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was prepared to assess the potential environmental effects of the proposed Project. The majority of the Project's impacts would occur during construction. Mitigation measures to reduce impacts have been adopted by the Lead Agency

(CPUC) and the USDA Forest Service as part of their respective approvals for the Project. In addition, SCE has committed to the implementation of Applicant-Proposed Measures (APMs) to reduce potentially significant adverse impacts related to construction and operation of the proposed Project.

The purpose of this Mitigation Monitoring Program is to ensure effective implementation of the mitigation measures, as well as APMs, adopted by the CPUC.

This plan includes:

- The mitigation measures, which SCE must implement as part of the Project, followed by the APMs that SCE has made part of the Project and is responsible for implementing;
- The actions required to implement these measures;
- Monitoring requirements;
- Determination of ~~E~~effectiveness~~ criteria~~; and
- Timing of implementation for each measure.

An Environmental Monitor (EM), designated by the CPUC or the Forest Service, shall conduct construction field-monitoring to ensure full implementation of all measures. In all instances where non-compliance occurs, the CPUC's or Forest Service's designated EM shall issue a verbal or written warning to the construction foreman and SCE's project manager, depending on the severity of the non-compliance. Non-compliances shall be reported to the CPUC's and/or Forest Service designated project managers. Any decision to halt work due to non-compliance shall be made by the CPUC or the Forest Service. The EM shall keep a record of any incidences of non-compliance with mitigation measures, APMs, permit conditions, or other conditions of Project approval. Weekly reports will be prepared that summarize compliance and construction activities. These weekly reports will be supplied to SCE, the CPUC, the Forest Service, applicable resource agencies, and posted on the CPUC project web site.

G.1.1 Major Required Plans and Reports

The mitigation measures detailed in this Mitigation Monitoring Program require SCE to prepare several plans and submit documentation, which must be approved by the CPUC and/or Forest Service (NFS lands) prior to construction of the proposed Project. Major requirements are listed in Table G.1-1.

Table G.1-1. Major Plans and Reports Required to be Submitted by SCE

Plan Report Title	Mitigation Measure(s) and APM(s)	Required to Initiate Construction
Fugitive Dust Emission Control Plan (FDECP)	AQ-1a, APM AQ-7	Yes
Habitat Restoration and Revegetation Plan	B-1a	Yes
Riparian Conservation Areas Treatment Plan	B-2	Yes
Weed Control Plan	B-3a	Yes
Pre-construction surveys for nesting birds	B-5	Yes
Protocol surveys for rare plants	B-7	Yes
Protocol surveys for California red-legged frogs	B-8a	Yes
Biological Monitoring	B-8b	No
Protocol surveys for Arroyo Toads	B-9	Yes
Protocol surveys for Desert Tortoise	B-10	Yes
Hazardous Material Spill kit(s)	B-12	Yes
Protocol surveys for listed riparian birds	B-15	Yes
Focused surveys for coastal California Gnatcatcher	B-16	Yes
Pre-construction surveys for Swainson's Hawks	B-18a	Yes
Protocol surveys for Mohave ground squirrel	B-22a	Yes
Construction Monitoring for Mohave ground squirrel	B-22b	Yes

Table G.1-1. Major Plans and Reports Required to be Submitted by SCE

Plan Report Title	Mitigation Measure(s) and APM(s)	Required to Initiate Construction
Focused presence/absence surveys for Southwestern pond turtles	B-24	Yes
Focused surveys for two-striped garter snakes and south coast garter	B-25	Yes
Focused surveys for Coast Range newts	B-26	Yes
CDFG protocol for burrowing owls (Implement)	B-29	Yes
Pre-and during construction nest surveys for spotted owl	B-30	Yes
Maternity colony or mibernaculum surveys for roosting bats	B-33a	Yes
Focused surveys for San Diego Desert woodrat	B-36	Yes
Focused surveys for ringtail ~~and~~	B-37	Yes
Focused surveys for American badgers	B-38	Yes
Programmatic Agreement – Cultural Resources	C-1a	Yes
Inventory Cultural Resources Report	C-1b	Yes
Historic Properties Treatment Plan (HPTP)	C-1e	Yes
Long-term plan for NRHP~~O~~-eligible sites	C-1i	No
Phase I Environmental Site Assessments (ESAs)	E-2a	Yes
Phase II Environmental Site Investigations (ESIs)	E-2b	Yes
Health and Safety Plan and Gas Monitoring Program	E-3b	Yes
Plans of access roads required to construct Route C, Route C Modified, or Route D	E-6b	Yes
Plan to avoid or minimize interference with oil field operation	G-1	Yes
Geological surveys for landslides	G-3	Yes
Report to ~~minimize~~ keep project structures ~~within~~ outside active fault zones	G-4	Yes
Geotechnical Investigation for groundshaking	G-5a	Yes
Geotechnical Investigation for liquefaction	G-5b	Yes
Geotechnical studies for potentially detrimental soil chemicals	G-6	Yes
Geotechnical analysis of settlement potential	G-9	Yes
Erosion Control Plan	H-1a	Yes
Monitoring of all wet-weather coordination with the FS and/or State Parks	H-1b	Yes
SCE Transmission Line Fire Plan	PSU-1a	Yes
Traffic Control Plans (TCP)	T-1a, T-1b	Yes
Construction Transportation Plan (CTP)	T-2	Yes
Wildland Traffic Control Plans	F-1a	Yes
Fire Management Plan	F-3a	Yes
Emergency Evacuation Plan	F-4a	Yes
Phase I Environmental Site Assessment (ESA)	APM HAZ-1	Yes
Soil Management Plan	APM HAZ-2	Yes
Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan	APM HAZ-5	Yes
Construction SWPPP	APM HYD-1	Yes
Operation Storm Water Management Plan (SWMP)	APM HYD-8	Yes
Fire Management Plan	PSU-1, APM HAZ-4	Yes
Traffic Management Plan	APM TRA-4	Yes
Substations – Landscape Plan	APM AES-23	Yes
Construction Monitoring and Unanticipated Cultural Resources Discovery Plan	APM CR-2b	Yes

Table G.1-1 includes some documents that are not required prior to construction, but which would likely be submitted during the construction phase. These plans and reports would be reviewed within 30 days of receipt of the completed submittal.

G.1-2 Review Procedures

The CPUC and Forest Service monitoring team, including the CPUC and Forest Service project managers and technical experts, will review all applicable reports and provide comments. Comments will be provided to SCE on these documents to devise an effective and feasible plan to accomplish the intended reduction in impacts, including assurance that effectiveness criteria are in place before monitoring begins. Deliverables sent to SCE will include a report on each plan or permit reviewed, in addition to a copy of the plan itself with marginal notes or comments, as appropriate. Each plan will be approved, once it is determined that it is in compliance with the required mitigation measure and that changes (if required) have been made.

G.1-3 Compliance Monitoring

Prior to the start of construction in a given area, the EM will review applicable pre-construction resource surveys and verify that appropriate flagging is in place to denote sensitive resources and construction workspace boundaries, including access roads and equipment/material staging areas. During construction, the EM will conduct compliance monitoring which will include periodic unscheduled inspections at the construction areas for active site mitigation measures. Active site mitigation measures are those measures that require action during the project construction. Examples of active site mitigation measures include measures such as AQ-1a: Implement Construction Fugitive Dust Control Plan, N-1a: Implement Best Management Practices for Construction Noise, and all other mitigation measures and permit conditions that note monitoring of compliance at construction areas. The EM will also review ongoing surveying requirements during construction, such as nesting birds, and confirm that newly discovered resources are flagged in the field and added to applicable resource maps being used by field personnel.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
Agricultural Resources				
AG-1: Construction activities would temporarily preclude the agricultural use of some Farmland	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/FS at least 30 days prior to the start of any construction activities on the affected agricultural parcels.	• SCE shall provide documentation of coordination efforts with property owners of Farmland (Prime Farmland, Farmland of Statewide Importance, Unique Farmland) directly affected by the Project and will be submitted to the CPUC for review. • CPUC shall monitor compliance during construction.	• Interference with agricultural operations would be limited or avoided. • Damaged agricultural lands would be restored.	Thirty (30) days prior to and during construction.
AG-3: Construction activities would interfere with agricultural operations	Mitigation Measure AG-1, above.	Refer to AG-1, above.	Refer to AG-1, above.	Prior to and during construction.
AG-4: Operation would interfere with agricultural operations	Mitigation Measure AG-1, above.	Refer to AG-1, above.	Refer to AG-1, above.	During operation.
Air Quality				
AQ-1: Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional	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).	• <u>Prior to construction,</u> SCE shall submit a construction FDECP to the CPUC and FS for review and approval.	• <u>PM10 and PM2.5</u> ~~Fugitive dust (PM10)~~ emissions are reduced.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
emission thresholds	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.	• SCE shall incorporate the requirements of the FDECP into the plans and specifications, and require compliance by the construction contractor. • CPUC and/or FS will monitor compliance at construction areas.	• Effectiveness can be determined by monitoring implementation of the control measures detailed in the FDECP.	

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	• ~~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.	• Prior to construction, SCE shall submit a list of diesel-fueled offroad equipment to the CPUC and FS indicating compliance. • If Tier 2 equipment is not available for any off-road engine larger than 50 hp, SCE will submit records to indicate either: (1) that retrofit equipment has been added to the engine, or (2) that no Tier 2 equipment or emissions equivalent retrofit equipment is available for a particular equipment type.~~If Tier 2 equipment is not available, documentation confirming this will be provided to the CPUC and FS with signed written correspondence by the appropriate construction contractor along with documented correspondence with at least two construction equipment rental firms~~.	NOx, PM, VOC, and CO ~~SO_2~~ emissions are reduced.	Prior to and during construction.
	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.	• SCE will require compliance by the construction contractor. • Compliance will be verified by the onsite monitor.~~CPUC and/or FS will monitor compliance at construction areas.~~	Exhaust emissions from Project construction are minimized to the extent feasible.~~CO, NOx and VOC emissions are reduced.~~	During construction.
	AQ-1d Heavy Duty Diesel Haul Vehicle On-Road Equipment Standards.	• Prior to construction, SCE shall	~~CO,~~ NOx, PM, ~~and~~	Prior to and

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	submit evidence of CARB certified Level 3 diesel emission controls to the CPUC and FS for on-road heavy duty diesel haul vehicles to be used during construction.~~a list of all heavy duty diesel vehicles to the CPUC and FS indicating compliance.~~	VOC, and CO emissions are reduced.	during construction.
	AQ-1e On-Road Vehicles Standards. All on-road construction vehicles, other than those meeting the requirements of 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.	• Prior to construction, SCE shall submit California registration and SMOG certification to the CPUC and FS for all on-road vehicles to be used during construction, with the exception of those vehicles meeting the requirements of measure AQ-1d.	~~CO,~~ NOx, PM, ~~and~~ VOC, and CO emissions are reduced.	Prior to and during construction.
	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.	• SCE shall provide maintenance records to the CPUC and FS upon request.	• Mechanical equipment is properly maintained, which reduces NOx emissions. • NOx and PM emissions are reduced.	Prior to and during construction.
	AQ-1g Restrict Diesel 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.	• ~~CPUC and/or FS~~Onsite monitor will ~~monitor~~ verify compliance at construction ~~areas~~sites.	NOx, PM, VOC and CO emissions are reduced.	During construction.
	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.	• SCE shall submit delivery schedules to the CPUC and FS at appropriate intervals to verify that deliveries are scheduled outside of peak traffic hours. • Onsite monitor will verify compliance at construction areas.~~CPUC and/or FS will monitor compliance at construction areas.~~	Traffic in areas where material deliveries occur remains generally free-flowing, as verified by the onsite~~environmental~~ monitor ~~(EM)~~.	During construction.
	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	• Prior to construction, SCE shall submit a list of gasoline-fueled off-road equipment to the CPUC and FS indicating compliance.	CO, NOx, and VOC emissions are reduced.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	1/Phase 2 compliant engines are determined not to be practicable, SCE shall provide documentation to the CPUC and FS with an explanation.	• In the event that 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.	• SCE shall submit a monthly helicopter use log including expected hours of operation, type of helicopter, and purpose of use to the CPUC and FS for review and approval.	NOx emissions reduced.	Prior to and during construction.
	AQ-1k: Waste Soil Trip Distance Minimization (Alt 4C Modified only) 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.	• Prior to construction, SCE shall submit documentation to the CPUC of coordination with local agencies to identify the nearest locations for reuse or disposal of waste soil.	Construction emissions are reduced.	Prior to and during construction.
	AQ-1l: Waste Soil Truck Capacity (Alt 4C Modified only) Double trailer trucks with a minimum total effective capacity of 20 cubic yards will be used to haul the switchyard construction waste soil.	• Onsite monitor will verify compliance at construction sites.	Construction emissions are reduced.	Prior to and during construction.
	AQ-1m 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.	• Prior to construction, SCE shall submit documentation to the CPUC of coordination with local agencies to identify the nearest locations for reuse or disposal of soil and rock wastes.	Construction emissions are reduced.	Prior to and during construction.
	AQ-1n 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.	• Onsite monitor will verify compliance at construction sites.	Construction emissions are reduced.	During construction.
AQ-3: Construction of the Project would expose sensitive receptors to substantial pollutant concentrations	Mitigation Measures AQ-1a through AQ-1j, above.	Refer to AQ-1a through AQ-1j, above.	Exposure of harmful emissions would be reduced in areas with sensitive receptors.	Varies, please refer to AQ-1a through AQ-1j above.
AQ-6: The Project would not conform to Federal General Conformity Rules	AQ-6 General Conformity Emission Offset Mitigation (Alt 6 Only). 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	~~CPUC and/or~~ FS will monitor compliance.	NOx and/or VOC emissions would be offset if standards are exceeded.	Post-construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	§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.			
AQ-8: The Project would not conform to Angeles National Forest air quality strategies.	Mitigation Measures AQ-1a through AQ-1j, above.	Refer to AQ-1a through AQ-1j, above.	Refer to AQ-1a through AQ-1j, above.	Varies, please refer to AQ-1a through AQ-1j above.
AQ-9: The Project would not conform with Applicable Air Quality Management Plans.	Mitigation Measures AQ-1a, AQ~~!~~-1b, and AQ-1d, above.	Refer to AQ-1a, AQ-1b, and AQ-1d, above.	Refer to AQ-1a, AQ-1b, and AQ-1d, above.	Varies, please refer to AQ-1a, AQ-1b, and AQ-1d above.
Biological Resources				
B-1: Construction activities would result in temporary and permanent losses of native vegetation.	**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. Both~~The~~ 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	• Prior to construction, SCE shall submit documentation providing pre-construction conditions and a Habitat Restoration and Revegetation Plan to the CPUC and FS for review and approval. • SCE will identify a Habitat Restoration Specialist to determine the most appropriate method of restoration. • SCE shall restore native vegetative communities to pre-construction conditions, and the creation or restoration of habitat shall be monitored for 5 years after mitigation. If necessary, remediation activities shall be taken during the 5-year period. • SCE's designated biologist shall monitor compliance and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	• Successful restoration and revegetation to pre-construction conditions, as verified by the Environmental Monitor (EM). • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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			

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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 from 3 to~~less than~~ 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 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			

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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	1:1*	1:1*	1:1*	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

Table G.1-2. Mitigation Monitoring Program

Impact	Measure					Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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			
	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	1:1*	1:1*	-	-			
	Exotic-Giant Reed	1:1*	1:1*	1:1*	1:1*			
	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	1:1*	1:1*	1:1*	1:1*			
	Ruderal Grassland	1:1*	1:1*	1:1*	1:1*			

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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. <u>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.</u> 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.	• Thirty (30) days prior to construction, training materials and a course outline shall be provided to the CPUC and FS for review and approval. • SCE shall submit documentation of training with a list of construction personnel who completed the training to the CPUC and FS. • SCE's designated biologist shall monitor and ensure compliance for the duration of construction.	Minimize unnecessary disruptions to sensitive species, as verified by the EM.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	• SCE shall submit documentation of tree-cutting activities and the use of Sporax to the CPUC and FS. • SCE's designated biologist shall monitor and ensure compliance for the duration of construction.	Minimize unnecessary disruptions to sensitive species, as verified by the EM.	Prior to and during construction.
	Mitigation Measures AQ-1a and H-1a, above/below.	Refer to AQ-1a and H-1a, above/below.	Refer to AQ-1a and H-1a above/below.	Refer to AQ-1a and H-1a above/below.
B-2: The Project would result in the loss of desert wash or riparian habitat.	Mitigation Measures AQ-1a, B-1a, B-1b, and H-1a above/below.	Refer to AQ-1a, B-1a, B-1b, and H-1a above/below.	Refer to AQ-1a, B-1a, B-1b, and H-1a above/below.	Refer to AQ-1a, B-1a, B-1b, and H-1a above/below.
	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.	• Prior to construction, SCE shall submit an FS RCA Treatment Plan to the CPUC and FS for review and approval. • Removal or road construction shall not occur in RCAs during breeding season for nesting birds (February 1 – August 15). • SCE's designated biologist shall monitor and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	Minimize disturbance at RCA crossings, as verified by the EM.	Prior to and during construction.
B-3: The Project would result in the establishment and spread of noxious weeds.	Mitigation Measures B-1a and B-2, above.	Refer to B-1a and B-2, above.	Refer to B-1a and B-2, above.	Refer to B-1a and B-2, above.
	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	• Prior to construction, SCE shall submit the Weed Control Plan to the CPUC and FS for review and approval. • SCE's designated biologist shall	Successful weed control, as verified by the EM.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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) with the goal of controlling	monitor for the duration of construction, and will provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.		

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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, and bumpers) before and after entering FS identified areas. On non-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			

Table G.1-2. Mitigation Monitoring Program

<table>
<tr><th>Impact</th><th>Measure</th><th>Monitoring Requirement</th><th>Determination of Effectiveness ~~Criteria~~</th><th>Timing of Action</th></tr>
<tr><td></td><td>roads, staging areas, and any other disturbance areas in a FS-approved method.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>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, 2008) 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.
<table>
<tr><th colspan="2">Weed Populations Along Construction Routes*</th></tr>
<tr><th>ANF Road Location</th><th>Noxious Weeds Identified</th></tr>
<tr><td>4N41</td><td>Isolated patch of Spanish broom</td></tr>
<tr><td>3N20</td><td>Isolated patches of Spanish broom, Scotch broom, and rockrose</td></tr>
<tr><td>3N23</td><td>Giant reed population in creek adjacent to road</td></tr>
<tr><td>2N23</td><td>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.</td></tr>
<tr><td>2N24</td><td>Scattered, isolated patches of Spanish broom and rockrose</td></tr>
<tr><td>2N25.2</td><td>Scattered, isolated patches of Spanish broom, rosemary, rockrose, and horehound</td></tr>
<tr><td>2N30.1</td><td>One isolated patch of Spanish broom</td></tr>
<tr><td>2N30.2</td><td>Scattered Spanish broom, bull thistle, tree of heaven, black locust,</td></tr>
</table></td><td>
• Prior to construction, SCE shall initiate eradication of the weed populations identified in the measures, and submit documentation of control measures to the CPUC and FS.
• Eradication measures shall occur every year until 100 percent control of these small, isolated populations is achieved, and SCE shall submit documentation of control measures to the CPUC and FS.
• Written daily logs shall be kept for vehicle maintenance and 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.
• SCE's designated biologist will monitor and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.</td><td>Successful eradication of sources of weed seed along the construction routes.</td><td>Prior to construction, and will continue until eradication efforts are 100 percent successful.</td></tr>
</table>

<table>
<tr><th colspan="5">Table G.1-2. Mitigation Monitoring Program</th></tr>
<tr><th>Impact</th><th>Measure</th><th>Monitoring Requirement</th><th>Determination of Effectiveness ~~Criteria~~</th><th>Timing of Action</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>tocalote, rockrose, eupatory, horehound, smilo grass, and tree tobacco infestations of a range of population sizes and densities.</td></tr>
<tr><td>3N27 north of Big Tujunga Creek to Mt. Gleason Rd</td><td>Scattered, isolated patches of Spanish broom</td></tr>
<tr><td>2N45</td><td>Moderate patch of giant reed and tree of heaven</td></tr>
<tr><td>2N65.1</td><td>Moderate infestation of tree spurge</td></tr>
<tr><td>2N65.2</td><td>Moderate infestation of Spanish broom and thoroughwort</td></tr>
<tr><td>2N66</td><td>Moderate patch of Spanish broom and tree of heaven</td></tr>
<tr><td>2N75</td><td>Moderate patch of Spanish broom</td></tr>
<tr><td>2N79</td><td>Isolated patch of Spanish broom</td></tr>
<tr><td>1N36</td><td>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.</td></tr>
<tr><td>Road west out of Shortcut Station</td><td>Isolated patches of Spanish broom</td></tr>
<tr><td colspan="2">*Specific locations are found in Figures A-2 through A-4 of Appendix A of the Biological Specialist Report Noxious Weed Assessment. [Aspen, 2008]</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td></td><td>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.</td><td>• Prior to construction, SCE shall commence weed control efforts in early spring, and submit documentation of control measures to the CPUC and FS.
• All plant debris shall be disposed of at a FS and/or CPUC-approved location.
• SCE's designated biologist shall monitor and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.</td><td>Successful eradication of sources of weed seed in assembly yards/staging areas.</td><td>Prior to construction, and will continue until eradication efforts are 100 percent successful.</td></tr>
<tr><td>B-4: Construction activities, including the use of access roads and helicopter</td><td>Mitigation Measures AQ-1a, B-1a, B-1b, B-2, ~~and~~ B-3a, and H-1a above/below.</td><td>Refer to B-1a, B-1b, B-2, ~~and~~ B-3a, and H-1a above/below.</td><td>Refer to B-1a, B-1b, B-2, B-3a, and H-1a above/below.~~Minimize disturbance and~~</td><td>Refer to B-1a, B-1b, B-2, B-3a, and H-1a above/below.~~Prior~~</td></tr>
</table>

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
construction, would result in disturbance to wildlife and may result in wildlife mortality.			~~mortality to wildlife, as verified by the EM.~~	~~to and during construction~~.
B-5: Construction activities conducted during the breeding season ~~w~~could result in the loss of nesting birds or raptors.	Mitigation Measures AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.
	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	• If construction and removal activities are scheduled to occur during the breeding season, prior to construction SCE shall submit documentation providing the results of the pre-construction nesting bird surveys to the CPUC and FS for review and approval. • The resume of the proposed biologists shall be provided to the CPUC, USACE, and FS for concurrence. • If a bird nest must be removed during the nesting season, SCE shall provide written documentation providing concurrence from the U.S. FWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the FS. • SCE's designated biologist shall monitor and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	Successful avoidance of nesting birds, as verified by the EM.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.			
B-6: The Project would cause the loss of foraging habitat for wildlife.	Mitigation Measures AQ-1a, B-1a, B-1b, B-2, ~~and~~ B-3a, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, ~~and~~ B-3a, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, and H-1a, above/below.~~Minimize the loss of foraging habitat for wildlife, as verified by the EM.~~	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, and H-1a, above/below.~~Prior to and during construction.~~
B-7: The Project could disturb endangered, threatened, or proposed plant species or their habitat.	Mitigation Measures AQ-1a, B-1a, B-1b, B-3a, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, H-1a, above/below.
	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 construction, the resume of the proposed biologists shall be provided to the CPUC and FS. • Prior to construction, SCE shall submit documentation providing results of the protocol surveys for rare plants to the CPUC and FS for review and approval. • All listed plant species shall be marked and avoided. • SCE's authorized biologist shall be present during all activities immediately adjacent to or within habitats that support rare plant	• Minimize disturbance to rare plants, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	species. • SCE's designated biologist shall monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.		
B-8: The Project could result in the loss of California red-legged frogs and mountain yellow-legged frogs.	Mitigation Measures AQ-1a, B-1a, B-1b, B-2, B-3a, H-1a and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, H-1a, and H-1b, above/below.
	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	• Prior to construction, the resume of the proposed biologists shall be provided to the CPUC and FS. • Prior to construction, SCE shall submit documentation providing results of the protocol surveys for the California red-legged frog to the CPUC for review and approval. • If the California red-legged frog is detected in or adjacent to the proposed ROW, SCE shall submit a monitoring plan with compliance measures determined in consultation with USFWS, CDFG, FS and CPUC.	• Minimize disturbance to red-legged frogs, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	following information to all personnel who will be present within~~on~~ 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	• SCE's authorized biologist shall be present during all activities immediately adjacent to or within habitat that supports populations of the California red-legged frog. • SCE's designated biologist will monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.		

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	<u>Determination of</u> Effectiveness ~~Criteria~~	Timing of Action
	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			

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	• The resume of the proposed biologists shall be provided to the CPUC<u>, USACE,</u> and FS. • SCE's designated biologist shall monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	Minimize disturbance to listed wildlife species, as verified by the EM.	Prior to and during construction.
B-9: The Project would result in the loss of arroyo toad<u>s</u>.	<u>Mitigation Measures AQ-1a, B-1a, B-1b, B-2, B-3a, B-8b, H-1a and H-1b, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-8b, H-1a, and H-1b, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-8b, H-1a, and H-1b, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-8b, H-1a, and H-1b, above/below.</u>
	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	• The resume of the proposed biologists shall be provided to the CPUC and FS. • SCE shall submit documentation providing results of the protocol	• Minimize disturbance to arroyo toads, as verified by the EM. • Effectiveness can be determined by	Prior to and during construction.

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	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 ~~AN~~FS and FWS approval. • 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 ~~AN~~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 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, habitat assessments~~surveys~~ will be conducted~~repeated~~ every ~~two~~ year~~s~~ 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.	surveys for arroyo toads to the CPUC and FS for review and approval. • If arroyo toad is detected in or adjacent to the proposed ROW, SCE shall submit a monitoring plan with compliance measures determined in consultation with USFWS, CDFG, FS, and CPUC. • SCE's authorized biologist shall be present during all activities immediately adjacent to or within habitat that supports populations of arroyo toad. • SCE's designated biologist shall monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	monitoring implementation of the control measures.	

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	• 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,			

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	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.			
B-10: The Project could result in the loss of desert tortoises.	Mitigation Measures AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.
	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. Clearance surveys shall be conducted 100 m into agricultural areas that are adjacent to suitable habitat. ~~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	• The resume of the proposed biologists shall be provided to the CPUC and FS. • SCE shall submit documentation providing results of the protocol surveys for desert tortoises to the CPUC and FS for review and approval. • If desert tortoise is detected in or adjacent to the proposed ROW, SCE shall submit a monitoring plan with compliance measures determined in consultation with USFWS, CDFG, FS, and CPUC. • SCE's authorized biologist shall be present during all activities immediately adjacent to or within habitat that supports populations of desert tortoise. • SCE's designated biologist will monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	• Minimize disturbance to desert tortoise, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to and during construction.

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	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			

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	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.			
B-12: The Project could result in the loss of special-status fish.	Mitigation Measures B-1a, B-1b, B-2, B-3a, B-8b, H-1a and H-1b, above/below.	Refer to B-1a, B-1b, B-2, B-3a, B-8b, H-1a, and H-1b, above/below.	Refer to B-1a, B-1b, B-2, B-3a, B-8b, H-1a, and H-1b, above/below.	Refer to B-1a, B-1b, B-2, B-3a, B-8b, H-1a, and H-1b, above/below.
	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~~a~~ largest potential 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 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.	• SCE shall submit documentation providing results of surveys for fish and other special status aquatic organism to the CPUC and FS for review and approval. • SCE shall submit documentation of a complete Hazardous Material Spill kit to the CPUC and FS for review and approval. • SCE's biological monitor with knowledge of the special status fishes known to occur in the area shall inspect the roadway for leaks, spills, or other debris a minimum of three times a day (unless otherwise approved by the FS)during construction. • Spills on the roadway will be logged	• Minimize disturbance to desert tortoise, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to, during and after construction.

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	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.	and reported to the CPUC and FS monitor weekly and cleaned up immediately. • All activities that occur within ponded or flowing water shall be coordinated with the FS on NFS lands. • At the completion of work at 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, and submitted to the CPUC no later than 30 days after construction. • SCE's designated biologist shall monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS.		
B. 13: The Project could result in the loss of Critical Habitat for the Santa Ana sucker.	Mitigation Measures B-1a, B-1b, B-2, B-3a, B-8b, ~~and~~ B-12, H-1a, and H-1b, above/below.	Refer to B-1a, B-1b, B-2, B-3a, B-8b, ~~and~~ B-12, H-1a, and H-1b, above/below.	Refer to B-1a, B-1b, B-2, B-3a, B-8b, B-12, H-1a, and H-1b, above/below.~~Avoid loss of critical habitat for the Santa Ana sucker.~~	Refer to B-1a, B-1b, B-2, B-3a, B-8b, B-12, H-1a, and H-1b, above/below.~~Prior to and during construction.~~
B-14: The Project could result in the loss of California condors.	Mitigation Measures B-1a, B-1b, B-2, B-3a, and B-8b, above.	Refer to B-1a, B-1b, B-2, B-3a, and B-8b, above.	Refer to B-1a, B-1b, B-2, B-3a, and B-8b, above.	Refer to B-1a, B-1b, B-2, B-3a, and B-8b, above.
	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 knowledge of California condor identification to monitor all construction activities within the Project area and assist SCE in the	• SCE shall submit a Waste Characterization and Management Plan to the CPUC and FS for review.	• Construction and demolition waste would be properly disposed which would	Prior to and during construction.

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	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 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, SCE will coordinate with a FWS condor biologist to	• CPUC and FS shall monitor compliance during construction.	minimize potential for impacts to California condors.	

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	determine if any condors have been tracked or observed in the vicinity of the Project area.			
B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.	Mitigation Measures AQ-1a, B-1a, B-1b, B-2, B-3a, B-5, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-5, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-5, H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-5, and H-1a, above/below.
	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. ~~and 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 ~~3~~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	• If construction activities occur during breeding season, prior to construction SCE shall submit documentation providing results of the protocol surveys for riparian birds to the CPUC and FS for review and approval. • Because construction activities may not occur for several years or be conducted in phases, these surveys shall be conducted annually unless the species has been detected in the Project area. • If a territory or nest is confirmed, the FWS, CDFG, NFS, or Park, as applicable shall be notified immediately. In coordination with the FWS and CDFG, a 500-foot disturbance-free buffer shall be established and no construction shall occur within this buffer during the breeding season. • SCE's designated biologist will monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	Avoid impacts to riparian bird habitats, as verified by the EM.	For southwestern willow flycatcher, surveys shall be conducted between 15 May and 15 July. Surveys for least Bell's vireo shall be conducted from 10 April to 1 Aug. Surveys for yellow-billed cuckoo shall occur from 1 June to 31 August. Surveys must occur prior to construction, and continue annually until construction is complete.

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	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 species.			
B-16: The Project would result in the loss of coastal California gnatcatchers.	Mitigation Measures AQ-1a and B-1b, above.	Refer to AQ-1a and B-1b, above.	Refer to AQ-1a and B-1b, above.	Refer to AQ-1a and B-1b, above.
	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	• Prior to construction, SCE shall submit documentation providing the results of the pre-construction focused surveys for coastal California gnatcatcher to the CPUC and FS for review and approval. • If a territory or nest is confirmed, the FWS and CDFG shall be notified immediately. In coordination with the FWS and CDFG, a 500-foot disturbance-free buffer shall be established. No Project activities may occur in these areas unless otherwise authorized by FWS and CDFG, and SCE shall obtain incidental take authorization from the FWS prior to further activities. • SCE's designated biologist will monitor and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	Successful avoidance of coastal California gnatcatcher, as verified by the EM.	Six surveys must be performed between 15 March and 30 June at least one week apart, and nine surveys must be performed between 1 July and 14 March at least two weeks apart, prior to construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.			
B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.	Mitigation Measures AQ-1a, B-1a, B-3a, and B-16, above.	Refer to AQ-1a, B-1a, B-3a, and B-16, above.	Refer to AQ-1a, B-1a, B-3a, and B-16, above.	Refer to AQ-1a, B-1a, B-3a, and B-16, above.
	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-	• SCE shall acquire habitat occupied by the coastal California gnatcatcher and/or restore unoccupied coastal sage scrub based on agreed-upon ratio and location as approved by the FWS upon consultation. • SCE shall ensure that mitigation areas are included in an existing management plan.	• Provide documentation of permanent protection of off-site coastal California gnatcatcher habitat to CPUC and FS. • Off-site land successfully	Prior to, during, and after construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	• SCE's designated biologist will monitor compliance and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	purchased or enhanced and transferred to an existing management plan.	
B-18: The Project could disturb nesting Swainson's Hawks.	Mitigation Measures AQ-1a and B-1b, above.	Refer to AQ-1a and B-1b, above.	Refer to AQ-1a and B-1b, above.	Refer to AQ-1a and B-1b, above.
	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.	• SCE shall submit documentation providing results of the focused surveys for Swainson's hawks to the CPUC for review and approval. • If nesting Swainson's hawks are detected in or adjacent to the proposed ROW, SCE will consult CDFG before project activities begin. • SCE's authorized biologist will be present during all activities immediately adjacent to or within habitat that could support populations of Swainson's hawks. • SCE's designated biologist will monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	• Minimize disturbance to Swainson's hawks, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Survey must be performed between 1 January and July 30, prior to construction.
	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	• If a nest tree must be removed, a Management Authorization must be obtained from the CDFG prior to nest removal. • If Swainson's hawks are present and direct impacts cannot be avoided, SCE's authorized biologist shall monitor the nest site to determine	• Minimize disturbance to Swainson's hawks, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to and during construction. Removal period is generally between 1 October and 1 February.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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).	activity and make removal recommendations. • If a nest is determined to be abandoned and contain live nestlings, SCE's authorized biologist will arrange for recovery and release of the young.		
B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.	<u>Mitigation Measures AQ-1a, B-1a, B-3a, and B-18a, above.</u>	<u>Refer to AQ-1a, B-1a, B-3a, and B-18a, above.</u>	<u>Refer to AQ-1a, B-1a, B-3a, and B-18a, above.</u>	<u>Refer to AQ-1a, B-1a, B-3a, and B-18a, above.</u>
	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).	• SCE shall submit nest surveys to the CPUC and FS for review. • SCE shall coordinate with CDFG and CPUC to acquire and ensure permanent protection of Habitat Management lands.	• Successful protection of off-site Swainson's hawk habitat.	Prior to, during, and after construction.
B-22: The Project could result in disturbance to Mohave ground squirrel<u>s</u>.	<u>Mitigation Measures AQ-1a, B-1a, B-1b, and B-3a, above.</u>	<u>Refer to AQ-1a, B-1a, B-1b, and B-3a, above.</u>	<u>Refer to AQ-1a, B-1a, B-1b, and B-3a, above.</u>	<u>Refer to AQ-1a, B-1a, B-1b, and B-3a, above.</u>
	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	• SCE shall submit documentation providing the results of the pre-construction protocol surveys for Mohave ground squirrels to the CPUC for review and approval. • SCE's designated biologist shall monitor and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	Successful avoidance of Mohave ground squirrels, as verified by the EM.	Surveys must be performed between 15 March and 15 July, prior to construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	<u>Determination of</u> Effectiveness ~~Criteria~~	Timing of Action
	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.	• SCE's designated biologist shall monitor and provide a copy of the monitoring reports to the CPUC for and FS review on a weekly basis.	Successful avoidance of Mohave ground squirrels, as verified by the EM.	Prior to construction.
	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	• SCE shall coordinate with CDFG and CPUC to acquire and ensure permanent protection of Habitat Management lands for Mohave ground squirrels. • SCE shall provide documentation of permanent protection of off-site Mohave ground squirrel habitat to the CPUC.	Off-site land successfully purchased or enhanced.	Prior to, during, and after construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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).			
B-23: The Project could result in the loss of candidate, Forest Service Sensitive, or special-status plant species.	Mitigation Measures AQ-1a, B-1a, B-1b, B-3a, B-7, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, B-7 and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, B-7 and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, B-7, and H-1a, above/below.
	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	• SCE shall coordinate with the CPUC and federal land manager (FS and USACE) to acquire and ensure permanent protection of special-status plants. • SCE shall provide documentation of permanent protection of off-site Mohave ground squirrel habitat to the CPUC and FS.	• Off-site land successfully purchased or enhanced. • Implementation of a long-term management plan.	Prior to, during, and after construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	<u>Determination of</u> Effectiveness ~~Criteria~~	Timing of Action
	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).			
B-24: The Project could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.	<u>Mitigation Measures AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</u>
	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 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	• SCE shall submit documentation providing pre-construction survey results to the CPUC review and approval. • The resume of the proposed biologists shall be provided to the CPUC and FS. • If avoidance of the nesting area is determined to be infeasible, the authorized biologist shall coordinate with CDFG, CPUC, and FS 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. • SCE's authorized biologist, approved by the CPUC and FS, shall monitor compliance, conduct clearance surveys for southwestern pond turtles at the beginning of construction each	• Project activities do not disturb identified (flagged) areas. • Minimize disturbance to the pond turtle, as verified by the EM.	Prior to and during construction. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 June.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	day, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.		
B-25: The Project could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.	<ins>Mitigation Measures AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</ins>	<ins>Refer to AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</ins>	<ins>Refer to AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</ins>	<ins>Refer to AQ-1a, B-1a, B-1b, B-3a, B-12, H-1a, and H-1b, above/below.</ins>
	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	• SCE shall submit documentation providing pre-construction survey results to the CPUC and FS for	• Project activities do not disturb identified (flagged) areas.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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 herpetologist~~biologist~~ 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.	review and approval. • The resume of the proposed biologists will be provided to the CPUC and FS for approval. • SCE's authorized biologist, approved by the CPUC and FS, shall monitor compliance, conduct clearance surveys for garter snakes at the beginning of construction each day, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	• Minimize disturbance to garter snake, as verified by the EM.	Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 September.
B-26: The Project could result in injury or mortality of, and loss of habitat for, Coast Range newts.	Mitigation Measures AQ-1a, B-1a, B-1b, B-3a, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-3a, H-1a, and H-1b, above/below.
	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 0.5 mile	• SCE shall submit documentation providing pre-construction survey results to the CPUC review and approval. • SCE's authorized biologist, approved by the CPUC and FS, shall monitor compliance, conduct clearance surveys for Coast Range newts at the beginning of construction each day, and provide a copy of the monitoring	• Project activities do not disturb identified (flagged) areas. • Minimize disturbance to the coast range newt, as verified by the EM.	Prior to and during construction. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 September.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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 amphibians~~Coast Range newts~~ 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.	reports to the CPUC and FS for review on a weekly basis.		
B-27: The Project 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.	Mitigation Measures AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.
	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.	• SCE shall submit documentation providing monitoring efforts to the CPUC and FS. • SCE's authorized biologist, approved by the CPUC and FS, shall monitor compliance, conduct clearance surveys for special-status herpetofauna at the beginning of construction each day, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	Minimize disturbance to special-status herpetofauna, as verified by the EM.	Prior to and during construction.
B-29: The Project would result in the loss of occupied burrowing owl habitat.	Mitigation Measures AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.
	B-29 **Implement CDFG protocol for burrowing owls.** In conformance with federal and State regulations regarding the protection of raptors, a	• SCE shall submit documentation providing results of the pre-	• Project activities do not disturb identified	Prior to and during

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	construction burrowing owl habitat assessment to the CPUC and FS for review and approval. • If suitable habitat exists, SCE will submit a copy, at least thirty (30) days prior to construction, of ground squirrel colony maps and the results of the burrowing owl survey, to the CPUC and FS for review and approval. • SCE's designated biologist will monitor compliance to ensure occupied burrows are not disturbed during the nesting season, new burrows and previously occupied burrows are not re-occupied, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	areas. • Minimize disturbance to burrowing owls, as verified by the EM.	construction.
B-30: The Project would result in the loss of occupied California spotted owl habitat.	Mitigation Measures AQ-1a, B-1a, and B-3a, above.	Refer to AQ-1a, B-1a, and B-3a, above.	Refer to AQ-1a, B-1a, and B-3a, above.	Refer to AQ-1a, B-1a, and B-3a, above.
	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~~	• SCE shall submit documentation providing pre-construction survey results to the CPUC and FS review and approval. • The resume of the proposed	• Project activities do not disturb nest sites. • Minimize disturbance to the spotted owl, as verified by the EM.	Protocol surveys must be performed between February 1 and August 15,

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	~~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) ~~active protected activity center~~. No project-related activities will be allowed within these dates (February 1-August 15) or until chicks have fledged. 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.	biologists will be provided to the CPUC and FS for approval. • SCE's designated biologist shall monitor compliance to ensure previously occupied nests are not re-occupied, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.		prior to construction. Monitoring will occur during construction.
B-31: The Project could disturb nesting California spotted owls.	Mitigation Measures AQ-1a, B-1b, and B-30 ~~and AQ-1a~~, above.	Refer to AQ-1a, B-1b, and B-30 ~~and AQ-1a~~, above.	Refer to AQ-1a, B-1b, and B-30, above. ~~Project activities do not disturb nest sites.~~ ~~Minimize disturbance to the spotted owl, as verified by the EM.~~	Refer to AQ-1a, B-1b and B-30, above. ~~Protocol surveys must be performed between February 1 and August 15, prior to construction. Monitoring will occur during construction.~~
B-32: The Project could disturb nesting avian "species of special concern."	Mitigation Measures AQ-1a, B-1a, B-1b, B-2, B-3a, and B-5 ~~and AQ-1a~~, above.	~~Please r~~Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, and B-5 ~~and AQ-1a~~, above.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, and B-5, above. ~~Successful avoidance of nesting birds, as verified by the EM.~~	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, and B-5, above. ~~Prior to and during construction.~~
B-33: The Project could result in mortality of, and loss of habitat for, special-status bat species.	Mitigation Measures AQ-1a, B-1a, B-1b, B-2, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, B-2, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, B-2, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, B-2, and B-3a, above.
	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	• SCE shall submit documentation providing pre-construction survey results to the CPUC review and approval.	• Project activities do not disturb identified (flagged) areas. • Minimize disturbance	Surveys for roosting bats must be performed 15

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	trees 12 inches in diameter or greater at 4.5 feet above grade with loose bark or other cavities) within 200 feet of project activities. SCE shall also conduct surveys for roosting bats during the maternity season (1 March to 31 July) 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 alternate~~mitigation~~ 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.	• The resume of the proposed biologists shall be provided to the CPUC and FS. • SCE's designated biologist shall monitor compliance to ensure previously occupied habitats are not re-occupied, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	to the roosting bat, as verified by the EM.	days prior construction activities, and surveys for roosting bats must be performed between1 March and 31 July, prior to construction. Monitoring will occur during construction.
	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 the FS~~ANF~~. 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	• SCE shall coordinate with CDFG, CPUC and FS to acquire and ensure provision of substitute habitats for roosting bats, if necessary. • SCE shall provide documentation of alternative habitat to the CDFG, CPUC and FS.	• Substitute habitat successfully established. • Minimize disturbance to the roosting bat, as verified by the EM.	Prior to and during construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	Under the direction of a qualified biologist, bats shall be safely evicted from trees or crevices within the grading footprint.	Avoid harming bats during the demolition period.	During construction.
B-35: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status mammals.	Mitigation Measures AQ-1a, B-1a, B-1b, B-2, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, B-2, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, B-2, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, B-2, and B-3a, above.
B-36: The Project could result in mortality of San Diego desert woodrats.	Mitigation Measures AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.
	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. 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	• SCE shall submit documentation providing pre-construction survey results to the CPUC and FS review and approval. • SCE's designated biologist shall monitor compliance to ensure	• Project activities do not disturb identified (flagged) areas. • Minimize disturbance to woodrats, as verified by the EM.	Prior to and during construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.	previously occupied nests are not re-occupied, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.		
B-37: The Project could result in mortality of, and loss of habitat for the ringtail.	<u>Mitigation Measures AQ-1a, B-1a, B-1b, B-3a, and H-1a, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-3a, and H-1a, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-3a, and H-1a, above/below.</u>	<u>Refer to AQ-1a, B-1a, B-1b, B-3a, and H-1a, above/below.</u>
	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.	• SCE shall submit documentation providing pre-construction survey results to the CPUC and FS review and approval. • SCE's designated biologist will monitor compliance to ensure previously occupied dens are not re-occupied, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	• Project activities do not disturb identified (flagged) areas. • Minimize disturbance to ringtail, as verified by the EM.	Prior to and during construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
B-38: The Project could result in mortality of American badgers.	Mitigation Measures AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.	Refer to AQ-1a, B-1a, B-1b, and B-3a, above.
	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.	• SCE shall submit documentation providing pre-construction survey results for badgers to the CPUC and FS review and approval. • SCE's designated biologist shall monitor compliance to ensure previously occupied dens are not re-occupied, and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis.	• Project activities do not disturb identified (flagged) areas. • Minimize disturbance to badgers, as verified by the EM.	Prior to and during construction.
B-39: The Project could result in the loss of wetland habitats.	Mitigation Measures AQ-1a, B-1a, B-1b, B-2, B-3a, B-12, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-12, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-12, and H-1a, above/below.	Refer to AQ-1a, B-1a, B-1b, B-2, B-3a, B-12, and H-1a, above/below.
B-42: The Project would result in effects to Management Indicator Species.	Mitigation Measures AQ-1a, B-1a, B-1b, B-1c, B-2, B-3a, B-3b, B-3c, B-5, B-8b, B-9, B-30, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-1c, B-2, B-3a, B-3b, B-3c, B-5, B-8b, B-9, B-30, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-1c, B-2, B-3a, B-3b, B-3c, B-5, B-8b, B-9, B-30, H-1a, and H-1b, above/below.	Refer to AQ-1a, B-1a, B-1b, B-1c, B-2, B-3a, B-3b, B-3c, B-5, B-8b, B-9, B-30, H-1a, and H-1b, above/below.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
Cultural Resources				
C-1: Construction may diminish the integrity of properties eligible for the National Register of Historic Places.	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/~~-~~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.	• The CPUC, FS and SCE shall develop a Programmatic Agreement (PA) which will guide the resolution of adverse effects on historic properties. • The PA will be completed 30 days prior to the start of construction.	• Identify significant cultural resources. • Avoid or reduce impacts to significant cultural resources.	Prior to construction.
	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). Results of these inventories shall also be filed with 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.	• SCE shall conduct field surveys in preparation of a cultural resources inventory report which will include recommendations regarding eligibility for the NRHP. The report will be submitted to the CPUC and FS for approval.	• Identify significant cultural resources in the APE. • Avoid or reduce impacts to significant cultural resources.	Prior to construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	C-1c Avoid and Protect Cultural 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.	• SCE's professional archaeologist shall monitor and provide a copy of the monitoring reports to the CPUC and FS for review on a weekly basis. • Compliance with the Historic Properties Treatment Plan (see Mitigation Measure C-1d).	Avoid or reduce impacts to significant cultural resources.	Prior to and during construction.
	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. Consultation shall include direct contact with Native American tribal representatives to seek their views on 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	• Determine potentially eligible cultural resources that cannot be protected from direct impacts, and complete a significance evaluation. • Incorporate evaluation into the Historic Properties Treatment Plan (see Mitigation Measure C-1d).	• Identify significant and unavoidable impacts to cultural resources. • Minimize direct impacts to cultural resources.	Prior to and during construction.

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Impact	Measure	Monitoring Requirement	<u>Determination of</u> Effectiveness ~~Criteria~~	Timing of Action
	Treatment Plan).			
	C-1e Develop and Implement ~~a~~ Historic Properties/ Historic<u>al</u> 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) 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 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 HP/HRMP shall define and map all known significant properties affected, or potentially affected, by the Project, and shall identify the cultural values that contribute to their eligibility for the NRHP. <u>A</u> Construction Phase Management Plan shall be included that details how 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 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 HP/HRMP shall detail provisions for monitoring construction in these high-sensitivity	• SCE shall prepare a research design and a scope of work for data recovery or additional treatment of significant sites that cannot be avoided. • The HPTP shall map and define all known significant properties within 50 feet of the Project, and at a minimum will include the following elements: marking of ESAs, archeological monitoring, personnel training, and effectiveness reporting.	• Identify significant cultural resources in the APE. • Avoid or reduce impacts to significant cultural resources.	Prior to and during construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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, CPUC, appropriate Native Americans, and the SHPO prior to implementation. The 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 HP/HRMP shall specify that archaeologists and other discipline specialists con-ducting 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 or other actions to reduce adverse effects to the characteristics of each property that make it eligible for the NRHP. 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, 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. Information gathered during the evaluation phase and the research design element of the 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, appropriate sampling methods 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 HP/HRMP consistent with Mitigation Measure C-1e (Develop and	• SCE shall prepare a research design and a scope of work for data recovery or additional treatment of significant sites that cannot be avoided. • Compliance with the Historic Properties Treatment Plan (see Mitigation Measure C-1d).	• Identify significant and unavoidable impacts to cultural resources. • Avoid or reduce impacts to significant cultural resources.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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 HP/HRMP where monitoring is required (see Mitigation Measure C-1e, Develop and implement a Historic Properties/Historical Resources Treatment Plan). These locations and their boundaries shall be defined and mapped in the 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. 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	• SCE shall conduct full-time monitoring by a qualified archaeologist at all High-Sensitivity Areas and ESAs identified in the HPTP. • SCE shall conduct intermittent monitoring in areas of moderate archaeological sensitivity. • Compliance with the Historic Properties Treatment Plan (see Mitigation Measure C-1d). • SCE shall submit a monthly report to the CPUC and FS for the duration of construction.	• Identify potential impacts to cultural resources due to construction disturbance. • Avoid or reduce impacts to identified cultural resources.	During construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	<u>Determination of</u> Effectiveness ~~Criteria~~	Timing of Action
	investigations, or payment of compensatory damages in the form of non-destructive cultural resources studies or protection.			
	C 1h 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	• SCE shall complete training for all construction personnel. • SCE shall provide to the CPUC and FS a list of construction personnel who have completed the cultural resources identification training prior to start of construction.	Avoid or reduce impacts to identified cultural resources.	During construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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 without first participating in the 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 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 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 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	• SCE shall develop a long-term plan to protect NRHP-eligible sites from direct impacts, and shall submit the plan to the CPUC and FS for review and approval 30 days prior to operation. • Compliance with the Historic Properties Treatment Plan (see Mitigation Measure C-1d). • SCE shall monitor annually and submit a monitoring report prepared by professional archaeologist for five years following completion of Project construction. • If the annual monitoring program identifies adverse effects to NRHP-eligible properties from operation or long-term presence of the Project, SCE shall notify the CPUC and FS immediately and implement mitigation measures.	Prevent direct impacts to cultural resources.	Post-construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	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.			
C-2: Native American human remains could be uncovered, exposed, and/or damaged during Construction.	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 to comply with NAGPRA. SCE shall comply with all relevant Public Resource Codes and Health and Safety Codes regarding the discovery and handling of human remains, shall support consultation with Native Americans and appropriate agencies and commissions, and shall comply with and implement actions and studies as directed by the CPUC, USACE, and/or Forest Service.	SCE shall monitor compliance during construction.	Avoid or reduce impacts to Native American human remains.	During construction.
Environmental Contamination and Hazards				
E-2: Excavation or grading could result in mobilization of existing soil or groundwater contamination from known sites	E-2a Perform Phase I ESAs Along Existing Transmission Line Rights-of-Way (ROWs). SCE shall conduct Phase I Environmental Site Assessments (ESAs) within a 0.25-mile corridor along the segments identified below to determine whether there is a record of hazardous material contamination which would affect construction activities. This investigation will determine the likelihood of on-site contamination and shall identify the need for further investigation and/or remediation of soil or groundwater within areas of ground disturbance for the Project. For example, if there would be little or no human contact with contaminated materials by avoidance of the area or because no excavation is required during construction, no further mitigation would be required. However, if Project construction activities would involve human contact with	• SCE shall submit Phase I ESAs (for the five areas identified in the measure) to the CPUC and FS. • SCE shall monitor compliance and ensure Mitigation Measure E-2b shall be implemented if necessary.	Avoid or reduce potential mobilization of existing contamination.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	contaminated materials that could potentially affect the health or safety of workers or the public during construction of the Project, then Mitigation Measure E-2b (Perform Phase II Investigations for potentially contaminated sites) shall be implemented. - Segment 7 from S7 MP 1.8 to MP 15.8 - Segment 8A from S8A MP 2.2 to MP 7.0, S8A MP 15.2 to MP 15.5, S8A MP 24 to 35.2 - Segment 8B from S8B MP 0.0 to MP 6.8 - Segment 8C from S8C MP 0.0 to MP 6.4 - Segment 11 from S11 MP 26 to MP 36.2			
	E-2b Perform Phase Ii Investigations for Potentially Contaminated Sites. Phase II Environmental Site Investigations (ESIs) shall be performed on sites that have been determined by the Phase I ESAs performed under APM HAZ-1 and Mitigation Measure E-2a (Perform Phase I ESAs along existing transmission line rights-of-way) to be potentially contaminated. If it is determined that disturbance or excavation of contaminated soils or groundwater would occur during construction at a given site, SCE would undertake a Phase II ESI involving sampling and further characterization of potentially contaminated areas within the Project ROW or reroute the line away from the contamination area. Should further investigation reveal high levels of hazardous materials, SCE would mitigate health and safety risk according to Los Angeles County Certified Unified Program Agency (CUPA) or Regional Water Quality Control Board (RWQCB) regulations or requirements. This would include site-specific Health and Safety Plans, Work Plans, and/or Remediation Plans.	SCE shall submit Phase II ESIs as required by APM HAZ-1 and Mitigation Measure E-2a to the CPUC and FS.	Avoid or reduce potential mobilization of existing contamination.	Prior to and during construction.
E-3: 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.	**E-3a Determine if Landfill Gases are Present.** To assess the likelihood that contamination from identified landfills could be present in the Project alignment construction zone, SCE shall complete a search of landfill records, plans, maps and gas monitoring to determine the limits of landfill waste and landfill gas plume for all landfills listed below. For all locations at which the records review cannot confirm a gas-free landfill perimeter adjacent to the Project construction zone, a soil vapor survey shall be conducted. The soil vapor survey shall consist of driving probes in areas of proposed excavation and grading activities along the transmission line corridors and substation sites. Vapor samples shall be tested for methane, other flammable gases, and volatile organic compounds. Laboratory test results shall be reported to the Department of Toxic Substances Control (DTSC) or the appropriate County Environmental Health Division and shall include an assessment of the contamination potential in the excavation area.	• SCE shall complete a search of landfill records, plans, maps and gas monitoring to determine the limits of landfill waste and landfill gas plume for all landfills listed. • Documentation of all site research and a copy of the Los Angeles CUPA approval letter shall be provided to the CPUC and FS.	Avoid or reduce potential encounters with landfill gases.	Thirty (30) days prior to construction.

Table G.1-2. Mitigation Monitoring Program

<table>
<tr><th>Impact</th><th>Measure</th><th>Monitoring Requirement</th><th>Determination of Effectiveness ~~Criteria~~</th><th>Timing of Action</th></tr>
<tr><td></td><td>Documentation of all site research and a copy of the Los Angeles CUPA approval letter shall be provided to the CPUC at least 30 days prior to the start of construction within the appropriate Project segment.

Landfill Sites Near Project Alignment
<table>
<tr><th>Segment</th><th>Milepost</th><th>Corresponding EDR Site ID No.</th></tr>
<tr><td>Segment 7</td><td>MP 2</td><td>35</td></tr>
<tr><td>Segment 7</td><td>MP 4.2</td><td>47</td></tr>
<tr><td>Segment 7</td><td>MP 4.3-4.4</td><td>50-52, 56</td></tr>
<tr><td>Segment 7</td><td>MP 4.7-4.9</td><td>62, 64</td></tr>
<tr><td>Segment 7</td><td>MP 10.8</td><td>165</td></tr>
<tr><td>Segment 7</td><td>MP 14.2-14.5</td><td>185, 193</td></tr>
<tr><td>Segment 7</td><td>MP 14.8-15.8</td><td>0</td></tr>
<tr><td>Segment 8A</td><td>MP 4.8-6.0</td><td>207</td></tr>
<tr><td>Segment 8B</td><td>MP 0.3</td><td>254</td></tr>
<tr><td>Segment 8B</td><td>MP 4.4</td><td>219</td></tr>
</table></td><td></td><td></td><td></td></tr>
<tr><td></td><td>E-3b Implement Personnel Safety and Monitoring Measures. If laboratory tests indicate the presence of landfill gases in the construction areas, a Health and Safety Plan shall be developed by a licensed industrial hygienist and a gas monitoring program shall be implemented by SCE or its contractors. A Health and Safety Plan shall also be developed for work in areas within 500 feet of active, inactive or abandoned oil wells that includes requirements for gas monitoring of excavations. A copy of the Health and Safety Plan and monitoring program shall be submitted to the appropriate CUPA agency and the CPUC at least 30 days prior to the start of construction within the appropriate Project segment.</td><td>• SCE shall submit a copy of the Health and Safety Plan to the CPUC and FS for review and approval.
• If personnel training is included in the Health and Safety Plan, completed sign-in sheet(s) with date, name, and signature of attendees (construction, operations and maintenance staff) will be provided to the CPUC and FS.</td><td>No soil or groundwater is contaminated as a result of improper handling and/or storage of hazardous materials during construction, as verified by the EM.</td><td>Thirty (30) days prior to and during construction.</td></tr>
</table>

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	E-3c Verify Location and Status of Abandoned Oil and Natural Gas Wells. Prior to excavation and construction activities, SCE shall contact the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) for specific information on wells located within 500 feet of the transmission line route, including location and abandonment details. SCE shall avoid construction near (within 50 feet) abandoned oil or gas wells. If a tower or trench is located within 50 feet of a plugged or abandoned well, SCE shall coordinate with DOGGR and provide written confirmation to the CPUC that the well has been correctly abandoned and does not require remedial plugging or the installation of a gas venting system. If an unrecorded well is encountered during construction, SCE shall stop construction and notify DOGGR immediately. Although SCE would not be responsible to properly abandon oil wells in the vicinity of the ~~proposed~~ Project, construction at the location will resume only after SCE provides the CPUC with written confirmation that the well has been correctly abandoned and does not require remedial plugging or the installation of a gas venting system.	• SCE shall obtain specific information from the DOGGR regarding wells located within 500 feet of the Project. • For wells located within 50 feet of the Project, SCE shall coordinate with DOGGR and provide written confirmation to the CPUC that the well has been correctly abandoned. • If an unrecorded well is encountered during construction, SCE shall stop construction and notify DOGGR. • CPUC will monitor for compliance.	• Unexpected wells are not encountered during the construction period. • Proper procedures are implemented if an unexpected well is encountered.	Prior to and during construction.
E-4: Unanticipated preexisting soil and/or groundwater contamination could be encountered during excavation or grading.	E-4a Appoint Individuals With Correct Training for Sampling, Data Review, and Regulatory Coordination. In the event that potential contaminated soil or groundwater is encountered during construction activities, samples shall be collected by an Occupational Safety and Health Administration (OSHA) trained individual with a minimum of 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) worker training. Laboratory data from suspected contaminated material shall be reviewed by the contractor's Health and Safety Officer and/or SCE's Field Environmental Representative and they shall coordinate with the appropriate regulatory agency (RWQCB or local CUPA agency) if contamination is confirmed, to determine the suitable level of worker protection and the necessary handling and/or disposal requirements.	• In the event that potential contaminated soil or groundwater is encountered during construction activities, samples shall be collected by an OSHA trained individual. • If contamination is confirmed, SCE shall coordinate with the appropriate regulatory agency.	Determine the suitable level of worker protection.	During construction.
	E-4b Document Compliance With APM HAZ-3. If the visual or olfactory evidence of contamination in the exposed soil is observed during grading or excavation work, the location and the potential contamination, results of laboratory testing, recommended remediation (if contamination is verified), and actions taken shall be documented in a report and submitted to the CPUC and FS (for NFS lands) for each event. This report shall be submitted within 30 days of receipt of laboratory data.	• If contamination is observed during grading or excavation work, a report documenting compliance with APM HAZ-3 must be submitted to the CPUC and FS within 30 days of receipt of laboratory data.	Determine the suitable level of worker protection.	During construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
E-6: Excavation or grading could result in mobilization of existing soil contamination or encountering ordnance from known~~associated with~~ munitions testing and disposal ~~explosives from known~~ sites.	E-6a Provide Ordnance Recognition Training (Alts 4c, 4c Modified, & 4d Only). SCE shall conduct training of all site personnel assigned to Alternative 4, Route C, Route C Modified, or Route D to recognize ordnance and, if possible, associated soil contamination. The training program shall be developed in consultation with Aerojet General and Cal EPA (DTSC). In addition, construction superintendents shall observe and direct all grading and excavation work along Alternative 4, Route C , Route C Modified, and Route D.	• SCE shall complete training for all construction personnel. • SCE shall provide to the CPUC completed sign-in sheet(s) with date, name, and signature of attendees (construction, operations and maintenance staff).	Avoid or reduce potential mobilization of existing contamination.	Prior to and during construction.
	E-6b Detect And Remove MEC From Access Roads (Alts 4c, 4c Modified, & 4d Only). SCE shall develop plans of access roads required to construct Route C, Route C Modified, or Route D. The plans shall be reviewed with the DTSC conceptual model of areas having or potentially having munitions and explosives of concern MEC. All access roads with potential to encounter MEC shall be evaluated by trained munitions specialists to detect and remove any MEC within existing or proposed access roads. MEC removal and disposal is under the jurisdiction of DTSC and, if required, shall be coordinated with DTSC and Aerojet General.	• SCE shall submit plans of access roads required to construct Route C or Route D to the CPUC.	Avoid encounters with MECs.	Prior to construction.
Geology, Soils, and Paleontology				
G-1: Project activities could interfere with access to known energy resources.	G-1 Coordination With Oil Field Operations. Operations and management personnel for the oil fields shall be consulted regarding access requirements, and SCE and its contractors shall coordinate construction activities across and along necessary oil field access roads in a manner to limit interference with oil field operations. A plan to avoid or minimize interference with oil field operations shall be prepared in conjunction with oil field operators prior to construction. SCE shall document compliance with this measure by submitting the plan to the CPUC for review 30 days prior to the start of construction in the affected Project segments.	• SCE and its contractors shall coordinate construction activities across and along necessary oil field access roads. • SCE shall submit a plan to the CPUC and FS documenting compliance 30 days prior to construction.	Minimize interference with oil field operations.	Prior to, during, and after construction.
G-2: Erosion could be triggered or accelerated due to construction activities.	Mitigation Measure H-1a, below.	Refer to H-1a, below.	Refer to H-1a, below.	Refer to H-1a, below.
G-3: Excavation and grading during construction activities could cause slope instability or trigger landslides.	G-3 Conduct Geological Surveys for Landslides and Protect Against Slope Instability. Design-level geotechnical investigations performed by SCE shall include geological surveys for landslides that will allow identification of specific areas with the potential for unstable slopes, landslides, earth flows, and debris flows along the approved transmission line route and in other areas of ground disturbance, such as access and spur roads and staging and work areas. The geotechnical investigations shall evaluate subsurface conditions, identify potential hazards, and provide information for development of excavation plans and procedures. If the	• Thirty (30) days prior to construction, SCE shall submit a geologic/geotechnical report to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance at construction areas.	Project construction activities do not cause slope instabilities, as verified by the EM.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	results of the geotechnical survey indicate the presence of unstable slopes at or adjacent to Project structures, appropriate support and protection measures shall be designed and implemented to maintain the stability of slopes adjacent to newly graded or re-graded access and spur roads, work areas, and Project structures during and after construction, and to minimize potential for damage to Project facilities. These design measures shall include, but are not limited to, retaining walls, visqueen, removal of unstable materials, and avoidance of highly unstable areas. Appropriate construction methods and procedures, in accordance with State and federal health and safety codes, shall be followed to protect the safety of workers and the public during drilling and excavation operations. SCE shall document compliance with this measure by submitting a report to the CPUC and FS (for NFS lands) for review at least 30 days prior to final Project design. The report shall document the investigations and detail the specific support and protection measures that will be implemented. Additionally, along Segment 8A (between approximately S8A MPs 5.4 and 6.6), where portions of the proposed project alignment and associated access roads are located adjacent to the Puente Hills Landfill in an area where known slope stability issues and landslides are present, SCE shall coordinate with the County Sanitation Districts of Los Angeles County (LACSD) regarding known landslides and landslide repairs along the southwestern boundary of the landfill and shall submit the geological survey and slope stability reports, including recommended support and protection measures for Segment 8 to the LACSD for review at least 30 days prior to final project design.			
G-4: Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards.	G-4 ~~Minimize~~ Avoid Placement of Project Structures Within Active Fault Zones. Prior to final Project design SCE shall perform a fault evaluation study to confirm the location of mapped traces of active and potentially active faults crossed by the Project route or other Project structures. For crossings of active faults, the Project design shall be planned so as not to locate towers or other Project structures on the traces of active faults; and in addition, Project components shall be placed as far as feasible outside the areas of mapped fault traces. Compliance with this measure shall be documented to the CPUC and FS in a report submitted for review at least 60 days prior to the start of construction.	• Sixty days prior to construction, SCE shall submit a fault evaluation study to the CPUC and FS for review and approval. • CPUC and/or FS will verify tower placement and monitor for compliance.	Project components at fault crossings are not damaged by surface fault ruptures.	Prior to, during, and after construction.
G-5: Project structures could be damaged by seismically induced groundshaking and/or ground failure exposing people or structures to	G-5a Reduce Effects of Groundshaking. The design-level geotechnical investigations performed by SCE shall include site-specific seismic analyses to evaluate ~~the peak~~ ground accelerations for design of Project components. Based on these findings, Project structure designs shall be modified/strengthened, as deemed appropriate by the Project engineer, if the anticipated seismic forces are found to be greater than standard design	• Prior to construction, SCE shall submit a geologic/geotechnical report, including site-specific seismic analyses and specific requirements to mitigate damage to Project components from seismic activity, to	• Seismic requirements specified in the geologic/geotechnical report are applied, as verified by the EM. • Seismic activity, such	Prior to, during, and after construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
hazards.	load stresses on Project structures. Study results and proposed design modifications shall be provided to the CPUC and FS for review at least 60 days before final Project design.	the CPUC for review and approval. • CPUC /FS will monitor compliance during construction.	as groundshaking, does not damage Project components.	
	G-5b Conduct Geotechnical Investigations for Liquefaction. Because seismically induced liquefaction-related ground failure has the potential to damage or destroy Project components, the design-level geotechnical investigations to be performed by SCE shall include investigations designed to assess the potential for liquefaction to affect the approved Project and all associated facilities, specifically at tower locations in areas with potential liquefaction-related impacts (portions of Segments 5, 7, 11, 8A, 8B, and 8C underlain by alluvium with the potential for shallow groundwater). Where these hazards are found to exist, appropriate engineering design and construction measures shall be incorporated into the Project designs as deemed appropriate by the Project engineer. Design measures that would mitigate liquefaction-related impacts could include construction of pile foundations, ground improvement of liquefiable zones, installation of flexible bus connections, and incorporation of slack in cables to allow ground deformations without damage to structures. Study results and proposed solutions to mitigate liquefaction shall be provided to the CPUC and FS for review at least 60 days before final Project design.	• Sixty (60) days prior to construction, SCE shall submit a geologic/geotechnical report, providing engineering design and construction measures to minimize impacts to the Project from liquefaction, to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance during construction.	• Engineering design and construction measures recommended in the geologic/ geotechnical report are applied, as verified by the EM. • Liquefaction does not damage Project components.	Prior to, during, and after construction.
G-6: Project structures could be damaged by problematic soils exposing people or structures to hazards.	G-6 Conduct Geotechnical Studies to Assess Soil Characteristics and Aid in Appropriate Foundation Design. The design-level geotechnical studies to be performed by SCE shall identify the presence, if any, of potentially detrimental soil chemicals, such as chlorides and sulfates. Appropriate design measures for protection of reinforcement, concrete, and metal-structural components against corrosion shall be utilized, such as use of corrosion-resistant materials and coatings, increased thickness of Project components exposed to potentially corrosive conditions, and use of passive and/or active cathodic protection systems. The geotechnical studies shall also identify areas with potentially expansive or collapsible soils and include appropriate design features, including excavation of potentially expansive or collapsible soils during construction and replacement with engineered backfill, ground-treatment processes, and redirection of surface water and drainage away from expansive foundation soils. Studies shall conform to industry standards of care and American Society for Testing and Materials (ASTM) standards for field and laboratory testing. Study results and proposed solutions shall be provided to the CPUC and FS, as appropriate, for review at least 60 days before final Project design.	• Sixty (60) days prior to construction, SCE shall submit a geologic/geotechnical report to the CPUC and FS for review and approval, including identification of potentially detrimental soil chemicals along the Project alignment and design measures to protect against corrosion and ensure stable foundations. • CPUC and/or FS will monitor compliance during construction.	• Engineering design measures recommended in the geologic/ geotechnical report are applied, as verified by the EM. • Corrosive, expansive, or collapsible soils do not damage Project components.	Prior to, during, and after construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
G-7: Transmission line structures could be damaged by landslides, earth flows, or debris slides, during operation.	Mitigation Measure G-3, above.	Refer to G-3, above.	Refer to G-3, above. ~~Project structures are not damaged by landslides and slope instabilities, as verified by the EM~~	Refer to G-3, above. ~~Prior to and during construction.~~
G-9: Existing structures could be damaged by ground settlement along the tunnel exposing people or structures to hazards.	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).** The potential for ground subsidence to occur during tunneling should be identified during design, and will identify Project-specific trigger levels that would require corrective action should subsidence occur. The settlement analysis would evaluate conditions along the tunnel alignment and at and adjacent to the proposed access shafts. Development and implementation of a Subsidence Monitoring Program is standard practice during construction of large diameter tunnels and access shafts in urban areas. As determined to be necessary, SCE or the tunnel contractor shall implement a subsidence monitoring program during shaft excavation and tunneling to detect subsidence, including measurements of groundwater levels, surface and subsurface settlement, ground movement and displacement, and movement in existing infrastructure as needed. SCE or the contractor will implement corrective actions, such as additional advance grouting or increased tunnel support, if measured displacement reaches the specified trigger levels. In addition, the Project specifications will require that the contractor conduct the tunneling process under pressure at all times to prevent soil loss and the development of narrow chimneys that may migrate to the surface. The results of the geotechnical analysis of settlement, Subsidence Monitoring Plan, and the relevant construction specifications shall be provided to the CPUC for review and approval at least 60 days prior to the start of construction (shaft excavation).	• Sixty (60) days prior to construction, SCE shall submit the settlement analysis, the Subsidence Monitoring Program, and relevant construction specifications to the CPUC for review and approval. • CPUC and/or FS will monitor compliance during construction.	Avoid damage to existing structures.	Prior to and during construction.
Hydrology and Water Quality				
H-1: Construction activities would degrade surface water quality through erosion and sedimentation.	Mitigation Measure B-2, above.	Refer to B-2, above.	Refer to B-2, above.	Refer to B-2, above.
	H-1a **Implement an Erosion Control Plan and Demonstrate Compliance With Water Quality Permits.** SCE shall develop and submit to the CPUC and FS for approval 30 days prior to construction an Erosion Control Plan, and implement Best Management Practices (BMPs), as described below. (Note: The Erosion Control Plan may be part of the same document as the Stormwater Pollution Prevention Plan.) Within the Erosion Control Plan, the applicant shall identify the location of all soil-disturbing activities, including	• SCE shall submit an Erosion Control Plan and Sediment Transport Plan, including the BMPs contained in this mitigation measure, to the CPUC and FS for review and approval. This erosion control plan will be included in the Project SWPPP.	• BMPs included in the SWPPP are applied, as verified by the EM. • Avoid degradation of surface water quality.	Thirty (30) days prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	<u>Determination of</u> Effectiveness ~~Criteria~~	Timing of Action
	but not limited to new and/or improved access and spur roads, the location of all streams and drainage structures that would be directly affected by soil-disturbing activities (such as stream crossings by access roads), and the location and type of all BMPs that would be installed to protect aquatic resources. The Erosion Control Plan shall include a proposed schedule for the implementation and maintenance of erosion control measures and a description of the erosion control practices, including appropriate design details. As part of the Erosion Control Plan, SCE shall maintain a logbook of all precipitation events within the Project area that produce more than one inch of precipitation within a 24-hour period. The logbook shall contain the date of the precipitation event, the approximate duration of the event, and the amount of precipitation (measured as the largest amount recorded by a rain gage or weather station within one mile of the Project). Additionally, the logbook shall include a narrative evaluation (and/or a numerical evaluation, if required by the FS or other jurisdictional agency) of the erosion-prevention effectiveness of the existing BMPs, as well as a description of any post-storm modifications to those BMPs. The logbook shall be submitted to the CPUC and FS for review within 30 days following the first storm event (after construction has begun) that produces greater than one inch of precipitation within a 24-hour period. SCE shall re-submit the logbook annually after the first storm of the rainy season that produces more than one inch of precipitation within a 24-hour period. The logbook shall be retired 5 years after completion of construction. In addition to the Erosion Control Plan, the applicant shall submit to the CPUC and the FS evidence of possession of all required permits before engaging in soil-disturbing construction/demolition activities, before entering flowing or ponded water, or before constructing a crossing at flowing or ponded water. Such permits may include, but are not limited to, a Streambed Alteration Agreement from the California Department of Fish and Game, a Clean Water Act (CWA) Section 404 permit from the USACE, a CWA Section 402 NPDES General Permit for Storm Water Discharges Associated with Construction Activities (General Permit) from the applicable Regional Water Quality Control Board(s) (RWQCBs), and/or a CWA Section 401 certification from the applicable RWQCBs.<u> In addition, if construction-related excavation activities on National Forest System (NFS) lands encounter perched groundwater, triggering the need for dewatering activities to occur in compliance with Applicant-Proposed Measure HYD-6 (Drilling and Construction Site Dewatering Management), SCE shall notify the Forest Service at the onset of dewatering and, upon the completion of dewatering activities at the affected site(s), SCE shall submit to the Forest Service written description of all executed dewatering activities, including steps taken to return</u>	• The applicant shall submit to the CPUC and FS evidence of all required permits. • CPUC and/or FS will monitor compliance during construction.		

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	encountered groundwater to the subsurface.			
	H-1b Dry Weather Construction. Any construction activities within the ANF and/or Chino Hills State Park (CHSP) [CHSP is only included as part of this measure for Alternative 4 (Routes A through D)] shall be scheduled to avoid anticipated precipitation events that are predicted to produce more than one inch of precipitation over a 24-hour period, unless expressly authorized by the FS and/or California Department of Parks and Recreation (State Parks). If an unexpected precipitation event occurs while construction activities are already underway, SCE shall contact the FS and/or State Parks for guidance. The FS and/or State Parks may require cessation of construction activities within their jurisdiction during any precipitation event in order to prevent excessive erosion and to protect aquatic resources. ~~.~~ On NFS lands, SCE shall also observe any criteria promulgated by the FS regarding construction during precipitation events. SCE shall provide documentation to the CPUC monitor of all wet-weather coordination with the FS and/or State Parks.	• SCE shall submit a construction schedule to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance during construction.	• Construction activities will occur under dry conditions, as verified by the EM. • Avoid degradation of surface water quality.	Prior to and during construction.
H-2: Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials.	Mitigation Measure H-1b, above.	Refer to H-1b, above.	Refer to H-1b, above.	Refer to H-1b, above.
H-4: Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows.	Mitigation Measure H-1a, above.	Refer to H-1a, above.	Refer to H-1a, above.	Refer to H-1a, above.
H-5: Project structures would be inundated by mudflow.	Mitigation Measure G-3, above.	Refer to G-3, above.	Refer to G-3, above.	Refer to G-3, above.
H-6: Discharge of contaminated groundwater during dewatering operations would degrade surface water quality.	Mitigation Measure H-1a, above. (ALT 5 ONLY)	Refer to H-1a, above.	Refer to H-1a, above.	Refer to H-1a, above.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
Land Use				
~~Pro~~L-1: Construction of the Project would temporarily disrupt, displace, or preclude existing residential land uses.	L-1a Construction Liaison – Property Owners. SCE shall provide a toll-free general phone number, and the name and contact information for a local public liaison (or liaisons) to all affected property owners within 300 feet of construction-related activities. The toll-free access number and the identified local public liaison(s) shall act as ~~the single~~ points of contact and interface between residents and construction crews for that area. The toll-free number and local public liaison(s) shall be available both in person and by phone, as necessary, for at least 14 days prior to the start of any construction-related activities and for up to six months following construction. The local public liaison(s) shall respond to all construction-related questions and concerns within a 72-hour period during construction when contact information is provided. Post-construction, replies shall be made within a two-week period. SCE shall provide summary documentation of all complaints, comments, and concerns communicated to the liaison every two months for the duration of construction and for one year following the completion of construction. The compliance documentation shall include the name and address of the person contacting the local public liaison(s), the date of contact, and what actions were taken by the local public liaison(s) to rectify and/or address the complaints, comments or concerns expressed. The compliance documentation shall be submitted to the CPUC throughout the duration of construction and for one year following construction.	• At least 60 days prior to construction, SCE shall submit documentation to the CPUC and FS describing the coordination efforts with property owners. • SCE shall provide documentation of all complaint, comments and concerns every two months for the duration of construction and for one year following the completion of construction. • CPUC and/or FS will monitor compliance during construction.	• Impacts to property owners are avoided. • Property owners' complaints, comments and concerns are addressed.	Prior to and during construction, and during operation.
	L-1b Advance Notification of Construction – Property Owners. SCE shall give at least 14 days advance notice of the start of any construction-related activities to potentially affected property owners. The notification shall include the toll-free general phone number, contact information for the local public ~~construction~~ liaison(s) (Mitigation Measure L-1a, Construction liaison – Property owners), including a phone number (or phone numbers), as well as an internet website address where additional information related to construction can be found. Notification shall be provided by: (1) mailing notices to all property owners within 300 feet of all approved ROW segments, construction-related work areas, and substation sites; and, (2) placing notices in local newspapers.	• SCE shall submit copies of all notices to the CPUC and FS for review and approval. • SCE shall submit proof of publication of notices in local newspapers to the CPUC and FS.	Residential and commercial uses along the transmission line route are notified of construction activities, as verified by the EM.	Prior to and during construction.
	L-1c Quarterly Construction Updates – Property Owners. Following publication/transmittal of the advance notification of construction (Mitigation Measure L-1b, Advance notification of construction – Property owners), SCE shall provide all affected property owners with updates and changes to all of the information provided in the pre-construction notification as related to their Segment-specific location. The updates shall be provided every quarter	• SCE shall submit copies of all notices to the CPUC and FS for review and approval. • SCE shall submit proof of publication of notices in local newspapers to the	Residential and commercial uses along the transmission line route are notified of construction activities, as verified by the EM.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	for the duration of all construction-related activities. ~~Post, including p~~Post-construction noticing for restoration activities shall be provided annually. The updates shall continue to provide the toll-free number and the name and phone number of the local public liaison(s) ~~an SCE-employed representative~~ to respond to all construction-related questions and concerns. The local public liaison(s) ~~SCE-employed representative~~ shall continue to respond to all questions and complaints within a 72-hour period during construction and within two weeks~~,~~ post-construction (Mitigation Measure L-1a, Construction liaison – Property owners). The updates shall be: (1) mailed to all property owners within 300 feet of all approved ROW segments, construction-related work areas, and substation sites; (2) placed in local newspapers; and, (3) posted on the Project's Internet website (Mitigation Measure L-1b).	CPUC and FS.		
L-2: Construction of the Project would temporarily disrupt, displace, or preclude existing non-residential land uses.	Mitigation Measures L-1a through L-1c, above.	Refer to L-1a through L-1c, above.	Refer to L-1a through L-1c, above.	Refer to L-1a through L-1c, above.
	L-2a Construction Plan Provisions – Non-Residential Property Owners. SCE shall incorporate provisions into its construction plans and schedules to minimize the length of time that construction-related activities occur in areas actively used for non-residential purposes, such as commercial and service uses, industrial uses, public/special uses, and educational facilities. SCE shall ensure that all affected non-residential property owners within 300 feet of the ROW are always provided with at least one point of vehicular (passenger car and truck) and pedestrian access to their respective properties throughout all phases of construction. Immediately following the completion of construction, SCE shall ensure that all affected non-residential properties and uses affected by construction outside of the ROW are fully restored to their pre-construction conditions.	• SCE shall submit incorporated provisions to the CPUC and FS for review and approval. • SCE shall ensure that all affected non-residential properties and uses are fully restored to their pre-construction conditions.	• Minimize construction-related disruptions to non-residential uses along the transmission line route, as verified by the EM. • Pre-construction conditions are restored.	Prior to and during construction.
	L-2b Aircraft Flight Path and Safety Provisions and Consultations ~~Property Owners~~. Prior to construction, SCE shall consult with the Federal Aviation Administration (FAA) and ensure the filing of all forms and associated specifications per the requirements of Federal Aviation Regulations (FAR) Title 14, Part 77. In addition, prior to the start of construction, SCE shall consult with all affected Airport Land Use Commissions (or their alternative process) and the FS to ensure that construction, operation, and maintenance of the Project does not conflict with local aircraft operations or associated safety provisions.	• SCE shall submit documentation of the coordination efforts with the FS, FAA and the Airport Land Use Commissions to the CPUC and FS.	Avoid interference with aircraft operations.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
L-4: Operation and maintenance of the Project would cause long-term disruption of existing and planned non-residential land uses.	L-4 Consult With Federal, State, and Local Agencies. Prior to construction, SCE shall consult with all federal, State, and local agencies, including local agency consortiums, having jurisdiction over lands within one-half mile of the Project's ROW and ancillary facilities to ensure that no permanent restrictions or preclusions of their land management practices occur. The SCE shall additionally ensure that a liaison to these agencies is available for the operational life of the Project to address and reconcile any future potential conflicts with land management practices. SCE will provide affected agencies with the name and contact information of the liaison and update that contact information as necessary.	SCE shall submit documentation of this coordination to the CPUC and FS.	Coordination efforts will minimize the potential for long-term disruption of existing and planned non-residential land uses.	Prior to and during operation.
L-5: Construction, operation or maintenance of the Project would conflict with relevant federal, State, or local land use plans, goals, or policies.	Mitigation Measures L-2b and L-4, above.	Refer to L-2b and L-4, above.	Refer to L-2b and L-4, above.	Refer to L-2b and L-4, above.
Noise				
N-1: Construction noise would substantially disturb sensitive receptors.	N-1a Implement Best Management Practices for Construction Noise. SCE shall implement the following noise-suppression techniques, at a minimum, to avoid possible violations of local rules, standards, and ordinances during construction: • On construction equipment, use noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer. • Install temporary sound walls or acoustic blankets around stationary noise sources (e.g., generators, pumps) to shield adjacent sensitive receptors. Where feasible, these sound walls or acoustic blankets shall have a height of no less than 8 feet, a Sound Transmission Class (STC) of 27 or greater, and a surface with a solid face from top to bottom without any openings or cutouts. • Minimize unnecessary construction vehicle idling time (see also Mitigation Measure AQ-1g: Restrict diesel engine idling to 5 minutes). The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. A "common sense" approach to vehicle use shall be applied; if a vehicle is not required for use immediately or continuously for construction activities, its engine shall be shut off. (Note: certain equipment, such as large diesel powered vehicles, require extended idling for warm-up and repetitive construction tasks and would therefore	CPUC and/or FS will monitor compliance during construction.	• Noise levels in along the project route are minimized, as verified by the EM. • Few if any complaints are received from residents and businesses.	During construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	not be subject to being shut off when not in use.)			
	N-1b Avoid Sensitive Receptors During Mobile Construction Equipment Use. SCE shall route all construction traffic and helicopter flight away from residences, schools, and recreational facilities to the maximum extent feasible.	CPUC and/or FS will monitor compliance during construction.	• Noise levels in the vicinity of sensitive receptors are minimized, as verified by the EM. • Few if any complaints are received from residents and businesses.	Prior to and during construction.
N-2: Construction noise levels would violate local standards.	Mitigation Measures N-1a, ~~and~~ N-1b, and L-2b above.	Refer to N-1a, ~~and~~ N-1b, and L-2b, above.	~~Please r~~Refer to N-1a, ~~and~~ N-1b, and L-2b, above.	Refer to N-1a, N-1b, and L-2b, above.~~Prior to and during construction.~~
Public Services and Utilities				
PSU-1: Emergency services would be needed if an accident or other emergency incident occurs at a construction site.	Mitigation Measure F-1, below.	Refer to F-1, below.	Refer to F-1, below.	Refer to F-1, below.
	PSU-1a Revise SCE's ~~Transmission Line~~ Fire Management Plan. Appendix D of the Proponent's Environmental Assessment (PEA) includes ~~a~~ the Transmission Line Project Fire Plan to reduce the risk of igniting a fire during construction and operation as well as controlling the spread of a fire should one occur. The Plan shall be revised with the following provisions and submitted to the CPUC and FS no less than 60 days prior to construction: • The Smoking and Fire Rules require the Constructor to designate smoking areas "…in a barren area or in an area cleared to mineral soil at least three feet in diameter." SCE shall revise the Plan to mandate that these smoking areas are located at a radius of at least 50 feet from all hazardous material, gas and oil storage areas, and equipment service areas. • In Section 1.6 of the Fire Plan, Precautions in Areas of Fire Hazards, SCE shall designate Critical Protection Sites. In particular, these sites will be areas associated with dry habitats, chaparral vegetation, inhabited property, and a considerable history of wildfires. Designations of these sites inform construction crews of the need for the precautions noted in Section 1.6, which include the following: prohibit smoking on the jobsite; require the use of spark arrestors on equipment exhaust; designation of a Fire Patrolperson whose responsibility shall be solely to monitor the	• SCE shall submit the revised Fire Management Plan to the CPUC and FS. • CPUC and/or FS will monitor compliance during construction.	Minimize potential for wildfires.	Sixty (60) days prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	Constructor's fire prevention activities; require portable firefighting equipment, shovels, axes, and other necessary firefighting equipment; and observe all other precautionary measures that may be ordered by the FS, Division of Forestry of the State, and County Fire Departments.			
	PSU-1b Review of Construction Methods by County Fire Departments. SCE shall coordinate with the Kern, Los Angeles, and San Bernardino County Fire Departments to review the specific construction methods and equipment, and identify any additional requirements that will minimize the potential for wildfires. Prior to construction, SCE shall include documentation of this coordination in the Transmission Line Project Fire Plan, and submit the Plan to the CPUC, FS (for NFS lands), and the county fire departments no less than 60 days prior to the start of construction, such as the following: • Any motor, engine, welding equipment, cutting torch, grinding device or equipment from which a spark, fire, or flame may originate shall not be used without first: (a) clearing away all flammable material for a distance of 10 feet, and (b) having on hand a round-point shovel with an overall length of not less than 46 inches and a fire extinguisher or water-filled backpack pump fully equipped and ready to use. This does not apply to power saws and other portable tools powered by a gasoline-fueled internal combustion engine (see next bullet). • Any portable gasoline-powered tool (chainsaws, etc.) shall not be used within 25 feet of any flammable materials without providing one round-point shovel with an overall length of not less than 46 inches or a fire extinguisher having a minimum rating of 2-BC. The fire tools must be unobstructed and within 25 feet of the tool operation at all times. Motor vehicles shall not be parked or operated outside of cleared work areas except for the specific purpose of clearing vegetation.	SCE shall submit documentation of this coordination to the CPUC and FS.	Coordination efforts will minimize the potential for wildfires.	Thirty (30) days prior to and during construction.
	PSU-1c Practice Safe Welding Procedures. SCE shall select a welding site that is free of native combustible material and/or clear the site of such material to minimize the fire hazard. All welding on supporting structures shall be performed during fabrication of the structures at the fabricator's yard, to the extent practicable.	CPUC and/or FS will monitor compliance.	Minimize presence of hazardous material at welding sites.	Prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	PSU-1d Fire Preventive Construction Equipment Requirements. SCE shall meet the following requirements for gasoline, diesel, or other hydrocarbon fuel-powered equipment prior to construction: • The exhausts of all equipment powered by gasoline, diesel, or other hydrocarbon fuel shall be equipped with effective spark arrestors. • The spark arrestor shall be designed to prevent the escape from the exhaust of carbon or other flammable particles over 0.0232 inches. Motor trucks, truck tractors, buses, and passenger vehicles (except motorcycles) shall not be subject to this provision if their exhaust systems are equipped with mufflers. • All welding rigs shall be equipped with a minimum of one 20-pound or two 10-pound fire extinguishers, and a minimum of five gallons of water in a fire-fighting apparatus.	SCE shall submit documentation of compliance to the CPUC and FS.	Minimize potential fire hazard.	Prior to and during construction.
PSU-2: Temporary lane closures during the construction period would interfere with emergency response vehicles.	Mitigation Measure T-1a, below.	Refer to T-1a, below.	Refer to T-1a, below.	Refer to T-1a, below.
PSU-4: Utility systems would be temporarily disrupted during the construction period.	**PSU-4 Notification of Utility Service Interruption.** Prior to Project construction in which a utility service interruption is known to be unavoidable, SCE shall notify members of the public, the jurisdiction, and the service providers that would be affected by the planned outage by mail. SCE shall also publish notice in a newspaper of local jurisdiction. The notice shall specify the estimated duration of the planned outage, and shall be published no less than seven days prior to the outage. Copies of notices and dates of public notification shall be provided by SCE to the CPUC and FS (NFS lands) no later than 30 days following notification.	SCE shall submit copies of notices and dates of public notification to the CPUC and FS.	Coordination efforts will minimize disruption to public works maintenance yards.	Thirty (30) days prior to and during construction.
PSU-5: Public Works maintenance yards would be disrupted during the construction period.	**PSU-5 Notification of Public Service Interruption.** Prior to the start of construction activities that would restrict access to a maintenance yard, SCE shall notify the Los Angeles County Public Works Department of the service locations to be affected and the duration of restricted activities at each site, and coordinate in order to avoid multiple or extended disruptions. Documentation of coordination efforts shall be completed and submitted to the CPUC and FS (NFS lands) upon request.	• SCE shall notify the Los Angeles County Public Works Department of potential disruptions. • Documentation of coordination efforts shall be submitted to the CPUC and FS upon request.	Coordination efforts will minimize disruption to public works maintenance yards.	Prior to and during construction
PSU-9: The amount of waste material recycled during construction activities would not	**PSU-9 Recycle Construction Waste.** SCE shall recycle a minimum of 50 percent of the waste generated during construction activities along the entire Project route. Following the completion of construction activities, SCE shall submit documentation to the CPUC and FS verifying the recycling of 50	Following the completion of construction activities, SCE shall submit documentation to the CPUC and FS verifying the recycling of 50 percent of	Recycling efforts will adhere to State standards.	During and after construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
adhere to State standards.	percent of generated Project waste.	generated Project waste.		
Traffic and Transportation				
T-1: Closure of roads to through traffic or reduction of travel lanes would result in substantial congestion.	T-1a Prepare Traffic Control Plans. Prior to the start of construction, SCE shall submit Traffic Control Plans (TCPs) to all agencies with jurisdiction over public roads that would be affected by overhead construction activities as part of the required traffic encroachment permits. TCPs shall define the locations of all roads that would need to be temporarily closed due to construction activities, including aerial hauling by helicopter and conductor stringing activities. The TCPs shall define the use of flag persons, warning signs, lights, barricades, cones, etc. to provide safe work areas and to warn, control, protect, and expedite vehicular and pedestrian traffic. The measures included in the TCPs shall be consistent with the standard guidelines outlined in the Standard Specifications for Public Works Construction, the U.S. Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD), and the Work Area Traffic Control Handbook (WATCH). Copies of the TCPs shall be sent to the FS and to the planning/or traffic departments of the affected local jurisdictions at least 30 days prior to the start of construction. TCPs shall also include measures to avoid disruptions or delays in access for emergency service vehicles and to keep emergency service agencies fully informed of road closures, detours, and delays. Police departments, fire departments, ambulance services, and paramedic services shall be notified at least one month in advance by SCE of the proposed locations, nature, timing, and duration of any construction activities and advised of any access restrictions that could impact their effectiveness. Provisions shall be ready at all times to accommodate emergency vehicles, such as immediately stopping work for emergency vehicle passage, short detours, and alternate routes developed in conjunction with local agencies. TCPs shall also identify all emergency service agencies, include contact information for those agencies, assign responsibility for notifying the service providers, and specify coordination procedures. Copies of the TCPs shall be provided to all affected police departments, fire departments, ambulance and paramedic services. Documentation of coordination with service providers shall be provided to the CPUC and FS 30 days prior to the start of construction.	• SCE shall provide copies of the TCPs submitted to all agencies with jurisdiction over public roads to CPUC and FS for review. • SCE shall submit documentation of coordination with service providers (police, fire, ambulance, paramedics) to the CPUC and FS for review. • CPUC and/or FS will monitor compliance during construction.	Traffic on public roadways affected by construction activities remains generally free-flowing, as verified by the EM.	Prior to and during construction.
	T-1b Restrict Lane Closures. Prior to the start of construction, SCE shall submit TCPs to all agencies with jurisdiction over public roads that would be affected by overhead construction activities as part of the required traffic encroachment permits. TCPs shall define the locations of all roads that would need to be temporarily closed due to construction activities, including	CPUC and/or FS will monitor compliance during construction.	Traffic on public roadways affected by construction activities remains generally free-flowing, as verified by	During construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	aerial hauling by helicopter and conductor stringing activities. The TCPs shall define the use of flag persons, warning signs, lights, barricades, cones, etc. to provide safe work areas and to warn, control, protect, and expedite vehicular and pedestrian traffic. The measures included in the TCPs shall be consistent with the standard guidelines outlined in the Caltrans Traffic Manual, the Standard Specifications for Public Works Construction, and the Work Area Traffic Control Handbook (WATCH). Copies of the TCPs shall be sent to the FS and to the planning/or traffic departments of the affected local jurisdictions at least 30 days prior to the start of construction. TCPs shall also include measures to avoid disruptions or delays in access for emergency service vehicles and to keep emergency service agencies fully informed of road closures, detours, and delays. Police departments, fire departments, ambulance services, and paramedic services shall be notified at least one month in advance by SCE of the proposed locations, nature, timing, and duration of any construction activities and advised of any access restrictions that could impact their effectiveness. Provisions shall be ready at all times to accommodate emergency vehicles, such as immediately stopping work for emergency vehicle passage, short detours, and alternate routes developed in conjunction with local agencies. TCPs shall also identify all emergency service agencies, include contact information for those agencies, assign responsibility for notifying the service providers, and specify coordination procedures. Copies of the TCPs shall be provided to all affected police departments, fire departments, ambulance and paramedic services. Documentation of coordination with service providers shall be provided to the CPUC and FS 30 days prior to the start of construction.		the EM.	
T-2: Construction traffic would result in congestion on area roadways.	T-2 Prepare Construction Transportation Plan. Where construction traffic has the potential to significantly affect regional and local roadways by generating additional vehicle trips, SCE shall prepare a Construction Transportation Plan (CTP) describing alternate traffic routes, timing of commutes, reduction in crew-related traffic, and other mitigation methods for reducing construction-generated additional traffic on regional and local roadways. The CTP shall also require construction workers to park personal vehicles at primary and secondary marshalling yards and carpool to work locations in order to limit the number of construction vehicles on the road. Construction vehicles shall be required to park within the Project ROW or on access roads to the maximum extent possible. SCE shall submit the CTP to Caltrans and the affected local jurisdictions for review and approval at least 30 days prior to commencing construction activities.	• SCE shall submit a Construction Transportation Plan identifying carpooling opportunities (meeting locations, etc.) to the CPUC for review and approval. • CPUC and /or FS will monitor compliance during construction.	Construction workers carpool to the project area, as verified by the EM.	Prior to and during construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
T-3: Construction activities could temporarily interfere with emergency response.	Mitigation Measures T-1a and T-1b, above.	Refer to T-1a and T-1b, above.	Refer to T-1a and T-1b, above.	Refer to T-1a and T-1b, above.~~Prior to and during construction.~~
T-4: Construction activities could temporarily disrupt transit routes.	**T-4 Avoid Disruption of Bus Service.** SCE will coordinate with the Los Angeles Metropolitan Transit Authority, Foothill Transit, Pasadena Area Transit System, Montebello Municipal Bus Lines, Norwalk Transit District, and Omnitrans at least 30 days prior to construction in the respective service territory of each agency noted to reduce potential interruption of bus transit services. Documentation of coordination efforts shall be submitted to the CPUC upon request.	• SCE shall submit documentation to the CPUC and FS of coordination efforts with the transit services noted in the measure. • CPUC and/or FS will monitor compliance during construction.	Bus service is not disrupted as a result of the Project, as verified by the EM.	Thirty (30) days prior to and during construction.
T-5: Construction activities would cause a temporary disruption to rail traffic or operations.	**T-5 Obtain and Comply With Railroad Permits.** SCE shall obtain permits/approvals from each of the affected railway operators (Union Pacific Railroad, Metrolink, and/or Amtrak) to ensure construction activities comply with each company's safety requirements and to avoid disruption to or congestion of rail traffic. Copies of permits shall be submitted to the CPUC prior to construction across or adjacent to rail lines.	• SCE shall submit documentation to the CPUC and FS of coordination efforts with railway operators noted in the measure. • CPU and/or FS will monitor compliance during construction.	Rail service is not disrupted as a result of the Project, as verified by the EM.	Thirty (30) days prior to and during construction.
T-6: Construction activities could temporarily interfere with the use of pedestrian/bicycle paths.	**T-6 Ensure Pedestrian and Bicycle Cir~~i~~culation and Safety.** Where construction will result in temporary closures of sidewalks or other pedestrian facilities, SCE shall provide temporary pedestrian access, through detours or safe areas along the construction zone, where feasible. Where construction activity will result in bike route or bike path closures, appropriate detours shall be established, where feasible, and detour signs shall be posted. Detours and closures required for safe pedestrian and bicycle access through or around the construction area shall be identified in a circulation plan included in the TCP's required under Mitigation Measure T-1. All detours and related signage shall be consistent with the standard guidelines outlined in the U.S. Department of Transportation's Manual on Uniform Traffic Control Devices (MUTCD).	• SCE shall provide temporary pedestrian or bicycle access where sidewalks or bike paths are closed due to construction. • CPUC and/or FS will monitor compliance during construction.	Pedestrian/bicycle paths are not disrupted or are adequately re-routed, as verified by the EM.	Prior to and during construction.
T-7: Construction would result in localized shortages of public parking along the Project ROW.	Mitigation Measure T-2~~5~~, above.	Refer to T-2~~5~~, above.	Refer to T-2~~5~~, above.	Refer to T-2, above.~~Prior to and during construction.~~
T-8: Construction would conflict with planned transportation projects.	**T-8 Avoid Conflicts With Planned Transportation Improvements.** Prior to final Project design SCE shall coordinate Project design with the California Department of Transportation (District 6, District 7 and District 8), ~~and~~ the Los Angeles County Metropolitan Transit Authority, and the traffic	• SCE shall submit documentation to the CPUC of coordination efforts with Caltrans and the Los Angeles County MTA.	No conflicts with planned improvements to SR-14, as verified by Caltrans.	Prior to and during construction

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	departments or public works departments of the counties of Kern, Los Angeles, and San Bernardino and the individual cities through which the proposed transmission route traverses, and to ensure that Project structures are appropriately placed to avoid conflict with any planned transportation projects~~potential expansion of SR-14~~.	• CPUC will monitor compliance during construction.		
T-10: Project transmission structures could present an aviation hazard.	T-10 **Notify US Military.** SCE shall provide a complete copy of the Project application, including the general location of the entire project alignment and the heights of towers to be located within each segment of the proposed Project to the Range Sustainability Officer of the Naval Air Systems Command.	SCE shall submit proof of notification to the CPUC and FS.	Prevent aviation hazards.	Prior to construction.
T-11: Underground construction activities would temporarily restrict access to properties.	T-11 **Provide Continuous Access to Properties (Alt 5 Only).** SCE shall provide at all times the ability to quickly lay a temporary steel plate trench bridge upon request to ensure driveway access to businesses, and shall provide continuous access to properties when not actively constructing the underground alignment. In the event that trench stability could be compromised by the laying of a temporary steel plate bridge during an early phase of trench construction, SCE may defer a request for access to the soonest possible time until the stability of the trench has been assured, provided SCE has provided 48-hour advance notification of the potential for disrupted access to any business that may experience such delayed access. The notification shall include information on restoring access and the estimated amount of time that access may be blocked. In addition, SCE shall develop construction plans that will minimize blocked access during the workday.	• SCE shall submit constructions plans and proof of notification to the CPUC and FS. • CPUC will monitor for compliance during construction.	• Avoid restricted access to private properties. • Provide notification in the event that access will be disrupted.	Prior to and during construction.
Visual Resources				
V-1: Temporary visibility of construction activities and equipment involved with the Project would alter the landscape character and visual quality of landscape views.	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.** SCE shall keep construction-related operations areas clean and tidy by storing building materials and equipment within the proposed construction staging areas and/or generally away from public view when feasible. SCE shall remove construction debris promptly at regular intervals. For areas of non-NFS lands where cleared vegetation would be visible from sensitive viewing locations, SCE shall dispose of cleared vegetation and woody material in a manner that is not visually evident and does not create visual contrasts. For NFS lands, in areas where cleared vegetation would be visible from sensitive viewing locations, SCE shall dispose of cleared vegetation and woody material off-site (not necessarily off-NFS lands), or the cleared vegetation shall be chipped and stored for restoration work, as approved by the FS, and in a manner that is not visually evident and does	CPUC and/or FS will monitor for compliance.	Avoid or minimize degradation of visual quality.	During construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	not create visual contrasts.			
V-2: 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.	Mitigation Measure V-1, above.	Refer to V-1, above.	Refer to V-1, above.	Refer to V-1, above.
	V-2a Use Tubular Steel Poles Instead of Lattice Steel Towers in Designated Areas. Where feasible, SCE shall use tubular steel poles, rather than lattice steel towers, in locations designated by the CPUC to reduce visual impacts as seen from sensitive receptor locations and/or to match existing and/or future wind turbine generator monopoles and/or to accomplish community desires. SCE shall submit a Structure Type and Treatment Plan to the CPUC as soon as possible after Project approval, demonstrating compliance with this.	• SCE shall submit a Structure Type and Treatment Plan for the lattice steel towers, tubular steel poles, and any other visible structures to the CPUC, as applicable, for review and approval. • CPUC and/or FS will monitor compliance during construction.	Views of the new transmission line will be less prominent.	Prior to and during construction.
	V-2b Treat Surfaces With Appropriate Colors, Textures, and Finishes. For all structures that are visible from sensitive viewing locations outside NFS lands, and for all NFS lands, SCE shall treat surfaces with appropriate galvanizing treatments, per APM AES-1, to most effectively blend the structures with the visible backdrop landscape, as determined by the CPUC (for non-NFS lands) and the FS (for NFS lands). For structures that are visible from more than one sensitive viewing location, if backdrops are substantially different when viewed from different vantage points, the darker color shall be selected, because dark colors tend to blend into landscape backdrops more effectively than lighter colors, which may contrast and reflect light, producing glare. At locations where a lattice steel tower or a tubular steel pole would be silhouetted against the skyline, non-reflective, light gray colors shall be selected to blend with the sky. The transmission line conductors shall be non-specular and non-reflective, per APM AES-4, and the insulators shall be non-reflective and non-refractive, per APM AES-3. SCE shall consult with the CPUC and the FS to ensure that the objectives of this measure are achieved. SCE shall submit a Structure Type and Treatment Plan for the lattice steel towers, tubular steel poles, conductors, insulators, substation structures, fences/walls, retaining walls, and any other visible structures, to the CPUC and FS, as appropriate, after Project approval, demonstrating compliance with this measure.	CPUC and/or FS will monitor compliance during construction.	Views of the new transmission line will be less prominent.	Prior to and during construction.
	V-2c Establish Permanent Screen. At Antelope and Vincent Substations, SCE shall establish a permanent screen of sufficient height for immediate visual screening around the new expansion areas of the Antelope and Vincent Substations. Plant materials selected for screening shall be locally appropriate, wind-resistant, non-invasive, and acclimated to the particular environment and micro-climate. Other screening materials shall blend in with the local landscape. SCE shall consult with the CPUC to ensure that the objectives of this measure are achieved. SCE shall submit landscaping	• At least 60 days prior to construction of the Antelope and Vincent Substations, SCE shall submit a landscaping plan to the CPUC for review and approval. • CPUC and/or FS will monitor compliance during construction.	Views of the transition station will be partially screened by specific plantings.	Sixty (60) days prior to and during construction.

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	plans for Antelope and Vincent Substations that demonstrate compliance with this measure to the CPUC for review and approval at least 60 days prior to the start of construction at these substations.			
	V-2d At Road Crossings, Structures Should be Offset so That They are Equidistant on Each Side of the Road Where Feasible (Alts 3, 4, and 7 Only). To the extent practical, in locations designated by the CPUC and the FS (for NFS lands), SCE shall relocate new transmission line structures at road crossings and trail crossings so that conductors are approximately mid-span at the road or trail and structures are kept away from the roadway or trail as far as possible. V-2d is compatible and complementary to APM AES-6 (Transmission Structures Set Back from Major Roadways).	SCE shall coordinate with the CPUC and FS to determine where structures should be offset.	Minimize visual complexity from sensitive receptor locations.	Prior to and during construction.
V-3: For a landscape with an existing transmission line, increased structure size and new materials would result in adverse visual effects.	Mitigation Measures V-1, V-2a through V-2c, V-2d (Alts 3, 4, and 7 only), V-4b and V-4d, above/below.	Refer to V-1, V-2a through V-2c, V-2d (Alts 3, 4, and 7 only), V-4b and V-4d, above/below.	Refer to V-1, V-2a through V-2c, V-2d (Alts 3, 4, and 7 only), V-4b and V-4d, above/below.	Refer to V-1, V-2a through V-2c, V-2d (Alts 3, 4, and 7 only), V-4b and V-4d, above/below.
	V-3a Match Spans of Existing Transmission Structures. If the new Project components are adjacent to an existing transmission line, SCE shall, where feasible, match existing structure spacing and spans as closely as possible in order to reduce visual complexity as seen from sensitive receptor locations. All new structures should also match the heights of existing transmission line structures to the extent possible as dictated by variation in terrain and kV-capacity of lines.	• SCE will submit a Structure Span and Spacing Plan, including construction drawings detailing structure locations, spacing, and spans to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance during construction.	The number of off-set tower placements is reduced and/or avoided to minimize visual complexity.	Prior to and during construction.
	V-3b On NFS Lands, Provide Restoration/Compensation for Impacts to Landscape Character And Visual Quality. All reasonable efforts shall be made to meet the Scenic Integrity Objectives (SIOs) shown on the SIO Map in the ANF Land Management Plan. SIO adjustments that exceed a drop of more than one SIO level would require a Project-specific amendment to Forest Plan (Part 3) Standards S9 and S10. In order to compensate for the Project's long-term visual impacts to the landscape character and visual quality, including but not limited to impacts to landscape character and visual quality of scenic highway and scenic trail viewsheds, SCE and the Forest Supervisor shall reach a consensus on what is a commensurate amount of restoration, monetary compensation, or landscape character/visual quality improvement.	• SCE shall submit a Landscape Restoration/Compensation Plan to the CPUC and FS for review and approval. • CPUC and/or FS will monitor for compliance.	Minimize impacts to landscape character and visual quality.	Sixty (60) days prior to and during construction.

Table G.1-2. Mitigation Monitoring Program				
Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
V-4: Vegetative clearing and/or earthwork associated with road improvements and pulling/splicing locations would adversely affect landscape character and visual quality.	V-4a Construct, Operate, and Maintain the Project Using Existing Access and Spur Roads Where Feasible. For non-NFS lands and in locations designated by the CPUC, to protect landscape character and promote visual quality, SCE shall remove existing transmission line towers and conductors using existing and already maintained access roads and spur roads, and shall construct the new transmission line using the existing and already maintained network of access roads and spur roads to the greatest practical extent. SCE shall submit plans for any new access roads and spur roads, and any maintenance plans for un-maintained access and spur roads, demonstrating compliance with this measure, to the CPUC for review and approval at least 60 days prior to the start of construction. For NFS lands, to protect landscape character and promote visual quality, SCE shall use only those access roads and spur roads designated by the FS for that purpose. For the new LST at Mill Creek Summit, SCE shall maintain vegetative screening as seen from the PCT, trailhead, and PCT feeder trail to the extent feasible and practical and as GO-95 allows. In an effort to protect the scenic integrity along the PCT, SCE and the FS have agreed that for the new LST at Mill Creek Summit, the existing vegetation around this tower and along the PCT, for the most part, shall not be cleared and will be preserved to the greatest degree possible without violating GO-95 Rule 35. The only sections that should be cleared of vegetation for operation and maintenance at this specific tower site is the area directly underneath the base of the new tower and the immediate space adjacent to FS Road 3N17 and the new tower (STR 34 M7-T2).	• SCE shall submit plans and construction drawings for access roads and spur roads to the CPUC and other affected agencies for review and approval. • CPUC and/or FS will monitor compliance during construction.	Views of new access and spur roads will be less prominent.	Sixty (60) days prior to and during construction.
	V-4b Slope-Round and Re-Contour in Areas as Prescribed. For areas of non-NFS lands where natural terrain includes rounded landforms, where soil types are conducive, and where cuts-and-fills and excavated materials would be visible from sensitive viewing locations, SCE shall employ slope-rounding techniques to blend earthwork with natural contours where feasible. Greater land area would be disturbed by this measure, possibly increasing exposure to soil erosion and possibly causing more vegetation disturbance, but the goal of this measure is a permanent landform that is natural-appearing in the long-term and may be more conducive to ~~easier and better~~ wildlife movement. During and following re-contouring, applicable mitigation measures of the other issue area sections shall be applied, including biological resources, cultural resources, geology and soils, hydrology and water resources, wilderness and recreation, land use, and possibly agricultural resources. SCE shall submit plans for proposed new, upgraded, or newly maintained access roads and spur roads or structure	• SCE shall submit an excavation plan to the CPUC for review and approval. • CPUC will monitor compliance during construction.	Views of excavated materials will be less prominent.	Sixty (60) days prior to and during construction.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	pads to the CPUC for approval at least 60 days prior to construction.			
	V-4c Avoid Locating New Roads in Bedrock on NFS Lands. Where feasible, re-opened and/or new access road and spur road locations on NFS lands shall be designed to avoid bedrock cuts, and ~~all road cuts~~ shall be located in soil material to protect landscape character, ensure revegetation opportunities, and promote visual quality. SCE shall submit road construction plans to the CPUC and FS for review and approval at least 60 days prior to the start of construction.	SCE shall submit road construction plans to the CPUC and FS, as applicable, for review and approval.	Designs will avoid bedrock cuts and protect landscape character.	Sixty (60) days prior to and during construction.
	V-4d Dispose of Excavated Materials as Prescribed. For non-NFS lands, SCE shall dispose of excavated materials (soil, rocks, and concrete, and reinforcing steel) in a manner that is not visually evident and does not create visual contrasts. For NFS lands, SCE shall dispose of excavated materials (excess soil and rocks) in disposal areas (either on-NFS lands or off-NFS lands) as designated by the FS. For NFS lands, the FS will designate whether any footings from existing transmission structures need to be removed. Any designated footings designated for removal (concrete, reinforcing steel, angle steel, anchor bolts, etc.) shall be disposed off-NFS lands in disposal areas that do not create visual contrasts. These sites shall be pre-approved by the CPUC and FS.	• SCE shall submit an excavation plan to the CPUC and FS, as applicable, for review and approval. • CPUC and/or FS will monitor compliance during construction.	Views of excavated materials will be less prominent.	Sixty (60) days prior to and during construction.
V-5: New metal surfaces associated with transmission infrastructure would potentially reflect sunlight and produce glint and glare in certain lighting conditions.	Mitigation Measure V-2b, above.	Refer to V-2b, above.	Refer to V-2b, above.	Refer to V-2b, above.
V-6: The Project would contribute to the long-term loss or degradation of a scenic highway viewshed or a scenic trail viewshed.	Mitigation Measure V-3b, above.	Refer to V-3b, above.	Refer to V-3b, above.	Refer to V-3b, above.
V-7: The Project would conflict with established visual resource management plans or landscape conservation plans.	Mitigation Measure V-3b, above.	Refer to V-3b, above.	Refer to V-3b, above.	Refer to V-3b, above.

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Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
Wilderness and Recreation				
R-1: Construction activities would restrict access to or disrupt activities within established recreational areas.	R-1a Coordinate Construction Schedule and Maintenance Activities With Managing Officer(s) for Affected Recreation Areas. SCE shall develop the Project construction schedule and coordinate construction with the authorized officer(s) or the agencies of all recreational areas affected by Project construction. SCE shall also coordinate maintenance activities beyond the periodic visual inspections which are required by current SCE Transmission Operations and Maintenance Policies and Procedures (TOM) with these parties, including but not limited to the following: FS (ANF); California Department of Fish and Game (CDFG); Pacific Crest Trail Association (PCTA); California State Park and Recreation Commission; California Department of Parks and Recreation; Kern County Department of Parks and Recreation; Los Angeles County Department of Parks and Recreation; San Bernardino County Regional Parks; Puente Hills Landfill Native Habitat Preservation Authority (Habitat Authority); Watershed Conservation Authority (WCA); and San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC). Through coordination efforts with the agencies listed above as well as any additional agencies that manage recreational resources which would be affected by the Project, ~~and at the discretion of the authorized officer(s) responsible for management of the affected resource(s),~~ SCE shall ensure the following occurs unless otherwise approved by the affected agencies: • Construction and maintenance activities are scheduled to avoid heavy recreational use periods (including major holidays) to the maximum extent feasible, with the understanding that such efforts may not always be feasible; • Staging areas for Project-related equipment, materials, and vehicles are located in areas with least possible effect on recreational activities and opportunities; and • Timetables for the required period of usage of each staging area are developed and adhered to in coordination with all affected resource agencies. SCE shall document its coordination and provide this documentation to the CPUC and the FS no less than 30 days prior to construction and maintenance activities (beyond periodic visual inspections).	• SCE shall submit documentation to the CPUC describing the coordination efforts with the authorized officer(s) of each affected agency. • CPUC and/or FS will monitor compliance during construction.	Few if any complaints are received from recreationists regarding preclusion of established recreational areas in the Project area.	Thirty (30) days prior to and during construction.
	R-1b Identify and Provide Noticing of Alternative Recreation Areas. SCE shall coordinate with the authorized recreation officer(s) or the agencies of all recreational areas affected by Project construction and maintenance activities (beyond periodic visual inspections), including but not limited to those listed under Mitigation Measure R-1a (Coordinate	• SCE shall submit documentation to the CPUC and FS describing the coordination efforts to identify alternative recreation sites/facilities with the authorized officer(s) of the	Alternate recreational areas are available to the public during construction, as verified by the EM.	Thirty (30) days prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	construction schedule and maintenance activities with managing officer(s) for affected recreation areas), the purpose of which is to accomplish the following: • Identify recreational areas (i.e., trails, parks, day-use areas) that would be closed during Project construction or maintenance activities; • To the extent feasible, identify alternative recreational areas for each resource that would be made unavailable to the public due to Project construction or maintenance activities; and • Post a public notice which identifies alternative recreational areas at FS Ranger Stations within the ANF and at all recreational areas to be closed due to Project construction or maintenance activities. SCE shall document these coordination efforts to identify and provide noticing of alternative recreational areas and submit this documentation to the CPUC and the FS no less than 30 days prior to construction and maintenance activities (beyond periodic visual inspections) that would occur within one-half mile of wilderness or recreation areas that would be affected by such activities.	each agency listed in Mitigation Measure R-1b. • CPUC and/or FS will monitor compliance during construction, including verification of public notice postings.		
	R-1c Notification of Temporary Closure of OHV Routes. SCE shall coordinate with the FS (ANF) to identify all Operational Maintenance Level (OML) 2 roads and other designated off-highway vehicle (OHV) routes which would be closed or otherwise made unavailable for use as a result of Project construction and/or maintenance activities. Included in this coordination effort, SCE shall prepare a public notice which identifies all OML 2 roads and OHV routes to be closed as a result of Project construction and/or maintenance activities and shall comply with the following: • Distribute the public notice to relevant FS Ranger Stations within the ANF; • Publish the public notice in local newspapers which service communities bordering the ANF; • Publish updated notices in local newspapers if any significant changes in scheduling occur; and • Maintain public notices and postings throughout the OML 2 road / OHV route closure period. SCE shall document these coordination efforts related to OML 2 road / OHV route closures and submit this documentation to the CPUC and FS no less than 30 days prior to construction and/or maintenance activities that would affect OHV routes.	• SCE shall submit proof of public notices and documentation of coordination efforts to the CPUC and FS. • CPUC and/or FS will monitor compliance.	Minimize disruption to OHV activities.	Thirty (30) days prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	R-1d Notification of Temporary Closure and Reroute of the Pacific Crest National Scenic Trail (PCT). SCE shall coordinate with the FS and with the Pacific Crest Trail Association (PCTA) regarding temporary closure of the PCT that would occur during Project construction and maintenance activities. The following shall be included in this coordination effort: • SCE and the PCTA shall identify trail diversions to be applied at each point where the PCT would be temporarily closed to through-traffic as a result of Project construction and maintenance activities; and • SCE shall post public notices of temporary closures/diversions of the PCT at FS Ranger Stations within the ANF and at additional locations determined to be appropriate by the PCTA. The public notice shall provide information on temporary trail reroutes that would be implemented during construction and maintenance activities as well as the time period for implementation of such reroutes. SCE shall document these coordination efforts, including the location of all posted notices, and submit this documentation to the CPUC and the FS for approval no less than 30 days prior to construction and maintenance activities that would occur within one-half mile of the PCT.	• SCE shall submit proof of public notices and documentation of coordination efforts to the CPUC and FS. • CPUC and/or FS will monitor compliance.	Minimize disruption to PCT uses and activities.	Thirty (30) days prior to and during construction.
	R-1e SCE Shall Compensate ANF for Lost Income from Adventure Pass Sales Due to Recreation Area Closures Associated With the Project~~assist~~. Prior to the onset of Project construction in the ANF, SCE shall coordinate with the FS to identify recreational resources on NFS lands in the ANF that would be temporarily closed as a direct result of Project construction. A resource is only considered to be closed directly as a result of Project construction if the resource is made entirely inaccessible to the public as a sole result of Project activities; in other words, no other factors contribute to the resource's inaccessibility. SCE shall coordinate with the FS in reviewing financial records of the Adventure Pass program as well as recreational use data for the ANF, in order to determine a compensation amount comparable to the direct impacts of the Project.	SCE shall identify and assist the FS in completing the backlogged maintenance.	Minimize disruption to recreational resources.	Prior to construction.
R-2: Operationa~~l~~ and maintenance activities would restrict access to or disrupt activities within established recreational areas.	Mitigation Measure R-1a through R-1d, above.	Refer to R-1a through R-1d, above.	Refer to R-1a through R-1d, above.	Refer to R-1a through R-1d, above.~~During operation.~~

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
R-4: The Project would cause or contribute to degradation of the Pacific Crest National Scenic Trail.	Mitigation Measure R-1a, R-1d, and R-1e above.	Refer to R-1a, R-1d, and R-1e, above.	Refer to R-1a, R-1d, and R-1e, above.	Refer to R-1a, R-1d, and R-1e, above.~~During operation.~~
R-5: 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.	R-5 Avoid Permanent Upgrades to Forest System Roads. SCE shall avoid the permanent upgrade of Forest System roads as a result of Project construction or operation and maintenance activities unless otherwise approved by the FS. Any road upgrades that are required to accommodate construction of the Project shall be temporary in nature. Following construction of the Project, existing OML standards designated for any temporarily improved roads shall be adhered to, thereby returning improved roads to existing maintenance practices, unless otherwise authorized by the FS. As determined to be necessary through coordination between SCE and the FS and at the discretion of the FS, SCE shall develop a plan for returning improved Forest System roads to existing conditions. SCE shall implement the restrictions for road improvements and maintenance set forth in the Special Use or Road Use Authorization to be issued by the FS for the Project.	• If necessary, SCE shall develop a plan for returning improved Forest System roads to existing conditions. • CPUC and/or FS will monitor compliance.	Minimize impacts to OHV trails.	Prior to and during construction.
R-6: The Project would facilitate unmanaged recreational uses that would contribute to the long-term loss or degradation of recreational opportunities.	Mitigation Measure R-5, above.	Refer to R-5, above.	Refer to R-5, above.~~Minimize impacts to unmanaged recreational uses.~~	Refer to R-5, above.~~Prior to and during construction.~~
Wildfire Prevention and Suppression				
F-1: Construction and/or maintenance activities would reduce the effectiveness of firefighting.	F-1~~a~~ Prepare Wildland Traffic Control Plans. SCE shall develop wildland traffic control plans in consultation with the FS, California Department of Parks and Recreation [Alternative 4 only], and Puente Hills Landfill Natural Habitat Authority (PHLNHA), as appropriate. The wildland traffic control plans shall stipulate mechanisms through which narrow roads shall be kept passable for emergency service providers in a wildfire-related or other emergency situation. SCE shall appoint a Road Master, who shall administer the wildland traffic control plans and facilitate emergency vehicle access in the event of a wildfire-related or other emergency. The wildland traffic control plans shall identify strategic locations for adequate construction and maintenance vehicle parking, as necessary, in consultation with the land management agency, and alternate routes for large equipment	• SCE shall submit the wildland traffic control plans to the FS, California Department of Parks and Recreation [Alternative 4 only], and PHLNHA. • CPUC and/or FS will monitor compliance during construction.	Minimize potential for interference with firefighting activities.	Thirty (30) days prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	and vehicle evacuation shall be identified to the extent possible. Wildland traffic control plans shall be prepared in consultation with the land management agencies for both construction and maintenance activities and shall be submitted to the FS, California Department of Parks and Recreation [Alternative 4 only], and PHLNHA at least 30 days prior to construction in areas managed by thee agencies.			
F-3: Construction and/or maintenance activities would increase the risk of wildfire.	F-3a Revise SCE's Fire Management Plan for Maintenance Activities. SCE's Fire Management Plan shall be revised to be applicable to Project maintenance activities located off NFS lands. All provisions of the Plan that are applicable to construction crews and activities shall be made applicable to maintenance crews and activities. The revised Plan shall be submitted to the CPUC and FS for review at least 60 days prior to construction.	SCE shall submit the revised Plan to the CPUC and FS for review and approval.	Minimize risk of wildfire during maintenance activities.	Sixty (60) days prior to construction, and during operation and maintenance.
	F-3b Cease Work During Red Flag Warning Events. During Red Flag Warning events, as issued daily by the National Weather Service in State Responsibility Areas (SRA) and Local Responsibility Areas (LRA), all non-emergency construction and maintenance activities off NFS lands shall cease in affected areas. An exception shall be made for transmission line testing where a transmission line may be tested, one time only, if the loss of another transmission facility could lead to system instability or cascading outages.	CPUC and/or FS shall monitor compliance.	Minimize risk of wildfire.	During construction and operation.
	F-3c Ensure Open Communication Pathways. All construction crews and inspectors shall be provided with radio and cellular telephone access that is operational along the entire length of the approved route to allow for immediate reporting of fires. Communication pathways and equipment shall be tested and confirmed operational each day prior to initiating construction activities at each construction site. All fires shall be reported to the fire agencies with jurisdiction in the Project area immediately upon ignition. Each crew member shall carry at all times a laminated card listing pertinent telephone numbers for reporting fires and defining immediate steps to take if a fire starts. Information on contact cards shall be updated and redistributed to all construction crew-members, as needed, prior to the initiation of construction activities and on the day the information change goes into effect. Outdated cards shall be destroyed.	• A laminated card with emergency contact names and numbers shall be submitted to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance.	Minimize risk of the spread of wildfires.	Thirty (30) days prior to construction, and during construction.
	F-3d Remove Hazards from the Work Area. SCE shall clear dead and decaying vegetation from the work area prior to starting construction and/or maintenance work. The work area includes only those areas where personnel are active or where equipment is in use or stored, and may include portions of the transmission ROW, construction laydown areas, pull sites, access roads, parking pads, and any other sites adjacent to the ROW where personnel are active or where equipment is in use or stored. Cleared	CPUC and/or FS will monitor compliance.	Removal of potential fire hazards will reduce the risk of wildfire.	Prior to and during construction and maintenance.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	dead and decaying vegetation shall either be removed or chipped and spread onsite in piles no higher than six (6) inches.			
	F-3e Comply With Non-Smoking Policy on PHLNHPA Lands. SCE and contractor personnel shall comply with the non-smoking policy on PH~~N~~LNHPA lands during construction and maintenance activities, and this commitment shall be written into SCE's Fire Management Plan for construction and maintenance.	CPUC, FS and SCE will monitor compliance.	Eliminate potential for wildfire due to smoking.	During construction and maintenance.
	F-3f Share Costs for ANF Fuelbreak Maintenance. SCE shall enter into a cost-sharing agreement with the FS for maintenance of the existing system of fuelbreaks. Cost-sharing for fuelbreak maintenance shall be required for backbone fuelbreaks in close proximity to the Project or that transect the path of the Project. A backbone fuelbreak is an identified key ridge or other linear geographical feature that has a high level of effectiveness in slowing or containing a wildfire. Backbone fuelbreaks in the vicinity of the Project include: Santa Clara Divide, Mill Creek, Flintridge, Clear Creek, Millard, Brown Mountain, Clamshell, Santa Anita Dam, Chantry and Monrovia (a.k.a. Redbox/Rincon). SCE's responsibility under the cost-sharing agreement would be proportional to the Project's potential impacts on wildfire prevention and suppression.	SCE shall submit a proposal for the cost-sharing agreement to the FS for review and approval.	Efficient fuelbreak maintenance.	Sixty (60) days prior to construction.
	F-3g Provide Transmission Line Safety Training to ANF Staff. SCE shall provide transmission line safety training to FS (ANF) staff prior to the start of the official fire season on an annual basis.	• SCE shall establish and conduct training sessions annually. • An outline of the program will be provided to the FS for review and approval. • Completed sign-in sheet(s) with date, name, and signature of attendees will be provided to the FS.	Efficient fuelbreak maintenance.	Annually, prior to fire season and prior to construction.
F-4: Construction and/or maintenance activities would increase the risk of personnel injury or death in the event of fire.	Mitigation Measure F-3b, above.	Refer to F-3b, above.	Refer to F-3b, above.	Refer to F-3b, above.
	F-4~~a~~ Prepare and Implement Emergency Evacuation Plan. SCE shall prepare an Emergency Evacuation Plan to ensure the safe and expedient ground-based evacuation of personnel in the event of an uncontrolled fire in the Project area, including addressing the Tujunga Creek bridge area. The Plan shall make explicit the following elements: a schedule of the locations of all personnel during the fire season, conditions under which to evacuate, chain of command, communications with ANF Emergency Operations Center, and identification of evacuation routes. An emergency evacuation officer shall be appointed to educate personnel about emergency evacuation routes prior to each day's construction activities, to carry out the Plan in the	• SCE shall submit the Emergency Evacuation Plan to the FS, PHLNHA, and California Department of Parks and Recreation (Alternative 4 only). • The FS, PHLNHA, and California Department of Parks and Recreation (Alternative 4 only) shall monitor compliance.	Ensure safe and expedient evacuation in the event of an emergency.	Thirty (30) days prior to and during construction.

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
	event that an evacuation order is issued or that a nearby uncontrolled fire threatens personnel safety, and to update the plan should access conditions change. The Emergency Evacuation Plan shall be submitted to the FS, PHLNHA, and California Department of Parks and Recreation [Alternative 4 only], as appropriate, for review and comment at least 30 days prior to Project construction.			
F-5: Presence of the overhead transmission line would increase the risk of wildfire and compromise firefighter safety.	F-5 Share Costs for Fuelbreak Maintenance (Alt 4 Only). SCE shall enter into cost-sharing agreements with the City of Chino Hills and Chino Hills State Park for maintenance of the existing system of fuelbreaks on and surrounding State Parks lands. Cost-sharing for fuelbreak maintenance shall be required for backbone fuelbreaks in close proximity to the Project or that transect the path of the project. A backbone fuelbreak is an identified key ridge or other linear geographical feature that has a high level of effectiveness in slowing or containing a wildfire. An agreement on cost sharing with each the City of Chino Hills and Chino Hills State Park shall be reached prior to the start of Project construction. SCE's responsibility under the cost-sharing agreement would be proportional to the Project's potential impacts on wildfire prevention and suppression.	SCE shall submit a proposal for the cost-sharing agreement to the City of Chino Hills and the Chino Hills State Park for review and approval.	Efficient fuelbreak maintenance.	Sixty (60) days prior to construction.
F-6: Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread.	Mitigation Measure B-3a, above.	Refer to B-3a, above.	Refer to B-3a, above.	Refer to B-3a, above.
Electrical Interference and Hazards				
EIH-1: The Project would cause radio, television, communications, or electronic equipment interference.	EIH-1a Limit the Conductor Surface Electric Gradient. As part of the design and construction process for the Project, SCE shall limit the conductor surface electric gradient in accordance with the Institute of Electrical and Electronic Engineers Radio Noise Design Guide.	SCE shall submit the design and construction process to the CPUC for review and approval.	Minimize electrical interference.	Prior to construction.
	EIH-1b Document and Resolve Electronic Interference Complaints. After energizing the transmission line, SCE shall respond to, document, and resolve radio/television/electronic equipment interference complaints received. These records shall be made available to the CPUC for review upon request. All unresolved disputes shall be referred by SCE to the CPUC for resolution.	Complaints and SCE's response to complaints shall be documented and available to the CPUC for review.	Resolve issues related to electrical interference.	During operation.
EIH-2: The Project would cause induced currents and shock hazards in joint use	EIH-2 Implement Grounding Measures. As part of the siting and construction process for the Project, SCE shall identify objects (such as fences, metal buildings, and pipelines) within and near the ROW that have the potential for induced voltages and shall implement electrical grounding	• SCE shall submit documentation regarding grounding measures. • SCE shall submit proof of public	• Minimize potential for shock hazards. • Property owners are	Thirty (30) days prior to construction, during

Table G.1-2. Mitigation Monitoring Program

Impact	Measure	Monitoring Requirement	Determination of Effectiveness ~~Criteria~~	Timing of Action
corridors.	of metallic objects in accordance with SCE's standards. The identification of objects shall document the threshold electric field strength and metallic object size at which grounding becomes necessary. SCE shall install all necessary grounding measures prior to energizing the transmission lines. Thirty days prior to energizing the lines, SCE shall notify in writing, subject to the review and approval of the CPUC, all property owners within and adjacent to the Project ROW of the date the line is to be energized. The written notice shall provide a contact person and telephone number for answering questions regarding the line and guidelines on what activities should be limited or restricted within the ROW. SCE shall respond to and document complaints received and the responsive action taken. These records shall be made available to the CPUC for review upon request. All unresolved disputes shall be deferred by SCE to the CPUC for resolution. The written notice shall describe the nature and operation of the lines, and SCE's responsibilities with respect to grounding all conducting objects. In addition, the notice shall describe the property owner's responsibilities with respect to notification for any new objects, which may require grounding and guidelines for maintaining the safety of the ROW.	notices to the CPUC. • Complaints and SCE's response to complaints shall be documented and available to the CPUC for review. • CPUC will monitor compliance during construction.	notified.	construction, and prior to operation.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
Agricultural Resources				
AG-1, AG-3, AG-4 (Refer to Table G.1-2 above for full impact titles)	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.	• SCE shall provide documentation of coordination efforts with property owners) impacted by the Project and will be submitted to the CPUC for review. • CPUC shall monitor compliance during construction.	Interference with agricultural operations would be limited or avoided.	Thirty (30) days prior to and during construction.
AG-1, AG-3, AG-4	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	CPUC shall monitor compliance during construction.	Interference with agricultural operations would be limited or avoided.	Prior to and during construction
AG-1, AG-3	APM AG-3: Avoid Harvest Season. To the extent feasible, construction in agricultural fields would be scheduled after the end of harvest season.	CPUC shall monitor compliance during construction.	Interference with agricultural operations would be limited or avoided.	Prior to and during construction.
Air Quality				
Applicable impacts not identified in Section 3.3 (Air Quality)	APM AQ-1: Use low sulfur fuel (e.g., <15ppm).	SCE will provide records of fuel purchases to the CPUC upon request.	NOx emissions are reduced.	Prior to and during construction.
	APM AQ-2: Use of clean burning on-road 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 Mitigation Measure AQ-1b).	SCE or its construction contractor will submit a list of diesel-fueled on-road and off-road equipment to the CPUC prior to construction indicating compliance.	NOx, VOC, and SO2 emissions are reduced.	Prior to and during construction.
	APM AQ-3: Construction workers will carpool when possible (see proposed Mitigation Measure AQ-1a and AQ-1c).	• As part of the Construction Transportation Plan (see Mitigation Measure T-2), SCE will identify carpooling opportunities (meeting locations, etc.). • CPUC and/or FS will monitor compliance during construction.	Minimize traffic congestion, thereby minimizing emissions.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	APM AQ-4: Restrict vehicle idling time to less than 10 minutes whenever possible (see proposed Mitigation Measure AQ-1g).	CPUC and/or FS will monitor compliance at construction areas.	NOx emissions are reduced.	During construction.
	APM AQ-5: Properly maintain mechanical equipment (see proposed Mitigation Measure AQ-1f).	SCE shall provide maintenance records to the CPUC upon request.	Mechanical equipment is properly maintained, which reduces NOx emissions.	During construction.
	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).	SCE shall provide maintenance records to the CPUC upon request.	Mechanical equipment is properly maintained, which reduces NOx emissions.	Prior to and during construction.
	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).	• SCE shall submit a construction FDECP to the CPUC and FS for review and approval. • SCE shall incorporate the requirements of the FDECP into the plans and specifications, and require compliance by the construction contractor. • CPUC will monitor compliance at construction areas.	• Fugitive dust (PM10) emissions are reduced. • Effectiveness can be determined by monitoring implementation of the control measures detailed in the FDECP.	Prior to and during construction.
	APM AQ-8: As feasible, restrict construction operations during the morning hours and during high wind events when NOX emissions are more likely to contribute to O3 formation (see proposed Mitigation Measure AQ-1a).	CPUC and/or FS will monitor compliance at construction areas.	NOx emissions are reduced.	During construction.
	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).	CPUC and/or FS will monitor compliance at construction areas.	NOx emissions are reduced.	During construction.
Biological Resources				
B-1, B-4, B-5, B-7, B-8, B-15, B-22, B-23, B-24, B-25, B-26, B-27, B-33, B-35, B-36, B-37, B-38, B-39, B-40	APM BIO-1: Pre-Construction Surveys. Pre-construction biological clearance surveys would be performed to minimize impacts on special-status plants or wildlife species.	• SCE will submit documentation providing the results of pre-construction surveys to the CPUC and FS for impacted areas. • CPUC and/or FS will review and approve the identification, mapping, and flagging of listed and sensitive plant species, as well as modification to the design for relocation of roads, laydown areas, towers, and other	• Minimize disturbance to special-status plants and wildlife species, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
		ground disturbing activities to avoid sensitive plants to the extent feasible. • If avoidance of sensitive plants is not possible, CPUC and/or FS will monitor transplanted or seeded plants to confirm health of listed and sensitive plant species for up to five years ensuring that survival would continue without further maintenance after five years. • If special-status wildlife species are present, SCE will submit a monitoring plan with compliance measures determined in consultation with the USFWS and CDFG. • SCE's designated biologist will monitor and provide a copy of the monitoring reports to the CPUC and Forest Biologist (NFS lands) for review on a weekly basis.		
B-1, B-3, B-7, B-8, B-15, B-16, B-17, B-22, B-23, B-24, B-25, B-26, B-27, B-29, B-30, B-31, B-39, B-40	APM BIO-2: Minimize Impacts to Vegetation. 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.	• At least sixty (60) days prior to construction, SCE will submit a Habitat Restoration and Revegetation Plan to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance with the plan.	Successful implementation of requirements set forth in the Habitat Restoration Plan, as verified by the EM.	Prior to, during, and after construction.
B-1, B-2, B-7, B-8, B-15, B-22, B-23, B-24, B-25, B-26, B-27, B-39, B-40	APM BIO-3: Avoid Impacts to State and Federal Jurisdictional Wetlands. Construction crews would avoid impacting 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.	• Prior to construction, SCE will submit final Project design plans and specification to the CPUC and Forest Service for review and approval. • If necessary, SCE will secure a SAA from the CDFG. • CPUC and/or FS will monitor compliance at construction areas.	Avoid streambeds and banks of streams along the route, as verified by the EM.	Prior to and during construction.
B-1, B-2, B-3, B-7, B-8, B-15, B-16, B-17, B-18, B-20, B-22, B-23, B-24,	APM BIO-4: BMPs. 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	• SCE will submit documentation of BMPs to the CPUC and FS for review and approval.	BMPs are applied, as verified by the EM.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
B-25, B-26, B-27, B-29, B-30, B-31, B-32, B-33, B-36, B-37, B-38, B-39, B-40	the construction and maintenance operations.	• CPUC and/or FS will monitor compliance at construction areas.		
B-1, B-2, B-3, B-7, B-8, B-15, B-16, B-17, B-18, B-20, B-23, B-24, B-25, B-26, B-27, B-29, B-30, B-31, B-32, B-35, B-36, B-38, B-40	APM BIO-5: Biological Monitors. 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 in order to protect native plants and wildlife, or special-status species. These restricted areas would be monitored to ensure their protection during construction.	SCE's designated biologists will monitor and provide monitoring reports to the CPUC and the Forest Biologist (NFS lands) for review on a weekly basis.	Construction activities remain outside flagged areas, as verified by the EM.	During construction.
B-1, B-2, B-3, B-7, B-8, B-15, B-16, B-17, B-16, B-18, B-20, B-23, B-24, B-25, B-26, B-27, B-29, B-30, B-31, B-32, B-33, B-36, B-37, B-38, B-40	APM BIO-6: Worker Environmental Awareness Program. 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.	• Prior to construction, SCE will establish and conduct an Environmental Training and Monitoring Program. An outline of the program will be provided to the CPUC for review and approval. • Completed sign-in sheet(s) with date, name, and signature of attendees (construction, operations and maintenance staff) will be provided to the CPUC. • CPUC and/or FS will monitor compliance with all environmental protection measures.	All field construction personnel are properly trained to identify environmental conditions in the project area.	Prior to and during construction.
B-1, B-2, B-7, B-8, B-15, B-20, B-22, B-23, B-24, B-25, B-26, B-27, B-39, B-40	APM BIO-7: Compensatory Mitigation. Where significant and unavoidable impacts on any special-status resources cannot be avoided, SCE would conduct compensatorye mitigation as determined by the regulatory agency.	Monitors will record significant and unavoidable impacts, and will report to the CPUC and any applicable regulatory agency.	The regulatory agency is provided compensation.	Prior to and during construction.
B-5, B-20, B-24, B-25, B-26, B-27	APM BIO-8: Avoid Impacts to Active Nests. 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.	• Prior to construction, SCE will submit documentation providing results of the protocol surveys for rare plants to the CPUC for review and approval. • All listed plant species shall be marked and avoided. • SCE's authorized biologist will be present during all activities immediately adjacent to or within habitats that support rare plant	• Minimize disturbance to raptors, as verified by the EM. • Effectiveness can be determined by monitoring implementation of the control measures.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
		species. • SCE's designated biologist will monitor compliance with measures identified in the monitoring plan and provide a copy of the monitoring reports to the CPUC for review on a weekly basis.		
B-20, B-21	APM BIO-9: Avian Protection. 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).	SCE will submit tower and pole design details to the CPUC and/or FS.	Minimize disturbance to raptors, as verified by the EM.	Prior to construction.
Cultural Resources				
C-1	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 (see Technical Appendix I). 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.	• For known cultural resources sites, CPUC and/or FS will monitor avoidance during construction. • If a site cannot be avoided, SCE will submit a Cultural Resources Report to the CPUC, FS and other responsible agencies (CHRIS, OHP, etc.) prior to construction.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.
C-1	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	• For known cultural resources sites, CPUC and/or FS will monitor avoidance during construction. • If a site cannot be avoided, SCE will submit a Cultural Resources Report to the CPUC, FS and other responsible agencies (CHRIS, OHP, etc.) prior to construction.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	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.			
C-1	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.	• For known cultural resources sites, CPUC and/or FS will monitor avoidance during construction. • If a site cannot be avoided, SCE will submit a Cultural Resources Report to the CPUC, FS and other responsible agencies (CHRIS, OHP, etc.) prior to construction.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.
C-1	APM CR-2b: 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.	• SCE will submit documentation of training with a list of construction personnel who completed the training to the CPUC and FS. • A designated monitor will ensure compliance for the duration of construction.	Minimize unnecessary disruptions to cultural resources, as verified by the EM.	Prior to and during construction.
C-1	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	For known archaeological sites, CPUC and/or FS will monitor avoidance during construction.	Cultural sites will be avoided, properly documented, and preserved for future	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	area" within which construction activities and personnel are not permitted. Monitoring will be conducted to ensure that the protective areas are maintained.		generations.	
C-1	APM CR-3: **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.	• For known cultural resources sites, CPUC and/or FS will monitor avoidance during construction. • If a site cannot be avoided, SCE will submit a Cultural Resources Report to the CPUC, FS and other responsible agencies (CHRIS, OHP, etc.) prior to construction.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.
C-1	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.	• For known archaeological resources sites, CPUC and/or FS will monitor avoidance during construction. • If a site cannot be avoided, SCE will submit a Cultural Resources Report to the CPUC, FS and other responsible agencies (CHRIS, OHP, etc.) prior to construction.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.
C-1	APM CR-3b: **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	• For known cultural resources sites, CPUC and/or FS will monitor avoidance during construction. • If a site cannot be avoided, SCE will submit a Cultural Resources Report to the CPUC, FS and other responsible agencies (CHRIS, OHP, etc.) prior to construction.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	of any significance evaluations of buildings and structures will be filed with the appropriate Information Center of the California Historical Resources Information System.			
C-1	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.	SCE shall provide documentation of coordination with appropriate Native American tribes, if necessary.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.
None identified.	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.	SCE shall submit documentation of the unavoidable impact(s) and the minimization measures to the CPUC and/or FS.	Minimize unnecessary disruptions to cultural resources, as verified by the EM.	Prior to and during construction.
None identified.	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	SCE shall submit documentation to the CPUC and/or FS whenever an archaeological study or data recovery is performed. For known archaeological sites, CPUC and/or FS will monitor avoidance during construction.	Minimize unnecessary disruptions to archaeological resources, as verified by the EM.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	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.			
None identified.	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.	• SCE shall submit documentation to the CPUC and/or FS of all reports and studies related to significant buildings and structures. • For known significant buildings and structures, CPUC and/or FS will monitor avoidance during construction.	Minimize unnecessary disruptions to significant buildings and structures, as verified by the EM.	Prior to and during construction.
C-1	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	• SCE shall complete training including response procedures for all construction personnel. • SCE shall provide to the CPUC and FS a list of construction personnel who have completed the cultural resources identification training prior to start of construction. • CPUC and/or FS will monitor avoidance during construction. • SCE shall provide documentation of all procedures performed in the event that human remains are discovered.	Avoid or reduce impacts to identified cultural resources.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	• 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			
C-2	APM CR-6: 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*. Archaeological excavations at sites will not, if at all possible, inappropriately disturb or remove human remains. Native Americans will be consulted to develop a protocol to be followed if human remains are encountered during any Project activity.	• SCE shall provide documentation of coordination with appropriate Native American tribes. • CPUC and/or FS will monitor avoidance during construction.	Avoid or reduce impacts to identified cultural resources.	During construction.
None identified.	APM CR-7: 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.	SCE shall provide documentation of coordination with appropriate Native American tribes, if necessary.	Cultural sites will be avoided, properly documented, and preserved for future generations.	Prior to and during construction.
Environmental Contamination and Hazards				
E-2	APM HAZ-1: Phase I Environmental Site Assessment (ESA). A Phase I ESA would be performed at each new or expanded substation location and along newly acquired transmission line rights-of-way (ROWs). The Phase I ESAs would include an electronic records search of federal, state, and local databases. The electronic records search would be contracted to Environmental Data Resources (EDR), a company which specializes in this type of work and who would produce a comprehensive report for the entire TRTP ROW. The EDR Report is used to identify sites located on federal, state, and local government agency databases which may have the potential to impact the proposed Project. The EDR report would be reviewed and, based on such review, any potential areas of concern along the ROW would be identified for further assessment. In addition, a Phase I ESA, which is compliant with ASTM 1927-05 (ASTM, 2005) would be performed on all property to be acquired. Based on the results of the	• SCE shall submit Phase I ESAs according to this measure, and shall submit documentation to the FS and CPUC. • CPUC and/or FS monitor compliance and ensure proper excavation measures are implemented if necessary.	• Avoid or reduce potential of encountering hazardous materials. • Avoid or reduce potential of mobilization of existing contamination.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	Phase I ESAs, additional assessment, characterization, and remediation of potential or known subsurface impacts may be conducted prior to construction activities. Such remediation could include the relocation of T/L structures as necessary to avoid impacted areas, or the removal and disposal of impacted soils and/or groundwater according to applicable regulations.			
E-1	APM HAZ-2: Hazardous Materials and Waste Handling Management. Hazardous materials used and stored on site for the proposed construction activities – as well as hazardous wastes generated on site as a result of the proposed construction activities – would be managed according to the specifications outlined below. • Hazardous Materials and Hazardous Waste Handling: A Project-specific hazardous materials management and hazardous waste management program would be developed prior to initiation of the Project. The program would outline proper hazardous materials use, storage and disposal requirements as well as hazardous waste management procedures. The program would identify types of hazardous materials to be used during the Project and the types of wastes that would be generated. All Project personnel would be provided with Project-specific training. This program would be developed to ensure that all hazardous materials and wastes were handled in a safe and environmentally sound manner. Hazardous wastes would be handled and disposed of according to applicable rules and regulations. Employees handling wastes would receive hazardous materials training and shall be trained in hazardous waste procedures, spill contingencies, waste minimization procedures and treatment, storage and disposal facility (TSDF) training in accordance with OSHA Hazard Communication Standard and 22 CCR. SCE would use landfill facilities that are authorized to accept treated wood pole waste in accordance with HSC 25143.1.4(b). • Construction Stormwater Pollution Prevention Plan (SWPPP): A Project-specific construction SWPPP would be prepared and implemented prior to the start of construction of the transmission line and substations. The SWPPP would utilize Best Management Practices (BMPs) to address the storage and handling of hazardous materials and sediment runoff during construction activities (California Stormwater Quality Association, 2004). • Transport of Hazardous Materials: Hazardous materials that would be transported by truck include fuel (diesel fuel and gasoline) and oil	• SCE shall complete training for handling of hazardous materials and waste for all construction personnel. • SCE shall provide to the CPUC and FS a list of construction personnel who have completed the training prior to start of construction. • SCE shall submit the hazardous materials management and hazardous waste management program, the SWPPP, and the Emergency Response Plan to the CPUC and FS for review and approval. • Written procedures for the transport of hazardous materials, and the fueling and maintenance of construction equipment and helicopters shall be submitted to the CPUC and FS for review and approval.	• OSHA compliant storage and handling of hazardous materials and waste. • Efficient and effective procedures are in place and result in transport of hazardous materials that is in compliance with U.S. Department of Transportation and Caltrans regulations. • Efficient and effective procedures are in place and result in adequate fueling and maintenance of construction equipment and helicopters. • Immediate and efficient response procedures are in place in the event of a hazardous spill.	Prior to construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	and lubricants for equipment. Containers used to stored hazardous materials would be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used would be established in accordance with U.S. Department of Transportation and Caltrans regulations. A qualified transporter would be selected to comply with U.S. Department of Transportation and Caltrans regulations. • Fueling and Maintenance of Construction Equipment: Written procedures for fueling and maintenance of construction equipment would be prepared prior to construction. Vehicles and equipment would be refueled on site or by tanker trucks. Procedures would include the use of drop cloths made of plastic, drip pans and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling stations would be located in designated areas where absorbent pad and trays would be available. The fuel tanks would also contain a lined area to ensure that accidental spillage does not occur. Drip pans or other collection devices would be placed under the equipment at night to capture drips or spills. Equipment would be inspected daily for potential leakage or failures. Hazardous materials such as paints, solvents, and penetrants would be kept in an approved locker or storage cabinet. • Fueling and Maintenance of Helicopters: Written procedures for fueling and maintenance of helicopters would be prepared prior to construction. Helicopters would be refueled at helicopter staging areas or local airports. Procedures would include the use of drop cloths made of plastic, drip pans and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling areas would be located in designated areas where absorbent pad and trays are available. • Emergency Release Response Procedures: An Emergency Response Plan detailing responses to releases of hazardous materials would be developed prior to construction activities. It would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. All hazardous materials spills or threatened release, including petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled would be			

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	immediately reported if the spill has entered a navigable water, stream, lake, wetland, or storm drain, if the spill impacted any sensitive area including conservation areas and wildlife preserved, or if the spill caused injury to a person or threatens injury to public health. All construction personnel, including environmental monitors, would be aware of state and federal emergency response reporting guidelines.			
E-4	APM HAZ-3: Soil Management Plan. A Soil Management Plan would be developed and implemented for construction of the proposed Project. The objective of the Soil Management Plan is to provide guidance for the proper handling, onsite management, and disposal of impacted soil that might be encountered during construction activities. The plan would include practices that are consistent with the California Title 8, Occupational Safety and Health Administration (Cal-OSHA) regulations, as well as appropriate remediation standards that are protective of the planned use. Appropriately trained professionals would be on site during preparation, grading, and related earthwork activities to monitor soil conditions encountered. The Soil Management Plan would provide guidelines for the following: • Identifying impacted soil • Assessing impacted soil • Soil excavation • Impacted soil storage • Verification sampling • Impacted soil characterization and disposal In the event that potentially contaminated soils were encountered within the footprint of construction, soils would be tested and stockpiled. The appropriate CUPA would determine whether further assessment is warranted.	• SCE shall submit the Soil Management Plan to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance during construction.	OSHA compliant handling, management, disposal of impacted soil.	Prior to and during construction.
E-5	APM HAZ-5: Spill Prevention, Countermeasure, and Control Plan and Hazardous Materials Business Plan • Spill Prevention, Countermeasure, and Control Plan (SPCC Plan). In accordance with Title 40 of the CFR, Part 112, SCE would prepare a SPCC for proposed and/or expanded substations. The plans would include engineered and operational methods for preventing, containing, and controlling potential releases, and provisions for quick and safe cleanup.	• SCE shall submit the SPCC Plan and HMBPs to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance during construction.	• Avoid hazardous spills. • Quick and safe cleanup in the event of a spill.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	• Hazardous Materials Business Plans (HMBPs). Prior to operation of new or expanded substations, SCE would prepare or update and submit, in accordance with Chapter 6.95 of the CHSD, and Title 22 CCR, an HMBP. The required documentation would be submitted to the CUPA. The HMBPs would include hazardous materials and hazardous waste management procedures and emergency response procedures including emergency spill cleanup supplies and equipment.			
Geology, Soils, and Paleontology				
G-4, G-5	APM GEO-1: Seismic Design. For new substation construction (e.g., expansion of Antelope Substation), specific requirements for seismic design will be followed based on the Institute of Electrical and Electronic Engineers' 693 "Recommended Practices for Seismic Design of Substation". (See Mitigation Measure G-6)	• Prior to construction, SCE will submit a geologic/geotechnical report, documenting site-specific geotechnical investigations, to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance during construction.	• Engineering design measures recom-mended in the geologic/geotechnical report are applied, as verified by the EM. • Seismic activity does not damage expansion area at Antelope Substation.	Prior to, during, and after construction.
G-3, G-4, G-5, G-6, G-7	APM GEO-2: Perform Geotechnical Studies. Prior to final design of substation facilities and transmission line tower foundations, a geotechnical study would be performed to identify site-specific geologic conditions in enough detail to support good engineering practice. (See Mitigation Measures G-1, G-4, G-5, G-6, G-7, G-8, and G-9)	• Prior to construction, SCE will submit a geologic/geotechnical report, documenting site-specific geotechnical investigations, to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance during construction.	Geologic conditions do not damage Project components.	Prior to, during, and after construction.
G-2	APM GEO-3: Construction SWPP. Transmission line and substation construction activities would be performed in accordance with the soil erosion/water quality protection measures specified in the Construction SWPPP. (See Mitigation Measures G-2 and H-1a)	• Prior to construction, SCE will submit a copy of the Construction SWPPP to the CPUC and FS for review and approval. • CPUC and/or FS will monitor compliance during construction.	Project construction activities do not cause soil erosion or degrade water quality.	Prior to and during construction.
G-8	APM PAL-1: The following mitigation measures have been developed to reduce the potential impacts of project construction on paleontological resources to a less than significant level. The measures are derived from the guidelines of the SVP and meet the requirements of Kern and Los Angeles counties and CEQA. These mitigation measures have been used throughout California and have been demonstrated to be successful in	• Prior to construction, SCE's appointed paleontological monitor will prepare a mitigation plan for the Project and submit it to the CPUC and FS (NFS lands) for review and approval. • The paleontological monitor will	Unique or significant fossils are not damaged by Project excavation.	During construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	protecting paleontological resources while allowing timely completion of construction (See Mitigation Measure G-10): • A certified paleontologist would be retained by SCE to supervise monitoring of construction excavations and to produce a mitigation plan for the proposed Project. Paleontological monitoring would include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor would have authority to temporarily divert grading away from exposed fossils in order to recover the fossil specimens. • If microfossils are present, the monitor would collect matrix for processing. In order to expedite removal of fossiliferous matrix, the monitor may request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Testing of stockpiles would consist of screen washing small samples to determine if significant fossils are present. Productive tests would result in screen washing of additional matrix from the stockpiles to a maximum of 6,000 pounds per locality to ensure recovery of a scientifically significant sample. • Quaternary Alluvium, Colluvium, and Quaternary Landslide Deposits have a low paleontological sensitivity level, and would be spot-checked on a periodic basis to insure that older underlying sediments are not being penetrated. • A certified paleontologist would prepare monthly progress reports to be filed with the client. • Recovered fossils would be prepared to the point of curation, identified by qualified experts, listed in a database to allow analysis, and deposited in a designated repository. • At each fossil locality, field data forms would record the locality, stratigraphic columns would be measured, and appropriate scientific samples submitted for analysis. • The certified paleontologist would prepare a final mitigation report to be filed with the client, the lead agency, and the repository.	monitor compliance at construction areas where excavation is being conducted in geologic units of moderate to high sensitivity. Areas of low sensitivity will be spot-checked periodically. • Monitoring reports will be submitted to the CPUC and FS (NFS lands) for review on a monthly basis. • If a fossil is recovered, SCE will prepare the fossil to the point of curation, list it in a database to allow analysis, and deposit it in a designated repository. • At each fossil locality, field data forms will record the locality, stratigraphic columns will be measured, and appropriate scientific samples will be submitted for analysis. • The paleontological monitor will prepare a final mitigation report and submit it to SCE, CPUC, FS, and the repository.		
Hydrology and Water Quality				
E-1, H-1, H-2, H-5	APM HYD-1: Construction SWPPP. A Construction SWPPP would be developed for the Project. Notices of Intent (NOIs) would be filed with the SWRCB and/or the RWQCBs, and a Waste Discharge Identification Number (WDID) would be obtained prior to construction. The SWPPP would be stored at the construction site for reference or inspection review. In addition, grading permit applications would be submitted, as applicable, to local jurisdictions. Implementation of the SWPPP would help stabilize graded areas and waterways, and reduce erosion and sedimentation. The	• SCE will submit a SWPPP to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance during construction.	BMPs included in the SWPPP are applied, as verified by the EM.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	plan would designate BMPs that would be adhered to during construction activities. Erosion minimizing efforts such as straw wattles, water bars, covers, silt fences, and sensitive area access restrictions (for example, flagging) would be installed before clearing and grading begins. Mulching, seeding, or other suitable stabilization measures would be used to protect exposed areas during construction activities. During construction activities, measures would be in place to ensure that contaminates are not discharged from the construction sites. The SWPPP would define 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 construction sites and during subsequent construction would be in place and monitored as specified by the SWPPP. A silting basin(s) would be established, as necessary, to capture silt and other materials, which might otherwise be carried from the site by rainwater surface runoff. In addition to a Construction SWPPP, all additionally required documents and procedures (as required in the anticipated April 2009 CGP) will be developed. These procedures may include effluent monitoring, receiving water monitoring, additional staff training, additional documentation, online reporting of all documentation and monitoring results, and project risk analysis.			
H-1, H-2, H-3	APM HYD-2: Environmental Training Program. An environmental training program would be established to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, and SWPPP measures, to all field personnel. A monitoring program would be implemented to ensure that the plans are followed throughout the period of construction.	• Prior to construction, SCE will establish and conduct an Environmental Training Program. An outline of the program will be provided to the CPUC for review and approval. • Completed sign-in sheet(s) with date, name, and signature of attendees (construction, operations and maintenance staff) will be provided to the CPUC.	No soil or groundwater is contaminated as a result of improper handling and/or storage of hazardous materials during construction, as verified by the EM.	Prior to and during construction.
G-2, H-2, H-3	APM HYD-3: Accidental Spill Control. The Construction SWPPP identified above would include procedures for quick and safe cleanup of accidental spills. The Construction SWPPP would prescribe hazardous materials handling procedures for reducing the potential for a spill during construction, and would include an emergency response program to ensure quick and safe cleanup of accidental spills. The SWPPP would identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, would be permitted.	• SCE will submit a SWPPP to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance during construction.	BMPs included in the SWPPP are applied, as verified by the EM.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
E-1, H-2	APM HYD-4: Non-storm Water and Waste Management Pollution Controls. Oil-absorbent materials, tarps, and storage drums would be used to contain and control any minor releases of transformer oil. In the event that excess water and liquid concrete escapes from foundations during pouring, it would be directed to bermed areas adjacent to the borings where the water would infiltrate or evaporate and the concrete would remain and begin to set. Once the excess concrete has been allowed to set up (but before it is dry), it would be removed and transported to an approved landfill for disposal.	• Prior to construction, SCE will submit a Hazardous Substance Control and Emergency Response Plan with grading permit applications to the appropriate oversight agency based on grading location, as well as to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance during construction.	No soil or groundwater is contaminated as a result of improper handling and/or storage of hazardous materials during construction, as verified by the EM.	Prior to and during construction.
None identified.	APM HYD-5: Hazardous Material Identification. A Phase I Environmental Site Assessment (ESA) would be performed at each new or expanded substation location and along newly acquired transmission line R-O-Ws. Depending on the results of the Phase I ESA, soil sampling would be conducted and remedial activities would be implemented, if applicable. If hazardous materials were encountered during any construction activities, work would be stopped until the material was properly characterized and appropriate measures were taken to protect human health and the environment. If excavation of hazardous materials is required, they would be handled, transported, and disposed of in accordance with federal, state, and local regulations.	• SCE shall submit Phase I ESAs according to this measure, and shall submit documentation to the FS and CPUC. • CPUC and/or FS monitor compliance and ensure proper excavation measures are implemented if necessary.	• Avoid or reduce potential of encountering hazardous materials. • Avoid or reduce potential of mobilization of existing contamination.	Prior to and during construction.
None identified.	APM HYD-6: Drilling and Construction Site Dewatering Management. Any dewatering operations associated with drilling and LST/TSP footing installation would follow applicable state and local regulatory requirements. If groundwater were encountered while excavating or constructing the transmission line or substations, dewatering operations would be performed. These operations would include, as applicable, the use of sediment traps and sediment basins in accordance with BMP NS-2 (Dewatering Operations) from the California Stormwater Quality Association's (CASQA) California Stormwater BMP Handbook – Construction (CASQA, 2003).	CPUC and/or Forest Service will monitor compliance during construction.	Dewatering operations abide by the California Stormwater BMP Handbook, as verified by the EM.	Prior to and during construction.
H-4, H-5	APM HYD-7:Flood and Erosion Structure Damage Protection. Transmission towers or other structures would not be placed within waterway protection corridors (floodways) defined by city and county codes. Aboveground project features such as transmission line towers and substation facilities will be designed and engineered to withstand potential flooding and erosion hazards. Although some project features may need to be placed within 100-year floodplain boundaries, they will be designed per applicable floodplain development guidelines. Measures would include specially designed footings to withstand flooding due either to a 100-yr flood event or a failure of a nearby upstream dam or reservoir. The main	• Prior to construction, SCE will submit final Project design plans and specification, specifically noting location of towers with respect to known waterways, to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance at construction areas.	Avoid waterway protection corridors.	During construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
	Project facilities (i.e., substations) will be located outside of known watercourses.			
None identified.	APM HYD-8: Operation Storm Water Management Plan. The post-construction (Operation) Storm Water Management Plan (SWMP) for Vincent Substation would be updated. The SWMP identifies potential pollutants based on the activities that take place at the site, and discusses the appropriate Best Management Practices that should be used to prevent pollutants from entering the storm water and non-storm water runoff from the site. The SWMP also includes requirements for periodic site training for employees and inspections by onsite personnel.	• SCE will submit a SWMP to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance during construction.	BMPs included in the SWMP are applied, as verified by the EM.	During operation.
Noise				
N-1, N-2	APM NOI-1: Limit Hours and Days for Construction. SCE would comply with all applicable noise ordinances pertaining to construction hour limitations. In the event that construction must occur outside the allowable work hours, a variance would be obtained.	CPUC will monitor compliance during construction.	Local noise standard violations are minimized, as verified by the EM.	During construction.
None identified.	APM NOI-2: Substation Noise Minimization. SCE would conduct noise studies at substations where noise emitting equipment is proposed (e.g., Antelope and Vincent substations). The results of these studies would be used to determine appropriate noise minimization measures, such that no local noise ordinance limits would be exceeded. Measures to accomplish this may include specifying quieter equipment from the manufacturer, installing noise control devices, and installing sound barriers and enclosures.	• SCE shall submit noise studies and proposed minimization measures to the CPUC. • CPUC will monitor compliance during construction.	Local noise standard violations are minimized, as verified by the EM.	Prior to and during construction.
N-1, N-2	APM NOI-3: Advance Notification. SCE would provide advanced notification of construction to the pertinent businesses and residences when appropriate and feasible.	SCE shall submit copies of notices and dates of public notification to the CPUC and FS.	Coordination efforts will minimize disruption to businesses and residents.	Prior to and during construction.
N-1	APM NOI-4: Establish Toll Free Number. SCE would establish a toll free telephone number for receiving questions or complaints during construction and develop procedures for responding to callers.	SCE shall submit documentation of the toll free number to the CPUC and FS.	Provide response for questions and/or complaints.	Prior to and during construction.
Public Services and Utilities				
PSU-1	APM PUB-1: Fire Management Plan. Establishes standards and practices that would minimize the risk of fire danger, and in case of fire, provide for immediate suppression and notification.	SCE shall submit the Fire Management Plan to the CPUC and FS for review and approval.	Avoid or reduce potential for fires.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
Traffic and Transportation				
T-1	APM TRA-1: Minimize Street Use. Construction activities would be designed to minimize work on or use of local streets.	• Prior to construction, SCE will submit a Construction Transportation Plan (See Mitigation Measure T-2) to the CPUC and Forest Service for review and approval. • CPUC and/or FS will monitor compliance during construction.	Traffic on public roadways remains generally free-flowing, as verified by the EM.	Prior to and during construction.
T-1	APM TRA-2: Obtain Permits. When local streets must be used for more than normal traffic purposes, an encroachment permit or similar authorization would be obtained from Caltrans, County, and/or local jurisdictions (or other agency) as applicable.	• Prior to construction, SCE will submit copies of all encroachment permits or similar authorizations obtained for the Project. • CPUC and/or FS will monitor compliance with permits/authorizations during construction.	Encroachment conditions are authorized.	Prior to and during construction.
T-1, T-5	APM TRA-3: Incorporate Protective Measures. Any construction or installation work requiring the crossing of a local street, highway, or rail line would incorporate the use of guard poles, netting, or similar means to protect moving traffic and structures from the activity. If necessary on state highways, continuous traffic breaks operated by the CHP would be planned and provided.	• Prior to construction, SCE will provide copies of the TCPs submitted to the applicable jurisdictions, to CPUC and FS for review. • CPUC and/or FS will monitor compliance during construction.	Traffic at road/rail crossings remains free-flowing during construction activities, as verified by the EM.	Prior to and during construction.
T-1	APM TRA-4: Prepare Traffic Management Plans. Traffic control and other management plans would be prepared where necessary to minimize project impacts on local streets.	• Prior to construction, SCE will provide copies of the Traffic Management Plans to the CPUC and FS. • CPUC and/or FS will monitor compliance during construction.	Traffic on public roadways affected by construction activities remains generally free-flowing, as verified by the EM.	Prior to and during construction.
T-9	APM TRA-5: Repair Damaged Streets. Any damage to local streets would be repaired, and streets would be restored to their pre-project condition.	CPUC and/or FS will monitor compliance following completion of construction.	Minimize permanent damage to roadways.	Within two months of completing construction.
Visual Resources				
V-2, V-5	APM AES-1: Transmission Lines - Reduce Light Reflection off Towers/Poles. Lattice steel towers (LSTs) and tubular steel poles (TSPs) will be constructed of steel that is galvanized and treated at the factory to create a dulled finish that will reduce reflection of light off of the tower members. As appropriate to the context, the galvanized coating will also be darkened to allow the towers to blend into the backdrops.	CPUC and/or FS will monitor for compliance.	Reduced glare in comparison to non-galvanized tower/poles.	Prior to construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
V-3	APM AES-2: Transmission Lines - TSPs Near Existing Residential Development. In areas that are in close proximity to existing residential development, TSPs will be specified to provide tower structures that relate visually to the other elements in these settings. The exceptions to this principle are: 1) LSTs are specified at turning tower locations and at long spans because, structurally, TSPs do not have the strength to withstand the forces exerted by the conductors at these locations; and 2) LSTs may be used to match existing structure types adjacent to the Project in the transmission corridor.	CPUC and/or FS will monitor for compliance.	Views of the transmission line will be less prominent.	Prior to and during construction.
None identified.	APM AES-3: Transmission Lines - Nonreflective/Nonrefractive Insulators. The insulators specified for this proposed Project will be made of materials that do not reflect or refract light.	CPUC and/or FS will monitor for compliance.	Avoid reflection or refraction of light in comparison to untreated insulators.	Prior to construction.
None identified.	APM AES-4: Transmission Lines - Nonreflective/Nonrefractive Conductors. The conductors specified for the Project will be nonspecular, that is, they will be treated at the factory to dull their surfaces to reduce their potential to reflect light.	CPUC and/or FS will monitor for compliance.	Avoid or reduce reflection or refraction of light in comparison to untreated conductors.	Prior to construction.
V-3	APM AES-5: Transmission Lines - New Structures Aligned with Existing Structures. To the extent feasible, new transmission structures that will be located in corridors containing existing transmission lines will be located to line up with the other transmission structures to create a higher level of visual unity.	CPUC and/or FS will monitor for compliance.	Minimize visual complexity from sensitive receptor locations.	Prior to and during construction.
V-2	APM AES-6: Transmission Lines - Transmission Structures Set Back from Major Roadways. Where conditions permit, transmission structures will be set back from the crossings of major roadways.	CPUC and/or FS will monitor for compliance.	Views of the transmission line will be less prominent.	Prior to and during construction.
V-2	APM AES-7: Transmission Lines - Avoid Structures in Middle of Lines of Sight. To the extent feasible, the final locations of transmission structures will be adjusted to avoid locations that place the structures in the middle of the line of sight from streets and other important views.	CPUC and/or FS will monitor for compliance.	Views of the transmission line will be less prominent.	Prior to and during construction.
None identified.	APM AES-8: Transmission Lines - Regrade/Revegetate Construction Sites. Any areas around new or rebuilt transmission structures that must be cleared during the construction process will be regraded and revegetated to restore the area to an appearance that will blend back into the overall landscape context.	CPUC and/or FS will monitor for compliance.	Minimize views of excavated areas.	During construction.
None identified.	APM AES-9: Access Roads - Use Existing Access Roads. To the extent feasible, existing access roads will be used.	CPUC and/or FS will monitor for compliance.	Minimize views of excavated areas.	During construction.
None identified.	APM AES-10: Access Roads - Helicopter Construction. In mountainous areas, particularly in the ANF, helicopters will be used for construction of towers in areas where extensive new road development would be required.	CPUC and/or FS will monitor for compliance.	Minimize views of excavated areas.	During construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
None identified.	APM AES-11: Access Roads - Minimize Road Modifications. Widening and grading of roads will be kept to the minimum required for access by proposed Project construction equipment.	CPUC and/or FS will monitor for compliance.	Minimize views of excavated areas.	During construction.
None identified.	APM AES-12: Access Roads - Dust Suppression. During the construction period, dust suppression measures will be used to minimize the creation of dust clouds potentially associated with the use of the access roads.	CPUC and/or FS will monitor for compliance.	Minimize visual obstructions.	During construction.
None identified.	APM AES-13: Access Roads - Cut and Fill Slope Revegetation. Any areas of exposed cut and fill slope created in the process of widening existing access roads or creating new access roads will be revegetated, as practicable, to blend back into the surrounding landscape.	CPUC and/or FS will monitor for compliance.	Minimize views of excavated areas.	During construction.
None identified.	APM AES-14: Marshalling Yards and Laydown Areas - Reuse Previously Disturbed/Low Visibility, Low Sensitivity Areas for Marshalling Yards. To the extent feasible, the sites selected for use as marshalling yards and laydown areas will be areas that are already disturbed, in locations of low visual sensitivity.	SCE shall submit final locations 30 days prior to construction.	Minimize views of excavated areas.	Prior to construction.
V-1	APM AES-15: Marshalling Yards and Laydown Areas - Cover Chain-Link Fencing with Fabric. During the construction period, the temporary chain-link fences surrounding the marshalling yards and laydown areas will be covered with fabric to limit views into these sites and to create a unified, tidy appearance.	CPUC and/or FS will monitor for compliance.	Minimize degradation of visual quality.	During construction.
	APM AES-16: Marshalling Yards and Laydown Areas - Reduce Glare and Light Spill. The lighting specified for the marshalling yards and laydown areas will be the minimum required to meet safety and security standards. All light fixtures will be hooded to eliminate any potential for glare effects and to prevent light from spilling off the site or up into the sky. In addition, the fixtures will have sensors and switches to permit the lighting to be turned off at times when it is not required.	CPUC and/or FS will monitor for compliance.	Avoid or reduce glare and light spill from sensitive receptor locations.	During construction.
V-1	APM AES-17: Marshalling Yards and Laydown Areas - Construction Site Cleanup. When the construction period is over, the fencing around the marshalling yards and laydown areas will be removed, the sites will be cleaned up, and their surfaces will be restored.	CPUC and/or FS will monitor for compliance.	Sites will be restored to pre-construction conditions.	After construction.
V-2, V-5	APM AES-18: Substations - Reflectivity Finish. ~~All s~~<u>S</u>ubstation equipment will be specified with a low reflectivity, neutral finish.<u> SCE will request dull finishes. Some equipment may not be available with a dull finish.</u>	CPUC and/or FS will monitor for compliance.	Avoid or reduce reflection of light in comparison to untreated equipment.	Prior to and during construction.
V-2, V-5	APM AES-19: Substations - Nonreflective/Nonrefractive Insulators. All insulators at the substations and on the takeoff equipment will be nonreflective and nonrefractive.	CPUC and/or FS will monitor for compliance.	Avoid reflection or refraction of light in comparison to untreated insulators.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
V-2, V-5	APM AES-20: Substations - Low Reflectivity Finish on Structures. The surfaces of all structures will be given low reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops.	CPUC and/or FS will monitor for compliance.	Avoid or reduce reflection of light in comparison to untreated structures.	Prior to and during construction.
V-2, V-5	APM AES-21: Substations - Reduce Glare and Light Spill. The lighting specified for the new and expanded substations will be the minimum required to meet safety and security standards. All light fixtures will be hooded to eliminate any potential for glare effects and to prevent light from spilling off the site or up into the sky. In addition, the fixtures will have sensors and switches to permit the lighting to be turned off at times when it is not required.	CPUC and/or FS will monitor for compliance.	Avoid or reduce glare and light spill from sensitive receptor locations.	Prior to and during construction.
V-2, V-5	APM AES-22: Substations - Chain-Link Dulled Finish. The chain-link fences surrounding the substations will have a dulled, darkened finish to reduce contrast with its surroundings.	CPUC and/or FS will monitor for compliance.	Reduce visual complexity.	Prior to and during construction.
V-2, V-3	APM AES-23: Substations - Landscape Plan. An appropriate landscape plan will be prepared for the area on the west side of the Vincent Substation expansion to screen the equipment from view and blend the substation into the surroundings.	SCE shall document coordination efforts and submit to reports to the CPUC and FS.	• Reduce visual complexity. • Minimize degradation of visual quality.	Prior to and during construction.
Wilderness and Recreation				
R-1, R-2	APM REC-1: Temporary closures. When temporary, short-term park or trail closures (including off-highway vehicle [OHV] routes and the PCT) are necessary for construction activities, SCE would coordinate those closures with applicable agencies. To the extent practicable, SCE would schedule construction activities to avoid heavy recreational use periods, such as holidays.	SCE shall document coordination efforts and submit reports to the CPUC and FS.	• Avoid interruptions during heavy recreation periods. • Minimize disruption of recreation activities.	Prior to and during construction.
R-1, R-2	APM REC-2: Closure notices. When temporary park or trail closures are necessary, SCE would post notice of the closure onsite 30 days prior to the closure and alternative access routes, when applicable.	SCE shall submit documentation of notice to the CPUC and FS.	• Avoid interruptions during heavy recreation periods. • Minimize disruption of recreation activities.	Prior to and during construction.
None identified.	APM REC-3: Revegetation. Any park areas temporarily affected by Project construction would be revegetated and returned to their original state. SCE would coordinate with owners of landscaped areas, parks, and hillsides to restore disturbed areas to a condition equal to or better than original.	SCE shall document coordination with landowners and restoration efforts, and submit reports to the CPUC and FS.	Affected park areas are returned to their pre-construction conditions.	Prior to and during construction.

Table G.1-3. Monitoring Plan for Applicant-Proposed Measures

Applicable Impact(s)	Measure	Monitoring Requirement	Effectiveness Criteria	Timing of Action
Wildfire Prevention and Suppression				
F-1, F-3, F-4	APM HAZ-4: Fire Management Plan. The Fire Management Plan, developed by SCE and presented in the PEA as Appendix D, would be implemented.	SCE shall submit the Fire Management Plan to the CPUC and FS for review and approval.	• Avoid or reduce potential for wildfires. • Provide procedures for immediate suppression, if necessary.	Prior to and during construction.

Volume 5 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

TEHACHAPI RENEWABLE TRANSMISSION PROJECT

Final Environmental Impact Report/Statement

Volume 5 Contents
Appendices

Appendix H.
Draft EIR/EIS Comments and Responses

H. Draft EIR/EIS Comments and Responses

H.1 Comments Received on the Draft EIR/EIS

Tables H-1 through H-5 list the persons, agencies, and organizations that provided comments on the Draft EIR/EIS during the public review period, which ended on April 6, 2009. The comments are grouped into sets and each comment set has been assigned a designation (A, B, C, D, or E) that indicates whether the comments are from public agencies or elected officials, groups or organizations, individuals, the applicant (SCE), or verbal comments received at public meetings. A Public Participation Hearing on the Draft EIR/EIS was held on March 19, 2009, and additional public meetings were held on March 18 and 24, 2009. These public meetings are described in Section 7.1 of the EIR/EIS.

Table H-1. Comments Received from Public Agencies and Elected Officials on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Agency/Affiliation	Name / Title of Commenter	Date of Comment
A.1	Antelope Valley Air Quality Management District	Alan J. De Salvio, Supervising Air Quality Engineer	02/25/09
A.2	City of Palmdale	Asoka Herath, Director of Planning	03/06/09
A.3	John A. Rowland High School	Robert S. Withers, Assistant Principal	03/11/09
A.4	South Coast Air Quality Management District	Steve Smith, Program Supervisor CEQA Section, Planning, Rule Development and Area Sources	03/18/09
A.5	Department of Transportation, Division of Transportation Planning, MS-32	Gary S. Arnold, Statewide Local Development-Intergovernmental Review Coordinator, Office of Community Planning	03/16/09
A.6	City of Brea	Charles View, Development Services Director	03/17/09
A.7	City of San Marino, Planning & Building Department	Amanda Thorson, Planning & Building Assistant	03/19/09
A.8	County of Los Angeles, Department of Public Works	Gail Farber, Director of Public Works, for Dennis Hunter, Assistant Deputy Director, Land Development Division	03/25/09
A.9	California Regional Water Quality Control Board, Santa Ana Region	Mark G. Adelson, Chief, Regional Planning Programs Section	04/01/09
A.10	City of Chino Hills Planning Commission	Karen S. Bristow	03/19/09
A.11	City of Chino	Charles E. Coe, Director of Community Development	04/02/09
A.12	City of Chino	Brent Arnold, City Planner	04/03/09
A.13	CA Department of Parks and Recreation, Inland Empire District	Ron Krueper, District Superintendent	04/03/09
A.14	CA Department of Fish and Game, South Coast Region	Edmund J. Pert, Regional Manager	04/06/09
A.15	County of Los Angeles, Chief Executive Office	William T. Fujioka, Chief Executive Officer	04/06/09
A.16	Acton Town Council	Jacqueline Ayer	04/06/09
A.17	Watershed Conservation Authority	Belinda V. Faustinos, Executive Officer	04/02/09
A.18	Puente Hills Landfill Native Habitat Preservation Authority	Bob Henderson, Chairman	04/02/09
A.19	City of El Monte	Minh Thai, Planning Services Manager	04/06/09
A.20	City of La Habra Heights	Brian Bergman and Stan Carroll, Council Members	04/06/09
A.21	City of Irwindale	Ray Hamada, Director of Planning & Community Development	04/02/09

Table H-1. Comments Received from Public Agencies and Elected Officials on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Agency/Affiliation	Name / Title of Commenter	Date of Comment
A.22	County Sanitation Districts of Los Angeles County	Debra Bogdanoff, Senior Engineer, Facilities Planning Department	04/06/09
A.23	City of Chino Hills	Jeanne B. Armstrong, Goodin, MacBride, Squeri, Day & Lamprey, LLP (Attorneys for the City of Chino Hills)	04/06/09
A.24	County of Los Angeles, Department of Public Works	Gail Farber, Director of Public Works, for Dennis Hunter, Assistant Deputy Director Land Development Division	04/02/09
A.25	California Regional Water Quality Control Board, Santa Ana Region	Glenn Robertson, Engineering Geologist / CEQA Coordinator	04/06/09
A.26	City of Ontario	Jerry L. Blum, Planning Director	04/06/09
A.27	U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region	Patricia Sanderson Port, Regional Environmental Officer	04/06/09
A.28	U.S. Environmental Protection Agency, Region IX	Kathleen M. Goforth, Manager, Environmental Review Office	04/06/09

Table H-2. Comments Received from Groups, Organizations, and Companies on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Group/Organization/Company	Name / Title of Commenter	Date of Comment
B.1	Monte Cristo Mining Property	Bob Kerstein	03/05/09
B.2	Endangered Habitats League	Dan Silver, Executive Director	03/17/09
B.3	Antelope Valley Environmental Group (AVEG)	Dean Webb	03/18/09
B.4	Chino Hills Car Wash, Inc.	Vic Galstanyan	03/19/09
B.5	Save Our Community	Jim Flournoy, Secretary	03/26/09
B.6	Aera Energy LLC	Jeffrey R. Maisch, Project Manager	03/31/09
B.7	Terra-Gen Power, LLC	Mark A. Casper, Vice President	04/01/09
B.8	Inland Action, Inc.	Edward Lasak, Chairman	04/02/09
B.9	Parente/Chino Hills Co LP and Parente Real Estate Investment Management Co (owned and controlled by Mary Borba Parente)	David E Watson, Hecht Solberg Robinson Goldberg & Bagley LLP (legal counsel for Mary Parente)	04/03/09
B.10	Aerojet	Jones Day	04/03/09
B.11	Cook Hill Properties	Norman E Witt, Jr, Senior Vice President	04/06/09
B.12	Chino Valley Community Church	Roger Nelson, Chairman, Elder Board	04/06/09
B.13	CA State Parks Foundation	Sara Feldman, Vice President for Programs	04/06/09
B.14	Gabrielino-Tongva Tribe	Felicia Sheerman, Tribal Councilwoman	04/06/09
B.15	Save Our Community	Jim Flournoy, Secretary	04/06/09
B.16	Hills for Everyone	Claire Schlotterbeck, Executive Director	04/06/09
B.17	California Wind Energy Association	Nancy Rader, Executive Director	04/06/09
B.18	Lancaster Highlands LLC, Hearthstone Inc (managing partner), and Landstone Communities LLC (project manager)	Colin Nemeroff, Project Planner, Stantec	04/06/09
B.19	Montebello Hills Sierra Club Task Force	Margot Eiser, Co-Founder	04/06/09
B.20	Inland Hills Church	Dave Stoecklein, Senior Pastor, President of the Board of Directors	03/31/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.1	Kyle Tejada	2/21/09
C.2	Kyle Tejada	2/22/09
C.3	Anna C. Loera	2/25/09
C.4	Evelyn Ignacio	2/21/09
C.5	Sally Kirn	2/22/09
C.6	Connie Thieman	3/1/09
C.7	Martin & Sue Turnbow	3/4/09
C.8	Eloy Loera	3/5/09
C.9	James and Karen Vita	3/10/09
C.10	Roger and Vione Cox	3/12/09
C.11	Theopilis Hester	3/12/09
C.12	Kai Cheng	3/12/09
C.13	Bob Armitage	3/15/09
C.14	The Oh Family	3/16/09
C.15	Richard Emrich	3/17/09
C.16	Nora Chang Emrich	3/17/09
C.17	Jennifer Hu	3/18/09
C.18	Kai Cheng	3/18/09
C.19	Arturo Martinez	3/18/09
C.20	Karen and Frank Bodnar	4/1/09
C.21	Michael Keyzers	3/20/09
C.22	Janet Thurston	3/19/09
C.23	Jim Flournoy	Prior to 4/6/09
C.24	Paul and Janet Goossens	3/19/09
C.25	Paul Goossens	3/19/09
C.26	Sona McCoy	3/19/09
C.27	Tom Shiah	3/19/09
C.28	Louis Bouwer	3/19/09
C.29	Scott Guiou	3/19/09
C.30	Alexandria Walker	3/19/09
C.31	Rosie Starr	3/19/09
C.32	Trina Tudrick	3/19/09
C.33	Emma Hu	3/19/09
C.34	Patrick Hu	3/19/09
C.35	Rick Wibbens	3/19/09
C.36	Dhun Nathani	3/23/09
C.37	Gary McCarthy	3/19/09
C.38	John Starr	3/19/09
C.39	Maggi Burns	3/19/09
C.40	Donna Newton	3/22/09
C.41	Rudy Cantu	3/27/09
C.42	Mary Rabinek	3/25/09
C.43	Mark Sael	3/27/09
C.44	Eileen Minton	3/26/09
C.45	Liane Saeli	3/27/09
C.46	Angie Ter-Veen	3/27/09
C.47	Juan Carrillo	3/23/09
C.48	Ronny Chang	3/17/09
C.49	Rudy Cantu	3/24/09
C.50	Evan Galbraith	3/27/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.51	Richard Kilar	4/4/09
C.52	Beverly Ng	4/1/09
C.53	Robert Scudder	3/28/09
C.54	Cesar and Kore Marie Aguins	4/13/09
C.55	Mrs. Jean Hodgeson	4/13/09
C.56	Ruth Dickie	4/2/09
C.57	Chuck Dickie	4/2/09
C.58	Aldo & Sylvia Casillas	3/30/09
C.59	Victor W. Weaver	4/2/09
C.60	Sylvia Casillas	3/30/09
C.61	Bradley & Linda Tosch	4/4/09
C.62	Sol Raskin	4/5/09
C.63	Rome Saura	4/2/09
C.64	Christine Teater	4/3/09
C.65	Mike Davies	4/6/09
C.66	Jamison Hebert & Alec Mapa	4/6/09
C.67	Richard Chi	3/27/09
C.68	shintopstar	4/4/09
C.69	Scott, Annie, Nelly & Gracey Wilson	4/6/09
C.70	Mike Vander Dussen	4/6/09
C.71	Heather Baiseri	4/2/09
C.72	Janelle McClaran	4/6/09
C.73	Felicia Lovio	4/6/09
C.74	Keith & Deborah Williams	4/3/09
C.75	Barry Fischer	Prior to 4/6/09
C.76	Christina Genis	4/5/09
C.77	James Vita	4/4/09
C.78	Jill McClaran	4/6/09
C.79	Chris Bond	3/31/09
C.80	Joseph Hebert	4/4/09
C.81	Katy Wu	4/6/09
C.82	David Greene	4/6/09
C.83	Carolyn Elfelt	4/5/09
C.84	Jim Flournoy	4/5/09
C.85	Robert Staats	4/5/09
C.86	Debra Belli	4/2/09
C.87	Mike McClaran	4/6/09
C.88	Ken & Kathy Hatton	4/3/09
C.89	Percy Segura	3/30/09
C.90	Joanne Genis	4/7/09
C.91	Paul Chen	3/25/09
C.92	Michael Elfelt	4/5/09
C.93	Lisa Hirsch	4/6/09
C.94	Shu Kitazaki	4/6/09
C.95	Michael W. Stover	4/5/09
C.96	Tina Bradford	4/6/09
C.97	Alicia Elfelt	4/6/09
C.98	Stephen Elfelt	4/6/09
C.99	Joan & Jim Ashlock	4/3/09
C.100	Albert Chan	4/1/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.101	Danny & Floramie Torres	4/6/09
C.102	Brandon Stewart	4/6/09
C.103	Dr. & Mrs. Lon McClanahan	4/6/09
C.104	Crystal Wylie	4/6/09
C.105	John, Trina, Carissa & Kate Van Steenwyk	4/6/09
C.106	Richard & Deanna Perez	4/6/09
C.107	Colin Nemeroff	4/6/09
C.108	Michael Machado	4/6/09
C.109	Andrew Teater	4/6/09
C.110	Miguel & Iveth Llaneras	4/6/09
C.111	Paul & Danika Hildebrandt	4/6/09
C.112	Hsin-Shou Huang	4/6/09
C.113	Andrew Teater	4/6/09
C.114	Jim & Diane Case	4/6/09
C.115	George Tejada	4/5/09
C.116	Elizabeth B. Flournoy	4/6/09
C.117	David C. Cowardin	4/6/07
C.118	Bob Machuca	4/6/09
C.119	Tom, Roanne, Laura, and Joanna Holliman	4/7/09
C.120	Jill Saaredra	4/6/09
C.121	Robert & Pamela Sheehan	4/5/09
C.122	Steven and Robin Somers	4/5/09
C.123	Setswko Imori	4/6/09
C.124	Edmundo Genis	4/5/09
C.125	Kimhai Mullins	4/1/09
C.126	Jeff and Dana Anastasi	4/6/09
C.127	Tracy Bryant	4/6/09
C.128	Jim and Annette Chamberlain	4/6/09
C.129	Kimberly A. Cody	4/6/09
C.130	Christine Grommes	4/6/09
C.131	Dicky Harsojo	4/6/09
C.132	Monica Hassis	4/6/09
C.133	Heather Higson	4/6/09
C.134	Steve Higson	4/6/09
C.135	Trish Kashou	4/6/09
C.136	Nate and Jessica Lazewski	4/6/09
C.137	Mandy Maldonado	4/6/09
C.138	Richard Minogue	4/6/09
C.139	Jean Moore	4/6/09
C.140	Michele Ramirez	4/6/09
C.141	Susan Ramos	4/6/09
C.142	James E. Byers	4/3/09
C.143	Albert Choy	4/3/09
C.144	Richard and Faye Heinrich	4/3/09
C.145	Mike and Kristine Jervis	4/3/09
C.146	Glenn A. Johnson	4/3/09
C.147	Beatrice and Joseph Kahananui	4/3/09
C.148	Mike and Carolyn Lush	4/3/09
C.149	Helen and Molly McElhattan	4/3/09
C.150	Sally and Louie Pontrelli	4/3/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.151	Luis Salinas	4/6/09
C.152	David and Nadene Shubin	4/3/09
C.153	John Shubin	4/3/09
C.154	Joseph Wagoner	4/3/09
C.155	Linda Weiss	4/3/09
C.156	Christine and Jedidiah Abbott	4/1/09
C.157	Tim and Sally Adams	4/3/09
C.158	Jessica Addington	4/4/09
C.159	Cheryle Anaya	4/1/09
C.160	Alma R. Anderson	4/1/09
C.161	Nancy Ansel	4/2/09
C.162	Jennifer Athans	4/4/09
C.163	Seema Bagai	4/2/09
C.164	Lynn Ball	4/1/09
C.165	Cindy Baughman	4/1/09
C.166	Molli Beightol	4/5/09
C.167	Cynthia L. Bock	4/1/09
C.168	Jack D. Bock	4/2/09
C.169	Don Bombardier	4/4/09
C.170	Irene and John Bowers	4/1/09
C.171	Louis Bouwer	4/3/09
C.172	Amy Brant	4/2/09
C.173	Jason Brant	4/5/09
C.174	Jill Brown	4/1/09
C.175	Rebecca Bub	4/2/09
C.176	Doug and Nicole Burns	4/2/09
C.177	Rosalee M. Carlson	4/3/09
C.178	Colleen Carr	4/1/09
C.179	George and Colleen Carr	4/1/09
C.180	Denise Castro	4/1/09
C.181	Crystal Chavers	4/1/09
C.182	David Chavers	4/3/09
C.183	Elvia Chavez	4/5/09
C.184	Amanda Clemons	4/1/09
C.185	Nodya S. Clemons	4/1/09
C.186	Gary and Diana Clinton	4/5/09
C.187	Kimberly Collier-Endress	4/1/09
C.188	Lindsey Courtney	4/6/09
C.189	Denise Covington	4/2/09
C.190	Katie Covington	4/4/09
C.191	Jennifer Cote	4/3/09
C.192	Marc and Monica Crockett	4/2/09
C.193	Chelsea Curran	4/1/09
C.194	Danielle Curran	4/1/09
C.195	Donna Curran	4/1/09
C.196	Holly Curran	4/1/09
C.197	Tom Curran	4/6/09
C.198	Kristi Day	4/1/09
C.199	Roger Day	4/1/09
C.200	Kevin Denkers	4/6/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.201	Kevin and Melany Denkers	4/2/09
C.202	Nicole DeVries	4/1/09
C.203	Nancy Dibble	4/5/09
C.204	Rusty Dowling	4/1/09
C.205	Hortendia (Dustie) Dwyer	4/3/09
C.206	Melissa Eckstine	4/5/09
C.207	Tammy Elliott	4/2/09
C.208	Adam Endress	4/6/09
C.209	Chad Espinoza	4/1/09
C.210	Kevin and Kym Falsetti	4/6/09
C.211	Larry Fawcett	4/2/09
C.212	Dinah Ferrer	4/2/09
C.213	Rosemarie Ferrer	4/4/09
C.214	Rosie Ferrer	4/3/09
C.215	Leah Fleischmann	4/2/09
C.216	Marc Fleischmann	4/2/09
C.217	Deanna Fragnoli	4/5/09
C.218	James M. Fragnoli	4/1/09
C.219	Alicia Fraley	4/4/09
C.220	Carol Garman	4/3/09
C.221	Michael T. Gaughan	4/5/09
C.222	Iris Gay	4/6/09
C.223	Sandra D. Gaughan	4/2/09
C.224	Joann Gitmed	4/2/09
C.225	John Glass	4/2/09
C.226	Nicole Goetz	4/2/09
C.227	Darlene I. Gold	4/3/09
C.228	Sean and Christy Gomez	4/4/09
C.229	Daniel and Evelyn Gomez	4/2/09
C.230	Jennifer and Kyle Gomez	4/6/09
C.231	Cyndi Gonzales	4/3/09
C.232	Dick Gonzales	4/3/09
C.233	Jennifer Gonzales	4/1/09
C.234	Kaylin Gonzales	4/3/09
C.235	Janis and Joseph Goodin	4/4/09
C.236	Dawn Goodman	4/1/09
C.237	Barbara Gray	4/2/09
C.238	Douglas C. Gray	4/2/09
C.239	Dan Hagopian	4/3/09
C.240	Shannon Hagopian	4/3/09
C.241	Phil Harrison	4/6/09
C.242	Henderson Family	4/2/09
C.243	Lisa Hernandez	4/3/09
C.244	John Hoover	4/6/09
C.245	Melissa Horton	4/1/09
C.246	Lisa Hunter	4/1/09
C.247	Carol A. Ingram	4/6/09
C.248	Jennifer Interiano	4/1/09
C.249	Vincent Jones	4/2/09
C.250	David and Julie Kidder	4/3/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.251	Patti Koyro	4/4/09
C.252	Lori Kyle	4/1/09
C.253	John Landherr	4/1/09
C.254	Mariah Langford	4/2/09
C.255	Justin Leewood	4/1/09
C.256	Peter Lin	4/1/09
C.257	Gary Lindsley	4/2/09
C.258	James and Ardyce Lindsley	4/1/09
C.259	Nicole Lindsley	4/6/09
C.260	Shelli Lindsley	4/1/09
C.261	Lisa Lopez	4/1/09
C.262	Toni Lopez	4/3/09
C.263	Holly Madewell	4/5/09
C.264	Rafael and Tracie Manriquez	4/1/09
C.265	Lisa Martin	4/3/09
C.266	Jean Martin	4/1/09
C.267	Marisa Martin	4/2/09
C.268	Rick Martin	4/3/09
C.269	Phillip Mata	4/4/09
C.270	Noel and Linda Mayfield	4/2/09
C.271	Mike and Nichole Medaris	4/1/09
C.272	Kayli Melendez	4/2/09
C.273	Francine D. Mellard	4/4/09
C.274	Steve Mellard	4/6/09
C.275	Lance Miller	4/2/09
C.276	Teresa Miller	3/31/09
C.277	Thomas M. Mark	4/6/09
C.278	Connie Moreno	4/4/09
C.279	David Mullins	4/1/09
C.280	Kathaleen Mullins	4/1/09
C.281	Alison Murphy	4/4/09
C.282	Bryan Murphy	4/4/09
C.283	Bob and Debbie Murray	4/5/09
C.284	Kay Murray	4/4/09
C.285	Robert Murray	4/4/09
C.286	Robbie Myers	4/6/09
C.287	Jean Massereddin	4/1/09
C.288	Yolanda Nevarez	Prior to 4/6/09
C.289	Michelle Nichiporuk	4/3/09
C.290	Carol Noble	4/2/09
C.291	Matt and Nicole Noreen	4/1/09
C.292	Marlina Nudo	4/1/09
C.293	John and Joy Muttmann	4/1/09
C.294	Weston O'Brien	4/5/09
C.295	Charlotte Odette	4/3/09
C.296	Donna Ostronic	4/6/09
C.297	Robert and Marla Osgood	4/1/09
C.298	Lisa Page	4/1/09
C.299	Robb Page	4/1/09
C.300	Frank and Kim Palumbo	4/1/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.301	Peggy M. Pearson	4/1/09
C.302	Steve and Heidi Pendleton	4/6/09
C.303	Jose F. Perez	4/2/09
C.304	Dorothy Poverelli	4/2/09
C.305	Linda Prewett	4/2/09
C.306	Steve Reed	4/1/09
C.307	Jerome and Michelle Reidman	4/2/09
C.308	Jane L. Rich	4/3/09
C.309	Casandra Rivard	4/5/09
C.310	Vanessa Roberts	4/2/09
C.311	Dorsie Rouse	4/3/09
C.312	Phil and Erin Ruhl	4/2/09
C.313	Dennis Salvatier	4/1/09
C.314	Sandee Sanderson	4/4/09
C.315	Robert and Shelly Schofield	4/6/09
C.316	Holly Scoltock	4/6/09
C.317	Cindy Seefoo	4/6/09
C.318	Joseph Servia	4/1/09
C.319	Pam Sheehan	4/2/09
C.320	Elizabeth Shetler	4/4/09
C.321	Jeffery C. Short	4/1/09
C.322	Pat Simons	4/3/09
C.323	Marcia P. Smith	4/5/09
C.324	Scott and Angela Stevenson	4/4/09
C.325	Patricia and Charles Suppe	4/2/09
C.326	Andrew, Christine, Julianne and Joseph Teater	4/3/09
C.327	Dave Ten Berge	4/3/09
C.328	Stephanie Ten Berge	4/3/09
C.329	Kelli Tencate	4/2/09
C.330	Jerry and Renee Tieszen	4/5/09
C.331	Lisa Trzcinski	4/6/09
C.332	Todd and Blanca Turner	4/4/09
C.333	Andrew Turpen	4/1/09
C.334	Matt and Heather Ulrich	4/2/09
C.335	Chris van Straten	4/1/09
C.336	David, Tina and Amanda Viel	Prior to 4/6/09
C.337	Diane and Kenny Villegas	4/3/09
C.338	Rosalie Vitali	4/3/09
C.339	David Vizzini	4/2/09
C.340	Gloria Vizzini	4/1/09
C.341	Rebecca Wagner	4/1/09
C.342	Rober J. Wallin	4/5/09
C.343	Jim and Maria Walski	4/6/09
C.344	Bryan and Andrea Ward	4/1/09
C.345	Dolores Weber	4/1/09
C.346	Mike Whipple	4/6/09
C.347	Leah Whipple	4/2/09
C.348	Penny Whittier	4/1/09
C.349	Jerry Wimberly	4/6/09
C.350	Peggy Wimberly	4/6/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.351	Bryce Winton	4/6/09
C.352	Lisa Winton	4/4/09
C.353	Rick Winton	4/4/09
C.354	Denise Wyrick	4/2/09
C.355	Joe Yersky	4/6/09
C.356	Ron and Danelle Young	4/2/09
C.357	Lisa Zangenberg	4/3/09
C.358	Cynthia Zuroff	4/2/09
C.359	Jonathan Zuroff	4/2/09
C.360	Debra and Gabriel Hernandez	4/6/09

Table H-4. Comments Received from Southern California Edison on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	EIR/EIS Section	Date of Comment
D.1	Executive Summary	4/6/09
D.2	Section 1: Introduction	4/6/09
D.3	Section 2: Description of Alternatives Including the Proposed Project	4/6/09
D.4	Section 3.2: Agricultural Resources	4/6/09
D.5	Section 3.3: Air Quality	4/6/09
D.6	Section 3.4: Biological Resources	4/6/09
D.7	Section 3.5: Cultural Resources	4/6/09
D.8	Section 3.6: Environmental Contamination & Hazards	4/6/09
D.9	Section 3.7: Geology, Soils, & Paleontology	4/6/09
D.10	Section 3.8: Hydrology and Water Quality	4/6/09
D.11	Section 3.9: Land Use	4/6/09
D.12	Section 3.10: Noise	4/6/09
D.13	Section 3.11: Public Services & Utilities	4/6/09
D.14	Section 3.12: Socioeconomics	4/6/09
D.15	Section 3.13: Traffic & Transportation	4/6/09
D.16	Section 3.14: Visual Resources	4/6/09
D.17	Section 3.15: Wilderness & Recreation	4/6/09
D.18	Section 3.16: Wildfire Prevention & Suppression	4/6/09
D.19	Section 3.17: Electrical Interference & Hazards	4/6/09
D.20	Section 4.0: Comparison of Alternatives	4/6/09
D.21	Section 5: Other Environmental and Regulatory Considerations	4/6/09
D.22	Section 6: Tehachapi Wind Resources Area	4/6/09

Table H-5. Verbal Comments Received at Public Workshops and Meetings

Comment Set	Name / Title of Commenter	Date of Comment
Public Workshops and Public Meetings – Palmdale, 3/18/2009		
E.1	Rex Moen	3/18/2009
E.2	Carl Gehricke	3/18/2009
E.3	Alexis Upton-Knittle	3/18/2009
E.4	Jackie Ayer	3/18/2009

Table H-5. Verbal Comments Received at Public Workshops and Meetings

Comment Set	Name / Title of Commenter	Date of Comment
Public Workshops and Public Participation Hearing – Chino Hills, 3/19/2009		
E.5	Assembly man, Curt Hagman	3/19/2009
E.6	Gary Neely	3/19/2009
E.7	Bill Kruger (Mayor Pro Tem)	3/19/2009
E.8	Mark Hensley	3/19/2009
E.9	Scott Murphy	3/19/2009
E.10	Brent Arrold	3/19/2009
E.11	Stan Carroll	3/19/2009
E.12	Brian Bergman	3/19/2009
E.13	Paul Benson	3/19/2009
E.14	Ed Graham	3/19/2009
E.15	Ron Krueper	3/19/2009
E.16	Debra Hernandez	3/19/2009
E.17	Jim Case	3/19/2009
E.18	Jeanette Short	3/19/2009
E.19	Stephen Blagden	3/19/2009
E.20	Barry Fischer	3/19/2009
E.21	Dave Cowardin	3/19/2009
E.22	Jim Prindville	3/19/2009
E.23	Denise Prindville	3/19/2009
E.24	Turan Golen	3/19/2009
E.25	Aziz Amiri	3/19/2009
E.26	Andrew Teater	3/19/2009
E.27	Brad Franklin	3/19/2009
E.28	Melanie Schlotterbeck	3/19/2009
E.29	Claire Schlotterbeck	3/19/2009
E.30	Al Matta	3/19/2009
E.31	Scott Kuethen	3/19/2009
E.32	Alan Scheiber	3/19/2009
E.33	Scott Guiou	3/19/2009
E.34	Joyce Butler	3/19/2009
E.35	Magdi Demin	3/19/2009
E.36	Gabriel Hernandez	3/19/2009
E.37	Heene	3/19/2009
E.38	Kyle Tejada	3/19/2009
E.39	Mindy Kolakowski	3/19/2009
E.40	Marci Kuethen	3/19/2009
E.41	Stephen Headley	3/19/2009
E.42	Janet Headley	3/19/2009
E.43	Stephen Burns	3/19/2009
E.44	Antoinette Sykes	3/19/2009
E.45	Louis Bouwer	3/19/2009
E.46	Valerie Wend	3/19/2009
E.47	Jeff Short	3/19/2009
E.48	Ross Fernandes	3/19/2009
E.49	Joanne Genis	3/19/2009
E.50	Neil Connolly	3/19/2009
E.51	Jackie Ayer	3/19/2009
E.52	Andrea Gullo	3/19/2009
E.53	Sara Feldman	3/19/2009

Table H-5. Verbal Comments Received at Public Workshops and Meetings

Comment Set	Name / Title of Commenter	Date of Comment
Public Workshops and Public Meetings – Pasadena, 3/24/2009		
E.54	Mr. Hamada-City of Irwindale	3/24/2009
E.55	Mary Jennings	3/24/2009

In addition to the comments submitted from those listed in the tables above, a number of comments were received after the close of the public review period for the Draft EIR/EIS. Those who submitted comments after the close of the public review period are listed in Table H-6 below.

Table H-6. Comments Postmarked or Emailed After the Close of the Public Review Period (April 6, 2009)

Comment Set	Agency/Group/Organization/Company	Name / Title of Commenter	Date of Comment
F.1	Endangered Habitats League	Dan Silver, Executive Director	4/7/09
F.2	NA	Becky Guiou	4/7/09
F.3	NA	Victor and Monica Rios	4/7/09
F.4	NA	Linda Kloss	4/7/09
F.5	NA	Jan Fusca	4/9/09
F.6	NA	Karina Vasquez	4/9/09
F.7	NA	Sharon Harich	4/14/09
F.8	NA	Dave & Ronda Rhodes	4/16/09
F.9	NA	Alan Boval	4/20/09
F.10	City of Diamond Bar	James DeStefano, City Manager	4/20/09
F.11	Goodin, MacBride, Squeri, Day & Lamprey, LLP	Jeanne B. Armstrong, Counsel for the City of Chino Hills	4/24/09
F.12	Johnson & Hanson, LLP	Kevin K. Johnson, Counsel for the Puente Hills Landfill Native Habitat Preservation Authority	6/4/09

In addition to the late comment letters listed in Table H-6 above, several additional submittals were received in late June, July, and early August 2009. As part of the CPUC's general proceeding, Californians for Renewable Energy (a.k.a. CARE) submitted comments on the Draft EIR/EIS in late June 2009. It should be noted that these comments are dated April 2, 2009; however, they were first received by the CPUC on June 20, 2009. CARE's late comments primarily address the potential effects of wind energy development projects. Also, Johnson & Hanson, LLP submitted late comments on the Draft EIR/EIS on July 24, 2009 on behalf of the Puente Hills Landfill Native Habitat Preservation Authority. This late comment package consisted of materials that were previously submitted to the CPUC as part of the general proceeding for SCE's application, and included responses to data requests from SCE, rebuttal testimony, mitigation proposals, and maps. Coontz & Matthews, LLP submitted a third late comment letter on August 5, 2009 on behalf of a property owner in La Habra Heights. The letter stated the property owner's opposition to the proposed Project. All of these comments were received too late to be given detailed consideration in the Final EIR/EIS and, except for the letter from Coontz & Matthews, consisted of information that had already been submitted as part of the CPUC's general proceeding. Although responses to these late comments have not been included in the Final EIR/EIS, the comments will be considered by the CPUC in rendering a decision on the proposed Project.

The CPUC also received a package of information dated August 12, 2009, from Goodin, MacBride, Squeri, Day & Lamprey, LLP, representing the City of Chino Hills. Although this package was labeled "Supplemental Comments on the Draft Environmental Impact Report", it consisted of a response to a data request from the CPUC regarding the 21st Century Green Partnership's proposed Mitigation and Cost Recovery Plan (see Section 5.3.4 of the EIR/EIS). This package did not contain comments on the Draft EIR/EIS.

H.2 General Responses to Major Comments

The following responses address common concerns raised by multiple commenters. These General Responses have been prepared in order to provide complete and comprehensive responses to many similar comments rather than repeating the same information multiple times in response to each individual comment. As needed, more detailed responses are provided to individual comments in the following section. The General Responses address the following topics:

- GR-1: Alternatives Identification, Screening, and Analysis
- GR-2: Electric and Magnetic Fields (EMF)
- GR-3: Electrical Interference
- GR-4: Noticing Procedures, Draft EIR/EIS Review Period
- GR-5: Effects on Property Values
- GR-6: Property Acquisition
- GR-7: Undergrounding of Transmission Lines
- GR-8: Use of 150-Foot-Wide ROW in Segment 8A
- GR-9: Contribution of Funds as Mitigation under the California Environmental Quality Act
- GR-10: Potential Failure of Transmission Structures

GR-1: Alternatives Identification, Screening, and Analysis

An important aspect of EIR/EIS preparation is the identification and assessment of a reasonable range of Project alternatives. Both CEQA and NEPA provide guidance on selecting alternatives for evaluation in an EIR and EIS. The State CEQA Guidelines (Section 15126.6(a)) state that:

> *An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation.*

According to the Council on Environmental Quality's (CEQ) NEPA Regulations (40 CFR §1502.14), an EIS must present the environmental impacts of the proposed action and alternatives in comparative form, defining the issues and providing a clear basis for choice by decision makers and the public. The alternatives analysis in an EIS must:

> a) *Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.*

> b) *Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.*
>
> c) *Include reasonable alternatives not within the jurisdiction of the lead agency.*
>
> d) *Include the alternative of no action.*
>
> e) *Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.*
>
> f) *Include appropriate mitigation measures not already included in the proposed action or alternatives.*

The CEQ has stated that "[r]easonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant" (CEQ, 1983). Furthermore, as stated in 40 CFR §1502.1, Purpose, an Environmental Impact Statement "shall inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

As described in the Tehachapi Renewable Transmission Project EIR/EIS Alternatives Screening Report (Appendix A of this EIR/EIS), SCE submitted applications to the CPUC and USDA Forest Service seeking authorization to construct and operate the Tehachapi Renewable Transmission Project. The Proponent's Environmental Assessment (PEA) submitted by SCE as part of the application to the CPUC included alternatives to the proposed Project evaluated by SCE. Potential alternatives were also developed by the CEQA Lead Agency (the CPUC) and the NEPA Lead Agency (USDA Forest Service), and based on comments made during Scoping (August-October 2007) by public agencies and the general public.

A total of 31 potential alternatives to SCE's proposed Project were initially considered for evaluation in the EIR/EIS, of which seven were carried forward for detailed analysis in the EIR/EIS, including the No Project/Action Alternative. The alternatives identified covered a broad range of options, including:

- Design variations to the SCE's proposed Project, which would provide transmission capabilities between the new Windhub Substation and the existing Mira Loma Substation;
- Alternate corridors for some segments of the proposed alignment, which would still provide for the delivery of power from the Tehachapi Wind Resources Area to the Mira Loma Substation; and
- Alternative system-wide design variations.

A comprehensive screening analysis, which is described in detail in the Alternatives Screening Report (Appendix A), was conducted to focus on alternatives that would meet CEQA and NEPA requirements. After initial screening, if a potential alternative did not meet the following criteria, it was eliminated from full evaluation: (1) meet the project objectives, purpose, and need; (2) was demonstrated to be infeasible (from economic, environmental, legal, social, or technological standpoint); (3) would not meet CAISO/WECC/NERC reliability planning criteria; or (4) would not avoid or lessen adverse effects of the proposed Project. A list of the alternatives that were considered but subsequently eliminated from detailed evaluation is provided below. Full descriptions of the range of alternatives considered, including the rationale for elimination of alternatives, is presented in Appendix A of this EIR/EIS.

Design Variations to SCE's Proposed Project

- Whirlwind Substation Site A Alternative
- Whirlwind Substation Site B Alternative
- Upgrade Transmission Through Angeles National Forest (ANF) in Segment 6 Only Alternative
- Reduced Upgrades in Segment 6 Alternative
- Co-Locate All SCE T/Ls in Either Segment 6 or 11 Across the ANF Alternative
- Reduced Number of 220-kV T/Ls in the ANF Alternative
- Segments 6 and 11 Double-Circuit Structures Alternative
- Segments 7/8A Single-Circuit 500-kV Structures Alternative
- Partial Composite Core Conductor Alternative

Alternate Corridors

- Segment 10A Route Alternative
- Segment 10B Route Alternative
- Windhub Substation to Cottonwind Substation to Whirlwind Substation Alternative
- Whirlwind Substation to Antelope Substation Alternative
- Antelope Substation to Vincent Substation Alternative
- Use LADWP Transmission Corridor through the ANF Alternative
- New SCE Corridor Across the ANF Alternative
- New Corridor along Highway 14 Alternative
- New Corridor through Cajon Pass Alternative
- San Gabriel Valley New Corridor Alternative

System Alternatives

- Transmission Lines to Midway Substation Alternative
- Non-Transmission System Alternative

In addition to the alternatives listed above, suggestions for alternatives were provided 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 (listed above), 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, please see Appendix A of this EIR/EIS.

- Avoid Impacts to Habitat Authority Properties
- Avoid Parklands, Public Open Space, and Recreation Areas
- 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

The alternatives that met the CEQA/NEPA alternatives screening criteria were retained for full analysis in the EIR/EIS. These include the following seven alternatives listed below.

- Alternative 1: No Project/Action Alternative;
- Alternative 2: SCE's Proposed Project;
- Alternative 3: West Lancaster Alternative;
- Alternative 4: Chino Hills Route Alternatives (Routes A through D);
- Alternative 5: Partial Underground Alternative;
- Alternative 6: Maximum Helicopter Construction in the ANF Alternative; and
- Alternative 7: 66-kV Subtransmission Alternative.

As described above, a wide range of potential alternatives were considered and evaluated in order to establish a reasonable range of alternatives to be evaluated in detail in this EIR/EIS.

GR-2: Electric and Magnetic Fields (EMF)

Many commenters were concerned about the public health effects of electric and magnetic fields (EMF) associated with the proposed transmission lines. The EIR/EIS addresses the potential health effects of EMF exposure in Section 5.3.1 as it pertains to 220-kV and 500-kV transmission lines. Other potential effects of EMF (e.g., electrical interference) are discussed in Section 3.17 of this EIR/EIS (see also General Response GR-3 below). This response includes the following topics:

- Approach to EMF Assessment and Studies about EMF Health Impacts
- Levels of EMF Exposure
- Methods to Reduce Magnetic Fields

Approach to EMF Assessment and Studies about EMF Health Impacts

The CPUC and USDA Forest Service recognize that there is a great deal of public interest and concern regarding potential health effects from exposure to EMF from power lines. To address public concerns about EMF, the EIR/EIS provides information regarding EMF associated with electric utility facilities and the potential effects of the proposed Project and the alternatives. Section 5.3.1.4 in Volume 3 of the Draft EIR/EIS summarizes the results of scientific review panels that have considered the body of EMF health effects research. As the EIR/EIS explains, potential health effects from exposure to electric fields from power lines is typically not of concern since electric fields are effectively shielded by materials such as trees, walls, etc. Therefore, the information in Section 5.3.1 of the EIR/EIS related to EMF focuses primarily on exposure to magnetic fields from power lines. However, it does not consider magnetic fields in the context of CEQA, NEPA, or the determination of environmental impacts. This is because there is no agreement among scientists as to whether exposure to EMF creates a potential health risk and because there are no defined or adopted CEQA or NEPA standards for defining health risk from EMF. The correlation between proximity to high-voltage power lines and increased leukemia and other cancer rates has been found to be true in some scientific studies and is supported by anecdotal evidence, but has not been found to be true in other studies nor has it been proven in laboratory experiments.[1] As a result, EMF information is presented in response to public interest and concern. Disclosure of such information is consistent with the EIR/EIS's role as "an informational document." (Pub. Res. Code § 21061; see also 42 U.S.C. § 4321.)

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[1] Rob Smerling, Harvard Health Publications. *Power lines and your health*. 2008. http://health.msn.com/health-topics/cancer/articlepage.aspx?cp-documentid=100202335&page=2. Accessed April 22, 2009.

For more than 20 years, questions have been asked regarding the potential effects within the environment of EMFs from power lines. Early studies focused primarily on interactions with the electric fields from power lines. In the late 1970s, the subject of magnetic field interactions began to receive additional public attention and research levels increased. A substantial amount of research into the health impacts of electric and magnetic fields has been conducted over the past several decades; however, much of the body of national and international research regarding EMF and public health risks remains contradictory and inconclusive. A discussion of a representative sample of these studies is included below.

In 1993, the CPUC implemented decision D.93-11-013[2] that requires the utilities use "low-cost or no-cost" reduction measures[3] for facilities requiring certification under General Order 131 D.[4] This decision is precautionary in nature and was implemented in recognition that "[i]n the absence of a final resolution of the question of such impact…the best response to EMFs is to avoid unnecessary new exposure to EMFs if such avoidance can be achieved at a cost which is reasonable in light of the risk identified." (52 CPUC 2d 1, 2.) The decision directed the utilities to use a four percent benchmark on the low-cost reduction measures. The decision also implemented a number of EMF measurement, research, and education programs, and provided the direction that led to the preparations of a California Department of Health Services (DHS) study described in Section 5.3.1.4 of the EIR/EIS.

Most recently, the CPUC issued Decision D.06-01-042[5], on January 26, 2006, affirming the low-cost/no-cost policy to reduce EMF exposure from new utility transmission and substation projects. This decision also adopted rules and policies to improve utility design guidelines for reducing EMF. The CPUC stated "at this time we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences." The CPUC has not adopted any specific limits or regulation on EMF levels related to electric power facilities.

As stated in the article "Power Lines and Your Health," encounters with electric and magnetic fields occur on a daily basis and it is still not possible to say with certainty if these impacts are negative, positive or negligible.[6] Reports from major research centers in at least nine countries have come to similar conclusions that there is no compelling evidence of any health hazard from power lines and that if power lines do have any effect on human health, it is small. They do, however, support continued research to look for even small effects on health.

Levels of EMF Exposure

Section 5.3.1.6 in Volume 3 of the Draft EIR/EIS presents the estimated EMF levels from SCE's proposed Project. For the proposed Project, magnetic fields are shown as ranging from 0 to 174.2 milliGauss (mG) on the left side of the ROWs and from 0 to 200.4 mG on the right side of the ROWs. The changes in magnetic fields are shown as ranging from -61.3 to +38.7 mG on the left side of the ROWs and from -41.7 to +152.2 mG on the right side of the ROWs. Table 5.3-6 shows the estimated magnetic field levels for the proposed 500-kV and 220-kV circuits.

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2 http://www.cpuc.ca.gov/Environment/emf/emfopen.htm. Accessed April 23, 2009.

3 The mitigation measures discussed here are precautionary in nature and are not "mitigation measures" within the context of CEQA or NEPA.

4 General Order 131-D is entitled "Rules Relating to the Planning and Construction of Electric Generation, Transmission/Power/Distribution Line Facilities and Substations Located in California."

5 http://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/53181.htm. Accessed April 23, 2009.

6 Rob Smerling, Harvard Health Publications. *Power lines and your health*. 2008. http://health.msn.com/health-topics/cancer/articlepage.aspx?cp-documentid=100202335&page=2. Accessed April 22, 2009.

The public routinely experiences exposure to EMF in the community from sources other than electric transmission lines and substations. Research on ambient magnetic fields in homes and buildings in several western states found average magnetic field levels within most rooms to be approximately 1 mG, while in a room with appliances present, the measured values ranged from 9 to 20 mG (Severson et al., 1988, and Silva, 1988). Immediately adjacent to appliances (within 12 inches), field values are much higher, as illustrated in Tables 5.3-3 and 5.3-4 in Volume 3 of the EIR/EIS and can range from 3 to 20,000 mG. These tables indicate typical sources and levels of electric and magnetic field exposure the general public experiences from appliances.

Outside of the home, the public also experiences EMF exposure from the electric distribution system that is located throughout all areas of the community. Estimates of the magnetic field exposures to the public from overhead 12.5-kV distribution lines range from 22 mG directly below the lines, to 8 mG at 40 feet from the lines, and 2 mG at 100 feet from the lines. In areas of underground distribution, which typically occurs in residential areas, the 12.5-kV circuits are not buried as deeply as transmission lines, and are not arranged to optimize field cancellation. The estimated fields for underground distribution lines range from 31 mG directly above the line, 4 mG 40 feet from the line, and 1.9 mG 100 feet from the line.[7]

Methods to Reduce Magnetic Fields

As discussed in Section 5.3.1.5 in Volume 3 of the Draft EIR/EIS, magnetic fields can be reduced either by cancellation or by increasing distance from the source. Cancellation is achieved in two ways. A transmission line circuit consists of three “phases,” three separate wires (conductors) on a transmission tower. The configuration of these three conductors can reduce magnetic fields. First, when the configuration places the three conductors closer together, the interference, or cancellation, of the fields from each wire is enhanced. This technique has practical limitations because of the potential for short circuits if the wires are placed too close together. There are also worker safety issues to consider if spacing is reduced. Second, in instances where there are two circuits (more than three phase wires), such as in portions of the proposed Project, cancellation can be accomplished by arranging phase wires from the different circuits near each other. In underground lines, the three phases are typically much closer together than in overhead lines because the cables are insulated (coated), but field cancellation still occurs.

The distance between the source of fields and the public can be increased by either placing the wires higher aboveground, burying underground cables deeper, or by increasing the width of the ROW. For transmission lines, these methods can prove effective in reducing fields because the reduction of the field strength drops rapidly with distance.

SCE’s Proposed EMF Reduction Measures

In accordance with CPUC Decisions D.93-11-013 and D.06-01-042, SCE evaluated “no-cost” and “low-cost” magnetic field reduction steps for the proposed transmission and substation facilities for facilities requiring certification under General Order 131 D.[8] SCE evaluated magnetic field reduction measures in the Field Management Plan prepared for the proposed Project and selectively adopted the measures for different segments of the proposed Project. Specific measures to reduce EMF that SCE has proposed in its plan for inclusion in the proposed Project are listed in Table 5.3-5 in the EIR/EIS, as well as below:

7 Washington State Department of Health. *Electric and Magnetic Field Reduction: Research Needs*. January, 1992.

8 General Order 131 D is entitled “Rules Relating to the Planning and Construction of Electric Generation, Transmission/Power/Distribution Line Facilities and Substations Located in California.”

Applicant-Proposed Measures – Electric and Magnetic Fields	
APM EMF-1	Circuit Phasing – Arrange the transmission line phases to reduce the level of magnetic field.
APM EMF-2	Taller Structures – Utilize taller structures, than required by standard line design, in order to reduce the level of magnetic field.
APM EMF-3	Circuit Placement – Locate the new transmission line in an inside position amongst existing transmission lines.
APM EMF-4	Compact Design – Utilize a different structure type, than required by standard design, which results in closer phase spacing and raises the conductor height, resulting in reduced magnetic field level.
APM EMF-5	Double-Circuit Construction – Combine the transmission line with another circuit on a single tower, which increases conductor height, resulting in reduced magnetic field.
APM EMF-6	Split Phasing – For a transmission line with bundled conductor, utilize a double-circuit tower and split the conductors to each side of the structure and arrange the phases to reduce the level of magnetic field.
APM EMF-7	Re-Phasing – Re-arrange the phases of an existing transmission line in the corridor with the proposed Project to reduce the level of magnetic field.
APM EMF-8	Increase ROW Width – Utilize a wider ROW than is the minimum necessary such that the magnetic field at the edge of the ROW is lower.

GR-3: Electrical Interference

Several commenters have expressed concern about shock hazards and electrical interference to devices such as cell phones, pacemakers, radio, medical equipment, and emergency communication equipment. A full discussion of electrical interference, as well as certain electrical hazards, that may result from the implementation of the proposed Project is included in Section 3.17 in Volume 2 of the Draft EIR/EIS.

Radio/TV/Communications/Electronic Equipment Interference

Section 3.17 of Volume 2 of the Draft EIR/EIS discusses potential interference with radio and television reception and other electronic equipment. Corona or gap discharges related to high frequency radio and television interference impacts are dependent upon several factors including the strength of broadcast signals and are anticipated to be very localized if it occurs. Individual sources of adverse radio/television interference impacts can be located and corrected on the power lines. Conversely, magnetic field interference with electronic equipment, such as computer monitors, can be corrected through the use of software, shielding or changes at the monitor location. Impact EIH-1 (The Project would cause radio, television, communications, or electronic equipment interference) is found to be significant, but mitigable to a less-than-significant level (Class II) with implementation of measures that would limit the conductor surface electric gradient (Mitigation Measure EIH-1a) and document and resolve electronic interference complaints (Mitigation Measure EIH-1b).

Cardiac Pacemakers

An area of concern related to electric fields from transmission lines has been the possibility of interference with cardiac pacemakers. Impacts to pacemakers from electric fields are discussed in Section 3.17 in Volume 2 of the Draft EIR/EIS. In 2004, EPRI produced a report (2004 EPRI review Electromagnetic Interference with Implantable Medical Devices: 1997-2003) about EMF interference to implanted cardiac pacemakers and defibrillators in the frequency range of 1 hertz (Hz) to 3 kilohertz (kHz). The report found that electric and magnetic fields could alter the function of pacemakers and implantable cardioverter defibrillators (ICDs), but electric fields appear to be the most likely source of interference. The magnitude or intensity of the magnetic field required to alter the function of these devices varies widely with frequency and waveform.

The electric fields associated with the proposed Project's transmission lines may be of sufficient magnitude to impact operation of a few older model synchronous pacemakers. However, when these pacemakers detect a spurious signal, such as a 60 Hz signal, they are programmed to revert to an asynchronous or fixed pacing mode of operation, returning to synchronous operation within a specified time after the signal is no longer detected.

Cardiovascular specialists do not consider prolonged asynchronous pacing to be a health risk; periods of operation in this mode are commonly induced by cardiologists to check pacemaker performance. Therefore, while the transmission line's electric field may affect operation of some older model pacemakers, the result of the interference is of short duration and is not considered significant or harmful (Class III).

Induced Currents and Shock Hazards

Power line fields can induce voltages and currents on conductive objects, such as metal roofs or buildings, fences, and vehicles. Transmission lines are designed to limit the short circuit current, from conductive items beneath the line, to a safe level (less than 5 milliampere). When a person or animal comes in contact with a conductive object a perceptible current or small electric shock may occur. These small electric shocks cause no physiological harm; however, they may present a nuisance.

The National Electrical Safety Code (NESC) specifies that transmission lines be designed to limit the power line field strength at ground level such that the short circuit current from vehicles or large objects near the line will be no more than 5 milliampere (mA). This requirement serves to limit the magnitude of electrical shock that the public could encounter from induced currents on large ungrounded metal objects in the vicinity of transmission lines. Although the NESC is titled as a "National" code it is intended as a guide standard and does not constitute a regulation unless it is adopted and codified by state or municipal governments. In the case of California, the CPUC has issued General Order No. 95 (G.O. 95), Rules for Overhead Electric Line Construction, as the relevant standard for transmission lines.

Impact EIH-2 (The Project would cause induced currents and shock hazards in joint use corridors) in Section 3.17.6 of the Draft EIR/EIS describes that these impacts do not pose a threat if the conducting objects are properly grounded. Mitigation Measure EIH-2 (Implement grounding measures) would ensure conducting objects are properly grounded and this impact would be less than significant (Class II).

GR-4: Noticing Procedures, Draft EIR/EIS Review Period

This General Response outlines NEPA and CEQA public noticing requirements, and provides a summary of the actions taken to involve the public in the TRTP environmental review process. As demonstrated below, the CPUC and USDA Forest Service exceeded applicable State and federal requirements in conducting the proposed Project's public noticing and public outreach efforts. For additional detail regarding the public participation efforts conducted for TRTP, see Section 7 (Consultation and Coordination) of this EIR/EIS. Section 7 provides details on the specific public outreach methods that were used to comply with CEQA and NEPA requirements.

Public Notification

The proposed Project was noticed consistent with NEPA and CEQA requirements (see Table below). The noticing conducted for TRTP included three methods of public notification – direct mail notices, newspaper advertisements, and publication of notices and documents on the Project website. In addition, public notification occurred at key Project milestones consistent with State and federal requirements, and included a phone information line, fax line, and email address where the public could ask questions about the Project and receive direct responses as well as provide comment.

In addition to the NEPA and CEQA requirements, the regulations and requirements of the USDA Forest Service and the CPUC were considered in planning public participation. USDA Forest Service requirements are the same as those identified in NEPA. CPUC Rule 2.4 requires that project's subject to CEQA must comply with the requirements of CEQA and the CEQA Guidelines. The table below summarizes the public noticing requirements for NEPA and CEQA.

NEPA Requirements - Noticing	CEQA Requirements - Noticing
National Environmental Policy Act Council of Environmental Quality Regulations: *40 CFR 1506.6 Public Involvement* • Make diligent effort to involve public. • Provide public notice of NEPA-related hearings, public meetings, and the availability of environmental documents. • Publish Notice of Intent (NOI) in Federal Register (1506.6[b][2]). • Send NOI to individuals who have requested it (1506.6[b][1]) • Actions of primarily local concern may include notice to: State and area-wide clearinghouses; tribes; affected State's noticing procedures; publication in local newspapers; local media; community organizations; newsletters; direct mailing to owners and occupants of nearby or affected property; and posting of notice on and off site in the area where the action is to be located.	California Environmental Quality Act *Section 15087(a) Public Review of Draft EIR* *(PRC §21092)* Lead agency shall provide public notice of the availability of the draft EIR at same time it sends notice of completion to the Office of Planning and Research. Notice shall be given by at least one of the following: 1. Publish at least one time in a newspaper of general circulation. If more than one area is affected then notice in newspaper of largest circulation in the areas. 2. Post notice on or offsite in project area. 3. Direct mailing to owners/occupants of property contiguous to the parcel or parcels on which the project is located.

To be consistent with these requirements, the Project team developed an initial Project notification list to use during each phase of the environmental review process, which included property owners, agencies, and community and interest groups. Property owners were identified through the list provided by SCE as part of its CPCN application to the CPUC. The property owner list included in their application was based on the requirement in CPUC's General Order 131-D (Item 1.b Section XI) that requires public utilities to notify property owners within 300 feet of a project route (not alternatives) when an application has been filed with the CPUC, which applied when SCE filed its application. Additional property owner addresses were researched and added to the notification list for those properties greater than 300 feet from the proposed Project route. Therefore, the initial notification list prepared for this Project included:

- Elected officials
- Federal, State, and local agency representatives
- Regional and Joint Power Authorities
- Angeles National Forest Scoping List (June 7, 2007)
- CPUC Service List (August 2007)
- Property owner list provided by SCE for the proposed route (submitted as part of the CPCN application and included property owners within 300 feet of the proposed Project route)
- Property owners within 301 to 500 feet of the proposed route
- Within the Angeles National Forest, property owners within 2.5 miles of the route
- Wind developers
- Tribal government representatives
- Potentially interested community organizations and interest groups
- Local libraries/document repository sites
- Property owners and interested parties provided by the City of Chino Hills

This notification list was updated after completion of the EIR/EIS scoping process and prior to the release of the Draft EIR/EIS to incorporate individuals and agencies that signed in at the scoping meetings; individuals and agencies that provided oral comments at the scoping meetings; those individuals and agencies that submitted written comments; and to include property owners along the alternative routes. The notification or mailing list was used to distribute the Notice of Preparation, Notice of Availability of the Draft EIR/EIS, and the Draft EIR/EIS public comment period extension notice. In addition, the notification list was used to mail hardcopies of the Draft EIR/EIS, and the Executive Summary and CD with an electronic version of the EIR/EIS, as described below.

- **Notice of Preparation (NOP) and Notice of Intent (NOI)**. Approximately 10,700 copies of the NOP were distributed to federal, State, regional, and local agencies, and elected officials. Forty-nine (49) of these copies went to the Project repository sites. An additional 4,600 postcard notices were distributed to property owners that were greater than 300 feet from the proposed Project ROW. To provide additional Project notification, over 100 11 X 17 laminated posters were posted along the proposed Project route and at entrances to major public venues near the SCE proposed Project route. The USDA Forest Service issued a NOI for the proposed Project, which was published in the Federal Register on September 7, 2007.
- **Notice of Availability (NOA) of the Draft EIR/EIS.** The NOA of the Draft EIR/EIS was mailed to approximately 15,000 addresses, including community organizations, interest groups, and property owners in the vicinity of the proposed Project route, and property owners along the alternative routes.
- **Draft EIR/EIS.** Copies of the full Draft EIR/EIS were sent to 109 interested parties and agencies, and to information repositories, which included public libraries and USDA Forest Service offices. Sixty-five (65) copies of the Executive Summary with CDs (pdf version of the Draft EIR/EIS) were also mailed to interested parties as part of the Draft EIR/EIS public review period.
- **Extension Notice.** A postcard **extension notice** was distributed to everyone on the Project notification list, which included over 15,000 individuals, announcing that the public comment period for the Draft EIR/EIS was extended from April 1 to April 6, 2009.
- **Newspaper Notices.** Notices were published in local and regional newspapers to announce the public scoping meetings, the alternatives meeting, the release of the Draft EIR/EIS, the Draft EIR/EIS public meetings, and the extension of the public comment period. The newspaper advertisements included information on the Project website address, phone information line, email address, and when applicable, the dates, locations and times of the public meetings. The notices were published as noted in the table below.

	Publication Dates and Events					
Newspapers	NOP/Public Meetings	NOP/Public Meetings	Alternatives Meeting	Draft EIR/EIS Public Meetings	Draft EIR/EIS Public Meetings	Public Meetings[2]
Daily Publication Newspapers						
Los Angeles Daily News	Aug. 28, 2007	Sept. 2, 2007		Feb. 13, 2009	Feb. 20, 2009	Mar. 4, 2009
Los Angeles Times[1]	Aug. 26, 2007	Aug. 30, 2007		Feb.13, 2009	Feb. 20, 2009[2]	
Antelope Valley Press	Aug. 26, 2007	Aug. 30, 2007		Feb.13, 2009		Mar. 4, 2009
The Signal Newspaper	Aug.26, 2007	Aug. 30, 2007		Feb.13, 2009		Mar. 5, 2009[3]
Whittier Daily News	Aug. 26, 2007	Aug. 29, 2007		Feb.13, 2009	Feb. 20, 2009	Mar. 4, 2009
La Opinion	Aug. 29, 2007	Sept. 2, 2007		Feb.13, 2009	Feb. 20, 2009	Mar. 4, 2009
Chinese LA Daily News	Aug. 29, 2007	Sept. 2, 2007	Jan. 8, 2008	Feb.17, 2009	Feb. 24, 2009	Mar. 4, 2009
The Korea Times	Aug. 30, 2007			Feb.14, 2009	Feb. 21, 2009	Mar. 4, 2009
Pasadena Star News	Aug. 30, 2007	Sept. 9, 2007		Feb.13, 2009		Mar. 4, 2009
San Gabriel Valley Tribune	Aug. 30, 2007	Sept. 9, 2007		Feb.13, 2009	Feb. 20, 2009	Mar. 4, 2009

Newspapers	Publication Dates and Events					
	NOP/Public Meetings	NOP/Public Meetings	Alternatives Meeting	Draft EIR/EIS Public Meetings	Draft EIR/EIS Public Meetings	Public Meetings[2]
Inland Valley Daily Bulletin	Sept. 6, 2007	Sept. 16, 2007	Jan. 7, 2008	Feb.18, 2009	Feb. 25, 2009[2]	Mar. 4, 2009
Weekly Publication Newspapers						
Agua Dulce/Acton Country Journal	Sept. 1, 2007	Sept. 8, 2007		Feb. 21, 2009[2]		Mar. 7, 2009
Acton/Agua Dulce News	Sept. 10, 2007			Feb.16, 2009	Feb. 23, 2009[2]	Mar. 9, 2009
Rosamond News	Sept. 10, 2007			Feb.16, 2009	Feb. 23, 2009[2]	Mar. 9, 2009
Champion Newspaper	Sept. 8, 2007	Sept. 15, 2007	Jan. 5, 2008	Feb.14, 2009	Feb. 21, 2009	Mar. 7, 2009
The Star Progress			Jan. 10, 2008	Feb.19, 2009		Mar. 5, 2009

1. The notices in the Los Angeles Times were all published as legal advertisements consistent with USDA Forest Service requirements. All other publications were display advertisements.
2. Advertisement includes public review end-date extension to April 6, 2009.
3. Newspaper printed incorrect advertisement; advertisement did not include the April 6 end date.

Availability of Project Documents

Since the release of the NOP (August 2007), Project documents have been available for public review at local public libraries and local Forest Service offices as well as the Project website. The repository sites were advertised in all mailed notices, workshop and meeting handouts, and on the website. The website included full-text electronic copies of all Project documents that have been completed to date and is, and will continue to be, updated after each Project milestone.

- **Document Repositories** were set up at 27 locations throughout the proposed Project area (49 locations were used during scoping);
- Establishment of an **electronic mail address and a telephone/fax hotline** for Project information;
- **CPUC Website.** The Project application, NOP, NOI, Draft EIR/EIS, and Project-related maps were posted on the Project website on the Internet at:

ftp://ftp.cpuc.ca.gov/gopher-data/environ/tehachapi_renewables/TRTP.htm

Public Workshops, Public Meetings, and a Public Participation Hearing

Public meetings were held during the public review periods to provide another opportunity to involve the public in the environmental review process and provide another avenue for submitting formal comments on the Draft EIR/EIS. Two public comment periods were held on this Project. The public scoping period was held from August 31 to October 1, 2007, and the public comment period for the Draft EIR/EIS was held from February 13 to April 6, 2009 (extended from the original date of April 1, 2009). Although public comment periods are requirements of environmental regulations, public meetings are not required as part of the environmental review process. Both State and federal requirements encourage public meetings. However, CEQA does require at least one scoping meeting for projects of statewide, regional, or area-wide significance as defined in Section 15206 of the CEQA Guidelines. The table below summarizes NEPA and CEQA requirements for public meetings.

Federal Requirements –Public Meetings	State Requirements – Public Meetings
National Environmental Policy Act Council of Environmental Quality Regulations: *40 CFR 1501.7 Scoping (b)(4)* As part of scoping, the lead agency *may* hold early scoping meeting or meetings. *40 CFR 1506.6 Public Involvement (c)* Hold or sponsor public hearings or meetings whenever appropriate; criteria include substantial public controversy and request for hearing by another agency with authority over the action.	California Environmental Quality Act *Section 15083 Early Public Consultation* Encourages early consultation but does *not* specify the need for a public meeting. *Section 15087 (PRC §21092) Public Review of Draft EIR* Public hearings are encouraged but not required. (No mention of public meetings.) *Section 15082(c)(1) NOP/Determination of EIR Scope* For projects of statewide, regional, and area-wide significance, the lead agency shall hold at least one scoping meeting.

Dates and locations of the Draft EIR/EIS public meetings were advertised in local and regional newspapers as described above, on the website, and in the public notices distributed on the proposed Project. For instance, the NOP included information on the scoping meetings, and the NOA included meeting locations, dates, and times for the public meetings on the Draft EIR/EIS. The information below presents a summary of the public workshops, meetings, and a Public Participation Hearing held to date on this Project:

- During the Scoping period **nine public scoping meetings** were held at seven different venues as follows:
  - September 6, 2007 at 6:30 pm at La Serna High School Cafeteria, Whittier
  - September 10, 2007 at 2:30 pm at the Palmdale Cultural Center, Palmdale
  - September 10, 2007 at 6:30 pm at the Palmdale Cultural Center, Palmdale
  - September 11, 2007 at 6:30 pm at the Kern County Library – Wanda Kirk Branch, Rosamond
  - September 12, 2007 at 6:30 pm at the Duarte Community Center, Duarte
  - September 13, 2007 at 6:30 pm at the Garvey Community Center, Rosemead
  - September 19, 2007 at 6:30 pm at the Altadena Community Center, Altadena
  - September 20, 2007 at 2:30 pm at the Chino Hills Council Chambers, Chino Hills
  - September 20, 2007 at 6:30 pm at the Chino Hills Council Chambers, Chino Hills
- During the public comment period on the Draft EIR/EIS, **three public workshops**, **two public meetings,** and **one Public Participation Hearing** were conducted by the CPUC and USDA Forest Service at the following dates and locations:
  - March 18, 2009 - Public workshop held at 5:00 pm at Hilton Garden Inn, Palmdale
  - March 18, 2009 - Public meeting held at 6:30 pm at Hilton Garden Inn, Palmdale
  - March 19, 2009 - Public workshop held at 5:00 pm at Chino Hills Library Community Room, Chino Hills
  - March 19, 2009 - Public Participation Hearing held at 6:30 pm at the Council Chambers, Chino Hills
  - March 24, 2009 - Public workshop held at 5:00 pm at the Pasadena High School Cafeteria, Pasadena
  - March 24, 2009 - Public meeting held at 6:30 pm at the Pasadena High School Cafeteria, Pasadena

The public workshops provided an opportunity for members of the public to learn about the Project and ask questions. EIR/EIS section authors were available at the workshops to respond to any questions presented by the workshop attendees. The workshops included Project-related handouts and reference materials (e.g., EIR/EIS, Map and Figure Series Volume), maps that showed the proposed and alternative routes, and continuous-loop PowerPoint presentations that provided information on the Project description, review process, and key issues of public concern and how these issues were addressed in the EIR/EIS. In addition, the workshops included the use of computers to show property owners the location of their property in relation to the proposed Project route, and large-scale visual simulations (on a separate large computer screen) to show how the proposed Project transmission towers and other Project components would look from different public viewing areas. Immediately after each of the three workshops, the CPUC and Forest Service held either a public meeting or a hearing to take public comment on the Project. A court reporter recorded all oral comments presented at the public meetings and at the Public Participation Hearing. The CPUC held a Public Participation Hearing in Chino Hills, which was facilitated by the Administrative Law Judge and included one CPUC Commissioner and representatives for the other commissioners. In addition to the public meetings/hearing, there were other publicly advertised avenues to provide public comment on the Project. Comments were accepted by mail, email, or phone/fax. All Project-related notices and reports included information on where and how comments could be provided to the CPUC and the USDA Forest Service.

Opportunities to Provide Further Comment

In addition to the public involvement and participation activities outlined above, there will be other opportunities for public involvement as part of the CPUC's proceedings and the USDA Forest Service decision-making process on the Project. After completion of the Final EIR/EIS, the CPUC will hold public hearings as part of the Commission's proceedings, which will provide additional opportunities for public comment on this Project. The USDA Forest Service will prepare a Record of Decision, which has a public appeal period.

CPUC General Proceeding

The CPUC's general proceeding is a formal review process in which the CPUC considers how approval of a project might impact the public interest. The General Proceeding includes, as stated in the Public Utilities Code §1002.3, the consideration of cost-effective alternatives to transmission facilities that meet the need for an efficient, reliable, and affordable supply of electricity. A general proceeding can include pre-hearing conferences, evidentiary hearings, and public participation hearings. The CPUC will seek a decision about the project that strikes a balance among power production, land use, environmental stewardship, and other factors. A CPUC Assigned Commissioner and an Administrative Law Judge (ALJ) are in charge of the general proceeding, which may in part occur while the environmental review is underway.

GR-5: Effects on Property Values

Several commenters have expressed concern about the effect of the proposed Project and/or alternatives on property values. A full discussion of operational impacts on property value, including a literature review, can be found in Section 3.12.6.1 under Impact S-1 (Operation and maintenance activities would affect property values along the Project alignment).

The CPUC has used a literature-review approach in addressing concerns regarding property values in five recent transmission line EIRs. Claims of diminished property value through decreased marketability are based on the reported concern about hazards to human health and safety and increased noise, traffic, and visual impacts associated with living in proximity to unwanted land uses such as power plants, freeways, high voltage transmission lines, landfills, and hazardous waste sites. Studies cited in "A Primer on Proximity Impact Research: Residential Property Values Near High-Voltage Transmission Lines" (Kinnard and Dickey, 1995) show three possible effects have been claimed, singly or in combination:

- **Diminished Price**, which is identified by comparing prices of units that are proximate to power lines with prices of similar and competitive properties more distant from power lines.

- **Increased Marketing Time.** Even when proximate properties sell at or near the same prices as more distant properties, claimants argue that proximate properties take longer to sell. Such increased marketing time can represent a loss to the seller by deferring receipt, availability, and use of sale proceeds.
- **Decreased Sales Volume.** A more subtle indicator of diminished property value if potential buyers decide not to buy in the impact area. A measurable decrease in sales volume in the impact area compared with sales volume in the control area where otherwise similar properties purportedly still are selling can represent evidence of decreased market value from proximity to the high voltage transmission lines (or claimed hazard).

A 2003 Electric Power Research Institute (EPRI) study, "Transmission Lines and Property Values: State of the Science," stated that differences in location and time of data collection, as well as research design, make direct comparisons of results from the various studies very difficult. Although quantitative generalizations from studies cannot be reliably made, the following conclusions from studies seem to be similar across numerous studies (EPRI, 2003) (Draft EIR/EIS, p. 3.12-25.):

- There is evidence that transmission lines have the potential to decrease nearby property values, but this decrease is usually small.
- Lots adjacent to the ROW often benefit, because they have open space next to them; lots next to adjacent lots often have value reduction.
- Higher-end properties are more likely to experience a reduction in selling price than lower-end properties.
- The degree of opposition to an upgrade project may affect size and duration of the sales-price effects.
- Setback distance, ROW landscaping, shielding of visual and aural effects, and integration of the ROW into the neighborhood can significantly reduce or eliminate the impact of transmission structures on sales prices.
- Although appreciation of property does not appear to be affected, proximity to a transmission line can sometimes result in increased selling times for adjacent properties.
- Sales-price effects are more complex than they have been portrayed in many studies. Even grouping adjacent properties may obscure results.
- Effects of a transmission line on sales prices of properties diminish over time and all but disappear in five years.
- Opinion surveys of property values and transmission lines may not necessarily overstate negative attitudes, but they understate or ignore positive attitudes.
- The release of findings from the Swedish study on EMF and health effects had no measurable influence on sales prices.

As discussed above, impacts on property values result from visual impacts, or health and safety concerns such as EMF. With regard to the proposed Project, visual impacts are addressed in Section 3.14 (Visual Resources). Segments 4, 5, 6 and 7, and the majority of Segments 11 and 8 would be in either existing ROWs or adjacent to existing utility ROWs. In addition, implementation of mitigation measures in the Visual Resources section, such as Mitigation Measure V-2a (Use tubular steel poles instead of lattice steel towers in designated areas), Mitigation Measure V 2b (Treat surfaces with appropriate colors, textures, and finishes), and other visual resources mitigation specific to Key Viewpoints, would reduce the visual impacts of the Project. (Draft EIR/EIS, p. 3.12-26.)

Concerns related to EMF are addressed in Section 5.3.1 (Magnetic Field Concerns) of the EIR/EIS. Portions of the proposed Project would be constructed within and adjacent to existing residential housing and commercial development. As discussed in Section 5.3.1.4 (Scientific Background) and General Response GR-2, there remains a lack of consensus in the scientific community regarding public health impacts due to EMF at the levels expected from electric power facilities. Further, there are no federal or State standards limiting human exposure to EMFs from transmission lines or substation facilities in California. For those reasons, it is not possible to reach any firm conclusions regarding potential EMF effects associated with the proposed Project.

However, the CPUC has implemented and recently re-confirmed a decision requiring utilities to incorporate "low-cost" or "no-cost" measures for managing EMF from power lines. These measures would be incorporated into the proposed Project design and may help to reduce perceived health effects of transmission lines that could adversely affect property values. However, as previously discussed, it is not possible to analyze potential EMF or property value quantitatively. The studies discussed above and in Section 3.12.6 additionally conclude that the potential for other environmental issue areas associated with transmission line projects (including aesthetics and noise) to have an effect on property value is usually smaller than anticipated and essentially impossible to quantify due to the individuality of properties and their respective neighborhoods, as well as differences in the personal preferences of individual buyers/sellers, and the weight of other factors that contribute to a person's decision to purchase a property.

Other factors (e.g., neighborhood factors, square footage, size of lot, irrigation potential) are much more likely than overhead transmission lines to be major determinants of the sales price of property (Kroll and Priestley, 1992). In addition, studies have generally concluded that over time, any adverse property value impacts diminish, and within five years the change is negligible. This is most likely due to increased screening as trees and shrubbery grow and/or diminished sensitivity to the line proximity in the absence of adverse publicity. (Draft EIR/EIS, p. 3.12-27 – 3.12-28)

While it is possible that property owners near the proposed Project route may believe that their homes will diminish in value because of Project implementation, the actual loss of property value and potential effects can only be tested through data from home sales. The Multiple Regression Analysis (MRA) method, as supported by the Kinnard and Dickey (1995) paper, requires that data be collected on as many market sales transactions as possible within the impact area and within one or more similar control areas over a few years prior to an awareness of a project to accurately reflect what buyers and sellers actually do as opposed to what potential buyers say they might do under specified hypothetical circumstances. (Draft EIR/EIS p. 3.12-25.)

The Wolverton-Bottemiller (2003) paper suggests that understanding the effects of transmission lines on property value is a highly dynamic process which requires on-going study, identification of accurate and reliable data sources, measurement consistency, and rich data sets that allow for variety in analytical methods. (Wolverton and Bottemiller, 2003) In order to assess whether particular environmental and physical changes associated with implementation of the proposed Project could affect property values, a market study of current and future properties within a specified distance from the transmission line would be required to evaluate property values with and without the proposed Project being constructed. However, the data that would be required to conduct such an analysis for the proposed Project is not realistically available and as such any conclusions regarding effects on property values would be speculative. (Draft EIR/EIS 3.12-28 through 3.12-29.)

As demonstrated by the studies discussed above, factors that have the potential to affect property value are numerous and varied; as a result, it is not possible to identify exactly how the Project would potentially affect private property values. However, because the conclusions of the studies, including the Kinnard-Dickey (1995) paper, are applicable to this analysis, it is possible to say that under the proposed Project, property-specific factors such as neighborhood features, square footage, size of lot, and irrigation potential are more likely to be major determinants in affecting property values than the presence of overhead transmission lines such as those included under the proposed Project. It is reasonable to assume that some aspect of Project construction and/or operation and maintenance would potentially affect private property values in the North and South Regions. However, as discussed above, the effects of transmission lines on property value are generally smaller in comparison to other relevant factors.

No properties are anticipated for taking under the proposed Project; however, Segment 10 would require the acquisition or lease of an estimated 681 acres of land. Landowners of any private parcels that would be crossed by the proposed Project would be compensated by SCE for use of its easement across the property based on the fair market value of the property taken (see General Response GR-6).[9] Because National Forest System (NFS) lands traversed by the proposed Project and/or alternatives are public lands, property value impacts would not apply to NFS lands themselves.

Impacts to revenues on farming land are discussed under Impact S 2 (Construction activities would cause a temporary decrease in revenue for agricultural landowners) in Socioeconomics Section 3.12 in Volume 2 of the Draft EIR/EIS. Impacts to farmland are discussed in Section 3.2 (Agricultural Resources) in Volume 1 of the Draft EIR/EIS.

GR-6: Property Acquisition

A number of commenters expressed concern over possible use of the power of eminent domain to acquire rights to construct the proposed Project across private property. The construction and maintenance of electric transmission lines is considered a "public use" for purposes of California eminent domain law. Public electric utilities, including SCE, are statutorily authorized by Public Utilities Code § 612 to exercise the power of eminent domain in order to acquire property or easements necessary to construct and maintain electric transmission lines. (Pub. Util. Code, § 612.) SCE therefore could resort to eminent domain proceedings to acquire property or easements necessary to complete the Project, if the Project is approved by the CPUC, and if voluntary negotiations for required property or easements are unsuccessful. Although the details of eminent domain proceedings are beyond the scope of this EIR/EIS, affected property owners would have the right to contest the necessity of condemnation of their land, as well as to present evidence as to the true fair market value of the property or property interests taken. The actual amount of just compensation paid would be determined in the eminent domain proceedings.

Some commenters offered general objections to the taking of private property for the Project. Such objections may be considered by the CPUC in making its ultimate decision on the proposed Project and in evaluating project alternatives. However, use of eminent domain proceedings is a traditional method of acquiring property for public utility projects where voluntary means of acquiring property fail. Generally, it is to the advantage of both SCE and the public to minimize or avoid construction across privately owned property where feasible alternative routings exist, as the costs of acquiring rights to cross private land (whether by voluntary agreement or by condemnation) tend to increase the overall costs of the project as a whole. These costs are a factor, which the CPUC will consider along with other relevant factors (e.g., environmental considerations, technical feasibility, pubic necessity for the project, and costs of alternative routing) in selecting among Project alternatives and determining which, if any, will be approved.

[9] "Fair market value" is a term defined by California Code of Civil Procedure section 1263.320(a) as "…the highest price on the date of valuation that would be agreed to by a seller, being willing to sell but under no particular or urgent necessity for so doing, nor obliged to sell, and a buyer, being ready, willing, and able to buy but under no particular necessity for so doing, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available." In addition, where the property acquired is a part of a larger parcel, the payment of severance damages may be required if the remaining property (remainder), after the portion acquired, has been diminished in market value when compared with the same remainder before the taking.

Should SCE be forced to condemn certain of the land parcels running along the selected transmission line route, the California Eminent Domain Law (contained in California Code of Civil Procedure, §§ 1230.010 – 1273.050.) covers, in great detail, the procedural aspects of bringing eminent domain action in court. In an eminent domain action, the only issue tried before a jury is valuation, whereas all other issues (e.g., the right to take the property) are tried by the court. *People v. Volz*, (1972) 25 Cal.App.3d 480, 487.

The measure of compensation for property taken is its fair market value, or the highest price on the date of valuation that would be agreed to by a seller, being willing to sell, but under no particular or urgent necessity for so doing, nor obliged to sell, and a buyer, being ready, willing and able to buy, but under no particular necessity for doing so, each dealing with the other with full knowledge of all the uses and purposes for which the property is reasonably adaptable and available. (Code. Civ. Proc., §§ 1263.320(a); 1263.310.) The principle which the law seeks to achieve in making this valuation is to place the owner in as good a position monetarily as if the property had not been taken. *San Diego Metropolitan Transit Development Bd. v. Chushman* (1997) 53 Cal.App.4th 918, 925.

Market value is generally determined by considering the following elements: (a) all uses to which the property is adapted or available; and (b) the highest and most profitable use to which the property might be put in the reasonably near future, to the extent that this probability affects its market value. *People v. Ocean Shore R.* (1948) 32 Cal. 2d 406, 425; *Ripon v. Sweetin* (2002) 100 Cal.App.4th 887, 899. And, as may be relevant to the situation at hand, where the property taken is part of a larger parcel, in addition to compensation for the property taken, compensation must be awarded for injury to the remainder. (Code Civ. Proc § 1263.410(a).) The measure of compensation for injury to the remainder is the amount of damage to the remainder, reduced by the amount of benefit to the remainder. (Code Civ. Proc. § 1263.410(b).) A separate valuation for loss of good will must be conducted where the condemnation proceeding takes property occupied by a business, or where a business occupies the remainder if the property taken is part of that larger parcel. (Code Civ. Proc. § 1263.510(a).)

Another key issue regarding valuation is the date that should be used for valuation of the property. Generally, if the condemner deposits the probable compensation in accordance with the applicable procedures, the date of valuation is the date on which the deposit is made. (Code Civ. Proc. § 1263.110.) Absent a deposit, if the issue of compensation is brought to trial within one year after commencement of the proceeding, the date of valuation is the date of commencement of the proceeding. (Code Civ. Proc. § 1263.120.) But, if the issue of compensation is not brought to trial within one year of commencement of the proceedings, the date of valuation is the date of commencement of the trial, unless the delay was caused by the defendant condemnee, in which case the date of valuation sis the date for commencement of the proceeding. (Code Civ. Proc. § 1263.130.)

If the Project is approved, SCE may have to purchase Williamson Act land for the required ROW. When public agencies, including investor-owned utilities such as SCE, acquire land that is under a Williamson Act contract, the contract becomes null and void. (Gov. Code, § 51295.) Therefore, the contract cancellation process would not apply. In particular, Government Code section 51295 provides that when a property is taken by eminent domain or is acquired in lieu of eminent domain for a public improvement by a public agency or person, "for the purposes of establishing the value of the land, the contract shall be deemed never to have existed."

Absent extraordinary circumstances, no financial compensation would be legally due to property owners whose property is arguably affected by the Project, but whose property is not directly within the project

ROW. Under California and federal constitutional law, "just compensation" is due only where public utility projects result in direct invasion or damage to legally recognized property interests. Compensation would thus be due to property owners who suffered some physical invasion (e.g., landslide) as a result of the Project, as well as to any property owners whose land was condemned for ROW or for other purposes related to the Project.

California law does not recognize any vested property right in existing views or other physical or aesthetic qualities of areas located outside the private property owner's property lines for purposes of eminent domain. (Cal. Const., art. I, §19.) There are two categories of regulatory action that are deemed *per se* takings: those that involve the government imposition of a permanent physical invasion of private property; and those involving a regulation that completely deprives the private property owner of all economically beneficial use of her property. (*Allegretti & Company v. County of Imperial* (2007) 138 Cal.App.4th 1261, 1270; Action *Apt. Ass'n v. Santa Monica Rent Ctl. Bd* (2001) 94 Cal.App.4th 587.) Private property has not been "taken" or "damaged" under the meaning of the California Constitution's eminent domain clause by a showing that government action has somewhat decreased the market value of the property. (*Regency Outdoor Advertising, Inc. v. City of Los Angeles* (2006) 39 Cal.4th 507, 516.). Therefore, no compensation would be due for effects on private property values caused solely by location of the Project near the affected private property (see General Response GR-5). For the same reason, effects on private property values resulting merely from location of the Project nearby would not constitute uncompensated "takings" or violations of due process under the California or United States Constitutions as suggested by some commenters.

Please note that SCE's proposed Project does not involve the acquisition of any residences or the displacement of any residents. Similarly, none of the Project alternatives involve acquisition of residences or displacement of residents.

GR-7: Undergrounding of Transmission Lines

During the alternatives development process, the concept of undergrounding the transmission lines was suggested by both agencies and the public. As discussed in detail in Section 3.2.11 of the Alternatives Screening Report, located in Appendix A of this EIR/EIS, several technologies were considered for undergrounding the transmission lines proposed as part of the TRTP, including those associated with High Voltage Alternating Current (HVAC) and High Voltage Direct Current (HVDC) technologies. With respect to HVDC technology, it was determined that at the power transfer levels and voltage required for the TRTP, the Project would need to utilize conventional HVDC technology, as opposed to the newer technologies associated with "HVDC Light" or "HVDC Plus" which have limited application at power transfer levels beyond about 1,000 MW and 150 kV DC. However, due to the greater long-term impacts associated with the large converter stations required for conventional HVDC technology (i.e., visually more obtrusive and greater permanent land disturbance), which far exceed the area needed for the transition stations required with use of underground HVAC technology, HVAC was determined to be the preferred technology for TRTP. Applicable HVAC cable technologies currently available for 500-kV underground transmission lines include the following: self-contained fluid-filled cables (SCFF); high-pressure fluid-filled cables (HPFF); solid dielectric (XLPE) cables; and gas-insulated lines (GIL).

The application of the SCFF cable type within the United States has largely been limited to the 115/138 kV range, with only a few miles at 220 kV installed commercially. As such, SCFF was eliminated as a potential technology for underground construction of the TRTP. HPFF cable systems range from 69 to 345 kV and have been in commercial operation for over 35 years. HPFF cable systems with rated system voltages up to and including 765 kV are commercially available and have passed long-term qualification tests; however, due to its potential to release of dielectric insulating fluid into the environment HPFF was also eliminated as a potential technology. Underground transmission XLPE cable has been available for system voltages up to 138 kV since the early 1970s; however, until recently there was a lack of widespread acceptance in the United States because of reliability problems associated with the first generation of cable and accessories. The first long-distance 500-kV XLPE lines were installed in Tokyo, Japan in 2000; this XLPE system consists of two circuits (with a third planned) and is installed in a cable tunnel and in ducts beneath bridges for 25 miles. As only one 500-kV XLPE system has been installed in the world, and was specially installed in a cable tunnel (and ducts), XLPE technology in considered to have scant operating history that can serve as a basis for demonstrating reliability at the voltage required for TRTP. Furthermore, underground transmission using XLPE is generally not suitable in areas of moderate to steep terrain. Therefore, due to the scant operating history for XLPE at 500 kV and the greater limitations associated with how and where XLPE cable systems can be constructed, XLPE was also eliminated as a potential technology.

The underground technology determined to be the most appropriate for the TRTP is GIL. GIL underground transmission system technology has primarily been used in applications where high power transfer (up to 765 kV) is required over short distances (i.e., less than 1,000 feet) utilizing 100 percent sulfur hexafluoride (SF_6) compressed-gas. The use of GIL technology for a long length of transmission line started in 1975 and consists of approximately 2,300 feet of 420 kV line in a tunnel. In 1998, a 275-kV GIL system was installed in a tunnel with other utilities in Nagoya, Japan for two miles and is the longest GIL installation to date. The first commercial application of second generation GIL technology, using a lower SF_6 gas percentage due to greenhouse gas concerns, was the construction of a "dip" in an existing 400-kV overhead transmission line in Geneva, Switzerland in 2000. However, since GIL has not been installed for long lengths as a direct-buried line, utilities remain hesitant to accept this technology. As such, construction of GIL technology within tunnels was determined to be the preferred methodology for the TRTP. Furthermore, unlike XLPE technology, GIL does not have slope limitations, as it can be fabricated to accommodate bends in the line; and, due to the rigid nature of the bus conductor and enclosure tube, GIL can be installed in vertical runs. Furthermore, since GIL can achieve a much higher capacity through use of a solid bus conductor compared to XLP technology, it requires less land disturbance to construct. Therefore, GIL technology was determined to be the preferred underground technology for the TRTP.

To install a GIL system housed in an underground tunnel would be a major construction effort. Excavation of vertical access shafts (at least 75 feet long and approximately 20 feet wide), followed by inclined straight-lined tunnel boring would be utilized to remove the earthen materials between the two tunnel endpoints. The tunnel required for installation of double-circuit 500-kV T/Ls would be circular, with a 16-foot internal diameter and an 18-foot external diameter, accounting for the one-foot-thick tunnel walls. For the application of GIL in Segment 8, as described for Alternative 5, the vertical access shaft at the western end would extend approximately 420 feet underground, while the estimated depth of the eastern access shaft would be approximately 100 feet (see Figure 2.5-5). In addition to these access shafts, approximately three ventilation system shafts would also be required, with depths of approximately 175, 160 and 260 feet, each with a diameter of 10 to 20 feet. Buildings would house the ventilation shafts or chimneys (aboveground), which would be at least 25 feet long by 20 feet wide and 10 feet in height. Aboveground transition stations would also be required at either terminus of the tunnel, each approximately 220 feet wide and 320 feet long (1.6 acres). Additional details for how such a GIL system would be installed is described in EIR/EIS Section 2.5, and depicted in Figures 2.5-3 through 2.5-5, as well as in Appendix A, Section 3.2.11, with examples provided in Photo 1 (assembly area required for a similar sized tunnel boring operation), Photo 2 (tunnel boring machines), Photo 3 (crane used to lift the front section of the tunnel boring machine), Photo 4 (transporting one section of a tunnel boring machine), Photo 5 (tunnel exit point), and Photo 6 (rail car engine for transporting equipment/materials through the tunnel).

As noted in the Alternatives Screening Report (Appendix A), the cost for constructing the transmission lines utilizing GIL technology is approximately 10 to 15 times more expensive than overhead construction. In 2008 dollars, the direct cost to SCE to install double-circuit 500-kV overhead transmission lines (as would be required in Segment 8) has been estimated at $7.3 million per mile, whereas the cost of undergrounding a double-circuit 500-kV transmission line utilizing GIL technology is on the order of $77 to $102 million per mile. These costs would be passed on to the rate payers.

In addition to the cost issue, the CPUC (Lead Agency) must also take into consideration the reliability issues associated with using a new technology in an application with minimal operating history. As discussed in the EIR/EIS Section 2.5.3.1, Operational Reliability Considerations, there is a lack of precedence in installing GIL systems of the length and voltage proposed under Alternative 5 (3.5 miles of double-circuit 500-kV T/L), 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 in operation (This section is part of SCE's electrical backbone for serving the southeastern portion of Southern California.). 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 issues. 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 (3.5 miles) 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.

GR-8: Use of 150-Foot-Wide ROW for a 500-kV Transmission Line

During the review period for the Draft EIR/EIS (February 13 to April 6, 2009), several comments were received questioning the feasibility of constructing and appropriateness of placing double-circuit 500-kV structures within the existing 150-foot ROW through the City of Chino Hills. As part of SCE's proposed Project (Alternative 2), SCE is proposing to remove the existing single-circuit 220-kV structures and install double-circuit 500-kV structures. Specifically within the City of Chino Hills, lattice steel towers (LSTs) would be installed from the western boundary of the City (~S8A MP 20.7) to approximately S8A MP 22.9 (near Coral Ridge Park), with tubular steel poles (TSPs) being installed throughout the rest of the City within the existing 150-foot ROW.

All 220-kV and 500-kV transmission lines currently designed and constructed on the SCE system have been designed in accordance with SCE's design standard document – Design Specification No. D-2005-198, 220 kV and 500 kV Transmission Lines, Revision 1, March 11, 2008 (Spec. No. D-2005-198). The fundamental purpose of Spec. No. D-2005-198 is to describe and document the design criteria necessary and appropriate for the design or analysis of high and extra high voltage lines on SCE's transmission network. It is intended to provide guidance and directive information for SCE engineers, their peers, consultants and contractors in the execution of the design or analysis work on 220-kV and 500-kV overhead transmission lines. SCE's design criteria characterizes the design requirements for all SCE projects in terms of the operating conditions, performance, material characteristics, and compliance with applicable codes, design standards and regulations. These criteria described in Spec. No. D-2005-198 are currently used as the basis for the design work on all of SCE's 220-kV and 500-kV transmission line projects, including TRTP. These design criteria with revisions and referenced documents describe the parameters, assumptions, conditions, and other design requirements upon which design drawings, calculations, specifications, and other design deliverables are based.

SCE's current Transmission Design specifications define the "typical 500-kV ROW" for double-circuit structures as 150 feet (Section 6.1, Line Design, of D-2005-198, Rev. 1). The specifications do not differentiate between residential and non-residential areas with respect to ROW width. It should also be noted that the circuit-to-circuit spacing and distance to edge of ROW, which determine the typical ROW widths, have been determined as a result of studies considering conductor size, tension and sag; electric and magnetic fields at the edge of the ROW; conductor blowout, insulator swing, and electrical clearance requirements to the edge of the ROW; maintenance and access; and current and potential land uses on adjacent lands. Furthermore, the State of California's governing code for transmission lines, General Order 95 (GO 95) – Rules for Overhead Electric Line Construction, do not define specific ROW widths. Therefore, building the double-circuit 500-kV structures within the existing 150-foot ROW through Chino Hills as part of TRTP would be acceptable and appropriate.

Furthermore, SCE's Transmission Design Specification E-2008-21, Construction of Transmission Line Access Roads and Tower Site Preparation, Section 1.8.5, states the following:

> All new tower and pole locations shall be clear of obstructions that would cause hindrance to maintenance operations. The following clearances shall be adhered to as required by Edison's Transmission Organization:
>
> For 220 kV & 500 kV T/L Right of Ways and all 66 kV Towers:
>
> - 100-foot radius from face of tower footings
>
> [Also provides clearance requirements for 66 kV & 115 kV poles]
>
> The following conditions where these clearances may not be provided are as follows:
>
> 1. Land Owner Property Rights.
> 2. Regulatory Requirements for a particular project.
> 3. Environmental Restrictions.
> 4. Topographic features that do not allow 100 foot clearances.
> 5. Other special conditions identified or approved by the Construction Representative.
>
> Edison's Transmission Organization will handle any existing issues on a site specific basis.

As noted by SCE in Data Request Set TRTP Chino Hills-07 (Question #4), the 100-foot clearance radius has been established as a guideline and applies only to the area of the ROW. Situations that conflict with SCE's Secondary Land Use Policy and Transmission Line Right of Way Requirements (i.e., property rights, regulatory requirements, environmental restrictions, topographic features, existing uses, and other special conditions) would be reviewed on a case-by-case basis by SCE. As there are environmental restrictions and/or other special conditions which would prevent the new TRTP structures through Chino Hills (in the 150-foot ROW) from meeting the clearance recommendations detailed in SCE's Transmission Design Specification E-2008-21, the Project would not be required to meet these clearance requirements. It should also be noted that the purpose for these clearances, as detailed in the same section of Specification E-2008-21, is to ensure that all new tower and pole locations are clear of obstructions that would cause hindrance to maintenance operations. Building the new double-circuit 500-kV structures within the existing 150-foot ROW within Chino Hills would not impede operations and maintenance activities. Therefore, building the double-circuit 500-kV structures within the existing 150-foot ROW through Chino Hills as part of TRTP would not violate SCE's design specifications.

With respect to the feasibility of construction within the existing 150-foot ROW through Chino Hills, it is acknowledged that the size of the laydown areas, as described in the EIR/EIS, would typically occupy an area of 200 feet by 200 feet; pulling and splicing locations would require an average area of 200 feet by 200 feet. The actual size of each site, however, can vary based on physical constraints and actual construction needs. If there is not available space adjacent to each structure location outside of the ROW that could be temporarily utilized during the assembly and erection of the structures, the construction contractor would modify the proposed construction site set-up area and construction sequencing. This is accomplished by adjusting the location of the materials delivered for assembly, the location of the assembly area, the positioning of the crane for erection, and the sequencing of the material delivery, assembly, and erection of the structures.

For example, within the Chino Hills area, smaller laydown areas and pulling/splicing locations would be utilized due to the limited availability of space. This is further emphasized upon review of the land disturbance estimates for Segment 8. Draft EIR/EIS Table 2.2-9, Notes 7 and 11, provide details of SCE's assumptions for the LST/TSP laydown and assembly areas (Note 7), and the wire stringing areas (a.k.a. pulling/splicing locations) (Note 11). These notes emphasize that there are several locations that SCE has preliminarily identified along Segment 8 where the dimensions would be altered (from the 200-foot by 200-foot average) to allow for construction in areas where physical constraints, such as a narrower ROW, prevent the use of a larger area. Locations for these construction areas have been preliminarily identified by SCE and are documented in the Project Road Stories, which were used to develop the description of the Project and support the environmental analysis presented in the EIR/EIS. The Project Road Stories have continually been updated by SCE throughout the EIR/EIS process as engineering details became available, and were distributed to the public upon request. SCE is confident that construction within the existing 150-foot ROW through Chino Hills is feasible.

Supplemental Data on Transmission Lines Located in Constrained Rights-of-Way

Within the United States, there are many instances of transmission lines located in close proximity to permanent structures, including residences. One specific example occurs within Georgia Power's service territory where there is an existing double-circuit 500-kV transmission line in a 150-foot ROW. Historically, within Cobb County, Georgia, near Kennesaw, the existing 150-foot ROW originally contained a 220-kV transmission line until the early 1980's at which point Georgia Power needed to increase capacity to a new generating station. As a result, in 1988 the 220-kV transmission line was replaced with a double-circuit 500-kV transmission line, utilizing LSTs ranging in height from 130 to 200 feet tall. Land uses along this corridor include a mixture of multi-family residential, where multi-story apartments are located within 75 feet of the ROW centerline; single-family residential, where homes and yards are located at the edge of the ROW; commercial; retail; and rural agriculture.

In addition to the above example in Georgia, SCE has identified several areas within California where high voltage (115 and 230 kV) transmission lines are located in close proximity to permanent structures. These are detailed in the table below. Although the voltages are not 500 kV, the range of distance from rooftop is between 6 and 55 feet, which would be similar to SCE's proposed Project (Alternative 2). Based on the data SCE provided regarding existing transmission lines located in constrained ROWs, SCE's specifications, and the State's guidelines (GO 95), installation of the proposed double-circuit 500-kV structures within the existing 150-foot ROW through the City of Chino Hills would not be a violation of any standards and would not be considered to overburden the ROW.

Examples of Transmission Lines in California Located in Constrained ROWs

Location (Zip Code)	Voltage	Owner	Line Name/Location	Approximate Line to Rooftop Distance (ft)
92121	230	SDG&E	Mission Peaker-1 to San Luis Rey	31
92121	230	SDG&E	Mission Peaker to San Onofre	33
90049	230/115	LADWP	Sta U to Kenter Canyon	38
90049	230/115	LADWP	Sta U to Kenter Canyon	28
91505	230/115	LADWP	Sta E to Sta G	10
91505	230/115	LADWP	Sta E to Nicholas Canyon	27
91356	230/115	LADWP	Sta U to Kenter Canyon	18
91345	230	LADWP	Rinaldi to Valley Generating Station	49
93003	230	SCE	Santa Clara to Mandalay	52
95118	230/115	PG&E	El Patio to Tap	55
95032	230	PG&E	Unknown to Metcalf Energy Center	41
95124	230	PG&E	Hicks to Unknown	24
95121	230/115	PG&E	Newark to Metcalf Energy Center	18
94539	230/115	PG&E	Newark to Moraga	40
94538	230/115	PG&E	Tap to Newark	42
94030	230/115	PG&E	Martin Peaker to San Mateo Peaker	28
94530	115	PG&E	El Cerrito (Sta G) to Sobrante	6
94553	230	PG&E	Tap to Sobrante	32
95864	230/115	SMUD	Hedge to Hurley	42
95821	230	PG&E	Brighton to Tap	50
90660	230	LADWP	Victorville to Sta B-1	43
91702	230	LADWP	Victorville to Sta B-1	34
91773	230	LADWP	Victorville to Sta B-1	15

SCE, 2008. Data Request Set TRTP CPUC-ED-05, June 2008, Question 5-04.

GR-9: Contribution of Funds as Mitigation under the California Environmental Quality Act

Contribution of funds towards unspecified future programs, improvements, or actions is not appropriate mitigation under CEQA. Assessment of fees is only appropriate if it is linked to a specific mitigation program. (See *Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173; *Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 141; see also *Carson Coalition for Healthy Families v. City of Carson* (2007) 2007 WL 3408624 at page 18 [unpublished].) A commitment to pay fees is not considered mitigation under CEQA unless there is evidence that mitigation will actually result. (See *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727 [requiring applicant to pay funds to purchase replacement groundwater not adequate where it was not known whether groundwater was available].) It is not clear from the fee-based mitigation measures proposed in some of the comments that the payment of fees will translate into actual mitigation. Nor do the comments define a mitigation program for the fees; CEQA does not accept as mitigation a plan to create and implement a future program. (See *San Franciscans for Reasonable Growth v. City & County of San Francisco* (1984) 151 Cal.App.3d 61, 79 [requirement that applicant pay an unspecified amount at an unspecified time, in compliance with an unspecified transit funding mechanism, was inadequate mitigation because it was not possible to evaluate its effectiveness].) Additionally, a mitigation fee program may not be considered adequate unless the program itself has been reviewed under CEQA. (See *California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026, 1030.)

Further, to the extent that the payment of fees would be used to alter existing conditions and impacts not caused by the proposed Project, CEQA prohibits exaction of such fees due to the lack of an essential nexus (i.e. connection) between the mitigation measure and a legitimate governmental interest. (CEQA Guidelines § 15126.4(a)(4)(A); *Nollan v. California Coastal Commission* (1987) 483 U.S. 825.) Additionally, mitigation measure must be "roughly proportional" to the impacts of the project. (CEQA Guidelines § 15126.4(a)(4)(B); *Dolan v. City of Tigard* (1994) 512 U.S. 374; *Ehrlich v. City of Culver City* (1996) 12 Cal.4th 854.)

For the reasons above, the fee-based mitigation measures proposed in several comments cannot be legally imposed. Where, as here, the lead agency makes this determination, the EIR need not analyze the mitigation measures. (CEQA Guidelines § 15126.4(a)(5).)

GR-10: Potential Failure of Transmission Structures

A number of comments received make reference to risks or potential impacts due to failure of the structures supporting the transmission line.

The design of transmission line structures (poles and towers) is governed by the CPUC (General Order No. 95), Rules for Overhead Electric Line Construction, which stipulate minimum loadings to ensure the safety and protection of the public. The design code requires the structures to have adequate strength to support physical loads from everyday conditions as well as extreme weather loads or combinations of loads. Design of the structures also incorporates safety factors to provide an additional margin to protect against failures of the structures. In addition, studies would be performed prior to final Project design to prevent placement of structures on known geologic features (landslides and fault traces) that could increase the potential for tower damage, as required by Mitigation Measures G-3 (Conduct geological surveys for landslides and protect against slope instability), G-4a (Minimize Project structures within active fault zones), G-5a (Reduce effects of groundshaking), G-5b (Conduct geotechnical investigations for liquefaction), and G-6 (Conduct geotechnical studies to assess soil characteristics and aid in appropriate foundation design).

The loading conditions used for transmission structure design include loading cases that are considered extreme loadings, which may represent earthquake or weather events that have a recurrence interval of 50 years, 100 years, or even longer. The structures are designed to resist these loads even though these long return intervals relate to a low probability that the loading condition will be experienced during the life of the transmission line. The concept for the use of extreme loading conditions is to design transmission lines for rare but probable loading conditions that could occur in the region they are located and within the expected life of the line. These conditions typically represent loadings from a weather event with a return interval such as 1 in 50 year or 1 in 100 year storms. For example, weather data can show that 100 mile per hour (mph) winds happen albeit infrequently, but there are no records of 250 mph winds and it is reasonable to design for the 100 mph wind case. Extreme loading conditions are embodied in relevant codes in California but is also in national and international codes and practices for the design of transmission lines (CPUC General Order No. 95, National Electrical Safety Code). The proposed Project is not unusual or different in terms of loadings that would be anticipated for all other lines currently in place in southern California as these are all required to meet the requirements of General Order No. 95.

The above is not to indicate that transmission structures never fail, but failures are extremely rare. Transmission structure failures have occurred in instances where anomalous structure loadings from tornadoes or micro-bursts have resulted in wind pressures or other loads in excess of the stipulated design extreme loading. In the event of a structure failure, it is necessary to consider how transmission structures behave when they are subject to loads greater than identified as the extreme weather design load.

Structure failures can be broadly characterized two categories:

- Category One: The structure remains intact but undergoes displacement or deflection. In these instances the transmission line is still supported by the structure and may be operational. However, due to member overstress, localized buckling, or foundation movement the structure is no longer plumb (i.e., not vertically straight or leaning) and conductors are displaced from their design position. This type of structure failure is typically remedied by replacing overstressed or buckled portions of the structure, and/or correcting foundation displacements by using either jacking techniques and the addition of compacted backfill or concrete or by use of high pressure grouting, thereby returning the structure to its originally designed position.
- Category Two: The structure overload is sufficient that the structure has unrecoverable deflections and damage or the structure does not remain intact. In these instances the transmission line is no longer supported by the structure and cannot be operated. This type of structure failure typically results in a portion of the structure buckling or crumpling to the extent that the transmission line is dropped to the ground. This type failure does not result in the structure falling or rotating about its base. The shafts of tubular steel poles consist of a single structural member which when loaded beyond design loads, unlike wood poles, does not physically break and fall to the ground. Rather the steel shaft yields and the structure is 'bent over." Lattice towers that fail have individual members that buckle or crumple, with this typically occurring in the area of the structure waist, which may be at a third to one-half the structure height. In most instances when either a tubular steel pole or lattice tower is loaded in excess of its design loading and begins to fail, the tension in the transmission line conductors begin to assert a load on the structure that pulls it in a longitudinal direction. This means that tower failures generally occur in a direction along the transmission line not perpendicular to the line.

The risk of failure is analyzed in the Draft EIR/EIS Section 3.7. Impacts G-4 through G-7 were determined to be mitigated to less than significant for Alternatives 2 through 7.

H.3 Responses to Individual Comments

The following pages present the written comments received on the Draft EIR/EIS during the public review period. Each of the comment documents has been given a number designation and the comments in each document have been individually numbered. Responses correspond to the comment numbers and immediately follow each comment document.

Table H-1. Comments Received from Public Agencies and Elected Officials on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Agency/Affiliation	Name / Title of Commenter	Date of Comment
A.1	Antelope Valley Air Quality Management District	Alan J. De Salvio, Supervising Air Quality Engineer	02/25/09
A.2	City of Palmdale	Asoka Herath, Director of Planning	03/06/09
A.3	John A. Rowland High School	Robert S. Withers, Assistant Principal	03/11/09
A.4	South Coast Air Quality Management District	Steve Smith, Program Supervisor CEQA Section, Planning, Rule Development and Area Sources	03/18/09
A.5	Department of Transportation, Division of Transportation Planning, MS-32	Gary S. Arnold, Statewide Local Development-Intergovernmental Review Coordinator, Office of Community Planning	03/16/09
A.6	City of Brea	Charles View, Development Services Director	03/17/09
A.7	City of San Marino, Planning & Building Department	Amanda Thorson, Planning & Building Assistant	03/19/09
A.8	County of Los Angeles, Department of Public Works	Gail Farber, Director of Public Works, for Dennis Hunter, Assistant Deputy Director, Land Development Division	03/25/09
A.9	California Regional Water Quality Control Board, Santa Ana Region	Mark G. Adelson, Chief, Regional Planning Programs Section	04/01/09
A.10	City of Chino Hills Planning Commission	Karen S. Bristow	03/19/09
A.11	City of Chino	Charles E. Coe, Director of Community Development	04/02/09
A.12	City of Chino	Brent Arnold, City Planner	04/03/09
A.13	CA Department of Parks and Recreation, Inland Empire District	Ron Krueper, District Superintendent	04/03/09
A.14	CA Department of Fish and Game, South Coast Region	Edmund J. Pert, Regional Manager	04/06/09
A.15	County of Los Angeles, Chief Executive Office	William T. Fujioka, Chief Executive Officer	04/06/09
A.16	Acton Town Council	Jacqueline Ayer	04/06/09
A.17	Watershed Conservation Authority	Belinda V. Faustinos, Executive Officer	04/02/09
A.18	Puente Hills Landfill Native Habitat Preservation Authority	Bob Henderson, Chairman	04/02/09
A.19	City of El Monte	Minh Thai, Planning Services Manager	04/06/09
A.20	City of La Habra Heights	Brian Bergman and Stan Carroll, Council Members	04/06/09
A.21	City of Irwindale	Ray Hamada, Director of Planning & Community Development	04/02/09
A.22	County Sanitation Districts of Los Angeles County	Debra Bogdanoff, Senior Engineer, Facilities Planning Department	04/06/09
A.23	City of Chino Hills	Jeanne B. Armstrong, Goodin, MacBride, Squeri, Day & Lamprey, LLP (Attorneys for the City of Chino Hills)	04/06/09
A.24	County of Los Angeles, Department of Public Works	Gail Farber, Director of Public Works, for Dennis Hunter, Assistant Deputy Director Land Development Division	04/02/09
A.25	California Regional Water Quality Control Board, Santa Ana Region	Glenn Robertson, Engineering Geologist / CEQA Coordinator	04/06/09
A.26	City of Ontario	Jerry L. Blum, Planning Director	04/06/09
A.27	U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Pacific Southwest Region	Patricia Sanderson Port, Regional Environmental Officer	04/06/09
A.28	U.S. Environmental Protection Agency, Region IX	Kathleen M. Goforth, Manager, Environmental Review Office	04/06/09

Table H-2. Comments Received from Groups, Organizations, and Companies on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Group/Organization/Company	Name / Title of Commenter	Date of Comment
B.1	Monte Cristo Mining Property	Bob Kerstein	03/05/09
B.2	Endangered Habitats League	Dan Silver, Executive Director	03/17/09
B.3	Antelope Valley Environmental Group (AVEG)	Dean Webb	03/18/09
B.4	Chino Hills Car Wash, Inc.	Vic Galstanyan	03/19/09
B.5	Save Our Community	Jim Flournoy, Secretary	03/26/09
B.6	Aera Energy LLC	Jeffrey R. Maisch, Project Manager	03/31/09
B.7	Terra-Gen Power, LLC	Mark A. Casper, Vice President	04/01/09
B.8	Inland Action, Inc.	Edward Lasak, Chairman	04/02/09
B.9	Parente/Chino Hills Co LP and Parente Real Estate Investment Management Co (owned and controlled by Mary Borba Parente)	David E Watson, Hecht Solberg Robinson Goldberg & Bagley LLP (legal counsel for Mary Parente)	04/03/09
B.10	Aerojet	Jones Day	04/03/09
B.11	Cook Hill Properties	Norman E Witt, Jr, Senior Vice President	04/06/09
B.12	Chino Valley Community Church	Roger Nelson, Chairman, Elder Board	04/06/09
B.13	CA State Parks Foundation	Sara Feldman, Vice President for Programs	04/06/09
B.14	Gabrielino-Tongva Tribe	Felicia Sheerman, Tribal Councilwoman	04/06/09
B.15	Save Our Community	Jim Flournoy, Secretary	04/06/09
B.16	Hills for Everyone	Claire Schlotterbeck, Executive Director	04/06/09
B.17	California Wind Energy Association	Nancy Rader, Executive Director	04/06/09
B.18	Lancaster Highlands LLC, Hearthstone Inc (managing partner), and Landstone Communities LLC (project manager)	Colin Nemeroff, Project Planner, Stantec	04/06/09
B.19	Montebello Hills Sierra Club Task Force	Margot Eiser, Co-Founder	04/06/09
B.20	Inland Hills Church	Dave Stoecklein, Senior Pastor, President of the Board of Directors	03/31/09

Volume 6 of 7

Final Environmental Impact Report/Statement

Southern California Edison's Application for the

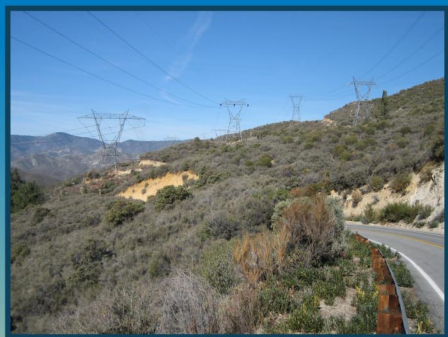
Tehachapi Renewable Transmission Project

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

TEHACHAPI RENEWABLE TRANSMISSION PROJECT

Final Environmental Impact Report/Statement

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Appendices

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009		
Comment Set	Name of Commenter	Date of Comment
C.1	Kyle Tejada	2/21/09
C.2	Kyle Tejada	2/22/09
C.3	Anna C. Loera	2/25/09
C.4	Evelyn Ignacio	2/21/09
C.5	Sally Kirn	2/22/09
C.6	Connie Thieman	3/1/09
C.7	Martin & Sue Turnbow	3/4/09
C.8	Eloy Loera	3/5/09
C.9	James and Karen Vita	3/10/09
C.10	Roger and Vione Cox	3/12/09
C.11	Theopilis Hester	3/12/09
C.12	Kai Cheng	3/12/09
C.13	Bob Armitage	3/15/09
C.14	The Oh Family	3/16/09
C.15	Richard Emrich	3/17/09
C.16	Nora Chang Emrich	3/17/09
C.17	Jennifer Hu	3/18/09
C.18	Kai Cheng	3/18/09
C.19	Arturo Martinez	3/18/09
C.20	Karen and Frank Bodnar	4/1/09
C.21	Michael Keyzers	3/20/09
C.22	Janet Thurston	3/19/09
C.23	Jim Flournoy	Prior to 4/6/09
C.24	Paul and Janet Goossens	3/19/09
C.25	Paul Goossens	3/19/09
C.26	Sona McCoy	3/19/09
C.27	Tom Shiah	3/19/09
C.28	Louis Bouwer	3/19/09
C.29	Scott Guiou	3/19/09
C.30	Alexandria Walker	3/19/09
C.31	Rosie Starr	3/19/09
C.32	Trina Tudrick	3/19/09
C.33	Emma Hu	3/19/09
C.34	Patrick Hu	3/19/09
C.35	Rick Wibbens	3/19/09
C.36	Dhun Nathani	3/23/09
C.37	Gary McCarthy	3/19/09
C.38	John Starr	3/19/09
C.39	Maggi Burns	3/19/09
C.40	Donna Newton	3/22/09
C.41	Rudy Cantu	3/27/09
C.42	Mary Rabinek	3/25/09
C.43	Mark Sael	3/27/09
C.44	Eileen Minton	3/26/09
C.45	Liane Saeli	3/27/09
C.46	Angie Ter-Veen	3/27/09
C.47	Juan Carrillo	3/23/09
C.48	Ronny Chang	3/17/09
C.49	Rudy Cantu	3/24/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009		
Comment Set	Name of Commenter	Date of Comment
C.50	Evan Galbraith	3/27/09
C.51	Richard Kilar	4/4/09
C.52	Beverly Ng	4/1/09
C.53	Robert Scudder	3/28/09
C.54	Cesar and Kore Marie Aguins	4/13/09
C.55	Mrs. Jean Hodgeson	4/13/09
C.56	Ruth Dickie	4/2/09
C.57	Chuck Dickie	4/2/09
C.58	Aldo & Sylvia Casillas	3/30/09
C.59	Victor W. Weaver	4/2/09
C.60	Sylvia Casillas	3/30/09
C.61	Bradley & Linda Tosch	4/4/09
C.62	Sol Raskin	4/5/09
C.63	Rome Saura	4/2/09
C.64	Christine Teater	4/3/09
C.65	Mike Davies	4/6/09
C.66	Jamison Hebert & Alec Mapa	4/6/09
C.67	Richard Chi	3/27/09
C.68	shintopstar	4/4/09
C.69	Scott, Annie, Nelly & Gracey Wilson	4/6/09
C.70	Mike Vander Dussen	4/6/09
C.71	Heather Baiseri	4/2/09
C.72	Janelle McClaran	4/6/09
C.73	Felicia Lovio	4/6/09
C.74	Keith & Deborah Williams	4/3/09
C.75	Barry Fischer	Prior to 4/6/09
C.76	Christina Genis	4/5/09
C.77	James Vita	4/4/09
C.78	Jill McClaran	4/6/09
C.79	Chris Bond	3/31/09
C.80	Joseph Hebert	4/4/09
C.81	Katy Wu	4/6/09
C.82	David Greene	4/6/09
C.83	Carolyn Elfelt	4/5/09
C.84	Jim Flournoy	4/5/09
C.85	Robert Staats	4/5/09
C.86	Debra Belli	4/2/09
C.87	Mike McClaran	4/6/09
C.88	Ken & Kathy Hatton	4/3/09
C.89	Percy Segura	3/30/09
C.90	Joanne Genis	4/7/09
C.91	Paul Chen	3/25/09
C.92	Michael Elfelt	4/5/09
C.93	Lisa Hirsch	4/6/09
C.94	Shu Kitazaki	4/6/09
C.95	Michael W. Stover	4/5/09
C.96	Tina Bradford	4/6/09
C.97	Alicia Elfelt	4/6/09
C.98	Stephen Elfelt	4/6/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.99	Joan & Jim Ashlock	4/3/09
C.100	Albert Chan	4/1/09
C.101	Danny & Floramie Torres	4/6/09
C.102	Brandon Stewart	4/6/09
C.103	Dr. & Mrs. Lon McClanahan	4/6/09
C.104	Crystal Wylie	4/6/09
C.105	John, Trina, Carissa & Kate Van Steenwyk	4/6/09
C.106	Richard & Deanna Perez	4/6/09
C.107	Colin Nemeroff	4/6/09
C.108	Michael Machado	4/6/09
C.109	Andrew Teater	4/6/09
C.110	Miguel & Iveth Llaneras	4/6/09
C.111	Paul & Danika Hildebrandt	4/6/09
C.112	Hsin-Shou Huang	4/6/09
C.113	Andrew Teater	4/6/09
C.114	Jim & Diane Case	4/6/09
C.115	George Tejada	4/5/09
C.116	Elizabeth B. Flournoy	4/6/09
C.117	David C. Cowardin	4/6/07
C.118	Bob Machuca	4/6/09
C.119	Tom, Roanne, Laura, and Joanna Holliman	4/7/09
C.120	Jill Saaredra	4/6/09
C.121	Robert & Pamela Sheehan	4/5/09
C.122	Steven and Robin Somers	4/5/09
C.123	Setswko Imori	4/6/09
C.124	Edmundo Genis	4/5/09
C.125	Kimhai Mullins	4/1/09
C.126	Jeff and Dana Anastasi	4/6/09
C.127	Tracy Bryant	4/6/09
C.128	Jim and Annette Chamberlain	4/6/09
C.129	Kimberly A. Cody	4/6/09
C.130	Christine Grommes	4/6/09
C.131	Dicky Harsojo	4/6/09
C.132	Monica Hassis	4/6/09
C.133	Heather Higson	4/6/09
C.134	Steve Higson	4/6/09
C.135	Trish Kashou	4/6/09
C.136	Nate and Jessica Lazewski	4/6/09
C.137	Mandy Maldonado	4/6/09
C.138	Richard Minogue	4/6/09
C.139	Jean Moore	4/6/09
C.140	Michele Ramirez	4/6/09
C.141	Susan Ramos	4/6/09
C.142	James E. Byers	4/3/09
C.143	Albert Choy	4/3/09
C.144	Richard and Faye Heinrich	4/3/09
C.145	Mike and Kristine Jervis	4/3/09
C.146	Glenn A. Johnson	4/3/09
C.147	Beatrice and Joseph Kahananui	4/3/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009		
Comment Set	Name of Commenter	Date of Comment
C.148	Mike and Carolyn Lush	4/3/09
C.149	Helen and Molly McElhattan	4/3/09
C.150	Sally and Louie Pontrelli	4/3/09
C.151	Luis Salinas	4/6/09
C.152	David and Nadene Shubin	4/3/09
C.153	John Shubin	4/3/09
C.154	Joseph Wagoner	4/3/09
C.155	Linda Weiss	4/3/09
C.156	Christine and Jedidiah Abbott	4/1/09
C.157	Tim and Sally Adams	4/3/09
C.158	Jessica Addington	4/4/09
C.159	Cheryle Anaya	4/1/09
C.160	Alma R. Anderson	4/1/09
C.161	Nancy Ansel	4/2/09
C.162	Jennifer Athans	4/4/09
C.163	Seema Bagai	4/2/09
C.164	Lynn Ball	4/1/09
C.165	Cindy Baughman	4/1/09
C.166	Molli Beightol	4/5/09
C.167	Cynthia L. Bock	4/1/09
C.168	Jack D. Bock	4/2/09
C.169	Don Bombardier	4/4/09
C.170	Irene and John Bowers	4/1/09
C.171	Louis Bouwer	4/3/09
C.172	Amy Brant	4/2/09
C.173	Jason Brant	4/5/09
C.174	Jill Brown	4/1/09
C.175	Rebecca Bub	4/2/09
C.176	Doug and Nicole Burns	4/2/09
C.177	Rosalee M. Carlson	4/3/09
C.178	Colleen Carr	4/1/09
C.179	George and Colleen Carr	4/1/09
C.180	Denise Castro	4/1/09
C.181	Crystal Chavers	4/1/09
C.182	David Chavers	4/3/09
C.183	Elvia Chavez	4/5/09
C.184	Amanda Clemons	4/1/09
C.185	Nodya S. Clemons	4/1/09
C.186	Gary and Diana Clinton	4/5/09
C.187	Kimberly Collier-Endress	4/1/09
C.188	Lindsey Courtney	4/6/09
C.189	Denise Covington	4/2/09
C.190	Katie Covington	4/4/09
C.191	Jennifer Cote	4/3/09
C.192	Marc and Monica Crockett	4/2/09
C.193	Chelsea Curran	4/1/09
C.194	Danielle Curran	4/1/09
C.195	Donna Curran	4/1/09
C.196	Holly Curran	4/1/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009		
Comment Set	Name of Commenter	Date of Comment
C.197	Tom Curran	4/6/09
C.198	Kristi Day	4/1/09
C.199	Roger Day	4/1/09
C.200	Kevin Denkers	4/6/09
C.201	Kevin and Melany Denkers	4/2/09
C.202	Nicole DeVries	4/1/09
C.203	Nancy Dibble	4/5/09
C.204	Rusty Dowling	4/1/09
C.205	Hortendia (Dustie) Dwyer	4/3/09
C.206	Melissa Eckstine	4/5/09
C.207	Tammy Elliott	4/2/09
C.208	Adam Endress	4/6/09
C.209	Chad Espinoza	4/1/09
C.210	Kevin and Kym Falsetti	4/6/09
C.211	Larry Fawcett	4/2/09
C.212	Dinah Ferrer	4/2/09
C.213	Rosemarie Ferrer	4/4/09
C.214	Rosie Ferrer	4/3/09
C.215	Leah Fleischmann	4/2/09
C.216	Marc Fleischmann	4/2/09
C.217	Deanna Fragnoli	4/5/09
C.218	James M. Fragnoli	4/1/09
C.219	Alicia Fraley	4/4/09
C.220	Carol Garman	4/3/09
C.221	Michael T. Gaughan	4/5/09
C.222	Iris Gay	4/6/09
C.223	Sandra D. Gaughan	4/2/09
C.224	Joann Gitmed	4/2/09
C.225	John Glass	4/2/09
C.226	Nicole Goetz	4/2/09
C.227	Darlene I. Gold	4/3/09
C.228	Sean and Christy Gomez	4/4/09
C.229	Daniel and Evelyn Gomez	4/2/09
C.230	Jennifer and Kyle Gomez	4/6/09
C.231	Cyndi Gonzales	4/3/09
C.232	Dick Gonzales	4/3/09
C.233	Jennifer Gonzales	4/1/09
C.234	Kaylin Gonzales	4/3/09
C.235	Janis and Joseph Goodin	4/4/09
C.236	Dawn Goodman	4/1/09
C.237	Barbara Gray	4/2/09
C.238	Douglas C. Gray	4/2/09
C.239	Dan Hagopian	4/3/09
C.240	Shannon Hagopian	4/3/09
C.241	Phil Harrison	4/6/09
C.242	Henderson Family	4/2/09
C.243	Lisa Hernandez	4/3/09
C.244	John Hoover	4/6/09
C.245	Melissa Horton	4/1/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009		
Comment Set	Name of Commenter	Date of Comment
C.246	Lisa Hunter	4/1/09
C.247	Carol A. Ingram	4/6/09
C.248	Jennifer Interiano	4/1/09
C.249	Vincent Jones	4/2/09
C.250	David and Julie Kidder	4/3/09
C.251	Patti Koyro	4/4/09
C.252	Lori Kyle	4/1/09
C.253	John Landherr	4/1/09
C.254	Mariah Langford	4/2/09
C.255	Justin Leewood	4/1/09
C.256	Peter Lin	4/1/09
C.257	Gary Lindsley	4/2/09
C.258	James and Ardyce Lindsley	4/1/09
C.259	Nicole Lindsley	4/6/09
C.260	Shelli Lindsley	4/1/09
C.261	Lisa Lopez	4/1/09
C.262	Toni Lopez	4/3/09
C.263	Holly Madewell	4/5/09
C.264	Rafael and Tracie Manriquez	4/1/09
C.265	Lisa Martin	4/3/09
C.266	Jean Martin	4/1/09
C.267	Marisa Martin	4/2/09
C.268	Rick Martin	4/3/09
C.269	Phillip Mata	4/4/09
C.270	Noel and Linda Mayfield	4/2/09
C.271	Mike and Nichole Medaris	4/1/09
C.272	Kayli Melendez	4/2/09
C.273	Francine D. Mellard	4/4/09
C.274	Steve Mellard	4/6/09
C.275	Lance Miller	4/2/09
C.276	Teresa Miller	3/31/09
C.277	Thomas M. Mark	4/6/09
C.278	Connie Moreno	4/4/09
C.279	David Mullins	4/1/09
C.280	Kathaleen Mullins	4/1/09
C.281	Alison Murphy	4/4/09
C.282	Bryan Murphy	4/4/09
C.283	Bob and Debbie Murray	4/5/09
C.284	Kay Murray	4/4/09
C.285	Robert Murray	4/4/09
C.286	Robbie Myers	4/6/09
C.287	Jean Massereddin	4/1/09
C.288	Yolanda Nevarez	Prior to 4/6/09
C.289	Michelle Nichiporuk	4/3/09
C.290	Carol Noble	4/2/09
C.291	Matt and Nicole Noreen	4/1/09
C.292	Marlina Nudo	4/1/09
C.293	John and Joy Muttmann	4/1/09
C.294	Weston O'Brien	4/5/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.295	Charlotte Odette	4/3/09
C.296	Donna Ostronic	4/6/09
C.297	Robert and Marla Osgood	4/1/09
C.298	Lisa Page	4/1/09
C.299	Robb Page	4/1/09
C.300	Frank and Kim Palumbo	4/1/09
C.301	Peggy M. Pearson	4/1/09
C.302	Steve and Heidi Pendleton	4/6/09
C.303	Jose F. Perez	4/2/09
C.304	Dorothy Poverelli	4/2/09
C.305	Linda Prewett	4/2/09
C.306	Steve Reed	4/1/09
C.307	Jerome and Michelle Reidman	4/2/09
C.308	Jane L. Rich	4/3/09
C.309	Casandra Rivard	4/5/09
C.310	Vanessa Roberts	4/2/09
C.311	Dorsie Rouse	4/3/09
C.312	Phil and Erin Ruhl	4/2/09
C.313	Dennis Salvatier	4/1/09
C.314	Sandee Sanderson	4/4/09
C.315	Robert and Shelly Schofield	4/6/09
C.316	Holly Scoltock	4/6/09
C.317	Cindy Seefoo	4/6/09
C.318	Joseph Servia	4/1/09
C.319	Pam Sheehan	4/2/09
C.320	Elizabeth Shetler	4/4/09
C.321	Jeffery C. Short	4/1/09
C.322	Pat Simons	4/3/09
C.323	Marcia P. Smith	4/5/09
C.324	Scott and Angela Stevenson	4/4/09
C.325	Patricia and Charles Suppe	4/2/09
C.326	Andrew, Christine, Julianne and Joseph Teater	4/3/09
C.327	Dave Ten Berge	4/3/09
C.328	Stephanie Ten Berge	4/3/09
C.329	Kelli Tencate	4/2/09
C.330	Jerry and Renee Tieszen	4/5/09
C.331	Lisa Trzcinski	4/6/09
C.332	Todd and Blanca Turner	4/4/09
C.333	Andrew Turpen	4/1/09
C.334	Matt and Heather Ulrich	4/2/09
C.335	Chris van Straten	4/1/09
C.336	David, Tina and Amanda Viel	Prior to 4/6/09
C.337	Diane and Kenny Villegas	4/3/09
C.338	Rosalie Vitali	4/3/09
C.339	David Vizzini	4/2/09
C.340	Gloria Vizzini	4/1/09
C.341	Rebecca Wagner	4/1/09
C.342	Rober J. Wallin	4/5/09
C.343	Jim and Maria Walski	4/6/09

Table H-3. Comments Received from Individuals on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	Name of Commenter	Date of Comment
C.344	Bryan and Andrea Ward	4/1/09
C.345	Dolores Weber	4/1/09
C.346	Mike Whipple	4/6/09
C.347	Leah Whipple	4/2/09
C.348	Penny Whittier	4/1/09
C.349	Jerry Wimberly	4/6/09
C.350	Peggy Wimberly	4/6/09
C.351	Bryce Winton	4/6/09
C.352	Lisa Winton	4/4/09
C.353	Rick Winton	4/4/09
C.354	Denise Wyrick	4/2/09
C.355	Joe Yersky	4/6/09
C.356	Ron and Danelle Young	4/2/09
C.357	Lisa Zangenberg	4/3/09
C.358	Cynthia Zuroff	4/2/09
C.359	Jonathan Zuroff	4/2/09
C.360	Debra and Gabriel Hernandez	4/6/09

Table H-4. Comments Received from Southern California Edison on the Draft EIR/EIS - postmarked through April 6, 2009

Comment Set	EIR/EIS Section	Date of Comment
D.1	Executive Summary	4/6/09
D.2	Section 1: Introduction	4/6/09
D.3	Section 2: Description of Alternatives Including the Proposed Project	4/6/09
D.4	Section 3.2: Agricultural Resources	4/6/09
D.5	Section 3.3: Air Quality	4/6/09
D.6	Section 3.4: Biological Resources	4/6/09
D.7	Section 3.5: Cultural Resources	4/6/09
D.8	Section 3.6: Environmental Contamination & Hazards	4/6/09
D.9	Section 3.7: Geology, Soils, & Paleontology	4/6/09
D.10	Section 3.8: Hydrology and Water Quality	4/6/09
D.11	Section 3.9: Land Use	4/6/09
D.12	Section 3.10: Noise	4/6/09
D.13	Section 3.11: Public Services & Utilities	4/6/09
D.14	Section 3.12: Socioeconomics	4/6/09
D.15	Section 3.13: Traffic & Transportation	4/6/09
D.16	Section 3.14: Visual Resources	4/6/09
D.17	Section 3.15: Wilderness & Recreation	4/6/09
D.18	Section 3.16: Wildfire Prevention & Suppression	4/6/09
D.19	Section 3.17: Electrical Interference & Hazards	4/6/09
D.20	Section 4.0: Comparison of Alternatives	4/6/09
D.21	Section 5: Other Environmental and Regulatory Considerations	4/6/09
D.22	Section 6: Tehachapi Wind Resources Area	4/6/09

Volume 7 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

Table H-5. Verbal Comments Received at Public Workshops and Meetings		
Comment Set	Name / Title of Commenter	Date of Comment
Public Workshops and Public Meetings – Palmdale, 3/18/2009		
E.1	Rex Moen	3/18/2009
E.2	Carl Gehricke	3/18/2009
E.3	Alexis Upton-Knittle	3/18/2009
E.4	Jackie Ayer	3/18/2009
Public Workshops and Public Participation Hearing – Chino Hills, 3/19/2009		
E.5	Assembly man, Curt Hagman	3/19/2009
E.6	Gary Neely	3/19/2009
E.7	Bill Kruger (Mayor Pro Tem)	3/19/2009
E.8	Mark Hensley	3/19/2009
E.9	Scott Murphy	3/19/2009
E.10	Brent Arrold	3/19/2009
E.11	Stan Carroll	3/19/2009
E.12	Brian Bergman	3/19/2009
E.13	Paul Benson	3/19/2009
E.14	Ed Graham	3/19/2009
E.15	Ron Krueper	3/19/2009
E.16	Debra Hernandez	3/19/2009
E.17	Jim Case	3/19/2009
E.18	Jeanette Short	3/19/2009
E.19	Stephen Blagden	3/19/2009
E.20	Barry Fischer	3/19/2009
E.21	Dave Cowardin	3/19/2009
E.22	Jim Prindville	3/19/2009
E.23	Denise Prindville	3/19/2009
E.24	Turan Golen	3/19/2009
E.25	Aziz Amiri	3/19/2009
E.26	Andrew Teater	3/19/2009
E.27	Brad Franklin	3/19/2009
E.28	Melanie Schlotterbeck	3/19/2009
E.29	Claire Schlotterbeck	3/19/2009
E.30	Al Matta	3/19/2009
E.31	Scott Kuethen	3/19/2009
E.32	Alan Scheiber	3/19/2009
E.33	Scott Guiou	3/19/2009
E.34	Joyce Butler	3/19/2009
E.35	Magdi Demin	3/19/2009
E.36	Gabriel Hernandez	3/19/2009
E.37	Heene	3/19/2009
E.38	Kyle Tejada	3/19/2009
E.39	Mindy Kolakowski	3/19/2009
E.40	Marci Kuethen	3/19/2009
E.41	Stephen Headley	3/19/2009
E.42	Janet Headley	3/19/2009
E.43	Stephen Burns	3/19/2009
E.44	Antoinette Sykes	3/19/2009
E.45	Louis Bouwer	3/19/2009
E.46	Valerie Wend	3/19/2009
E.47	Jeff Short	3/19/2009
E.48	Ross Fernandes	3/19/2009
E.49	Joanne Genis	3/19/2009

Table H-5. Verbal Comments Received at Public Workshops and Meetings		
Comment Set	Name / Title of Commenter	Date of Comment
E.50	Neil Connolly	3/19/2009
E.51	Jackie Ayer	3/19/2009
E.52	Andrea Gullo	3/19/2009
E.53	Sara Feldman	3/19/2009
Public Workshops and Public Meetings – Pasadena, 3/24/2009		
E.54	Mr. Hamada-City of Irwindale	3/24/2009
E.55	Mary Jennings	3/24/2009

Table H-6. Comments Postmarked or Emailed After the Close of the Public Review Period (April 6, 2009)			
Comment Set	Agency/Group/Organization/Company	Name / Title of Commenter	Date of Comment
F.1	Endangered Habitats League	Dan Silver, Executive Director	4/7/09
F.2	NA	Becky Guiou	4/7/09
F.3	NA	Victor and Monica Rios	4/7/09
F.4	NA	Linda Kloss	4/7/09
F.5	NA	Jan Fusca	4/9/09
F.6	NA	Karina Vasquez	4/9/09
F.7	NA	Sharon Harich	4/14/09
F.8	NA	Dave & Ronda Rhodes	4/16/09
F.9	NA	Alan Boval	4/20/09
F.10	City of Diamond Bar	James DeStefano, City Manager	4/20/09
F.11	Goodin, MacBride, Squeri, Day & Lamprey, LLP	Jeanne B. Armstrong, Counsel for the City of Chino Hills	4/24/09
F.12	Johnson & Hanson, LLP	Kevin K. Johnson, Counsel for the Puente Hills Landfill Native Habitat Preservation Authority	6/4/09

Appendix I.
Programmatic Agreement with State Historic Preservation Officer

PROGRAMMATIC AGREEMENT
AMONG
THE U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, THE U.S. ARMY CORPS OF ENGINEERS, THE CALIFORNIA PUBLIC UTILITIES COMMISSION, SOUTHERN CALIFORNIA EDISON COMPANY AND THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TEHACHAPI RENEWABLE TRANSMISSION PROJECT SEGMENTS 4 THROUGH 11, KERN, LOS ANGELES AND SAN BERNARDINO COUNTIES, CALIFORNIA

WHEREAS, the U.S. Department of Agriculture Forest Service, Angeles National Forest (ANF) and the U.S. Department of the Army, Los Angeles District, Corps of Engineers (COE) have determined that issuing permit(s) allowing or facilitating the removal and relocation of existing transmission and sub-transmission lines and other related facilities and constructing new 220 kV and 500 kV transmission lines and associated facilities comprising Segments 4 through 11 of the Tehachapi Renewal Transmission Project (hereinafter, "TRTP" or "Project"; depicted in Attachment 1) constitutes an "Undertaking" as defined at 36 CFR § 800.16(y); and

WHEREAS, historic properties and cultural resources on public lands administered and regulated by the ANF and the COE are managed according to the National Historic Preservation Act (NHPA) (P.L. 89-665, as amended) as amended, Archaeological Resources Protection Act (ARPA)(P.L. 96-95, as amended), National Environmental Policy Act (NEPA)(P.L. 91-190, as amended), American Indian Religious Freedom Act (AIRFA)(P.L. 95-341, as amended), and Native American Graves Protection and Repatriation Act (NAGPRA)(P.L. 101-601), applicable regulations (e.g., 36 CFR Parts 60, 63, 296, and 800; 43 CFR Part 10), and applicable Executive Orders (e.g., 13007, 13175, and 13287), and these have been considered during consultation for this Programmatic Agreement (PA); and

WHEREAS, the ANF and COE have consulted with the California State Historic Preservation Officer (SHPO), pursuant to 36 CFR § 800.14(b)(3) about this Undertaking and have notified and invited the Advisory Council on Historic Preservation (ACHP) per 36 CFR § 800.6(a)(1)(C) to participate in consultation to resolve the potential effects of the Undertaking on Historic Properties, and as per their letter dated February 2, 2009 the ACHP has elected not to participate in this PA; and

WHEREAS, the ANF is the lead Federal agency for the Undertaking for the purpose of complying with Section 106 of the NHPA and its implementing regulations found at 36 CFR Part 800, and the ANF shall be responsible for managing historic properties within the Area of Potential Effects (APE) for the Undertaking pursuant to the NHPA; and

WHEREAS, the California Public Utilities Commission (CPUC) shall be responsible for managing all historical resources within the APE for the Project pursuant to the California Environmental Quality Act (CEQA; California Public Resources Code, Division 13, Sections 21000–21177, as amended) on lands outside the boundaries of ANF and outside COE administered and regulated lands, and the CPUC shall consult with the ANF as the lead federal agency regarding the management of historical resources outside of the boundaries of ANF and COE administered and regulated lands; and

WHEREAS the ANF and the COE in consultation with the State Historic Preservation Officer (SHPO) have determined that a phased approach for compliance with NHPA Section 106 is appropriate for the Undertaking because all effects of the Undertaking on historic properties cannot be known prior to the approval of the Project (36 CFR § 800.14(b)(1)(ii)) and there is the potential to encounter unanticipated historic properties during the life of the Project (36 CFR § 800.13(a)(1)), and that the completion of the identification of historic properties, determinations of specific effects on historic properties, and consultation concerning measures to avoid, minimize, or mitigate any adverse effects will be carried out as part of planning for and prior to implementing any specific Project activities that have the potential to cause adverse effects on historic properties; and

WHEREAS, the ANF may issue Temporary Special Use Permits for TRTP-related construction activities as well as a 50-year term Special Use Permit and/or right-of-way for TRTP Segments 6 and 11 on ANF administered lands pursuant to the Federal Land Policy and Management Act (P.L. 94-579) of 1976, as amended, which statute authorizes the Forest Service to permit the occupancy, use, or traversing of National Forest lands for generation, transmission, and distribution of electrical power; and

WHEREAS, the COE may issue permits for portions of TRTP Segments 4 through 11 pursuant to Section 404 of the Clean Water Act (CWA), and may otherwise permit TRTP activities on Federal lands under the administrative authority of the COE associated with the Los Angeles County Drainage Area, including Santa Fe and Whittier Narrows Flood Control Basins, along TRTP Segments 7 and 8A pursuant to 10 USC § 2668, which authorizes the COE to grant easements for use of COE administered lands for poles and lines for transmission and distribution of electrical power and for substations for electric power transmission lines, and the COE has participated in this consultation and is a Signatory to this PA; and

WHEREAS, the CPUC is the lead State agency for compliance with the CEQA and has certain responsibilities under State laws and regulations to take into account and mitigate the effects of this Project on historical resources eligible for or included on the California Register of Historical Resources (CRHR) and is coordinating compliance with State law with federal agency responsibilities to comply with Section 106 of the NHPA, and has participated in this consultation and is an Invited Signatory to this PA; and

WHEREAS, the CPUC has the authority per California Code of Regulations Title 14 § 15064.5 to regulate construction activities outside ANF and COE administered lands for the protection of historical resources that may be affected by the Project, and has received from SCE an application (A.07-06-031) for a Certificate of Public Convenience and Necessity seeking authorization for construction of TRTP Segments 4 through 11; and

WHEREAS, Southern California Edison Company (SCE) has participated in this consultation, will be the entity to whom the ANF and the COE issues any permits related to TRTP activities, and SCE will have responsibility for carrying out specific terms of this PA, so therefore SCE is an Invited Signatory to this PA; and

WHEREAS, in developing this PA, consultation has been performed with federally recognized California Indian tribes (per 36 CFR § 800.2(c)(3); 36 CFR § 800.2(d); 36 CFR § 800.3(f)(2); 36

CFR § 800.14(b)(2); and 36 CFR § 800.14(f)), i.e., San Manuel Band of Mission Indians, the Gabrielino-Tongva Tribe (per 36 CFR § 800.2(c)(5)), and these tribes and interested parties have been invited to participate as Concurring Parties to this PA,

NOW, THEREFORE, the ANF, COE, and SHPO (hereinafter "Signatories") and CPUC and SCE (hereinafter "Invited Signatories") agree that the Signatories and Invited Signatories, to the extent of their respective legal authorities, shall ensure that the following stipulations of this PA are implemented to take into account the effects of the Undertaking and Project on historic properties and historical resources.

STIPULATIONS

The Signatories and Invited Signatories shall ensure that the following measures are implemented.

I. DEFINITIONS

The definitions found at 36 CFR § 800.16 apply throughout this PA except where another definition is offered in this PA.

(A) ***APE***. A single APE is defined as consisting of the following components:

(1) Prior to and during construction of the TRTP, the APE within ANF administered lands shall include all areas in which:

- (a) Historic properties could sustain direct effects as a result of the Undertaking and is defined to include:
  (1) two continuous corridors for Segments 6 and 11, each a total of 500 feet wide . The TRTP Segment 6 right-of-way (ROW) extends south from the SCE Vincent Substation near the city of Acton, approximately 27 miles across ANF lands to the southern boundary of the ANF bordering the city of Duarte. The corridor along TRTP Segment 11 ROW extends south from the SCE Vincent Substation approximately 23 miles across ANF lands to the southern boundary of the ANF bordering the city of Altadena (see Attachment 1); and
  (2) any ancillary Project use areas or facilities locations that are outside these 500-foot wide corridors and permitted by the ANF, including but not limited to marshalling yards, access and spur roads, helicopter fly yards/support areas, helicopter landing zones, construction turn-around/pull out, guard pole locations, and splicing/pulling set-up areas. A 50-foot wide buffer will extend beyond either side of the center line of any access road or other linear facility. A 100-foot wide buffer will extend beyond the proposed boundary of any marshalling yard, splicing/pulling set-up areas, or other areas similarly used for the Project.
  (3) the entire area of any COE administered or regulated lands associated with the Project plus a 100-foot wide buffer around all such lands.
- (b) Any area within which historic properties could sustain indirect effects as a result of the Undertaking.

(2) Prior to and during construction of the TRTP, the APE for Segments 4, 5, 7, 8, 10 and 11 and any alternative alignments approved by the CPUC for construction and outside the boundaries of ANF administered lands shall include the following areas:

(a) All areas of the Undertaking in which historic properties could sustain direct effects and is defined to include continuous corridors for each linear segment, each a total of 250 feet wide (see Attachment 1).

(b) Any ancillary Project use areas or facilities locations that are outside these 250-foot wide corridors, including, but not limited to marshalling yards, access and spur roads, helicopter fly yards/support areas, helicopter landing zones, construction turn-around/pull out, guard pole locations, and splicing/ pulling set-up areas. A 50-foot wide buffer shall extend beyond either side of the center line of any access road or other linear facility. A 100-foot wide buffer will extend beyond the proposed boundary of any marshalling yard, splicing/pulling set-up areas, or other areas similarly used for the Project.

(c) The entire area of any COE administered or regulated lands associated with the Project plus a 100-foot wide buffer around all such lands.

(d) Any areas within which historic properties or historical resources could sustain indirect effects as a result of the Undertaking.

(3) Prior to and during construction, the APE for Segment 9 (substations) will be

(a) the total area of any ground disturbance required for each substation plus a 100-foot buffer around the area of disturbance; and

(b) The entire area of any COE regulated lands associated with the Project plus a 100-foot wide buffer around all such lands.

(c) Any areas within which historic properties or historical resources could sustain indirect effects as a result of the Undertaking.

(4) Following construction and for purposes of operation and maintenance activities as may be required, the APE for Segments 4, 5, 6, 7, 8, 10 and 11 or any built alternative alignments will be the width of any ROW or easement granted to SCE by the ANF or any other party and as memorialized in legally binding agreements among the relevant parties. The APE for Segment 9 (substations) will be the area of each substation defined in any easement, deed or other legal definition for the substation parcel. Any lands administered by or under the regulatory authority of the COE shall be included in the APE.

(B) ***Concurring parties***. Concurring Parties may propose amendments to this PA. Amendments proposed by Concurring Parties may be considered at the discretion of the Signatories.

(C) ***Cultural resource***. A cultural resource is an object or definite location of human activity, occupation, or use identifiable through field inventory, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, buildings, places, or objects and definite locations of traditional cultural or religious importance to specified social and/or culture groups. Cultural resources include the entire spectrum of resources, from artifacts to cultural landscapes, without regard to eligibility for listing on the National Register of Historic Places (NRHP) or CRHR.

(D) ***Historic property***. *A*ny prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior and per the eligibility criteria at 36 CFR § 60.4. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the NRHP criteria. The term *eligible for inclusion in the National Register* includes both properties formally determined as such in accordance with regulations of the Secretary of the Interior and all other properties that meet the NRHP criteria.

(E) ***Historical resource***. A cultural resource listed in or determined eligible for listing in the California Register of Historical Resources by the CPUC or other appropriate government agency per CEQA and CEQA *Guidelines*.

(F) ***Invited Signatories***. Invited Signatories to this PA are the CPUC and SCE. Invited Signatories are non-Federal entities that have specific responsibilities as defined in this PA and may propose amendments to this PA. Amendments proposed by Invited Signatories Parties may be considered at the discretion of the Signatories.

(F) ***Lands Administered by the Corps of Engineers*** (COE) means any Federal lands under the administrative authority of the U.S. Army Corps of Engineers, Los Angeles District, including the Santa Fe and Whittier Narrows Flood Control Basins.

(G) ***Lands Regulated by the Corps of Engineers*** means any lands subject to regulation by the COE according to any permit issuing by the COE per the Clean Water Act (P.L. 92-500, as amended) or other law.

(H) ***Management of cultural resources, historic properties, and historical resources***. The term "management" refers to any historic preservation activity undertaken by any Signatory or Invited Signatory to this PA, including, archaeological, historical, ethnographic and other research to identify cultural resources, historic properties and historical resources; efforts to evaluate and determine the historical significance of any cultural resource and its eligibility for listing in the NRHP or CRHR; efforts to determine the Undertaking's effects/impacts to historic properties/ historical resources; designing and implementing measures for the preservation or protection of cultural resources; consultation among the parties to this PA and the public; designing and implementing mitigation measures for unavoidable adverse effects/impacts to historic properties and historical resources; preparation of reports and other documentation of historic preservation efforts; public education; preparation for, and curation of, artifacts, reports, notes, digital data, and other related materials (e.g., per 36 CFR Part 79); and any other activity required per this PA or applicable historic preservation law.

(I) ***Signatories***. Signatories to this PA are the ANF, COE and SHPO. Signatories have the exclusive authority to amend or terminate this PA.

(J) ***Undertaking***. Issuing any permit(s) individually or collectively by the ANF or COE allowing or facilitating demolition, construction, operation or maintenance activities for TRTP Segments 4 through 11 on ANF or COE administered or other lands constitutes an "Undertaking" as defined at 36 CFR § 800.16(y) and is the undertaking addressed by this PA.

II. COORDINATION OF THIS PROGRAMMATIC AGREEMENT with THE ANGELES NATIONAL FOREST/CALIFORNIA PUBLIC UTILITIES COMMISSION JOINT ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT FOR TRTP SEGMENTS 4 THROUGH 11

The CPUC and ANF will implement the historic preservation measures of the *State of California Public Utilities Commission and United States Department of Agriculture Southern California*

Edison's Tehachapi Renewable Transmission Project /Final Environmental Impact Report/ Environmental Impact Statement (2009) as adopted by the CPUC and the ANF in any decision to permit the Project. The ANF and CPUC will endeavor to make the historic properties management provisions of this PA as consistent as possible with the objectives and terms of the EIR/EIS.

Government agencies and the public identified in the scoping and public notification process for the TRTP Segments 4 through 11 draft EIR/EIS were advised in the draft EIR/EIS that historic properties associated with the Project would be managed consistent with the mitigation measures identified in the final EIR/EIS and adopted by the agencies, consistent with the stipulations of this PA. A proposed final draft of this PA has been circulated for public comment as an attachment to the Final EIR/EIS for TRTP Segments 4 through 11. The ANF, COE and SHPO have consulted with the CPUC and SCE and have taken into consideration applicable public comments, if any, received regarding the draft PA in preparing this final PA. Additionally, the ANF has made written requests to the San Manuel Band of Mission Indians, a federally recognized tribe, to provide comments regarding the proposed final draft PA and has consulted with the other Signatories and Invited Signatories to take into consideration applicable comments received from the tribes in making this final PA.

III. MANAGEMENT OF CULTURAL RESOURCES IN THE APE

(A) The eligibility criteria for listing a property in the NRHP (at 36 CFR Part 60) shall be the criteria used in determining the historical significance of any cultural resources in the APE considered for NRHP listing. No cultural resource less than 50 years old will be considered under this PA unless the resource is listed on or eligible for listing on the NRHP. The SHPO shall be consulted in determinations of historical significance of resources according to their responsibilities defined in this PA.

(B) Any cultural resource in the APE that may be adversely affected by the Undertaking may be assumed by SCE to be eligible for listing in the NRHP or CRHR and SCE shall follow the procedures in this Subsection, below.

(1) SCE will notify in writing the ANF, COE and CPUC (according to the protocols in Subsection C, below) of its intention to assume NRHP or CRHR eligibility for a resource and identify the NRHP or CRHR eligibility criterion or criteria under which the affected characteristics of a resource are assumed to be historically significant. The ANF, COE and CPUC shall respond to SCE within 10 days of receipt of SCE's notification to agree or disagree with SCE's proposed assumption of eligibility. SCE shall compile the responses and forward them to the ANF, COE and CPUC. The ANF will forward the record of consultation to the SHPO unless ANF or COE disagrees with SCE's assumption of NRHP eligibility. SHPO will have 45 days to respond to the ANF. SCE may not assume NRHP eligibility of a resource if the ANF, COE or SHPO objects in writing. SCE may not assume CRHR eligibility of a resource if CPUC objects in writing. If SCE receives an objection to any proposed assumption of eligibility it will either continue to consult with the objecting agency or follow the protocols in Subsection C, below.

(2) Either with its notification regarding NRHP or CRHR eligibility or following concurrence by the relevant agencies with SCE's assumption of eligibility, SCE will submit to the ANF, COE and CPUC a proposed plan to treat (mitigate) the adverse

effects of the Project on the affected cultural resource(s). If a treatment plan is submitted separately from a notice of assumed eligibility the ANF, COE and CPUC shall respond in writing to SCE within 10 days of receipt of SCE's treatment plan. SCE shall compile the responses and forward them to the ANF, COE and CPUC along with a revised treatment plan, if necessary, taking into account the comments received. If the ANF concurs with the treatment plan it will forward the record of consultation regarding treatment of adverse effects to any resource assumed to be NRHP eligible to SHPO for comment or concurrence. SHPO will have 45 days to respond. If SHPO does not respond, the ANF shall ensure that SCE implements the treatment plan in which ANF has concurred. ANF will take into account any comments received from SHPO regarding a treatment plan and direct SCE to make such changes to a plan as the ANF, in consultation with the COE and CPUC, deems appropriate. If SCE receives an objection to any proposed treatment of adverse effects it will either continue to consult with the objecting agency or follow the protocols in Subsection C, below.

(3) Any treatment plan proposed by SCE may allow for a phased approach to treatment so that if SCE believes that its assumption of NRHP or CRHR eligibility is not supported by data or other information recovered during an initial phase of study, SCE may again consult with ANF, COE, CPUC and SHPO seeking concurrence that a resource is, in fact, not NRHP or CRHR eligible or that an alternative treatment of adverse effects is more appropriate. Any revision or amendment to a treatment plan will follow the protocol for concurrence by the ANF, COE, CPUC and SHPO as for the original treatment plan defined in this Subsection B(2).

(4) SCE may propose to the CPUC that any resource not considered NRHP eligible is, nevertheless, eligible for CRHR listing and propose a plan to mitigate any adverse impacts to the resource consistent with CEQA. The CPUC may at its discretion accept or reject SCE's assumed CRHR eligibility or any proposed mitigation. The CPUC shall respond in writing within 10 days of receipt of any SCE proposed assumption of CRHR eligibility or mitigation plan to either accept, accept with required modifications, or reject SCE's proposed eligibility assumption or mitigation plan. If SCE receives an objection from the CPUC regarding the CRHR eligibility assumption or mitigation plan it will either continue to consult with the CPUC or follow the protocols in Subsection C, below.

(C) When managing cultural resources, historic properties and historical resources per this PA and the Construction Phase Management Plan required in Stipulation IV, or the HP/HRMP required in Stipulation V, SCE will conform to the following protocol.

(1) If the subject resources are listed or eligible for listing on the NRHP, SCE will, at the direction of the ANF, provide all relevant information to and consult with the ANF. The ANF will coordinate its review of all submittals with the CPUC, and with the COE if any properties are on COE administered or regulated lands. Once the ANF and CPUC (and COE, if participating) have come to agreement regarding the management of any affected historic properties, SCE shall compile the record of consultation and agreement, provide it to the ANF, and the ANF will submit it to the SHPO for comment or concurrence. SHPO will have 45 days to respond. The ANF has the authority to determine how any resource on ANF lands will be managed should SHPO not respond within the allotted time. The COE has the authority to determine how any resource on COE administered or regulated lands (except COE regulated lands on the ANF) will be managed should SHPO not respond within the allotted time. The complete record of consultation among the ANF,

COE (if participating), SHPO and CPUC shall be provided to all the Signatories and Invited Signatories by SCE within 30 days following any ANF or COE determination.

(2) If the subject resources are determined not listed or eligible for listing on the NRHP but are eligible for the CRHR, SCE will, at the direction of the CPUC, provide all relevant information to and consult with the CPUC. The CPUC will coordinate its review of all submittals with the Signatories and SCE. The CPUC has the authority to make a final determination regarding a cultural resource's eligibility to the CRHR. The ANF and COE may decline to participate in this review by written notification to the CPUC.

(D) Should any Signatory or Invited Signatory disagree regarding the management of any cultural resource, they will consult to resolve the disagreement per Stipulation X (Objection), below.

IV. CONSTRUCTION PHASE MANAGEMENT PLAN

This PA provides for the preparation and implementation of a Construction Phase Management Plan (CPMP) and a Historic Properties/Historical Resources Management Plan (HP/HRMP) which will define procedures for the management of historic properties during the construction phase (CPMP) and future operation and maintenance phase (HR/HPMP) of the Project.

(A) The Construction Phase Management Plan (CPMP) has been prepared by SCE and approved by the ANF, COE and CPUC and is made Attachment 2 to this PA. The CPMP for the Undertaking details a historic preservation program to:

(1) identification of potential historic properties including any Traditional Cultural Properties in the APE.
(2) evaluate cultural resources for eligibility for inclusion on the NRHP;
(3) Determine ways to avoid, minimize, or mitigate adverse effects on historic properties within the APE;
(4) Manage previously unidentified archaeological or historic sites discovered during construction of the TRTP;
(5) consult and coordinate with government agencies, Indian tribes, and the public with regard to implementation of the CPMP;
(6) provide for curation of archaeological and historical items associated with the historic preservation program for the Undertaking;
(7) define the roles and responsibilities of the ANF, COE, CPUC, and SCE in any management of historic properties in the APE.

(B) Implementation of the CPMP
ANF will implement the CPMP required to protect values of historic and/or unevaluated properties within the APE. CPUC will implement the CPMP necessary to protect values of historical resources and/or unevaluated cultural resources situated on non-federal lands. The CPMP, including NRHP/CRHR evaluation, determination of effects, review, and consultation processes may be completed in phases and by task, as directed by the ANF and the CPUC. The CPMP shall provide sufficient flexibility to permit Notices to Proceed for portions of the Undertaking on a phased (tiered) basis. Components of the CPMP may be prepared and implemented prior to completion of the final CPMP, in consultation and with agreement of the Signatories and Invited Signatories.

(C) Changing the CPMP after Its Implementation

Should any Signatory, Invited Signatory or Concurring Party determine that changes to the CPMP are warranted to modify existing elements, or to add or delete some elements, of the historic preservation program defined by the CPMP, all the Parties to the PA shall consult to make the agreed upon changes. The ANF shall then consult in writing with the SHPO to determine if proposed changes constitute a significant revision of the historic preservation program. The SHPO shall have 45 days to respond in writing to the proposed changes to the CPMP. If the ANF and SHPO concur that the proposed changes do not constitute a significant revision to the CPMP, or if the SHPO fails to respond within the prescribed time, then the ANF and SCE shall proceed to revise and implement the appropriate elements of the CPMP. Should any Signatory or Invited Signatory object regarding proposed changes to the CPMP, the objecting parties shall proceed according to Stipulation X of this PA.

SCE shall describe any revision to the CPMP, whether determined significant or insignificant, in its annual Historic Preservation Compliance Report (HPCR) as required in Stipulation VI(B).

V. HISTORIC PROPERTIES/HISTORICAL RESOURCES MANAGEMENT PLAN

The purpose of the HP/HRMP is to direct the management of historic properties and historical resources in the post-construction, operations and maintenance (O&M) phase of the TRTP. SCE will notify the ANF of the date when construction is deemed to have been completed and O&M begins for each Segment.

(A) SCE shall develop a HP/HRMP for the Undertaking detailing a historic preservation program to:

(1) Outline a process for survey and identification of potential historic properties including any Traditional Cultural Properties in the APE;
(2) Outline a process for evaluation of cultural resources for eligibility for inclusion on the NRHP;
(3) Determine ways to avoid, minimize, or mitigate adverse effects on historic properties within the APE;
(4) Manage previously unidentified archaeological or historic sites discovered during operation and maintenance of the TRTP;
(5) consult and coordinate with government agencies, Indian tribes, and the public with regard to implementation of the HP/HRMP;
(6) provide for curation of archaeological and historical items associated with the historic preservation program for the Undertaking;
(7) support interpretation of historic properties to the public and other public involvement in historic preservation; and define the roles and responsibilities of the ANF, COE, CPUC, and SCE in any long-term management of historic properties in the APE.

(B) Contents of the HP/HRMP

The HP/HRMP shall address, at a minimum and in appropriate detail, the elements defining the historic preservation program. The HP/HRMP may include provisions for the programmatic treatment of adverse effects to historic properties. The HP/HRMP shall be written and organized in a manner so that sensitive information (e.g., archaeological site or traditional cultural property locations) regarding historic properties and historical resources is kept confidential.

(C) Preparation of the HP/HRMP

The HP/HRMP may be prepared by SCE as a single document addressing all Segments of the TRTP, compiled incrementally by Segment, or may be completed in phases and by task. The HP/HRMP shall provide sufficient flexibility to permit Notices to Proceed for portions of the Undertaking on a phased (tiered) basis. Any version of the HP/HRMP will be prepared as circulated for review as defined in (C) (1 through 4) below. If the HP/HRMP is prepared incrementally, by phase or by task, SCE will first prepare a basic HP/HRMP that defines the general principles and procedures SCE will follow in the management of historic properties, historical resources and unevaluated resources as outlined in (A) (1 through 5), above. The HP/HPMP will then be supplemented for each TRTP Segment by specific management prescriptions for each historic property, historical resource and unevaluated resource.

(1) Not less than 60 days prior to the estimated date of completing construction on the first TRTP Segment, an Administrative Draft HP/HRMP addressing at least the first to be completed segment shall be prepared and submitted by SCE to the ANF for review and comment. Within 30 calendar days following receipt, the ANF shall provide written comments to SCE. The ANF will direct SCE to make revisions to the Administrative Draft HP/HRMP consistent with the ANF's written comments. The resulting document will be the Draft HP/HRMP.

(2) The ANF shall distribute the Draft HP/HRMP to the COE, CPUC, SHPO, and Concurring Parties for review and comment. Reviewers of the Draft HP/HRMP will have 45 calendar days from date of reciept to provide their written comments to the ANF. The ANF, at its sole discretion, may extend the review/comment period for any or all of the reviewing parties, but under no circumstances will the review/comment period exceed 60 calendar days.

(3) The ANF shall take into account comments received from the COE, CPUC, SHPO, and Concurring Parties who have participated in reviewing the Draft HP/HRMP. The ANF will direct SCE to make appropriate changes in the Draft HP/HRMP based on reviewer comments. SCE shall make the changes to the Draft HP/HRMP as directed by the ANF. SCE shall submit a revised HP/HRMP to the ANF within 90 calendar days of receipt of the ANF's directive to make changes. Upon acceptance by the ANF, the resulting document will be the Final HP/HRMP. The Final HP/HRMP shall be provided to the Signatories and Invited Signatories within 10 days of receipt from SCE by the ANF of an acceptable Final HP/HRMP. The ANF, COE, CPUC, and SHPO shall indicate their acceptance of the Final HP/HRMP in letters of concurrence signed by the ANF COE, CPUC, and the SHPO.

(4) The ANF shall notify the Concurring Parties that the Final HP/HRMP has been completed. The ANF shall, within 30 calendar days of the ANF's and SHPO's acceptance of the Final HP/HRMP, provide copies of the Final HP/HRMP to the Concurring Parties. The ANF shall provide copies, or provide access to copies, of the Final HP/HRMP to members of the public who request copies, subject to applicable confidentiality provisions.

Should any Signatory, Invited Signatory or Concurring Party object to the content of the Draft or Final HP/HRMP, the ANF will proceed to resolve the objection(s) consistent with Stipulation X, below.

(D) Implementation of the Final HP/HRMP

Upon written acceptance by the Signatories, the Final HP/HRMP shall be implemented under the authority of this PA as ANF's historic preservation program for compliance with NHPA Section 106 for the post-construction operations and maintenance phase of the Undertaking.

(E) Historic Preservation Compliance Report

An HPCR will be prepared consisted with Stipulation VI(B), below.

(F) Changing the HP/HRMP after Its Implementation

Should any Signatory, Invited Signatory or Concurring Party determine that changes to the HP/HRMP are warranted to modify existing elements, or to add or delete some elements, of the historic preservation program defined by the HP/HRMP, all the Parties to the PA shall consult to make the agreed upon changes. The ANF shall then consult in writing with the SHPO to determine if proposed changes constitute a significant revision of the historic preservation program. The SHPO shall have 45 days to respond in writing to the proposed changes to the HP/HRMP. If the ANF and SHPO concur that the proposed changes do not constitute a significant revision to the HP/HRMP, or if the SHPO fails to respond within the prescribed time, then the ANF and SCE shall proceed to revise and implement the appropriate elements of the HP/HRMP. Should any Signatory or Invited Signatory object regarding proposed changes to the HP/HRMP, the objecting parties shall proceed according to Stipulation X of this PA.

SCE shall describe any revision to the HP/HRMP, whether determined significant or insignificant, in its annual HPCR.

VI. REPORTING

(A) SCE will submit draft reports of any cultural resource work undertaken pursuant to this PA to the ANF and the CPUC within 60 days of completion of fieldwork unless otherwise agreed to by the ANF, CPUC and SCE. Reports for Historic Properties/Historical Resources that cannot be avoided will include management recommendations that may include but not be limited to avoidance and mitigation measures, monitoring, data recovery methods, and long-term management goals. ANF will notify the COE and Concurring Parties that draft reports are available for their review and comment subject to Stipulation XIII (Confidentiality of Records and Information). The COE and any Concurring Party wishing to comment must do so in writing to the ANF within 30 days of receipt of any report. Any draft reports pertaining to the evaluation of NRHP significance of cultural resources or treatment of historic properties will be provided to the SHPO by the ANF for comment within 30 days of receipt. The ANF will share any relevant comments with the other Signatories and Invited Signatories and take into account the relevant comments when directing SCE to prepare either a revised draft report or a final report to be submitted to the ANF and CPUC within 60 days unless otherwise agreed to by the ANF, CPUC and SCE. Reports will be submitted electronically unless otherwise stipulated by the ANF or CPUC. The number of hard copies to be submitted will be determined by the ANF and CPUC as appropriate. Any extensions to complete reports must be approved by the ANF or CPUC. Copies of all final reports prepared during a calendar year will be submitted to all Signatories and Invited Signatories with the annual HPCR.

(B) ANF will direct SCE to compile an HPCR of cultural resource management activities conducted pursuant to this PA. A draft HPCR will be provided to the ANF and CPUC by SCE not less than 30 days prior to the anniversary date of the execution of this PA. The ANF and CPUC will review the draft HPCR and cause SCE to make such changes as the ANF and CPUC require.

Within not more than 45 days following the anniversary date of the execution of this PA the ANF will submit to the SHPO, COE and Concurring Parties the HPCR. An HPCR will be required of SCE annually for the first 5 years following completion of construction on all segments of the Project. After 5 years the reports will be filed every three years unless the ANF directs otherwise.

The HPCR will, at a minimum, report the following management activities in sufficient detail to allow the ANF and SHPO to determine that all terms and provisions of the PA have been carried out in the reporting year regarding efforts to:

(1) inventory, evaluate, manage, and treat adverse effects to historic properties within the APE;
(2) consult and coordinate with government agencies, tribes, and the public with regard to implementation of the HP/HRMP;
(3) provide for curation of archaeological and historical items associated with the historic preservation program for the Undertaking;
(4) support interpretation of historic properties to the public and other public involvement in historic preservation; and
(5) any other activities as required of SCE by the ANF to comply with this PA.

VII. STANDARDS

(A) Professional Qualifications: All actions prescribed by this PA that involve the identification, evaluation, analysis, recordation, treatment, monitoring, and disposition of Historic Properties and that involve the reporting and documentation of such actions in the form of reports, forms or other records, shall be carried out by or under the direct supervision of a person or persons meeting, at a minimum, the Secretary of the Interior's Professional Qualifications Standards (PQS) for archaeology, history, or architectural history, as appropriate (48 FR 44739). However, nothing in this stipulation may be interpreted to preclude any party qualified under the terms of this paragraph from using the services of properly supervised persons who do not meet the PQS.

(B) Curation and Curation Standards: To the extent permitted under California Public Resources Code § 5097.98 and § 5097.991 the materials and records resulting from the actions cited in paragraph A of this stipulation and located on non-federal lands shall be curated in accordance with 36 CFR Part 79. Where Federal lands are involved, all records and materials resulting from the actions cited in paragraph A of this stipulation shall be curated in accordance with 36 CFR Part 79 and the provisions of the NAGPRA (43 CFR Part 10) as applicable. Unless otherwise agreed to and stipulated in the HP/HRMP, ANF will attempt to have all collections curated at one location appropriate to each county. If cultural materials are recovered from private lands, ANF will seek to have the materials donated through a written donation agreement to be curated with other cultural materials. No human remains will be curated. If any human remains are discovered in the course of the Undertaking, the preferred course of treatment will be identified as provided for in the CPMP and HP/HRMP, in consultation with the most likely descendant and landowner and consistent with state and federal legal requirements.

(C) Documentation Standards reporting on and documenting the actions cited in paragraph (A) of this stipulation shall conform to every reasonable extent with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (48 FR 44716-44740), as well as the California Office of Historic Preservation's Preservation Planning Bulletin Number 4(a) December 1989, *Archaeological Resource Management Reports (ARMR): Recommended*

Contents and Format for the Preparation and Review of Archaeological Reports, and any specific county or local requirements or report formats as necessary.

VIII. NATIVE AMERICAN CONSULTATION

The ANF shall continue to consult with Indian tribes and other Native Americans with cultural ties to the APE as follows.

(1) Indian tribes, Native American groups, organizations and individuals with cultural ties shall, at a minimum, be recognized as those "Native American Contacts" for the counties of Kern, Los Angeles, and San Bernardino identified by the California Native American Heritage Commission, as well as Indian tribes recognized by the Secretary of the Interior per 36 CFR §§ 800.2(c)(3), 800.2(d), 800.3(f)(2), 800.14(b)(2), 800.14(f)), and as interested parties per 36 CFR § 800.2(c)(5)). Indian tribal consultation procedures by the ANF per this PA shall be consistent with current regulations and guidance of the ACHP.

(2) The ANF will consult with Indian tribes per NHPA, ARPA, AIRFA, and NAGPRA, applicable regulations (e.g., 36 CFR Part 296 and 43 CFR Part10), and applicable Executive Orders (e.g., 13007 and 13175). Cultural items subject to NAGPRA will be managed according to applicable provisions of NAGPRA.

(3) The ANF will consult with the COE, CPUC, Native American Heritage Commission and SCE to develop a list of tribes, organizations, groups, and individuals ("consultation list") that will be consulted regarding Indian tribe interests in the TRTP. This listing shall be up-dated at least every 2 years following execution of this PA or until the HP/HRMP has been executed. The consultation list will be used by the ANF for all Indian tribe consultations.

(4) The ANF and CPUC shall ensure that Indian tribes on the consultation list are included in public notifications regarding the drafting of this PA.

(5) The ANF shall not delegate their government-to-government consultation responsibilities pertaining to the Undertaking on Federally administered lands. The ANF will be responsible for keeping the administrative record of all Indian tribe consultation regarding the Undertaking and shall share that record with the other Signatories, Invited Signatories and Concurring Parties as requested. Consultation shall be initiated and maintained by the ANF.

IX. COSTS

SCE shall bear the expense of identification, evaluation, and treatment of all cultural properties directly or indirectly affected by TRTP-related activity to the extent that such properties are affected by the Project. Such costs shall include, but not be limited to, pre-field planning, field work, post-field analysis, research, preparation of reports (including draft and final versions), and costs associated with curation of Project-related documentation and artifact collections.

X. RESOLVING OBJECTION

(A) Should any of the Signatories or Invited Signatories to this PA object, at any time, to the manner in which the terms of this PA are implemented they will make the objection to the ANF.

The ANF will immediately notify the other Signatories and Invited Signatories, request comments on the objection within 30 days, and then proceed to consult with the SHPO for a period of no more than 30 days to resolve the objection. The ANF will take any comments provided by the other Signatories, Invited Signatories and SHPO into account. If the Signatories and Invited Signatories resolve the objection within the consultation period, the ANF may authorize the disputed action to proceed in accordance with the terms of such resolution.

(B) If, at the end of the 30 day consultation period, the Signatories determine that the objection cannot be resolved through such consultation, the Signatories will forward all documentation relevant to the objection to the Council pursuant to 36 CFR § 800.2(b)(2). Any comments provided by the Council within 45 days after its receipt of all relevant documentation will be taken into account by the Signatories in reaching a final decision regarding the objection. The ANF shall have the authority per the NHPA to make the final decision resolving the objection if the objection pertains to historic properties in the APE affected by the Undertaking, except for lands administered by the COE in which case the ANF shall receive prior written approval of the COE. The CPUC shall have the authority per CEQA to make the final decision resolving the objection if the objection pertains solely to historical resources subject to CRHR. The ANF or the CPUC, as appropriate, will notify the SHPO, COE, the Council, and SCE in writing of its final decision within 14 days after it is rendered.

(C) The Signatories' and Invited Signatories' responsibility to carry out all other actions under this PA that are not the subject of the objection will remain unchanged.

(D) At any time during implementation of the terms of this PA, should a written objection pertaining to the PA be raised by a Concurring Party, the ANF shall immediately notify the SHPO about the objection and take the objection into account. The SHPO may comment on the objection to the other Signatories and Invited Signatories. The ANF or the CPUC shall consult with the objecting party for a period of no more than 30 days from the date of the objection. Within 14 days following closure of consultation, the ANF or the CPUC will render a decision regarding the objection and notify all parties of its decision in writing. In reaching its final decision the ANF or CPUC, subject to COE approval on COE administered land, will take into account all comments from the parties regarding the objection. Any dispute pertaining to the NRHP or CRHR eligibility of historic properties, historical resources, or cultural resources covered by this PA will be addressed by the Signatories pursuant to 36 CFR § 800.4(c)(2). The Signatories shall determine if Stipulation X.A and X.B shall be implemented to resolve a dispute regarding the eligibility of such historic properties, historical resources, or cultural resources.

(E) Any consultation period for resolving an objection may be extended by unanimous consent of the Signatories for such period as the Signatories shall declare in writing and by notification to the Council.

XI. AMENDMENT

(A) Any Signatory, Invited Signatory or Concurring Party to this PA may at any time propose amendments, whereupon all Signatories shall consult among each other to consider such amendments pursuant to 36 CFR § 800.6(c)(7) and § 800.6(c)(8). This PA may be amended only upon written agreement of all the Signatories.

(B) The resource treatment delineated in Appendix B may be amended collectively or by individual resource through consultation among and agreement by the Signatories without requiring amendment of the PA, unless the Signatories through such consultation decide otherwise.

(C) Amendments to this PA shall take effect on the dates that they are fully executed by the Signatories.

XII. TERMINATION

(A) Only Signatories may terminate this PA. If a Signatory proposes to amend this PA, and it is not amended as provided for in Stipulation XI, or if a Signatory proposes termination of this PA for other reasons, the Signatory proposing termination shall notify the other Signatories in writing, explain the reasons for proposing termination, and consult for no more than 30 days to seek alternatives to termination.

(B) Should such consultation result in a written agreement on an alternative to termination, the Signatories shall proceed in accordance with that agreement.

(C) Should such consultation fail, the Signatory proposing termination may terminate this PA by promptly notifying the other Signatories in writing.

(D) Should this PA be terminated, then the Signatories shall either consult in accordance with 36 CFR § 800.14(b) to develop a new agreement or request the comments of the Council pursuant to 36 CFR §§ 800.4–800.6. The Signatories may include the Invited Signatories in the consultation.

(E) Beginning with the date of termination, the Signatories shall ensure that until and unless a new PA is executed for the actions covered by this PA, such Undertaking shall be reviewed individually in accordance with 36 CFR §§ 800.4–800.6 or according to applicable state law, depending upon the nature of the action.

(F) Any Signatory, Invited Signatory or Concurring Party may terminate their participation in the PA if their roles and responsibilities originally assigned under this PA are no longer appropriate or necessary, by agreement of the Signatories. The PA will otherwise continue in full force and effect following the departure of any party unless the Signatories decide otherwise.

XIII. CONFIDENTIALITY OF RECORDS AND INFORMATION

The Signatories and Invited Signatories shall maintain the confidentiality of records and information pertaining to the location and nature of cultural resources, including historic properties about which there are culturally sensitive issues, consistent with NHPA Section 304, ARPA Section 9, and California Government Code 6254.10, as applicable. The ANF for NRHP resources or CPUC for CRHR resources may determine that certain records and files are appropriate to distribute to parties outside the agency.

XIV. ANNUAL MEETINGS

The Signatories and Invited Signatories may agree to meet annually, beginning one year from the date of the execution of this PA to discuss implementation of this PA and other items of mutual interest if such a request is made by one of the Signatories. These meetings may coincide with delivery of the HPCR and may occur by teleconference or in-person meetings at the discretion of the Signatories and Invited Signatories.

XV. DURATION OF THIS PA

Unless this PA is terminated pursuant to stipulation XII above, another agreement executed for the Undertaking supersedes it, or the Undertaking itself has been terminated, this PA will remain in full force and effect until ANF, in consultation with the other Signatories, determines that all aspects of the Undertaking have been completed and that all terms of this PA and any subsequent tiered agreements have been fulfilled in a satisfactory manner. Upon a determination by ANF that all aspects of the Undertaking have been completed and that all terms of this PA and any subsequent tiered agreements have been fulfilled in a satisfactory manner, ANF will notify the other signatories and concurring parties of this PA in writing of the agency's determination. This PA will terminate and have no further force or effect on the day that ANF so notifies the other signatories to the PA.

This PA will expire if the Undertaking or the stipulations of this PA have not been implemented within five (5) years from the date of its execution. At such time, and prior to work continuing on the undertaking, the ANF shall either execute a MOA pursuant to 36 CFR § 800.6, or request, take into account, and respond to the comments of the ACHP per 36 CFR § 800.7. Prior to such time, the ANF may consult with the other consulting parties to reconsider the terms of the PA and amend it in accordance with Stipulation XI above. The ANF shall notify the signatories as to the course of action it will pursue within 30 days.

This PA expires 25 years from its effective date unless extended by written agreement of the Signatories. The Signatories and Invited Signatories shall consult at year 10 to review this PA. Additionally, the Signatories and Invited Signatories shall consult not less than one year prior to the expiration date to reconsider the terms of this PA and, if acceptable, have the Signatories extend the term of this PA. Reconsideration may include continuation of the PA as originally executed or amended, or termination. Extensions are treated as amendments to the PA under Stipulation XI.

XVI. EFFECTIVE DATE

This PA shall take effect on the date that it has been fully executed by the Signatories. Amendments to this PA shall take effect on the dates they are fully executed by the Signatories, or such other self-executing dates as may be described in those amendments.

EXECUTION AND IMPLEMENTATION OF THIS PA is evidence that the ANF and COE have afforded the Council a reasonable opportunity to comment on the Undertaking and its effects on historic properties. The Signatories, Invited Signatories and Concurring Parties to this PA represent that they have the authority to sign for and bind the entities on behalf of whom they sign.

SIGNATORIES:

UNITED STATES DEPARTMENT OF AGRICULTURE – FOREST SERVICE, ANGELES NATIONAL FOREST,

By: ______________________________ Date: ____________________

Jody Noiron
ANF Supervisor

UNITED STATES DEPARTMENT OF THE ARMY, LOS ANGELES DISTRICT, CORPS OF ENGINEERS,

By: ______________________________ Date: ____________________
Colonel Thomas H. Magness, IV
District Commander

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

By: ______________________________ Date: ____________________
Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

INVITED SIGNATORIES:

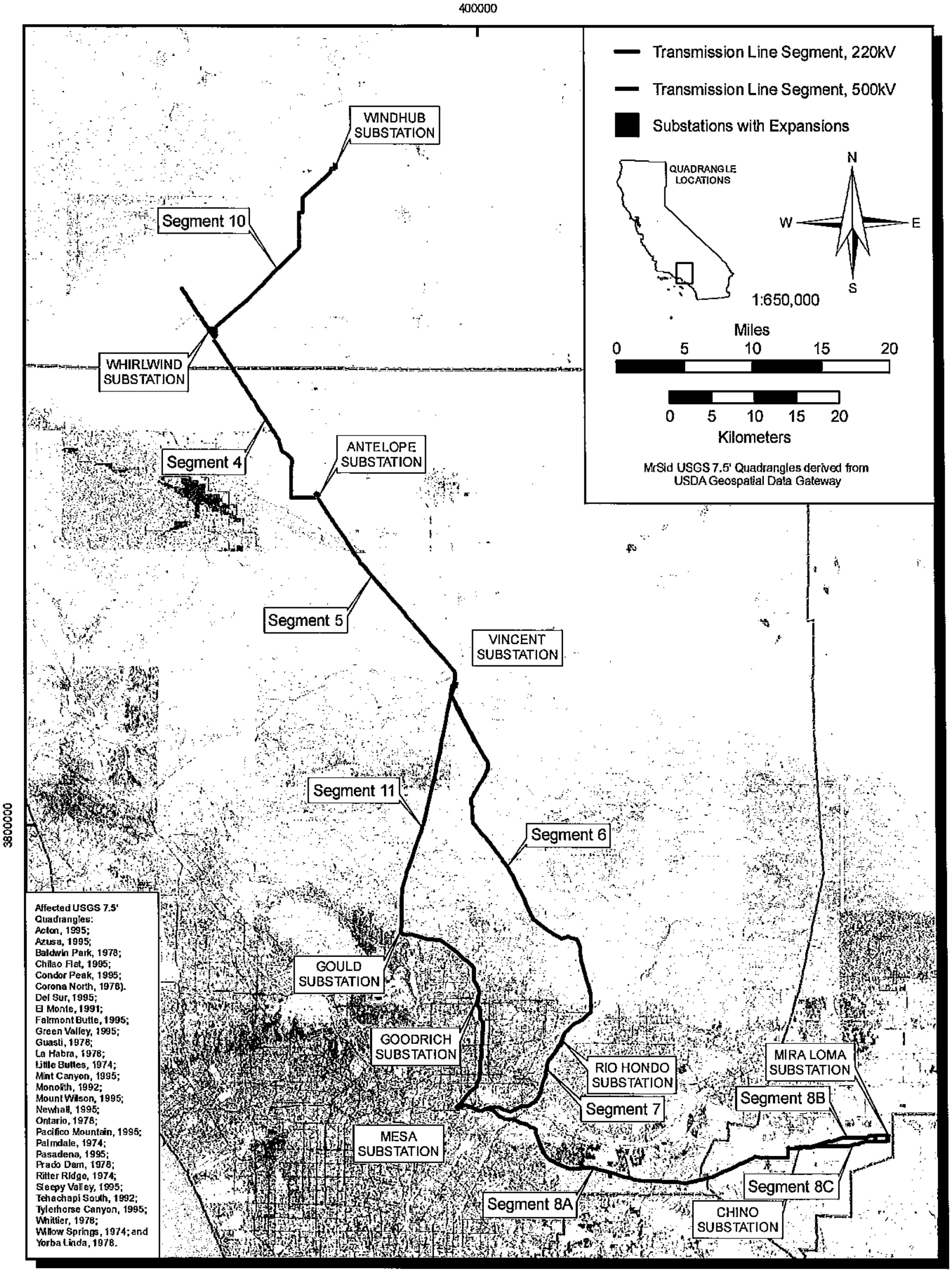
CALIFORNIA PUBLIC UTILITIES COMMISSION

By: ______________________________ Date: ____________________
Paul Clanon
Executive Director

SOUTHERN CALIFORNIA EDISON COMPANY

By: ______________________________ Date: ____________________
Paul L. Multari
Director SCE Project Management Organization

CONCURRING PARTIES



Attachment 1: Location of Tehachapi Renewable Transmission Project Segments 4 through 11.

Pacific Legacy Incorporated

CONFIDENTIAL

PROGRAMMATIC AGREEMENT AMONG THE U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE ANGELES NATIONAL FOREST, THE U.S. ARMY CORPS OF ENGINEERS, THE CALIFORNIA PUBLIC UTILITIES COMMISSION, THE SOUTHERN CALIFORNIA EDISON COMPANY AND THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER, REGARDING THE TEHACHAPI RENEWABLE TRANSMISSION PROJECT SEGMENTS 4 THROUGH 11, KERN, LOS ANGELES, AND SAN BERNARDINO COUNTIES, CALIFORNIA

ATTACHMENT 2:

CONSTRUCTION PHASE MANAGEMENT PLAN FOR CULTURAL RESOURCES ASSOCIATED WITH THE SOUTHERN CALIFORNIA EDISON TEHACHAPI RENEWABLE TRANSMISSION PROJECT, SEGMENTS 4–11 KERN, LOS ANGELES AND SAN BERNARDINO COUNTIES, CALIFORNIA

Prepared for

Southern California Edison Company
P.O. Box 800
Rosemead, California 91770
Attention: Adam Sriro

Prepared by

Pacific Legacy, Inc.
1525 Seabright Avenue
Santa Cruz, California 95062

July 2009

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APPENDICES

1.0 INTRODUCTION

This Construction Phase Management Plan (CPMP) is prepared in accordance with Stipulation IV of the ***Programmatic Agreement among the U.S. Department of Agriculture Forest Service Angeles National Forest, the U.S. Army Corps of Engineers, the California Public Utilities Commission, the Southern California Edison Company and the California State Historic Preservation Officer, regarding the Tehachapi Renewable Transmission Project Segments 4 through 11, Kern, Los Angeles, and San Bernardino Counties, California*** (hereinafter PA). The following CPMP is an attachment to, and made part of the PA, and defines the process to be followed by the Angeles National Forest (ANF), the Army Corps of Engineers (COE), the California Public Utilities Commission (CPUC) and Southern California Edison Company (SCE) for the identification and management of cultural resources in the Area of Potential Effects (APE) of the Undertaking during construction.

The APE for the Undertaking is defined in the PA under Stipulation I.A. A single APE consists of the following components.

Prior to and during construction of the TRTP, the APE within ANF administered lands shall include all areas in which:

(a) Historic properties could sustain direct effects as a result of the Undertaking and is defined to include:
(1) two continuous corridors for Segments 6 and 11, each a total of 500 feet wide . The TRTP Segment 6 right-of-way (ROW) extends south from the SCE Vincent Substation near the city of Acton, approximately 27 miles across ANF lands to the southern boundary of the ANF bordering the city of Duarte. The corridor along TRTP Segment 11 ROW extends south from the SCE Vincent Substation approximately 23 miles across ANF lands to the southern boundary of the ANF bordering the city of Altadena (see attached Figure 1); and
(2) any ancillary Project use areas or facilities locations that are outside these 500-foot wide corridors and permitted by the ANF, including but not limited to marshalling yards, access and spur roads, helicopter fly yards/support areas, helicopter landing zones, construction turn-around/pull out, guard pole locations, and splicing/ pulling set-up areas. A 50-foot wide buffer will extend beyond either side of the center line of any access road or other linear facility. A 100-foot wide buffer will extend beyond the proposed boundary of any marshalling yard, splicing/pulling set-up areas, or other areas similarly used for the Project.
(3) the entire area of any COE regulated lands associated with the Project plus a 100-foot wide buffer around all such lands.

(b) Any area within which historic properties could sustain indirect effects as a result of the Undertaking.

Prior to and during construction of the TRTP, the APE for Segments 4, 5, 7, 8, 10 and 11 and any alternative alignments approved by the CPUC for construction and outside the boundaries of ANF administered lands shall include the following areas:

(a) All areas of the Undertaking in which historic properties could sustain direct effects and is defined to include continuous corridors for each linear segment, each a total of 250 feet wide (see attached Figure 1).
(b) Any ancillary Project use areas or facilities locations that are outside these 250-foot wide corridors, including, but not limited to marshalling yards, access and spur roads, helicopter fly yards/support areas, helicopter landing zones, construction turn-around/pull out, guard pole locations, and splicing/ pulling set-up areas. A 50-foot wide buffer shall extend beyond either side of the center line of any access road or other linear facility. A 100-foot wide buffer will extend beyond the proposed boundary of any marshalling yard, splicing/pulling set-up areas, or other areas similarly used for the Project.
(c) The entire area of any COE regulated lands associated with the Project plus a 100-foot wide buffer around all such lands.
(d) Any areas within which historic properties or historical resources could sustain indirect effects as a result of the Undertaking.

Prior to and during construction, the APE for Segment 9 (substations) will be
(a) The total area of any ground disturbance required for each substation plus a 100-foot buffer around the area of disturbance; and
(b) The entire area of any COE regulated lands associated with the Project plus a 100-foot wide buffer around all such lands.
(c) Any areas within which historic properties or historical resources could sustain indirect effects as a result of the Undertaking.

Following construction and for purposes of operation and maintenance activities as may be required, the APE for Segments 4, 5, 6, 7, 8, 10 and 11 or any built alternative alignments will be the width of any ROW or easement granted to SCE by the ANF or any other party and as memorialized in legally binding agreements among the relevant parties. The APE for Segment 9 (substations) will be the area of each substation defined in any easement, deed or other legal definition for the substation parcel. Any lands administered by or under the regulatory authority of the COE shall be included in the APE.

The project vicinity is depicted in Figure 1, herein. Figures depicting the locations of known cultural resources within the current APE and within a 1-mile radius are included as Appendix A.

Figure 1. Project Vicinity Map.

2.0 INVENTORY OF CULTURAL RESOURCES WITHIN THE APE

Cultural resource inventories have been completed for the TRTP Segment 4-11 APE in a manner consistent with the Secretary of Interior's Standards and Guidelines for Identification (48 FR 44720-23) and California's State Office of Historic Preservation's publications *Archaeological Resources Management Reports (ARMR): Recommended Contents and Format* (December 1989) and *Guidelines for Archaeological Research Designs* (February 1991).

A cultural resources inventory of TRTP Alternative 2, SCE's preferred project, was completed by Pacific Legacy, Inc. and is documented in the report, *Cultural Resources Inventory of the Southern California Edison Company Tehachapi Renewable Transmission Project, Kern, Los Angeles, and San Bernardino Counties, California* (2007), submitted to the ANF, the CPUC and the SHPO. A subsequent cultural resources inventory was completed by Applied Earthworks (AE) for Alternatives 3 through 7 (AE 2009). Results of all inventories are incorporated into the EIR/EIS for the TRTP (CPUC 2009). A summary of resources in the APE for all alternatives is provided in EIR/EIS. This CPMP addresses only those resources within the APE for the proposed project (Alternative 2). Cultural resources known within the APE for the project are summarized in Table 1 of this CPMP.

In accordance with the PA, the ANF, the COE, and the CPUC will ensure that any additional areas within the APE not yet inventoried for cultural resources including, but not limited to, any rerouting of the right-of-way (RoW) and activity locations not identified by the time the PA was executed (i.e., marshalling yards, staging areas, new access roads, existing roads requiring maintenance, pull sites, etc.) will be subject to cultural resource inventory by SCE according to the standards identified in the PA. SCE shall submit to the ANF and the CPUC cultural resource inventory reports, which will include preliminary recommendations of National Register of Historic Places (NRHP) eligibility and a description of potential effects to historic properties and/or unevaluated cultural properties as specified in Stipulation VI of the PA. Copies of all inventory reports shall be forwarded to the SHPO for comment.

Table 1. Cultural Resources Inventory for TRTP Segments 4-11.

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
Segment 4									
CA-KER-303 P-15-000303	A-1d	B-1	Prehistoric		Prehistoric midden with formal artifacts and approximately 30 burials	Unknown	Intersects Existing Road, Potential Road Construction, Const 8R and Const 9	Ground disturbance within resource boundaries	Flag and avoid; no maintenance to road; cap 2735 ft of road; Evaluate and minimize impacts
CA-KER-733 P-15-000733	A-1d	B-1	Prehistoric		Prehistoric lithic scatter of rhyolite, chert, obsidian, and quartz	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap; see CA-KER-303 for capping length
CA-KER-2172 P-15-002172	A-1d	B-1	Prehistoric		Prehistoric 'campsite' with small lithic scatter and possible hearth	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap; see CA-KER-303 for capping length
CA-KER-3549H P-15-0003549	A-1d	B-2	Historic	BSO	Historic Los Angeles Aqueduct, see also CA-LAN-2105H	Recommended Eligible for NRHP	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Historic Property/Historical Resource Management Plan; Manage; no maintenance to road
CA-KER-7214H P-15-012793 PL-SCE-Tehachapi-01H	A-1d		Historic		Historic debris scatter	Not Evaluated	None	None	Avoid
CA-KER-7215/H P-15-012794 PL-SCE-Tehachapi-02H	A-1d	B-3	Multi-Component		Prehistoric lithic scatter with groundstone and a historic debris scatter	Not Evaluated	Intersects Const 10R	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
CA-KER-7216 P-15-012795 PL-SCE-Tehachapi-07	A-1d	B-1	Prehistoric		Prehistoric lithic scatter	Not Evaluated	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap; see CA-KER-303 for capping length
CA-KER-7217 P-15-012796 PL-SCE-Tehachapi-08	A-1d	B-1	Prehistoric		Prehistoric lithic scatter with groundstone	Not Evaluated	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap; see CA-KER-303 for capping length
CA-LAN-1783 P-19-001783	A-1b, A-1c	B-4	Prehistoric		Prehistoric lithic scatter	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 567 ft of road
CA-LAN-3477H P-19-003477	A-1a	B-5	Historic	BSO	Historic Antelope Substation (ca. 1952), featuring a water tower that predates the substation	Not Eligible	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	No management required
CA-LAN-3719 P-19-003719 PL-SCE-Tehachapi-09	A-1b, A-1c		Prehistoric		Prehistoric lithic scatter	Not Evaluated	None	None	Avoid
CA-LAN-3720H P-19-003720 PL-SCE-Tehachapi-54H	A-1b, A-1c	B-4	Historic		Historic materials deposit (ca. 1950)	Not Evaluated	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
CA-LAN-3723/H P-19-003723 PL-SCE-Tehachapi-03H	A-1b	B-6	Multi-Component		Prehistoric lithic scatter with groundstone and historic debris	Not Evaluated	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 835 ft of road

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
CA-LAN-3727 P-19-003727 PL-SCE-Tehachapi-04H	A-1b	B-6	Prehistoric		Prehistoric lithic scatter with formal tools and ground stone artifacts	Unknown	Intersects Existing Road, Potential Road Construction, and Const 24	Ground disturbance within resource boundaries	Flag and avoid; no maintenance to road; cap 2026 ft of road; Evaluate and minimize impacts
CA-LAN-3795 19-003795 Æ-AVEK-1	A-1c	B-7	Prehistoric		Prehistoric archaeological site with lithics, groundstone, shell and fire-affected-rock	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 1328 of road
P-15-012792 PL-SCE-Tehachapi-ISO18	A-1d		Prehistoric	ISO	Prehistoric lithic isolate, chert edge modified flake	Not Eligible	None	None	No management required
P-19-186857 5015300243	A-1a	B-5	Historic	BSO	Historic linear resource, 13.7 miles of the Southern California Edison Antelope PS 74 transmission line (ca. 1937)	Not Eligible	Intersects Existing Road, Potential Road Construction, and Const [Unlabeled]	None	No management required
PL-SCE-Tehachapi-06	A-1b, A-1c		Prehistoric		Prehistoric lithic scatter	Not Evaluated	None	None	Avoid
PL-SCE-Tehachapi-ISO17	A-1b, A-1c		Prehistoric	ISO	Prehistoric isolate, a rock cairn and a semi-circular rock ring	Not eligible	None	None	No management required
Segment 5									
CA-LAN-806 P-19-000806	A-2c	C-1	Prehistoric		Prehistoric steatite quarry	Unknown	Intersects Existing Road, Potential Road Construction, and Const 47	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Flag and avoid; no maintenance to road; cap 1182 of road
CA-LAN-1636 P-19-001636	A-2b, A-2c		Prehistoric		Prehistoric schist boulder with cupule petroglyphs	Unknown	None	None	Avoid
CA-LAN-1770 P-19-001770	A-2c	C-2	Prehistoric		Prehistoric hunting blinds with lithic and groundstone scatter	Unknown	Within 26 ft of Const 41, within 34 ft of Existing Road, and within 28 ft of Potential Road Construction	None	Flag and Avoid
CA-LAN-1771 P-19-001771	A-2c		Prehistoric		Prehistoric hunting blind	Unknown	None	None	Avoid
CA-LAN-1956 P-19-001956	A-2c	C-3	Prehistoric		Prehistoric cupules and oval ring of schist boulders filled with schist fragments	Unknown	Within 21 ft of Existing Road	None	Flag and Avoid
CA-LAN-1957 P-19-001957	A-2c		Prehistoric		Prehistoric petroglyph feature	Unknown	None	None	Avoid
CA-LAN-3385H P-19-003385	A-2a	C-4	Historic		Historic ranch	Not Eligible (O'Neill et al. 2007)	Intersects Existing Road and Cont 16	Ground disturbance within resource boundaries	No management required
CA-LAN-3477H P-19-003477	A-2a	C-5	Historic	BSO	Historic Antelope Substation (ca. 1952), featuring a water tower that predates the substation	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	No management required
CA-LAN-3653 P-19-003653 AP2-101	A-2c	C-1	Prehistoric		Prehistoric milling site with mortars, cupules, milling slick, and petroglyph	Unknown	Within 36 ft of Existing Road	None	Flag and Avoid

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
CA-LAN-3655/H P-19-003655	A-2b		Multi-Component		Prehistoric lithic scatter and historic debris scatter	Recommended Eligible for CRHR (Jackson and Armstrong 2008)	None	None	Avoid
CA-LAN-3656H P-19-003656	A-2b	C-6	Historic		Historic foundation with retaining wall, rock cairn, and rock scatter	Unknown	Within 40 ft of Existing Road	None	Flag and Avoid
CA-LAN-3729H P-19-003729 PL-SCE-Tehachapi-10H	A-2e	C-7	Historic		Historic materials deposit with multiple loci	Not Eligible (O'Neill et al 2007)	Intersects Existing Road and Const 66	Ground disturbance within resource boundaries	No Management required
CA-LAN-3733H P-19-003733 PL-SCE-Tehachapi-11H	A-2e	C-7	Historic		Historic debris scatter (ca. 1935-50)	Not Evaluated	Within 18 ft of Existing Road	None	Flag and Avoid
CA-LAN-3734 P-19-003734 PL-SCE-Tehachapi-12	A-2d, A-2e	C-8	Prehistoric		Prehistoric lithic scatter	Recommended Not Eligible for CRHR (Jackson and Armstrong 2008)	Intersects Const 61	Ground disturbance within resource boundaries	Construction monitoring; minimize impacts
CA-LAN-3735 P-19-003735 PL-SCE-Tehachapi-13	A-2b	C-9	Prehistoric		Prehistoric lithic scatter with groundstone	Not Evaluated	Within 23 ft of Existing Road	None	Flag and Avoid
CA-LAN-3736 P-19-003736 PL-SCE-Tehachapi-14	A-2b	C-6	Prehistoric		Prehistoric lithic scatter with groundstone	Not Evaluated	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 453 ft of road
CA-LAN-3737 P-19-003737 PL-SCE-Tehachapi-15	A-2b	C-10	Prehistoric		Prehistoric lithic scatter	Not Evaluated	Intersects Existing Road, Potential Road Construction, and Const 31	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts; Flag and avoid; no maintenance to road, cap 184 ft of road
CA-LAN-3738 P-19-003738 PL-SCE-Tehachapi-16	A-2b		Prehistoric		Prehistoric lithic scatter	Not Evaluated	None	None	Avoid
CA-LAN-3739 P-19-003739 PL-SCE-Tehachapi-17	A-2b	C-11	Prehistoric		Prehistoric lithic scatter	Not Evaluated	Within 26 ft of Existing Road	None	Flag and avoid
CA-LAN-3740 P-19-003740 PL-SCE-Tehachapi-18	A-2c	C-12	Prehistoric		Prehistoric lithic scatter with groundstone	Not Evaluated	Intersects Existing Road, Potential Road Construction, and Const 40	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Flag and avoid; no maintenance to road, cap 290 ft of road
CA-LAN-3741 P-19-003741 PL-SCE-Tehachapi-19	A-2c	C-13	Prehistoric		Prehistoric lithic scatter with groundstone	Not Evaluated	Intersects Const 39	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
CA-LAN-3742 P-19-003742 PL-SCE-Tehachapi-20	A-2c	C-3	Prehistoric		Prehistoric bedrock milling features and lithic scatter	Not Evaluated	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 123 ft of road

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
P-19-186857 5015300243	A-2a	C-5	Historic	BSO	Historic linear resource, 13.7 miles of the Southern California Edison Antelope PS 74 transmission line (ca. 1937)	Not Eligible	Intersects Existing Road, Potential Road Construction, and Const [Unlabeled]	Ground disturbance within resource boundaries	No management required
Segment 6									
5015100148	A-3d	D-1	Historic	BSO	Historic road	Unknown	Intersects Helicopter Const Site	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
5015100206	A-3c	D-2	Prehistoric		Prehistoric lithic scatter	Unknown	Intersects Helicopter Fly Yard	Ground disturbance within resource boundaries	Evaluate and minimize impacts
5015200133	A-3f	D-3	Historic	BSO	Historic road	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
5015200136	A-3e	D-4	Historic	BSO	Historic road	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
5015400076	A-3d	D-1	Historic	BSO	Historic road	Unknown	Intersects Existing Road, Potential Road Construction, Helicopter Landing Zone, Pull Site, and Const 72	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
5015500229	A-3a, A-3b	D-5	Multi-Component		Prehistoric lithic scatter and historic structural remains and debris	Unknown	Intersects Helicopter Fly Yard	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
Æ-TRTP-1	A-3a, A-3b	D-5	Prehistoric		Prehistoric lithic scatter	Unknown	Intersects Helicopter Fly Yard	Ground disturbance within resource boundaries	Evaluate and minimize impacts
CA-LAN-1128/H-2131 P-19-001128/P-19-002131 05015500006/05015500120	A-3a	D-6	Multi-Component		Prehistoric habitation with midden, FAR, groundstone, lithic tools and debitage, worked bone, beads, and one human burial; historic structural remains and debris	Unknown	Intersects Existing Road, Potential Road Construction, Pull Site, Const 15, Const 16, and Const 17	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Flag and avoid; no maintenance to road; cap 8001 ft of road
CA-LAN-1299 P-19-001299 5015100045	A-3c		Prehistoric		Prehistoric milling site	Unknown	None	None	Avoid
CA-LAN-1300 P-19-001300	A-3c		Prehistoric		Prehistoric processing site	Unknown	None	None	Avoid
CA-LAN-1315H P-19-001315	A-3c		Historic		Historic mill site	Unknown	None	None	Avoid
CA-LAN-1357H P-19-001357	A-3d	D-1	Historic		Historic debris scatter	Unknown	Within 8 ft of Helicopter Landing Zone	None	Flag and Avoid
CA-LAN-1359/2249 P-19-001359/P-19-002249	A-3d	D-7	Prehistoric		Prehistoric lithic scatter with midden	Recommended Not Eligible	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road; cap 194 ft of road
CA-LAN-1360 P-19-001360	A-3c	D-2	Prehistoric		Prehistoric midden	Unknown	Intersects Helicopter Fly Yard	Ground disturbance within resource boundaries	Evaluate and minimize impacts
CA-LAN-1382 P-19-001382 5015500025	A-3b		Prehistoric		Prehistoric lithic scatter	Unknown	None	None	Avoid

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
CA-LAN-1523/H P-19-001523	A-3d	D-8	Multi-Component		Prehistoric lithic scatter with midden and historic debris scatter	Unknown	Intersects Helicopter Fly Yard	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
CA-LAN-2206H P-19-002206	A-3b	D-9	Historic		Historic mines	Unknown	Within 6 ft of Existing Road	None	Flag and Avoid
CA-LAN-2212 P-19-002212	A-3c		Prehistoric		Prehistoric lithic scatter	Unknown	None	None	Avoid
CA-LAN-2363 P-19-002363	A-3a, A-3b	D-10	Prehistoric		Prehistoric habitation with midden, bone, groundstone, pendant fragment debitage, and shell	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 630 ft of road
CA-LAN-2411 P-19-002411	A-3b	D-11	Prehistoric		Prehistoric habitation with midden, FAR, lithic debitage, and groundstone	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 359 ft of road
CA-LAN-3004 P-19-003004	A-3b	D-12	Prehistoric		Prehistoric habitation with midden, FAR, earth ovens, stone cairns, bone, groundstone, and lithic debitage	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 220 ft of road
CA-LAN-3008 P-19-003008	A-3a	D-10	Prehistoric		Prehistoric lithic scatter of rhyolite, quartz, and chalcedony	Unknown	Within 34 ft of Existing Road	None	Flag and Avoid
CA-LAN-3009 P-19-003009	A-3a		Prehistoric		Prehistoric granite/quartz rock feature	Not Eligible	None	None	Avoid
CA-LAN-3018 P-19-003018	A-3d		Prehistoric		Prehistoric lithic scatter with midden	Unknown	None	None	Avoid
CA-LAN-3025 P-19-003025	A-3b	D-11	Prehistoric		Prehistoric midden deposits with FAR	Unknown	Intersects Existing Road, Potential Road Construction, Pull Site, Const 28, and Const 29	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Flag and avoid; no maintenance to road; cap 2207 ft of road
CA-LAN-3031 P-19-003031	A-3d		Prehistoric		Prehistoric lithic scatter with midden	Unknown	None	None	Avoid
CA-LAN-3032 P-19-003032	A-3c		Prehistoric		Prehistoric lithic scatter with midden	Unknown	None	None	Avoid
CA-LAN-3037H P-19-003037	A-3d	D-1	Historic	BSO	Historic Angeles Crest Highway	Unknown	Intersects Helicopter Landing Zone and Pull Site	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
CA-LAN-3136 P-19-003136	A-3c, A-3d	D-13	Prehistoric		Prehistoric lithic scatter including cores and groundstone	Unknown	Intersects Existing Road and Pull Site	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Flag and avoid; no maintenance to road; cap 264 ft of road
CA-LAN-3265H P-19-003265	A-3a, A-3b		Historic		Historic materials deposit	Unknown	None	None	Flag and avoid
CA-LAN-3425 P-19-003425	A-3a		Prehistoric		Prehistoric cache of granite rocks	Unknown	None	None	Avoid
CA-LAN-3562H P-19-003562	A-3b	D-14	Historic	BSO	Historic Gold Queen Mill site access road	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
CA-LAN-3606H P-19-003606	A-3a	D-6	Historic	BSO	Historic road	Unknown	Intersects Existing Road, Pull Site, Marshalling Yard, Const 13, and Const 14	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
CA-LAN-3731 P-19-003731 PL-SCE-Tehachapi-22	A-3a	D-15	Prehistoric		Prehistoric bedrock milling station with incipient mortar	Not Evaluated	Within 26 ft of Existing Road	None	Flag and Avoid
P-19-120072 5015500184	A-3b	D-14	Prehistoric		Prehistoric habitation with midden, earth ovens, debitage, and groundstone	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 1572 ft of road
P-19-120074 5015100098	A-3d	D-1, D-7, D-8	Historic	BSO	Historic road	Unknown	Intersects Existing Road, Pull Site, and Helicopter Landing Zone	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186545 05015500116/05015500158	A-3a, A-3b	D-12, D-14, D-16	Historic	BSO	Historic road	Unknown	Intersects Existing Road, Pull Site, and Const 33	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186875 5015500188	A-3c		Historic	BSO	Historic road	Unknown	None	None	Avoid
P-19-186876 5015500186	A-3a	D-15	Historic	BSO	Historic transmission tower line	Unknown	Intersects Existing Road, Pull Site, Const 2, Const 3, Const 4, and Const 5	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Manage; no maintenance to road
P-19-186917 5015200102	A-3d, A-3e, A-3f	D-3, D-4, D-17	Historic	BSO	Historic dirt road	Unknown	Intersects Existing Road, Helicopter Landing Zone, Pull Site, Const 85, Const 87, Const 88, Const 90, Const 95, Const 96, Const 100, Const 101, Const 102, Const 105, Const 113, Const 114, and Const 115	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186921 5015100102	A-3b	D-16	Historic	BSO	Historic paved and dirt road	Unknown	Intersects Existing Road, Pull Site, and Const 34	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186925 5015500194	A-3a, A-3c	D-16	Historic	BSO	Historic Bootlegger electrical distribution circuit	Unknown	Intersects Existing Road, Pull Site, and Const 34	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Manage; no maintenance to road
P-19-187713 5015500185	A-3a, A-3c	D-10	Historic	BSO	Historic Angeles Forest Highway	Not Eligible (code 6Z)	Const 28	Ground disturbance for road maintenance within resource boundaries	No management required
P-19-187817 5015100201	A-3e, A-3f	D-17	Historic	BSO	Historic road	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
Segment 7									
P-19-186917 5015200102	A-4a	E-1	Historic	BSO	Historic road	Unknown	Intersects Const 1, Const 2, Pull Sites, Potential Road Construction, and Existing Road	Ground disturbance within resource boundaries	Manage; no maintenance to road
Woodland Duck Farm	A-4c	E-2	Historic	BSO	Historic structures and structural remains	Unknown	Intersects Const 44, Const 45, Const 46 Pull Sites, and Existing Roads	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Manage; no maintenance to road
Segment 8									
Battista Ciocca	A-5a	F-1	Historic		Site of historic orchard and structures	Unknown	Intersects Proposed 66kV Pole Construction Area	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
Battista Ciocca Dairy	A-5a	F-1	Historic		Site of historic dairy and related structures	Unknown	Within 14 ft of Proposed 66kV Pole Construction Area	None	Flag and avoid
Bayse Adobe Site	A-5a		Historic		Site of historic structures	Unknown	None	None	Avoid
Briano Winery	A-5a	F-2	Historic		Site of historic structures	Unknown	Intersects Proposed 66kV Pole Construction Area	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
CA-LAN-3728H P-19-003728 PL-SCE-Tehachapi-05H	A-5d	F-3	Historic	BSO	Remains of a windmill and four water storage devices.	Not Evaluated	Intersects Pull Site	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
CA-SBR-12570H P-36-013390 PL-SCE-Tehachapi-24H	A-5e		Historic	BSO	Historic windmill with well collar, pipe and two water towers	Not Evaluated	None	None	Avoid
Early oil discoveries	A-5a	F-4	Historic	BSO	Historic structures and structural remains	Unknown	Intersects Two Proposed 66kV Pole Construction Areas	Ground disturbance within resource boundaries	Evaluate and minimize impacts
Estratta Farm	A-5a	F-1	Historic		Site of historic structures	Unknown	Intersects Proposed 66kV Pole Construction Area	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
Farmer Home Site	A-5a	F-1	Historic		Site of historic structures	Unknown	Intersects Proposed 66kV Pole Construction Area	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
Irwin	A-5a	F-5	Historic		Site of historic orchard and structures	Unknown	None	None	Avoid
John Briano Dairy	A-5a	F-5	Historic		Site of historic structures	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
CA-LAN-2583H	A-5a	F-2, F-4	Historic	BSO	Historic foundations of La Merced Adobe	Unknown	8 ft from Proposed 66kV Pole Construction Area	None	Flag and avoid
Mission Vieja Monument	A-5a	F-4	Historic		Site of historic monument	Unknown	Intersects Proposed 66kV Pole Construction Area	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
Nutt Farm	A-5a	F-2	Historic		Site of historic structures and farmstead	Unknown	Intersects Proposed 66kV Pole Construction Area	Ground disturbance within resource boundaries	Flag and Avoid
P-19-100505	A-5b		Prehistoric	ISO	Prehistoric scraper isolate	Not Eligible NRHP	None	None	No management required
P-19-120031	A-5c	F6	Prehistoric		Prehistoric shell scatter with groundstone	Unknown	Within 20 ft of Pull Site	None	Flag and avoid
P-19-120032	A-5c		Prehistoric		Prehistoric trail	Unknown	None	None	Avoid
P-36-012533	A-5g	F-7	Historic		Historic debris laid as engineered road bed	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-36-012621	A-5g	F-8	Historic		Historic buildings, including one single family residence (ca. 1957) and other structures (ca. 1976)	Unknown	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-36-012622	A-5g	F-9	Historic		Historic farm	Unknown	Within 5 ft of Const 33, Const 34, and Const 35	None	Flag and avoid

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
Segment 9									
CA-KER-7214H P-15-012793 PL-SCE-Tehachapi-01H	A-1c, A-1d, A-6a	G-1	Historic		Historic debris scatter	Not evaluated	Construction Associated with Whirlwind Substation	Ground disturbance within resource boundaries	Evaluate and minimize impacts
CA-LAN-3477H P-19-003477	A-1a, A-2a	G-2	Historic	BSO	Historic Antelope Substation (ca. 1952), featuring a water tower that predates the substation	Not Eligible NRHP	Construction Associated with Antelope Substation and Expansion	Ground disturbance within resource boundaries	No management required
P-15-012482	A-6e	G-3	Historic	ISO	Historic isolate, glass scatter of 20 fragments from a sun-colored amethyst (SCA), milk glass bottle	Not Eligible NRHP	Construction Associated with Windhub Substation	None	No management required
P-15-012790 PL-SCE-Tehachapi-ISO15	A-6e	G-3	Prehistoric	ISO	Prehistoric lithic isolate, chert biface	Not Eligible NRHP	Construction Associated with Windhub Substation	None	No management required
P-15-012791 PL-SCE-Tehachapi-ISO16	A-6e	G-3	Prehistoric	ISO	Prehistoric lithic isolate, rhyolite core	Not Eligible NRHP	Within 30' of Proposed Windhub Substation	None	No management required
P-19-186857 5015300243	A-1a, A-2a	G-2	Historic	BSO	Historic linear resource, 13.7 miles of the Southern California Edison Antelope PS 74 transmission line (ca. 1937)	Not Eligible NRHP	Construction Associated with Antelope Substation and Expansion	Ground disturbance within resource boundaries	No management required
P-19-186870 5015100143	A-7d	G-4	Historic	BSO	Historic linear resource, transmission tower line	Unknown	Construction Associated with Gould Substation	Ground disturbance within resource boundaries	Evaluate and minimize impacts
P-19-187713 5015500185	A-2e, A-7a	G-5	Historic	BSO	Historical Angeles Forest Highway	Not Eligible NRHP, code 6Z	Within 10 ft of Proposed Vincent Substation and Expansion	None	Manage; no maintenance to existing road
PL-SCE-3A-SUB-ISO1	A-6e	G-3	Prehistoric	ISO	Prehistoric lithic isolate, microcrystalline chert edge-modified flake tool	Not Eligible NRHP	Within 33 ft of Proposed Windhub Substation	None	No management required
PL-SCE-Tehachapi-3A-10 (also PL-SCE-Tehachapi-56)	A-6e	G-3	Prehistoric		Prehistoric lithic scatter	Recommended Not Eligible CRHR (Way and Jackson 2008)	Construction of Proposed Windhub Substation	Ground disturbance within resource boundaries	Construction monitoring; minimize impacts
PL-SCE-Whirlwind-2H	A-1c, A-1d, A-6a	G-6	Historic		Historic materials deposit of glass, porcelain, metal, terra cotta, and enamelware	Not evaluated	Construction of Proposed Whirlwind Substation	Ground disturbance within resource boundaries	Evaluate and minimize impacts
PL-SCE-Whirlwind-3H	A-1c, A-1d, A-6a	G-6	Historic		Historic debris scatter of glass and metal	Not Evaluated	Construction of Proposed Whirlwind Substation	Ground disturbance within resource boundaries	Evaluate and minimize impacts
Segment 10									
AP3-1005-1	A-6d, A-6e		Prehistoric	ISO	Prehistoric lithic isolate, core	Ineligible NRHP	None	None	No management required
CA-KER-3549H P-15-003549	A-6a, A-6b, A-6c, A-6d	H-1	Historic	BSO	Historic Los Angeles Aqueduct, see also CA-LAN-2105H	Recommended Eligible NRHP	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Historic Property/Historical Resource Management Plan; Manage; no maintenance to road

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
CA-KER-6340H P-15-010951	A-6c	H-1	Historic		Historic debris scatter	Not Evaluated	Within 41 ft of Existing Road	None	Flag and avoid
CA-KER-6341H P-15-010952	A-6d	H-2	Historic		Historic debris scatter	Not Evaluated	Intersects Existing Road	None	Manage; no maintenance to road
CA-KER-7038 P-15-012496	A-6d, A-6e		Prehistoric		Prehistoric hearth feature	Unknown	None	None	Avoid
CA-KER-7218 P-15-012797 PL-SCE-Tehachapi-25	A-6d, A-6e	H-3	Prehistoric		Prehistoric lithic scatter	Not Evaluated	Intersects Const 6, Potential Road Construction, and Pull Site	Ground disturbance within resource boundaries	Evaluate and minimize impacts
CA-KER-7219H P-15-012798 PL-SCE-Tehachapi-26H	A-6c	H-4	Historic		Historic complex with concrete foundations	Not Evaluated	Intersects Const 49 and Existing Road	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Manage, no maintenance to road
CA-KER-7220H P-15-012799 PL-SCE-Tehachapi-27H	A-6c	H-1	Historic		Historic footing and debris scatter	Not Evaluated	Within 17 ft of Existing Road	None	Flag and avoid
CA-KER-7226H P-15-012805 PL-SCE-Tehachapi-34H	A-6c	H-5	Historic		Historic debris scatter	Not Evaluated	Intersects Const 47, Existing Road, and Potential Road Construction	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts; Manage; no maintenance to road
P-15-012782 PL-SCE-Tehachapi-ISO06	A-6d, A-6e		Historic	ISO	Historic isolate, BOYCO oil can	Ineligible NRHP	None	None	No management required
PL-SCE-Tehachapi-3A-02H	A-6d	H-2	Historic		Historic materials deposit	Recommended Not Eligible CRHR (Jackson 2009)	Intersects Existing Road	Ground disturbance for road maintenance within resource boundaries	Construction monitoring; minimize impacts
PL-SCE-Tehachapi-10-01H	A-6c	H-1	Historic		Historic materials deposit	Not Evaluated	Within 5 ft of Existing Road	None	Flag and avoid
Segment 11									
5015100006	A-7e		Historic		Historic cable tramway and hotel	Unknown	None	None	Avoid
5015100063	A-7d		Historic	BSO	Historic Arroyo Seco Road	Unknown	None	None	Avoid
5015100086	A-7d, A-7e		Historic		Historic structural remains	Not Evaluated	None	None	Avoid
5015100087	A-7e		Historic	BSO	Historic paved road	Not Evaluated	None	None	Avoid
5015100192	A-7d, A-7e	I-1	Historic	BSO	Historic road	Unknown	Intersects Pull Site	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
5015100203	A-7e		Historic		Historic Mt. Lowe District with multiple contributing elements	Mt. Lowe NRHP District	None	None	Avoid
5015199001	A-7d		Prehistoric	ISO	Prehistoric groundstone isolate, mano	Not Eligible NRHP	None	None	No management required
Æ-TRTP-3	A-7a	I-2	Prehistoric		Prehistoric lithic scatter	Unknown	Intersects Proposed Marshalling Yard	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
CA-LAN-2343/H P-19-002343 5015100073	A-7e, A-7f	I-3	Multi-Component	BSO	Historic Mt. Wilson Toll Road, constructed 1907, built over prehistoric trail	Unknown	Intersects Pull Site	Ground disturbance within resource boundaries	Evaluate and minimize impacts
CA-LAN-2350 P-19-002350 5015500069	A-7b	I-4	Prehistoric		Prehistoric habitation with groundstone and midden	Unknown	Intersects Existing Access Road and Const 30	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Flag and avoid; no maintenance to road, cap 657 ft of road
CA-LAN-2412 5015500083	A-7a	I-2	Prehistoric		Prehistoric lithic scatter with groundstone	Unknown	Intersects Existing Access Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road; cap 371 ft of road
CA-LAN-2993 P-19-002993 5015500141	A-7a	I-5	Prehistoric		Prehistoric stone feature of granitic rock	Unknown	41 ft from Existing Access Road	None	Flag and avoid
CA-LAN-2994 P-19-002994 5015500162	A-7b	I-6	Prehistoric		Prehistoric habitation with potential earth oven, midden, and groundstone	Unknown	Intersects Existing Access Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 141 ft of road
CA-LAN-2995 P-19-002995, 5015500163	A-7b	I-6	Prehistoric		Prehistoric earth oven complex	Unknown	Intersects Existing Access Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 184 ft of road
CA-LAN-2996 P-19-002996 5015500164	A-7b	I-6	Prehistoric		Prehistoric earth ovens and midden	Unknown	Intersects Existing Access Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid; no maintenance to road; cap 140 ft of road
CA-LAN-2998 P-19-002998 5015500166	A-7a	I-5	Prehistoric		Prehistoric stone features of granitic rock	Unknown	Intersects Existing Access Roads	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road; cap 1084 ft of road
CA-LAN-3037H P-19-003037 5015100111	A-7c	I-7	Historic	BSO	Historic Angeles Crest Highway	Unknown	Intersects Existing Roads and Potential Road Construction	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
CA-LAN-3090H P-19-003090 5015100123	A-7e	I-8	Historic	BSO	Historic Lower Sam Merrill Trail (ca. 1934)	Contributing Element, NRHP District, Mt. Lowe Rail	Intersects Const 83	Ground disturbance within resource boundaries	Historic Property/Historical Resource Management Plan; Construction monitoring; minimize impacts
CA-LAN-3099H P-19-003099 5015100114	A-7e		Historic	BSO	Millard Canyon Trail with Historic irrigation pipelines and reservoir	Not Evaluated as of 2002	None	None	Avoid
CA-LAN-3152H P-19-003152 5015100037	A-7d	I-7, I-12	Historic		Historic foundation remains and debris from CCC Camp (ca. 1930)	Unknown	Intersects Existing Access Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
CA-LAN-3295/H P-19-003295 5015500193	A-7a	I-2	Multi-component		Prehistoric lithic scatter and circular rock feature; historic debris scatter.	Unknown	Intersects Proposed Marshalling Yard and Existing Road	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Manage, no maintenance to road, cap 678 ft of road
CA-LAN-3638H P-19-003638 5015100199	A-7e		Historic		Historic mining tunnels and adits	Unknown	None	None	Avoid

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
CA-LAN-3721H P-19-003721 5015500222 PL-SCE-Tehachapi-33H	A-7b	I-9	Historic	BSO	Historic water collection basin with pipe	Not Evaluated	Intersects Pull Site	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts
CA-LAN-3722 P-19-003722 5015500223 PL-SCE-Tehachapi-35	A-7a	I-5	Prehistoric		Prehistoric lithic scatter with groundstone	Not Evaluated	Intersects Proposed Access Road	Ground disturbance for road maintenance within resource boundaries	Flag and avoid or evaluate and minimize impacts
CA-LAN-3730H P-19-003730 PL-SCE-Tehachapi-21H	A-7a		Historic		Historic debris scatter	Not Evaluated	None	None	Avoid
CA-LAN-3732H P-19-003732 PL-SCE-Tehachapi-23H	A-7a		Historic		Historic structural remains and debris scatter	Not Evaluated	None	None	Avoid
P-19-100439 5015599010	A-7a		Prehistoric		Prehistoric lithic isolate, quartzite flake	Ineligible NRHP	None	None	Avoid
P-19-100496 05-01-55-921-IAO-01	A-7a		Prehistoric	ISO	Prehistoric groundstone isolate, milling stone fragment	Ineligible NRHP	None	None	No management required
P-19-100631 PL-SCE-Tehachapi-ISO10	A-7a		Prehistoric	ISO	Prehistoric lithic isolate, rhyolite core	Ineligible NRHP	None	None	No management required
P-19-180689, 05015100128/05015100129	A-7e		Historic	BSO	Historic Rubio Pavilion/Rubio train shed foundations	Contributing element, NRHP District, Mt. Lowe Rail	None	None	Avoid
P-19-186860 5015100138	A-7c	I-10	Historic	BSO	Historic Southern California Edison poles (ca.1930)	Unknown	Intersects Proposed Marshalling Yard and Existing Road	Ground disturbance within resource boundaries	Flag and avoid or evaluate and minimize impacts; Manage, no maintenance to road
P-19-186870 5015100143	A-7d, A-7e, A-7f	I-1, I-3, I-8	Historic	BSO	Historic linear resource, transmission tower line	Unknown	Intersects Pull Sites, Const 69, Const 70, Const 71, Const 72, Const 73, Const 74, Const 75, Const 76, Const 77, Const 78, Const 79, Const 80, Const 81, Const 82, Const 83, Const 84, Const 85, Const 86, Const 87, and Const 88	Ground disturbance within resource boundaries	Evaluate and minimize impacts
P-19-186871 5015100142	A-7d	I-7	Historic	BSO	Historic road and retaining features	Unknown	Intersects Existing Road and Const 66	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186872 5015100144	A-7d, A-7e	I-1	Historic	BSO	Historic road	Unknown	Within 30 ft of Const 75	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186873 5015100145	A-7d, A-7e	I-11	Historic	BSO	Historic road	Unknown	Intersects Const 76	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road

Cultural Resource Designation	Appendix A Figure	Appendix B-I Figure	Period	BSO/ISO	Description	NRHP/CRHR Status	Disturbance Area	Potential Impact	Management Measures
P-19-186876 5015500186	A-7a, A-7b, A-7c	I-2, I-4, I-5, I-6, I-7, I-9, I-10, I-12	Historic	BSO	Historic transmission tower line	Unknown	Intersects Existing Access Roads, Potential Road Construction, Pull Sites, Const 17, Const 18, Const 19, Const 20, Const 21, Const 22, Const 23, Const 24, Const 25, Const 27, Const 28, Const 29, Const 31, Const 32, Const 33, Const 34, Const 35, Const 36, Const 37, Const 38, Const 39, Const 40, Const 41, Const 42, Const 43, Const 44, Const 45, Const 46, Const 47, Const 48, Const 49, Const 50, Const 51, Const 52, Const 53, Const 54, Const 55, Const 56, Const 57, Const 58, Const 59, Const 60, Const 61, Const 62, Const 63, Const 64, Const 65, Const 66, and Const 67	Ground disturbance within resource boundaries	Evaluate and minimize impacts
P-19-186877 5015500187	A-7a, A-7b, A-7c, A-7d	I-2, I-7, I-9, I-10, I-12	Historic	BSO	Historic road	Unknown	Intersects Existing Access Road, Const 31, Const 33, Const 34, Const 35, Const 36, Const 37, Const 38, Const 39, Const 40, Const 42, Const 43, Const 44, Const 45, Const 46, Const 47, Const 48, Const 49, Const 50, Const 51, Const 60, Const 61, Const 63, Marshalling Yards, Potential Road Construction, and Pull Sites	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186921 5015100102	A-7b	I-9	Historic	BSO	Historic paved and dirt road	Unknown	Intersects Const 31, Existing Road, and Pull Sites	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186923 5015100103	A-7c, A-7d	I-12	Historic	BSO	Historic road complex	Unknown	Intersects Existing Access Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
P-19-186925 5015500194	A-7a, A-7b	I-2	Historic	BSO	Historic Bootlegger electrical distribution circuit	Unknown	Intersects Existing Road and Proposed Marshalling Yard	Ground disturbance within resource boundaries	Evaluate and minimize impacts; Manage, no maintenance to road
P-19-187713 5015500185	A-7c	I-10	Historic	BSO	Historic Angeles Forest Highway	Not Eligible NRHP, code 6Z	Intersects Existing Access Road	Ground disturbance for road maintenance within resource boundaries	Manage; no maintenance to road
TRTP-RSS-1	A-7a	I-2	Prehistoric		Prehistoric lithic scatter with groundstone and midden	Unknown	Intersects Proposed Marshalling Yard	Ground disturbance within resource boundaries	Evaluate and minimize impacts

3.0 CULTURAL RESOURCE MANAGEMENT MEASURES

Construction of the TRTP will be designed to avoid impacts to cultural resources within the APE whenever feasible. The construction of new towers and new access routes, the maintenance and modification of existing roads for construction, the use and modification of pullouts, and the construction of staging areas, wire-pulling sites, and tower construction yards all include ground disturbing activities that have the potential to impact cultural resources. This section outlines the measures SCE will employ to avoid and manage cultural resources within the TRTP APE, as summarized in Table 1, above. Appendices B through I provide illustrations depicting how TRTP facilities will be constructed to avoid cultural resources or, where avoidance is not feasible, how potential effects to those resources will be managed. Consistent with the mitigation measures of the EIR/EIS, the following management measures will be implemented to train workers in recognizing and taking measures to protect cultural resources; determine the potential for cultural resources to be affected; and to mitigate any adverse effects to historic properties and historical resources (as defined in the PA).

3.1 WORKER TRAINING

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 participating in the cultural resources identification training.

3.2 AVOIDING CULTURAL RESOURCES

As specified in Stipulation III.B of the PA, NRHP eligibility of resources may be assumed if the resources will be avoided. Measures will be implemented to either avoid impacts or to minimize impacts to the cultural resources wherever feasible regardless of their NRHP eligibility status. Examples of complete avoidance include:

- re-locating proposed new towers and related construction areas outside of site boundaries;
- re-aligning proposed access roads or proposed spur roads to avoid sites;
- construction of all support work areas outside of resource boundaries;
- flagging of archaeological site boundaries for avoidance;
- capping resources with protective material (e.g. road base or temporary metal plating);
- adding road base or capping material to existing access roads to create a buffer between construction activities and the cultural resource
- discontinuing road maintenance activities for existing roads within and immediately adjacent to archaeological sites; and
- pre-construction designation of turn-around areas and access routes when work conducted is in close proximity to cultural resources.

Consistent with mitigation measures outlined in the TRTP Segments 4-11 EIR/EIS, each archaeological site within a 50-foot buffer zone of areas of ground disturbance will be identified as an Environmentally Sensitive Area (ESA). Each ESA will be flagged for avoidance prior to ground disturbing activities. Periodic (not less than once weekly) monitoring will be conducted to ensure compliance during construction activities.

SCE will make efforts to minimize impacts to archaeological sites that have been evaluated and determined ineligible for listing on the NRHP by limiting areas of direct impact to the extent possible, flagging for avoidance, monitoring during construction and capping of existing roads through archaeological sites.

3.3 PROTECTION OF HUMAN REMAINS

The ANF, COE, CPUC and SCE shall ensure that any human remains encountered during the course of the Undertaking are treated in a respectful manner and consistent with applicable law. No construction activities will be allowed within 100 feet of the discovery site of human remains until a Notice to Proceed is provided by the ANF or COE as appropriate. The ANF or COE will consult in accordance with 36 CFR §800.11. Reasonable and good faith efforts shall be made by the ANF, COE and CPUC to identify the appropriate Native American Indian tribes, group(s) and individuals, or other ethnicgroup(s) and individuals, related to the burial, and consult with them concerning the treatment of the remains. Native American human remains, associated grave goods, or objects of cultural patrimony discovered on federal lands will be treated in accordance with the requirements of NAGPRA.

If human remains are discovered on non-federal lands, the CPUC shall ensure that the human remains will be treated in accordance California Health & Safety Code Section 7050.5 and any other applicable state law. No construction activities will be allowed within 100 feet of the discovery until a Notice to Proceed is provided by the CPUC.

3.4 UNANTICIPATED DISCOVERY

If previously unidentified archaeological or historic sites are discovered during construction of the TRTP, work on that portion of the Project within 500 feet of the discovery will stop immediately and the qualified archaeologist monitoring the discovery will determine a safe distance to redirect/relocate work to prevent further impacts/affects on the resource. SCE will implement appropriate measures to protect any find from further adverse effects; the ANF or COE (as appropriate) and CPUC will be notified by SCE within 24 hours of any find and provided information regarding the location and nature of the discovery and steps taken by SCE to protect the find. Construction affecting the resource will not resume until SCE has received a Notice to Proceed from the ANF, COE or CPUC as appropriate.

Initial assessments of NRHP eligibility and effects will be prepared by SCE within 30 days of the date of the find. Within the following 15 days, the ANF or COE (as appropriate), CPUC, and SCE shall review these preliminary assessments, consult with Indian tribes per PA Stipulation VIII, notify appropriate tribes per ARPA that a permit may be issued regarding archaeological mitigation at any affected resource on ANF or COE administered lands, make determinations of NRHP and CRHR eligibility and adverse effects, and develop a plan for avoiding or mitigating adverse effects on any NRHP-eligible property. The ANF (as the lead Federal agency) will submit these determinations to the SHPO for review and comment. SHPO shall comment within 30 days of receipt of the determinations by the ANF. If SHPO does not respond within 15 days, ANF and other Signatories may proceed with the determinations and management.

During the 15-day SHPO review period the ANF or COE and SCE will prepare and execute an Archaeological Investigation Permit per ARPA for any unanticipated discovery on ANF or COE administered lands that is NRHP-eligible and which cannot be avoided by TRTP construction. Construction will not proceed within an area designated by the ANF or COE (as appropriate) and CPUC relating to any unanticipated discovery until the requirements of 36 CFR 800.13 (b)(3) have been satisfied for finds on Federal lands or applicable CEQA requirements have been satisfied for finds on State regulated lands. If the discovery involves human remains or objects covered by NAGPRA, consultation with Indian tribes will comply with PA Stipulation VIII.

3.5 CURATION

All publicly owned items, records, and materials resulting from implementation of this PA and CPMP shall be maintained at a local curatorial facility in accordance with standards specified in 36 CFR Part 79. The ANF will consult with SCE to determine the curatorial arrangements. A curatorial agreement may be executed between the ANF, SCE and the curatorial facility prior to the implementation of any archaeological data recovery that may be required under the terms of this PA. If no suitable facility can be identified to house the material recovered during implementation of this PA and CPMP, the ANF shall consult with the SHPO to identify and finalize alternative arrangements. This process will be followed with CPUC if items, records, and materials resulting from implementation of this PA on non-federal lands are created.

As appropriate, the ANF shall consult with Indian tribes to establish the appropriate disposition of any Native American cultural items recovered from Federal lands, and shall repatriate all such items in compliance with Federal or state laws as appropriate. Cultural items subject to NAGPRA will be managed according to applicable provisions of NAGPRA, including implementing regulations at 43 CFR Part 10.

Archaeological and other materials recovered from private lands will remain the property of the legal landowner unless some arrangement has been made by a Signatory or Invited Signatory to the PA for the legal transfer of ownership of such remains to a qualified curation facility. Human remains will not be curated.

4.0 EVALUATION OF HISTORICAL SIGNIFICANCE AND DETERMINATIONS OF EFFECT

Requirements to conduct NRHP and CRHR eligibility assessments and determine the Undertaking's effects will be decided by ANF and CPUC, in consultation with the COE. The ANF and the CPUC shall ensure that any determinations of NRHP eligibility will be made pursuant to 36 CFR §§ 60.4 and 800.4(c). The CPUC shall ensure that CRHR eligibility will be made pursuant to Public Resources Code Section 5024.1. The ANF shall ensure that effects of the Undertaking on historic properties will be assessed according to 36 CFR §§ 800.5 and 800.9. In addition, if any cultural resources are found eligible for the NRHP or CRHR, a treatment plan shall be written by SCE and approved and implemented by the ANF prior to construction to show the steps that will be carried out to achieve data recovery for each historic property.

Initial assessments of NRHP/CRHR eligibility and effects will be prepared by SCE. The ANF shall review these preliminary assessments, make determinations of NRHP eligibility and effects, and submit these determinations to the SHPO for review and comment. If the ANF, COE and SHPO cannot agree on NRHP eligibility, the ANF shall seek a determination from the Keeper of the National Register, which determination will be considered final. The CPUC shall make final determinations of CRHR eligibility for any cultural resources on non-federal lands.

NRHP/CRHR eligibility and effect determinations and treatment of adverse effects will conform to the processes outlined as follows.

NRHP/CRHR evaluation, determination of effects, review, and consultation processes will be required if either of the following circumstances apply. First, whenever historic properties or unevaluated cultural resources are present in the APE, and effects of the Undertaking/Project cannot be reasonably predicted. Second, if the properties are potentially subject to effects from the Undertaking and these effects cannot be reasonably avoided through implementation of appropriate resource management measures defined in the CPMP.

The ANF may exercise the following options in making determinations of NRHP eligibility and assessing effects to historic properties or properties assumed NRHP eligible:

(1) assume NRHP eligibility of any cultural resource in the APE or accept a recommendation by COE or SCE assuming eligibility of any cultural resource in the APE, after consultation with the COE (as appropriate), with the CPUC and SHPO regarding its assuming NRHP eligibility; or
(2) follow procedures outlined in regulations at 36 CFR § 800.4, consulting with the appropriate parties; or
(3) for archaeological resources, conduct archaeological test excavations and other studies to evaluate the eligibility of a resource per NRHP criterion (d) and, as appropriate, confine archaeological field investigations only to the area of each affected resource which may be subject to ground disturbing activities, provided that avoidance and protection measures shall be implemented for areas of each resource not affected by

Project ground disturbing activities and that available information from the entire site area is taken into consideration when evaluating historical significance; or

(4) comply with the terms of the *First Amended Regional Programmatic Agreement among the U.S.D.A. Forest Service, Pacific Southwest Region, California State Historic Preservation Office. Advisory Council on Historic Preservations regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Undertakings of the National Forests of the Pacific Southwest Region* ("Regional PA"; 1996) or any subsequent programmatic agreement that explicitly replaces the Regional PA; or

(5) historic archaeological resources comprised exclusively of 20th century materials such as metal cans, glass bottles a*nd shards, ceramics, lumber, machinery parts, sheet metal and metal fragments, and other accumulations that can reasonably be interpreted to constitute single or multiple refuse disposal events, are not accompanied by discernable structural remains, and are not associated with or contributors to an historic district may be considered by the ANF and the COE as ine*ligible for the NRHP. This class of site will have adequate site record documentation and evaluation completed according to the methodology developed in Appendix K of this CPMP. The CPUC may determine such resources are not CRHR eligible.

NRHP/CRHR evaluations will not be required prior to implementing the Undertaking or Project whenever the effects can be reasonably predicted, and the following conditions exist:

(1) the historic properties/historical resources and/or unevaluated properties will not be affected in accordance with 36 CFR §§ 800.3(1) and 800.16(i) because they are clearly outside areas where effects will occur; or

(2) the historic properties/historical resources and/or unevaluated properties will be treated as if they are eligible for the NRHP/CRHR and appropriate management and maintenance measures will be effectively applied to ensure that, in accordance with 36 CFR § 800.5(a)3(b), their values will not be adversely affected.

Treatment of adverse effects to resources NRHP listed, determined NRHP eligible, or assumed NRHP eligible may be carried out by SCE consistent with a Historic Properties Treatment Plan implemented by the ANF in consultation with COE (if applicable), SHPO and CPUC. Mitigation of significant adverse impacts to historical resources or resources assumed CRHR eligible may be carried out by SCE consistent with a Historical Resources Mitigation Plan implemented by the CPUC on non-federal lands.

5.0 IMPLEMENTATION OF THE CONSTRUCTION PHASE MANAGEMENT PLAN (CPMP)

The ANF, as the lead federal agency, will coordinate the implementation of the CPMP required to protect values of historic and/or unevaluated properties that are located on National Forest lands, COE administered lands, and COE regulated lands. The ANF and CPUC will coordinate implementation of the CPMP necessary to protect values of historical and/or unevaluated resources situated on non-federal lands. The Mitigation Measures listed in the EIR/EIS for this Undertaking and incorporated into this CPMP will be followed. Changes may be made to the CPMP after implementation consistent with PA Stipulation IV.C.

6.0 REFERENCES

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Appendix J.
Candidate Locations for Installation of Tubular Steel Poles as Mitigation

APPENDIX J

Tehachapi Renewable Transmission Project

Candidate Locations for the Use of Tubular Steel Poles for Visual Mitigation

Described below are feasible locations for the possible use of tubular steel poles (TSPs) as mitigation for adverse visual impacts identified in the Draft EIR/EIS. These are a subset of the locations recommended in the *TRTP Visual Resources Specialist Report* for the installation of TSPs. The California Public Utilities Commission (CPUC) has determined that all other recommended locations for the installation of TSPs are infeasible, impractical, or undesirable due to engineering limitations, construction constraints, or ineffectiveness in reducing adverse visual impacts.

No decisions have been made as to whether TSPs should be installed in the locations described below. The CPUC will need to deliberate on the desirability and effectiveness of installing TSPs at the candidate locations. There are various factors that need to be considered by the CPUC in making these decisions, including cost and schedule implications, as well as the amount of burden that should be imposed on the utility to design, install, and maintain a new family of TSP transmission structures. Because there is subjectivity involved in visual preferences for TSPs versus other types of transmission structures, the CPUC has formulated draft guidelines for effective, practical, and feasible use of TSPs as visual mitigation. The draft guidelines are presented in Attachment A to this appendix.

<u>Segment 10</u>

Location: All portions of Segment 10 below 3,000 feet in elevation (Mile Post (MP) 10.5 to Whirlwind Substation).

Reason: This is an area where wind energy projects are expected to be developed in the near future, including the approved PdV Wind Energy Project. The TRTP visual analyst recommended TSPs in this area because they would be more visually compatible with the planned wind turbines than the proposed lattice steel towers (LSTs).

Disadvantages: SCE has indicated that TSPs in this area would likely consist of “H-frame” TSPs rather monopole-type TSP structures, which would result in bulky and visual prominent structures. Simulations indicate that, unlike LSTs, the TSPs would remain visually prominent at middleground and background distances due to their greater bulk compared to LSTs. There are few foreground viewers in this area because the area is only sparsely developed and is located away from most public roadways. *(Please note that if TSPs are used in this area, LSTs would still be needed for dead-end and angle structures. Even on long straight stretches of the transmission line, every eleventh structure would need to be a dead-end structure.)*

<u>Segment 4 (North of Whirlwind Substation)</u>

Location: All portions of Segment 4 below 3,000 feet in elevation north of Whirlwind Substation (MP 2.3 to MP 3.8). This portion of the Project consists of two parallel 220-kV double-circuit lines.

Reason: Same reasons described above for Segment 10.

Disadvantages: While TSPs in this area would likely be monopoles (because the proposed lines in this are 220 kV rather than 500 kV), they would still be bulkier and more visually prominent than LSTs. Unlike LSTs, the TSPs would remain visually prominent at middleground and background distances due to their greater bulk. There are few foreground viewers in this area because it is undeveloped area and located away from public roadways.

Segment 4 (West of Antelope Substation)

Location: East-west-trending segment immediately west of Antelope Substation (MP 18.0 to MP 19.6).

Reason: Nearby 110th Street is designated as a Priority 2 Scenic Highway by Los Angeles County. This designation may be related to the nearby Antelope Valley Poppy Reserve and adjacent areas with prolific wildflower blooms in the spring, which attract numerous visitors during blooming season. Because a preference for TSPs is sometimes expressed by the public and because TSPs have a more appealing, streamlined appearance compared to LSTs, TSPs have been recommended in this area. Also, because Segment 1 leading into Antelope Substation has recently been constructed using TSPs, use of TSPs in this portion of Segment 4 would be visually compatible with Segment 1.

Disadvantages: No specific disadvantages were identified. However, LSTs would still be used for angle structures.

Segment 7

Location: Northernmost portion of Segment 7, immediately south of Angeles National Forest, from MP 1.0 to MP 2.2.

Reason: There are residential properties immediately adjacent to both sides of the transmission corridor in this area. For close-up foreground views, residents have generally expressed a visual preference for TSPs. *(However, please note that 500-kV TSPs are much larger than any TSPs commonly encountered in the Los Angeles metropolitan area, so the visual preference for TSPs expressed by residents is probably not based on experiences with TSPs of this size.)*

Disadvantages: None identified; however, SCE has already proposed the use of TSPs in this area. It was determined that the area recommended for TSPs by the TRTP visual analyst and the area already proposed for TSPs by SCE were basically the same and that it was impractical to extend the use of TSPs any further north or south of the area already recommended by SCE. No additional TSPs are recommended in this area.

Segment 8

Location: Segment 8B, generally between Cypress Avenue and Euclid Avenue in the City of Ontario (approximately MP 0.8 to MP 1.5). This is a double-circuit 220-kV line. *(Please note that the TRTP visual analyst recommended the use of TSPs for most of Segment 8A and other portions of Segment 8B as well. However, for various reasons, it was determined that the use of TSPs in these areas was either not practical from a construction standpoint or would not be effective from a visual mitigation standpoint because of the large number of angle and dead-end structures in these segments. In general, it is not practical and may not be feasible to design and construct TSP angle and dead-end structures at 500-kV voltage, especially for double-circuit structures. SCE's proposed Project already includes TSPs in Segment 8A from MP 23.0 to MP 35.0 except at angle locations.)*

Reason: This is a residential area with residential neighborhoods in close proximity to both sides of the transmission corridor.

Disadvantages: None identified.

Segment 8

Location: Segment 8B, from MP 4.8 to MP 6.0 in the City of Ontario. This is a double-circuit 220-kV line.

Reason: This is an existing residential neighborhood with homes immediately adjacent to the transmission corridor.

Disadvantages: This portion of Segment 8B has numerous angle structures and SCE has not determined if these 220-kV angle structures can be designed as TSPs. If TSPs can be used at angle locations, this portion of Segment 8B could also be constructed using TSPs. In addition, SCE is investigating whether the new 220-kV circuit can be installed on the existing towers in this area, which, if possible, would mean that new structures would not be installed and, therefore, consideration of the use of TSPs would be moot.

If it is decided that both portions of Segment 8B discussed above (MP 0.8-1.5 and MP 4.8-6.0) should be constructed using TSPs, then consideration should be given to constructing all of Segment 8B using TSPs. This would prevent alternating between TSPs and LSTs in developed and undeveloped areas, which would provide better visual continuity and also provide TSPs adjacent to future residential development that is planned in most of this area.

ATTACHMENT A

Guidelines for the Use of Tubular Steel Poles to Mitigate Visual Impacts Associated with Transmission Lines

The following guidelines have been developed to assist with decisions regarding the appropriate use of tubular steel poles (TSPs) to reduce adverse visual impacts sometimes associated with transmission line projects. Although some people have expressed a visual preference for TSPs over the more common lattice steel towers (LSTs), it should be recognized that there are certain practical limitations to the use of TSPs. Moreover, in some circumstances, the use of TSPs may not reduce adverse visual effects on the landscape and may even increase the visual prominence of transmission structures.

These guidelines are intended to address transmission projects with voltages of 220 kV and higher.

TSPs are generally preferred when:

- A transmission line is located immediately adjacent to a residential neighborhood.
- A transmission line is located within or immediately adjacent to an active recreation facility, such as a park, playfield, or trail. This may also apply to transmission lines located on active agricultural land.
- Predominant viewing locations are in close proximity to the transmission line (i.e. the transmission structure is located in the immediate foreground for a large number of viewers).

TSPs are generally <u>not</u> preferred (i.e. LSTs are preferred) when:

- Transmission structures are located in the distant middleground or background for predominant viewing locations (because LSTs generally fade into the background better when viewed from distant locations), especially when viewed against a landform background, such as hills or mountains.
- Placed adjacent to existing transmission lines (i.e. in the same corridor) with structures comprised of LSTs. However, TSPs may be acceptable when adjacent lines in the corridor are comprised only of subtransmission and/or distribution lines, which are lower in voltage and, therefore, have structures that are substantially smaller in size than transmission lines. In such a circumstance, the new transmission line would be the visually dominant feature in the corridor.

TSPs are generally <u>not</u> practical in the following situations:

- For dead-end and angle structures for 500-kV transmission lines. TSPs <u>may</u> be feasible for dead-end and angle structures for 220-kV transmission lines.
- For locations above 3,000 feet in elevation because of the ice loading that must be factored into the structural design.
- In rugged terrain due to access constraints that may make it impractical to transport TSPs to tower sites. (Note: TSPs for high-voltage transmission lines are too heavy to be lifted into place by helicopter.)

Additional considerations:

- Because TSP spans are sometimes shorter than comparable LST spans, transmission segments utilizing TSPs may require more structures to cross a given distance than if LSTs are used. The introduction of additional structures into the landscape needs to be considered in evaluating the visual advantages of TSPs compared to LSTs.

- If a transmission segment comprised of TSPs is proposed adjacent to an existing transmission line comprised of LSTs, consideration must be given to the potential need for the spans of the two adjacent lines to match. To match shorter spans of the line comprised of TSPs, it may be necessary to construct new intermediate LSTs on the existing adjacent transmission line.

- For reasons of visual continuity, it is best not to repeatedly change from one structure type to another along a segment of transmission line. For instance, if TSPs are recommended in an area for visual reasons, then relatively long continuous distances comprised of TSPs should be constructed, rather than alternating between TSPs and LSTs across that distance.
- TSPs may help with conductor “swing” concerns in narrow ROWs.
- Unique (i.e. “one off”) structures should be avoided.
- Schedule and cost implications of TSPs over LSTs should be considered.

Appendix K.
Noise Technical Report

Final Report

Tehachapi Renewable Transmission Project
Noise Technical Report

Prepared for

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL℠ Company

Southern California Edison Company
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December 2007

Prepared by

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Acronyms

ADNL	annual Day-Night Level
AN	audible noise
ANF	Angeles National Forest
CCR	California Code of Regulations
CFR	United States Code of Federal Regulations
CEQA	California Environmental Quality Act
CMP	corridor management plan
CNEL	Community Noise Equivalent Level
CPUC	California Public Utilities Commission
dB	decibel
dBA	A-weighted sound pressure level
DNL	Day–Night Level (or L_{dn})
EMF	electric and magnetic fields
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
GO	General Order
KOP	Key Observation Point
kV	kilovolt
L_{dn}	day–night level (or DNL)
L_{eq}	Equivalent Sound Level
L_{max}	maximum noise level
LMP	Forest Land Management Plan
L_n	statistical or percentile noise level
LORS	laws, ordinances, regulations, and standards
LST	lattice steel tower
msl	mean sea level
MVA	megavolt ampere

MW	megawatt
NEPA	National Environmental Policy Act
OHGW	overhead ground wire
OHV	off-highway vehicle
OPGW	optical ground wire
PCT	Pacific Crest Trail
ROW	right-of-way
SCE	Southern California Edison
SEL	sound exposure level
SIO	Scenic Integrity Objective
SMS	Scenery Management System
SVC	Static VAR Compensator
T/L	transmission line
TRTP	Tehachapi Renewable Transmission Project
TSP	tubular steel pole
TWRA	Tehachapi Wind Resource Area
USDA	U.S. Department of Agriculture
USGS	United States Geological Survey

1.0 Introduction

Southern California Edison's (SCE) Tehachapi Renewable Transmission Project (TRTP) (proposed Project) 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 Los Angeles Basin (Figure 1-1). This Noise Technical Report was prepared to analyze the noise impacts of implementing the TRTP and its alternatives.

Generally, the proposed Project has the potential to affect nearby noise sensitive receptors. The study quantifies noise levels for the current environment, and predicts noise levels due to implementation of the proposed Project. Additionally, this study quantifies existing corona noise levels at six representative locations and predicts future corona noise levels due to implementation of the proposed Project.

In response to the California Environmental Quality Act (CEQA) requirements for assessment of a proposed Project's noise impacts, this technical report documents representative noise conditions that exist in the Antelope Valley, San Gabriel Mountains, San Gabriel Valley, and Inland Empire regions through which the proposed Project would pass, and evaluates the potential impacts to the noise environment due to implementation of the TRTP.

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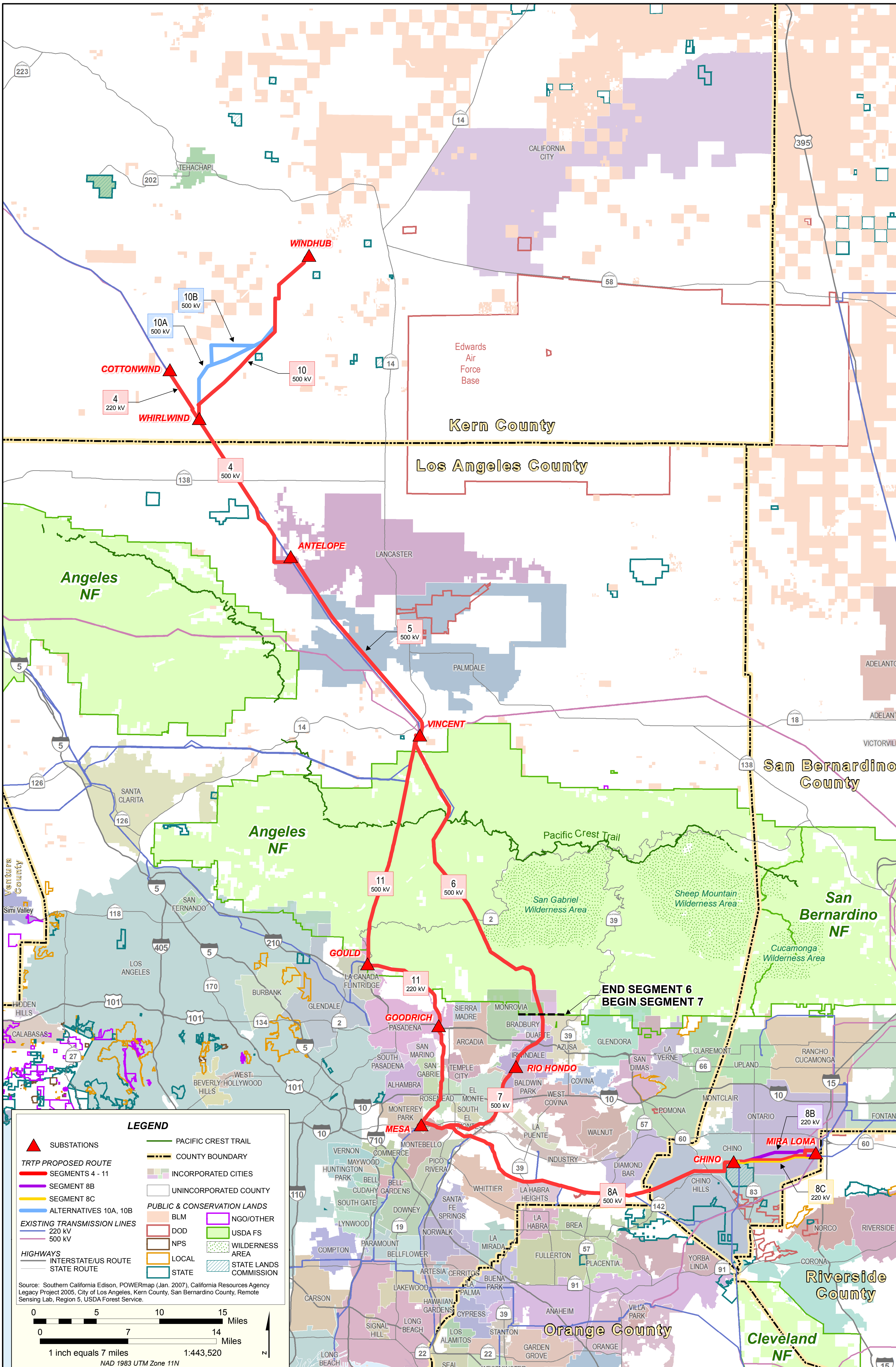

Southern California Edison (SCE) has no indication or reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties to be implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

2007

Tehachapi Renewable Transmission Project PEA

Figure 1-1. PROJECT LOCATION MAP

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

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2.0 Fundamentals of Noise

This section provides an overview of the fundamentals of noise. Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. Table 2-1 summarizes the technical noise terms used in this report.

TABLE 2-1
Definitions of Acoustical Terms

Term	Definitions
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Background Noise Level	The underlying ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically makeup the background. The background level is generally defined by the L_{90} percentile noise level.
Intrusive Noise	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal content, the prevailing ambient noise level as well as the sensitivity of the receiver. The intrusive level is generally defined by the L_{10} percentile noise level.
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the measured pressure to the reference pressure, which is 20 micropascals.
A-weighted Sound Pressure Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Community Noise Equivalent Level (CNEL)	A 24-hour average A-weighted L_{eq} noise level, where 5 dBA is added to evening levels between 7:00 p.m. and 10:00 p.m. and 10 dBA is added to nighttime levels between 10:00 p.m. and 7:00 a.m. For a continuous source that emits the same noise level over a 24-hour period, the CNEL will be 6.7 dBA greater than the L_{eq}.
Equivalent Sound Level (L_{eq})	The L_{eq} integrates fluctuating sound levels over a period of time to express them as a steady-state sound level. As an example, if two sounds are measured and one sound has twice the energy but lasts half as long, the two sounds would be characterized as having the same equivalent sound level. Equivalent Sound Level is considered to be related directly to the effects of sound on people since it expresses the equivalent magnitude of the sound as a function of frequency of occurrence and time.
Day–Night Level (L_{dn} or DNL)	A 24-hour average A-weighted L_{eq} noise level where 10 dBA is added to nighttime levels between 10:00 p.m. and 7:00 a.m. For a continuous source that emits the same noise level over a 24-hour period, the L_{dn} will be 6.4 dBA greater than the L_{eq}.
Statistical or Percentile Noise Level (L_n)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (for example, L_{50} is the level exceeded 50 percent of the time)

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to how a person perceives or hears sound, thus achieving very good correlation in terms of how to evaluate acceptable and unacceptable sound levels.

A-weighted sound levels are typically measured or presented as the equivalent sound pressure level (L_{eq}), which is defined as the average noise level, on an equal energy basis for a stated period of time, and is commonly used to measure steady state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by L_{xx}, where xx represents the percentile of time the sound level is exceeded. The L_{90} is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period. Table 2-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

TABLE 2-2
Typical Sound Levels Measured in the Environment and Industry

Noise Source At a Given Distance	A-Weighted Sound Level in Decibels	Qualitative Description
Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1000 feet) Shout (0.5 feet)	100	
N.Y. subway station Heavy truck (50 feet)	90	Very annoying Hearing damage (8-hr, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70 to 80	
	70	Intrusive (Telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft whisper (5 feet)	30	Very quiet
Broadcasting/Recording studio	20	
	10	Just audible

Adapted from Table E, “Assessing and Mitigating Noise Impacts”, NY DEC, February 2001.

Another metric used in determining the impact of environmental noise is the differences in response that people have to daytime and nighttime noise levels. During the evening and nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to evening and nighttime noise levels, the DNL (also abbreviated as L_{dn}) and CNEL were developed. The DNL is a noise index that accounts for the greater annoyance of noise during the nighttime hours (10:00 p.m. to 7:00 a.m.). The CNEL is a noise index that accounts for the greater annoyance of noise during both the evening hours (7:00 p.m. to 10:00 p.m.) and nighttime hours.

Ground type also plays into how much attenuation will occur. Hard ground is any highly reflective surface in which the phase of the sound energy is essentially preserved upon reflection. Hard surfaces, such as parking lots or bodies of water, do not have this absorption capability. Soft ground is any highly absorptive surface in which the phase of the sound energy is changed upon reflection. Surfaces such as soft dirt, grass or terrain covered with dense vegetation absorb some of the sound energy as the sound passes over, and therefore increases the attenuation experienced. (U.S.DOT 2007)

DNL values are calculated by averaging hourly L_{eq} sound levels for a 24-hour period, and applying weighting factors nighttime L_{eq} values. CNEL values are calculated similarly, except that a weighting factor is also added to evening L_{eq} values. The weighting factors, which reflect the increased sensitivity to noise during evening and nighttime hours, are added to each hourly L_{eq} sound level before the 24-hour DNL or CNEL is calculated. For the purposes of assessing noise, the 24-hour day is divided into three time periods, with the following weightings:

- Daytime hours: 7:00 a.m. to 7:00 p.m. (12 hours) - Weighting factor of 0 dBA
- Evening hours (for CNEL only): 7:00 p.m. to 10:00 p.m. (3 hours) - Weighting factor of 5 dBA
- Nighttime hours (for both CNEL and DNL): 10:00 p.m. to 7:00 a.m. (9 hours) - Weighting factor of 10 dBA

The adjusted time period noise levels are then averaged (on an energy basis) to compute the overall DNL or CNEL value. For a continuous noise source, the DNL value is easily computed by adding 6.4 dBA to the overall 24-hour noise level (L_{eq}). For example, if the expected continuous noise level from a noise source is 60.0 dBA, the resulting DNL from the source would be 66.4 dBA. Similarly, the CNEL for a continuous noise source is computed by adding 6.7 dBA to the overall 24-hour L_{eq}.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects such as startling and hearing loss

In most cases, environmental noise may produce effects in the first two categories only. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

The general human response to changes in noise levels that are similar in frequency content (for example, comparing increases in continuous [L_{eq}] traffic noise levels) are summarized below:

- A 3-dB change in sound level is considered a barely noticeable difference
- A 5-dB change in sound level will typically be noticeable
- A 10-dB change is considered to be a doubling in loudness.

The electrical effects of high-voltage transmission lines fall into two broad categories: corona effects and field effects. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone.

Audible noise on transmission lines and structures is due to the effects of corona. Corona is a function of transmission line voltage, conductor diameter, and condition of the conductor and the suspension hardware. The electric field gradient is the rate at which the electric field changes and is directly related to the line voltage. The electric field gradient is greatest at the surface of the conductor. Large-diameter conductors have lower electric field gradients at the conductor surface and, hence, lower corona than smaller conductors, everything else being equal. Irregularities (such as nicks and scrapes on the conductor surface) or sharp edges on suspension hardware concentrate the electric field at these locations and, thus, increase corona at these spots. Similarly, contamination on the conductor surface, such as dust or insects, can cause irregularities that are a source for corona. Raindrops, snow, fog, and condensation are also sources of irregularities. Corona typically becomes a design concern for transmission lines at 345 kilovolts (kV) and above.

The highest levels of corona and, hence, audible noise will occur during heavy rain when the line conductors are wet. During these wet conditions or foul weather conditions, the conductor will produce the greatest amount of corona noise. However, during heavy rain the ambient noise generated by the rain will typically be greater than that the ambient noise generated by corona.

3.0 Regulatory Context and Significance Criteria

This section provides the regulatory context and significance criteria that apply to the TRTP. The proposed Project will require approvals from the California Public Utilities Commission (CPUC), and the U. S. Forest Service, Angeles National Forest (ANF). The CPUC will evaluate the proposed Project's noise impacts in light of the requirements of California Environmental Quality Act (CEQA), while the ANF will evaluate the proposed Project's noise effects under the National Environmental Policy Act (NEPA).

The following sections present the criteria that these agencies will apply in determining whether any of the proposed Project's noise levels would be potentially significant under CEQA or adverse under NEPA.

3.1 California Environmental Quality Act

CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the proposed Project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance " (California Code of Regulations [CCR], Title 14, § 15382).

Appendix G of the CEQA Guidelines, under Noise, lists the following questions to be addressed while determining whether the potential impacts of a project are significant.

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?
3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?
6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

CEQA does not specify a threshold for "substantial increase" for noise.

3.2 National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA), requires "Federal agencies to include in their decision-making processes appropriate and careful consideration of all environmental effects of proposed actions, analyze potential environmental effects of proposed actions and their alternatives for public understanding and scrutiny, avoid or minimize adverse effects of proposed actions, and restore and enhance environmental quality as much as possible"(United States Code of Federal Regulations [CFR])Title 40 Part 6). NEPA requires an Environmental Impact Statement (EIS) be prepared when "The Federal action may directly or through induced development have a significant adverse effect upon local ambient air quality, *local ambient noise levels*, surface water or groundwater quality or quantity, water supply, fish, shellfish, wildlife, and their natural habitats." It is important to note that NEPA does not specify a threshold for "significant adverse effect" for noise and that NEPA is only triggered when there is a "federal action," such as the issuance of a federal permit.

While there are no federal regulations that limit overall environmental noise levels, there are federal guidance documents that address environmental noise and regulations for specific sources (for example, aircraft or federally funded highways).

The only energy facility specific requirements are those of the Federal Energy Regulatory Commission (FERC) which regulates interstate electrical transmission lines, natural gas, and petroleum pipelines. The FERC limits specifically address compressor facilities associated with pipelines under its jurisdiction and limits the noise to 55 dBA Day-Night Level (DNL) in noise sensitive areas (FERC, 2002).

There are also federal highway and aircraft guidelines/regulations established by the Federal Highway Administration (FHWA) (CFR Title 23 Part 772) and Federal Aviation Administration (FAA) (CFR Title 18 Part 150). A summary of federal guidelines/regulations is presented in Table 3-1.

TABLE 3-1
Summary of Federal Guidelines/Regulations for Exterior Noise (DBA)

Agency	L_{eq}	DNL
Federal Energy Regulatory Commission	[49]	55
Federal Highway Administration	67	[67]
Federal Aviation Administration	[59]	65
U.S. Department of Transportation—Federal Rail and Transit Authorities (FRA 1998 and FTA 1995)[a, b,]	Sliding scale, refer to Figure 3-1	Sliding scale, refer to Figure 3-1
U.S. Environmental Protection Agency (EPA 1974)[c]	[49]	55
U.S. Department of Housing and Urban Development (HUD)[d]	[59]	65

Note: Brackets [59] indicate calculated equivalent standard. Because FHWA regulates peak noise level, the DNL is assumed equivalent to the peak noise hour.

Sources:
[a] FRA, 1998
[b] FTA, 1995
[c] EPA, 1974
[d] CFR Title 24 Part 51B

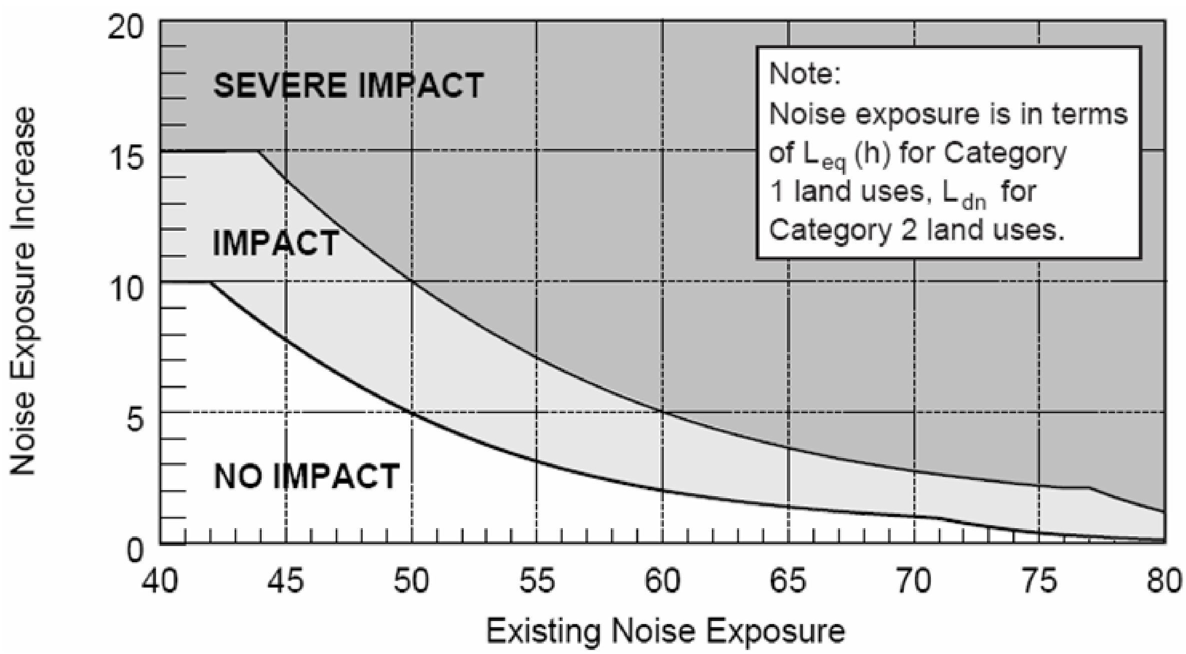

FIGURE 3-1
FRA and FTA Allowable Increase in Cumulative Noise Level
(Note: Residential uses are included in Category 2)

For the purposes of this document, the FERC guidelines re used as a general threshold for operational noise that is not associated with aircraft. For aircraft related operational noise, the FAA's threshold is used on an annualized basis (ADNL – Annual Day-Night Level).

3.3 Local Plans, Laws, Ordinances, Regulations and Standards

A review was conducted of local plans, laws, ordinances, regulations, and standards (LORS) related to noise adopted by each of the jurisdictions through which the proposed Project would pass. Section 7.0, Compliance with Laws, Ordinances Regulations, and Standards, contains a table that identifies the applicable plans and LORS for the jurisdictions through which the proposed Project would pass. It is also noted in the table whether the Project would be consistent with the intent of those plans and LORS related to noise.

The assessment of the proposed Project's consistency with the plans and LORS is presented for informational purposes only because CPUC General Order (GO) No. 131-D, Section XIV B clarifies that "[l]ocal jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the Commission's jurisdiction. However in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Due to this GO, the public utilities are directed to consider local regulations and consult with local agencies, but the regulations and general plans of the counties and cities are not applicable, as the counties and cities do not have jurisdiction over the proposed Project.

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4.0 Project Description

4.1 Overview

Southern California Edison's (SCE) Tehachapi Renewable Transmission Project (TRTP) includes a series of new and upgraded high-voltage electric transmission lines (T/L) and substations to deliver electricity from new wind farms in eastern Kern County, California, to the Los Angeles Basin (Figure 1-1).

The purpose of the proposed TRTP is to provide the electrical facilities necessary to integrate levels of new wind generation in excess of 700 megawatts (MW) and up to approximately 4,500 MW in the Tehachapi Wind Resource Area (TWRA). The major components of the proposed Project have been separated into eight distinct segments. Under separate application to the California Public Utilities Commission (CPUC), SCE has 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 delineation 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 facilities proposed for each segment are summarized below. Typical tower configurations and substation layouts are provided in Figures 4-1 through 4-14.

4.2 Proposed Project

4.2.1 Segment 4: Whirlwind 500/220 kV Transmission Line Elements

Segment 4 includes construction of new 220 kilovolt (kV) and 500 kV transmission lines. The 220 kV component would be two new single-circuit 220 kV transmission lines traveling approximately 4 miles over new right-of-way (ROW) from the Cottonwind Substation to the proposed new Whirlwind Substation. The two transmission lines would parallel each other on separate sets of structures within the same new ROW.

The 500 kV component would be one new single-circuit 500 kV transmission line traveling approximately 16 miles over new ROW from the proposed new Whirlwind Substation to the existing Antelope Substation.

It is estimated that the width of the new ROW for all new transmission line segments would be 200 feet.

4.2.2 Segment 5: Antelope–Vincent No. 2 500 kV Transmission Line

Segment 5 includes a rebuild of 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 over existing ROW between the existing Antelope Substation and the existing Vincent Substation.

4.2.3 Segment 6: New Replacement Rio Hondo–Vincent No. 2 500 kV Transmission Line

Segment 6 includes a rebuild of approximately 32 miles of existing 220 kV transmission line to 500 kV standards along existing ROW from existing Vincent Substation to the southern boundary of the Angeles National Forest (ANF). This segment includes the rebuild of approximately 27 miles of the existing Antelope–Mesa 220 kV T/L and approximately 5 miles of the existing Rio Hondo–Vincent No. 2 220 kV T/L.

4.2.4 Segment 7: New Mira Loma–Vincent 500 kV Transmission Line

Segment 7 includes a rebuild of approximately 16 miles of existing 220 kV transmission line to 500 kV standards over existing ROW from the southern boundary of the ANF to the existing Mesa Substation. This segment would replace the existing Antelope–Mesa 220 kV T/L. To accommodate the 500 kV construction, various lower-voltage subtransmission lines between the Rio Hondo and Mesa substations would be relocated mostly within existing ROW.

4.2.5 Segment 8: New Mira Loma–Vincent 500 kV Transmission Line

Segment 8 includes a rebuild of approximately 33 miles of existing 220 kV transmission line to 500 kV standards from a point approximately 2 miles east of the existing Mesa Substation (the "San Gabriel Junction") to the existing Mira Loma Substation. This segment would also include the rebuild of approximately 7 miles of the existing Chino–Mira Loma No. 1 220 kV T/L from single-circuit to double-circuit 220 kV structures.

Segment 8 has been divided into three separate subsegments: Subsegment 8A, Subsegment 8B, and Subsegment 8C. Subsegments 8A and 8C would address the rebuild of various 220 kV transmission lines to 500 kV standards, while Subsegment 8B specifically consists of the rebuild of the existing Chino–Mira Loma No. 1 220 kV T/L with 220 kV double-circuit structures.

Existing ROW would be used for this segment, except where approximately 3 miles of new ROW would be required to accommodate new construction in several locations along the proposed route. Also as part of this segment, various subtransmission and distribution lines in the Mesa Substation and Chino Substation areas would require relocation within existing ROW.

4.2.6 Segment 9: Substation Facilities

Segment 9 would include the construction of a new substation, the Whirlwind Substation, as well as the upgrade of several other existing substations with new equipment. The 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 near the TWRA. Three alternative sites, A, B, and C, have been identified as potential locations for the new Whirlwind Substation. Construction of the new Whirlwind Substation at any of these sites would require property acquisition. It is estimated Alternative Site A would require acquisition of approximately 113 acres; Alternative Site B would require acquisition of approximately 102 acres; and Alternative Site C would require acquisition of approximately 106 acres.

Upgrades would occur at the existing Antelope, Vincent, Mesa, Gould, and Mira Loma substations to accommodate new transmission line construction and system compensation elements. Upgrades at the Antelope and Vincent substations would include expansions of existing switchyards outside of existing property boundaries. It is estimated that the Antelope expansion would require SCE to acquire an additional 28 acres of property at the substation site, and the expansion at the Vincent Substation would require SCE to acquire an additional 0.2 acre at the substation site.

4.2.7 Segment 10: New Whirlwind–Windhub 500 kV Transmission Line

Segment 10 would be a new 500 kV transmission line traveling approximately 17 miles over new ROW between the Windhub Substation and the proposed new Whirlwind Substation. It is estimated that the width of the new ROW would be 330 feet.

4.2.8 Segment 11: New Mesa–Vincent (via Gould) 500/220 kV Transmission Line

Segment 11 includes a rebuild of approximately 19 miles of existing 220 kV transmission line to 500 kV standards along existing and new ROW between the existing Vincent and Gould substations. This segment would also include the addition of 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 Substation and the existing Mesa Substation. As part of this segment, SCE proposes to also acquire additional ROW width along the portion of the existing ROW from the Gould Substation to a point approximately 3 miles north of the substation.

Common to all segments will be the installation of telecommunications infrastructure. For transmission segments, optical ground wire (OPGW) would be installed as part of 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. It would be installed at the tops of transmission line structures in the same manner as conventional OHGW during transmission line construction. The OPGW would be approximately 11/16 inch in diameter. For the substations, new telecommunications infrastructure will be constructed in conjunction with construction of the new Whirlwind Substation, and various telecommunications components will be enhanced to support new facilities at the Vincent Substation.

Summary information regarding each segment of the proposed TRTP is provided in Table 4-1.

TABLE 4-1
Summary Of Proposed Project Components By Segment
Tehachapi Renewable Transmission Project (TRTP)

Overall Project Construction

- Proposed construction duration of 55 months (estimated to begin in April 2009 and end in November 2013)
- Transmission facility construction generally scheduled for Monday through Friday, 7:00 a.m. to 5:00 p.m.; when extended hours would require a variance, it would be acquired
- Substation construction generally scheduled for Monday through Friday, 7:00 a.m. to 5:00 p.m.; when extended hours would require a variance, it would be acquired
- Workforce ranging in size from 10 to 300 persons, with daily average workforce of approximately 75 persons
- Disturbance of approximately 1,444 acres, with restoration of approximately 1,297 acres, resulting in permanent land disturbance of approximately 147 acres

Segment 4: Whirlwind 500/220 kV Transmission Line Elements

- Initiates at the Cottonwind Substation and ends at the existing Antelope Substation
- Construct two new parallel 4-mile single-circuit 220 kV transmission lines between the Cottonwind Substation and the proposed new Whirlwind Substation
- Construct new 16-mile single-circuit 500 kV Antelope–Whirlwind 500 kV T/L
- All construction within new 200-foot-wide ROW (20 miles)
- Erect approximately 165 new transmission structures, including:
  - 88 single-circuit 220 kV LSTs
  - 77 single-circuit 500 kV LSTs
- Would require approximately 34 new pulling locations, 34 tensioner locations, and 19 new splicing locations

Segment 5: Antelope–Vincent No. 2 500 kV Transmission Line

- 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 18-mile single-circuit Antelope–Vincent No. 2 500 kV T/L
- All construction in existing 200-foot-wide ROW (18 miles)
- Erect approximately 67 new transmission structures, including:
  - 67 single-circuit 500 kV LSTs
- Would require approximately 14 new pulling locations, 16 tensioner locations, and 7 new splicing locations

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

- *Editors Note: For brevity, Segment 6 is named "New Replacement Rio Hondo–Vincent No. 2 500 kV T/L" in other sections of this PEA document*
- Initiates at the existing Vincent Substation and ends at the southern boundary of the ANF
- Remove 27 miles of the existing Antelope–Mesa 220 kV T/L between Vincent Substation and the southern boundary of the ANF
- Remove 5 miles of the existing Rio Hondo–Vincent No. 2 220 kV T/L between Vincent Substation and the "crossover" span
- Construct new 27-mile single-circuit Rio Hondo–Vincent No. 2 500 kV T/L (initially energized at 220 kV)
- Construct new 5-mile single-circuit Mira Loma–Vincent 500 kV T/L from the Vincent Substation to the "crossover span"

TABLE 4-1
Summary Of Proposed Project Components By Segment
Tehachapi Renewable Transmission Project (TRTP)

- Eliminate the existing crossing of the Rio Hondo–Vincent No. 2 220 kV T/L over the Antelope–Mesa 220 kV T/L
- All construction in existing 200- to 400-foot-wide ROW (32 miles)
- Erect approximately 140 new transmission structures, including:
  - 2 single-circuit 220 kV LSTs
  - 30 single-circuit 500 kV TSPs
  - 104 single-circuit 500 kV LSTs
  - 4 three-pole dead-end 500 kV structures
- Would require approximately 16 new pulling locations, 16 tensioner locations, and 16 new splicing locations

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

- *Editors Note: For brevity, Segment 7 is named "New Mira Loma–Vincent 500 kV T/L" in other sections of this PEA document*
- Initiates at the southern boundary of the ANF and ends at the existing Mesa Substation
- Remove and replace existing 220 kV structures with 500 kV structures
- Remove 16 miles of the existing Antelope–Mesa 220 kV T/L between the southern boundary of the ANF and the Mesa Substation
- Construct new 16-mile 500 kV double-circuit transmission line to include the Rio Hondo–Vincent No. 2 500 kV T/L (initially energized at 220 kV) and the 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 construction in existing 200- to 250-foot-wide ROW (16 miles)
- Erect approximately 81 new transmission structures, including:
  - 1 double-circuit 220 kV LST
  - 2 double-circuit 500 kV TSPs
  - 2 single-circuit 500 kV LSTs
  - 76 double-circuit 500 kV LSTs
- Erect approximately 150 new double-circuit 66 kV subtransmission LWSPs and TSPs
- Would require approximately 16 new pulling locations, 16 tensioner locations, and 16 new splicing locations

Segment 8: Section of New Mira Loma–Vincent 500 kV Transmission Line

- *Editors Note: For brevity, Segment 8 is named "New Mira Loma–Vincent 500 kV T/L" in other sections of this PEA document*
- Initiates near the Mesa Substation and ends at the 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 single- and double-circuit 500 kV T/L to include approximately 33 miles of the new Mira Loma–Vincent 500 kV T/L
- Construct approximately 7 miles of new double-circuit 220 kV T/L from the Chino Substation to the Mira Loma Substation
- Relocate several existing 66 kV subtransmission lines in the area of the existing Mesa Substation and the existing Chino Substation

TABLE 4-1
Summary Of Proposed Project Components By Segment
Tehachapi Renewable Transmission Project (TRTP)

- Most construction in existing 150- to 250-foot-wide ROW (30 miles); additional construction in new 100-foot-wide ROW (3 miles); additional construction in new 240-foot-wide ROW (< 1 mile); additional construction in new 150-foot-wide ROW (< 1 mile)
  - Rose Hills Cemetery ROW relocation (existing: 200-foot-wide; future: 240-foot-wide)
  - Hacienda Heights ROW expansion (existing: 150-foot-wide; future: 250-foot-wide)
  - Fullerton Road new ROW (existing: none; future: 100-foot-wide)
  - Ontario ROW expansion (existing: 100-foot-wide; future: 250-foot-wide)
- Erect approximately 226 new transmission structures, including:
  - 2 single-circuit 220 kV LSTs
  - 57 double-circuit 220 kV LSTs
  - 3 single-circuit 500 kV LSTs
  - 92 double-circuit 500 kV LSTs
  - 2 single-circuit 220 kV TSPs
  - 11 double-circuit 220 kV TSPs
  - 5 three-pole dead-end 220 kV structures
  - 4 single-circuit 500 kV TSPs
  - 50 double-circuit 500 kV TSPs
- Erect approximately 14 new double-circuit 66 kV subtransmission LWSPs
- Would require approximately 33 new pulling locations, 33 tensioner locations, and 33 new splicing locations

Segment 9: Substation Facilities

- Construct new Whirlwind Substation; activity would require acquisition of new substation property between approximately 102 to 113 acres
- 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 28 acres for Antelope upgrade and approximately 0.2 acre for Vincent upgrade.
- Upgrade existing Mesa and Gould Substations to accommodate new 220 kV equipment
- Upgrade existing Mira Loma Substation to accommodate new 500 kV equipment

Segment 10: New Whirlwind–Windhub 500 kV Transmission Line

- Initiates at the Windhub Substation and ends at the proposed new Whirlwind Substation
- Construct new 17-mile single-circuit Windhub–Whirlwind 500 kV T/L
- All construction (17 miles) within new 330-foot-wide ROW
- Erect approximately 96 new transmission structures, including:
  - 96 single-circuit 500 kV LSTs
- Would require approximately 16 new pulling locations, 16 tensioner locations, and 7 new splicing locations

Segment 11: New Mesa–Vincent (via Gould) 500/220 kV Transmission Line

- Initiates at the existing Vincent Substation and ends at the existing Mesa Substation
- Remove 4 miles of the existing Vincent–Pardee No. 1 220 kV T/L
- Remove 15 miles of the existing Eagle Rock–Pardee 220 kV T/L
- Construct new 19-mile 500 kV single-circuit T/L between Vincent and Gould Substations (initially energized at 220 kV)
- String 18 miles of new 220 kV conductor on the vacant side of the double-circuit structures of the Eagle Rock–Mesa 220 kV T/L

TABLE 4-1
Summary Of Proposed Project Components By Segment
Tehachapi Renewable Transmission Project (TRTP)

- Most construction would take place within existing 200- to over 400-foot-wide ROW (19 miles); additional ROW width of approximately 250 feet would be required on the west side of the existing ROW near Gould Substation (for up to 3 miles)
- Erect approximately 76 new transmission structures, including:
  - 2 single-circuit 220 kV poles
  - 7 single-circuit 220 kV LSTs
  - 67 single-circuit 500 kV LSTs
- Would require approximately 12 new pulling locations, 15 tensioner locations, and 5 new splicing locations

Note: Mileages are approximate.

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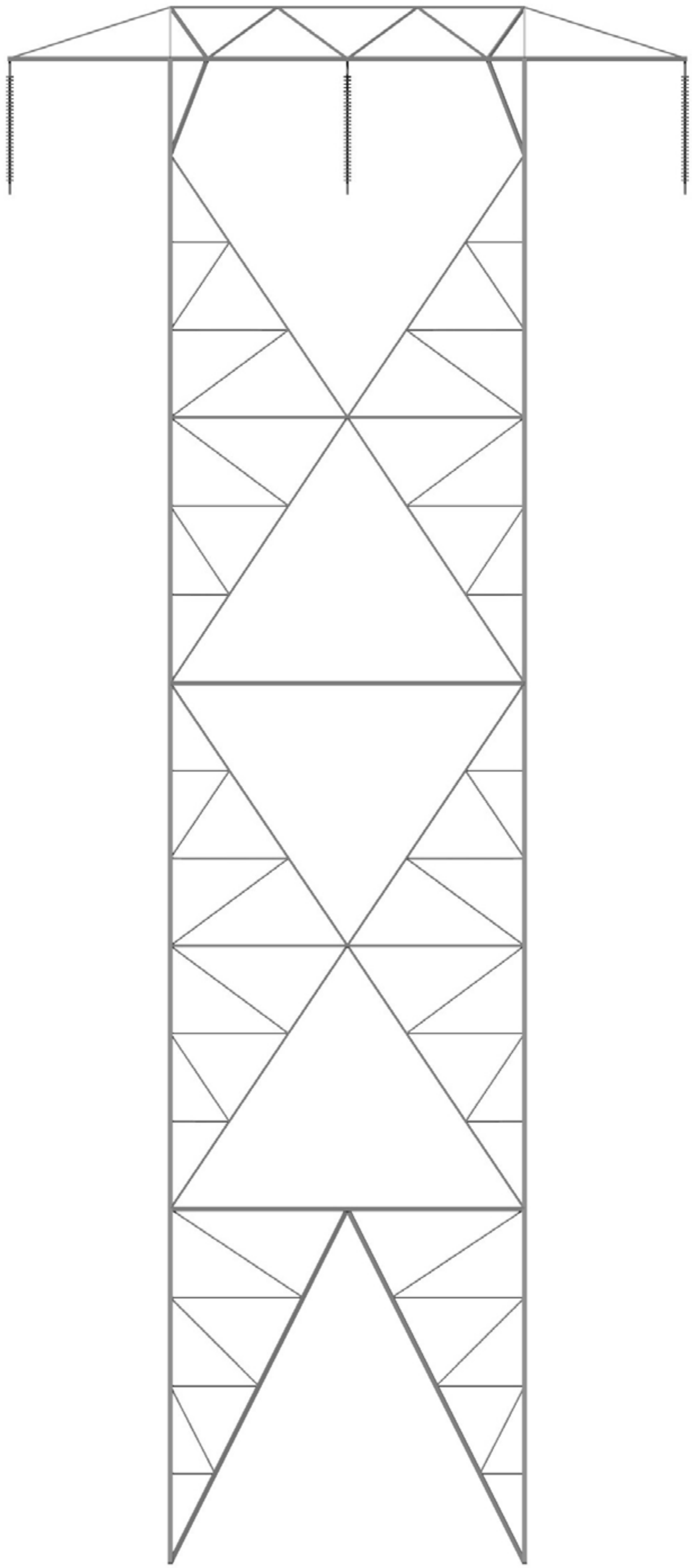

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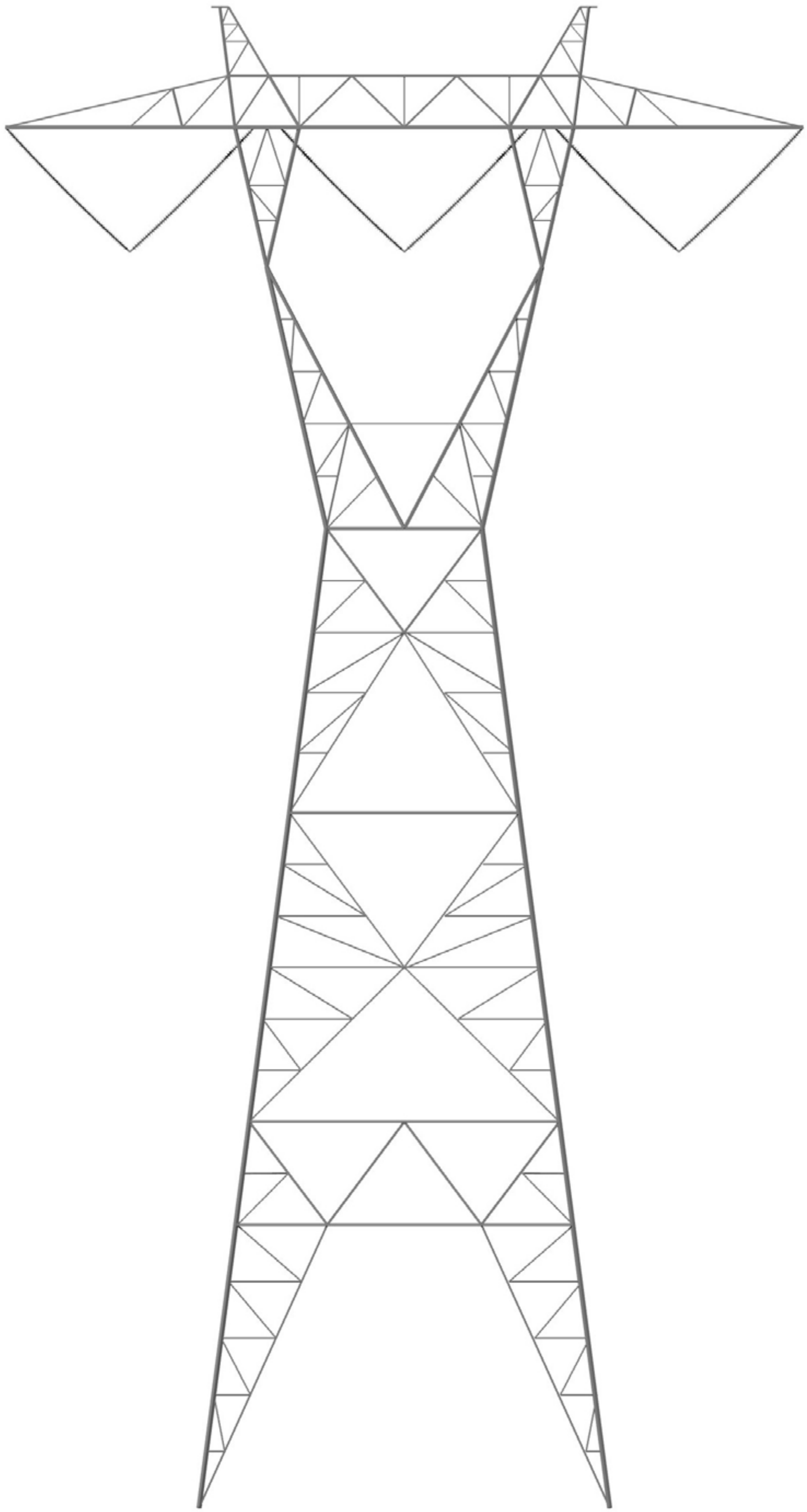
Tehachapi Renewable Transmission Project PEA

Figure 4-1. 220 kV SINGLE-CIRCUIT LATTICE STEEL TOWER

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL℠ Company



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Tehachapi Renewable Transmission Project PEA

Figure 4-2. 500 kV SINGLE-CIRCUIT LATTICE STEEL TOWER

SOUTHERN CALIFORNIA EDISON
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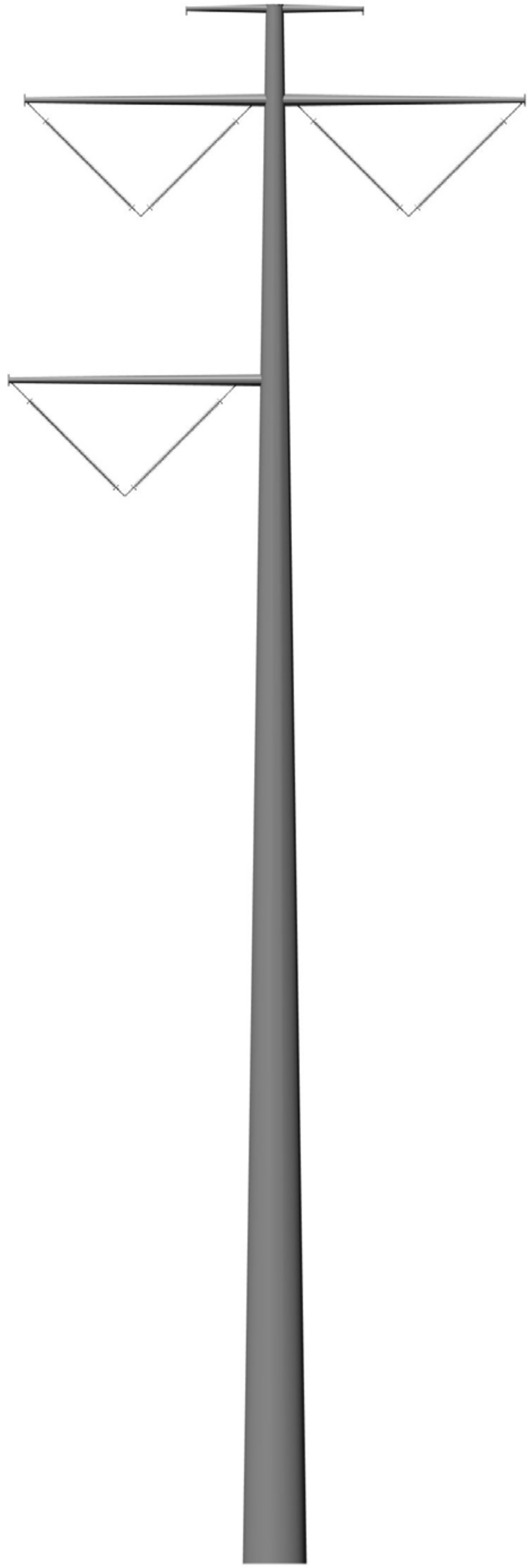

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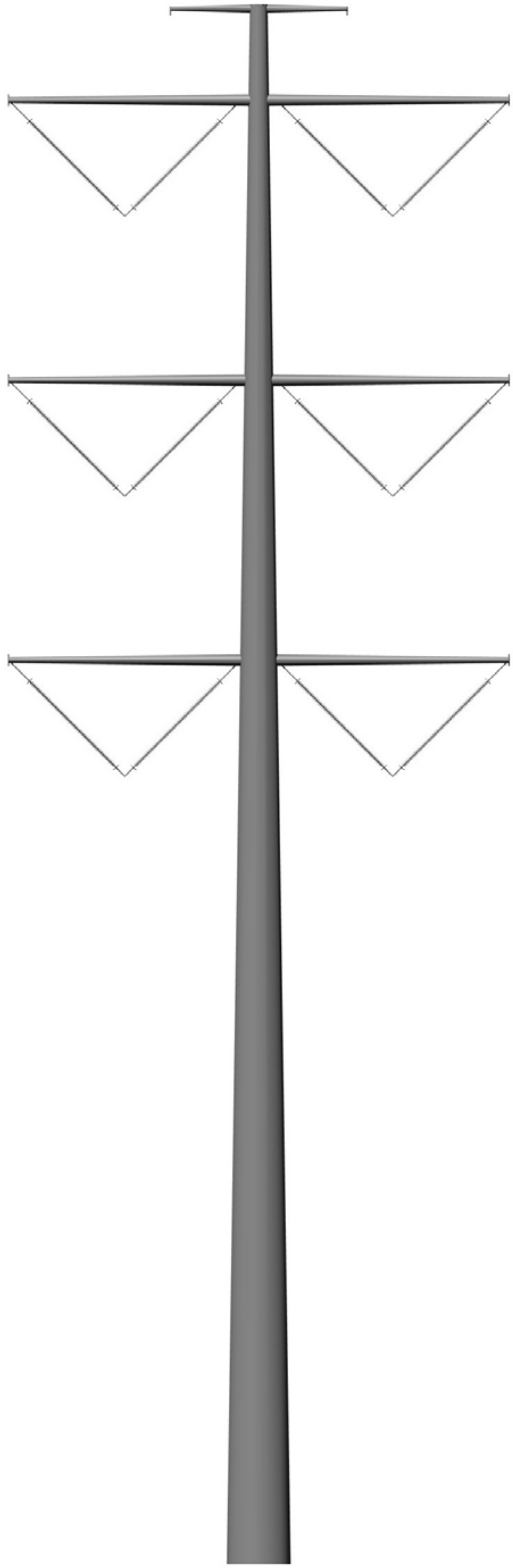
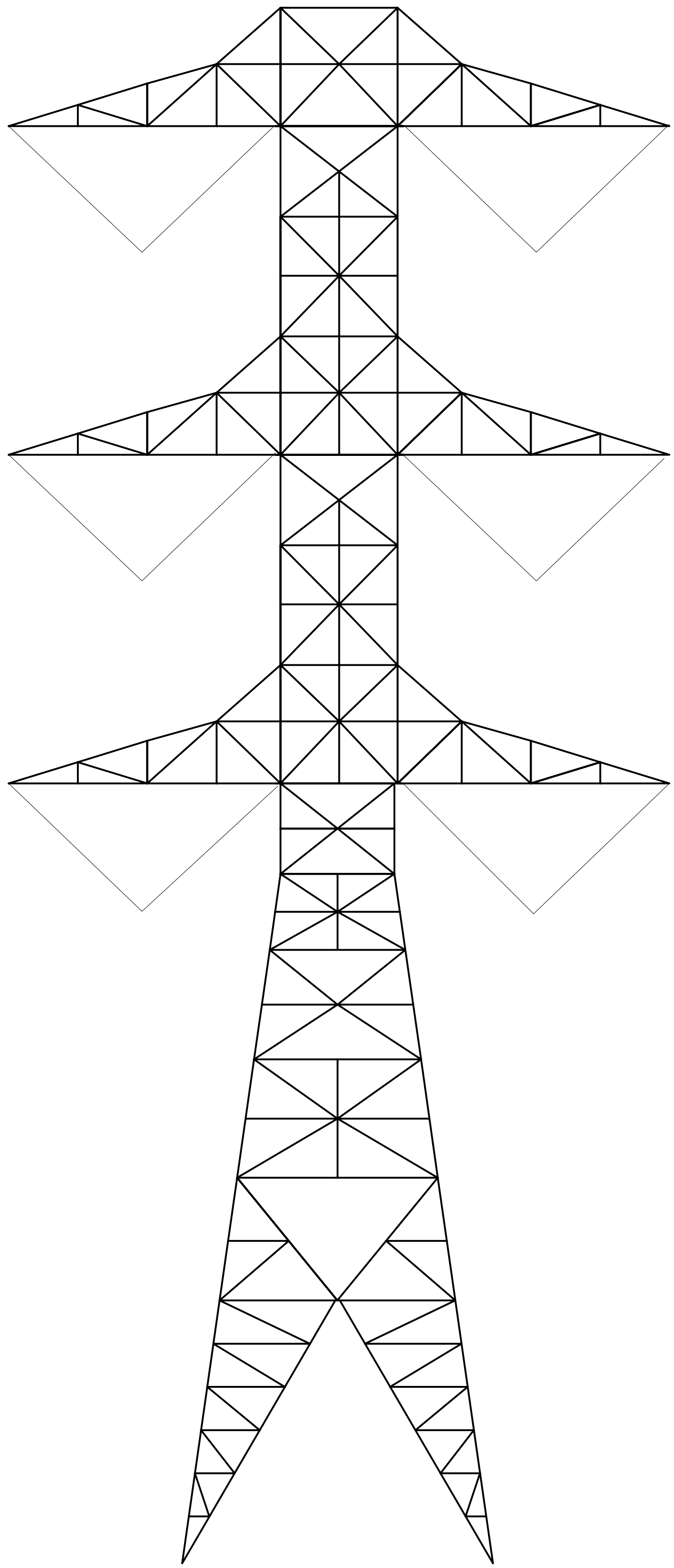
ES022007005SCO346851.KK.01.06 TRTP_NTR.013.ai 8/07



	2007	**Tehachapi Renewable Transmission Project PEA**	Figure 4-4. 500 kV DOUBLE-CIRCUIT TUBULAR STEEL POLE	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company



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Tehachapi Renewable Transmission Project PEA

Figure 4-5. 500 kV DOUBLE-CIRCUIT LATTICE STEEL TOWER

SOUTHERN CALIFORNIA EDISON
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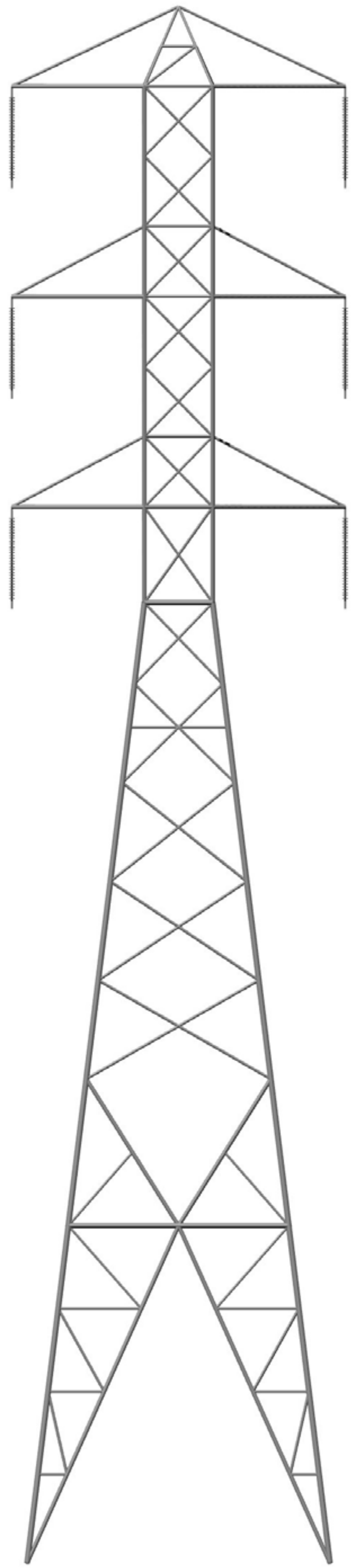

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Tehachapi Renewable Transmission Project PEA

Figure 4-6. 220 kV DOUBLE-CIRCUIT LATTICE STEEL TOWER

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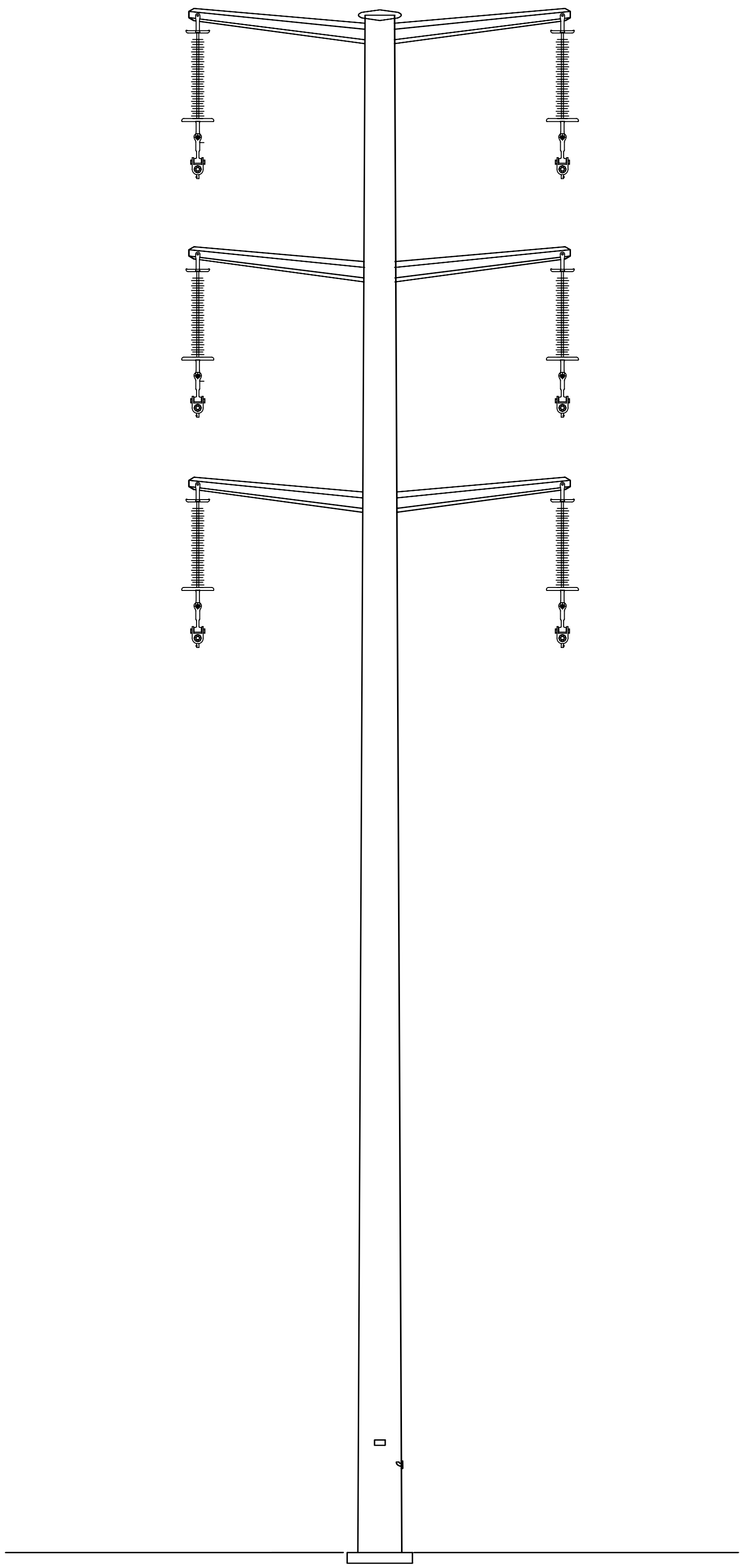

ERECTION DRAWING

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Tehachapi Renewable Transmission Project PEA

Figure 4-7. TYPICAL DOUBLE-CIRCUIT 66 kV TUBULAR STEEL POLE

SOUTHERN CALIFORNIA EDISON

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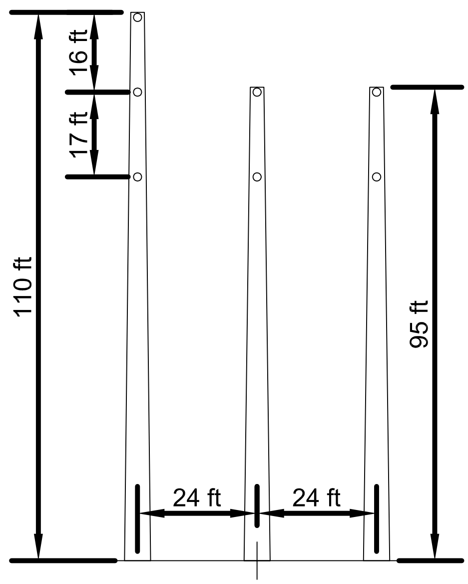
220kV DC 3-POLE DE



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Tehachapi Renewable Transmission Project PEA

Figure 4-8. TYPICAL DOUBLE-CIRCUIT 220 kV 3-POLE STEEL DEAD-END

SOUTHERN CALIFORNIA EDISON
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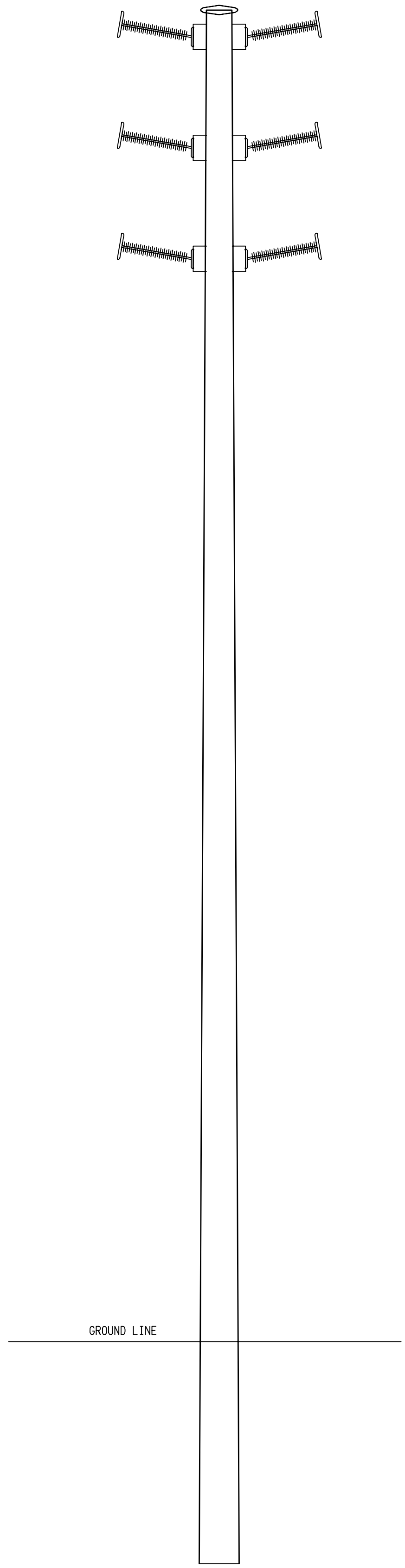

ERECTION DRAWING

	2007	**Tehachapi Renewable Transmission Project PEA**	Figure 4-9. TYPICAL 66 kV LIGHT WEIGHT STEEL POLE	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

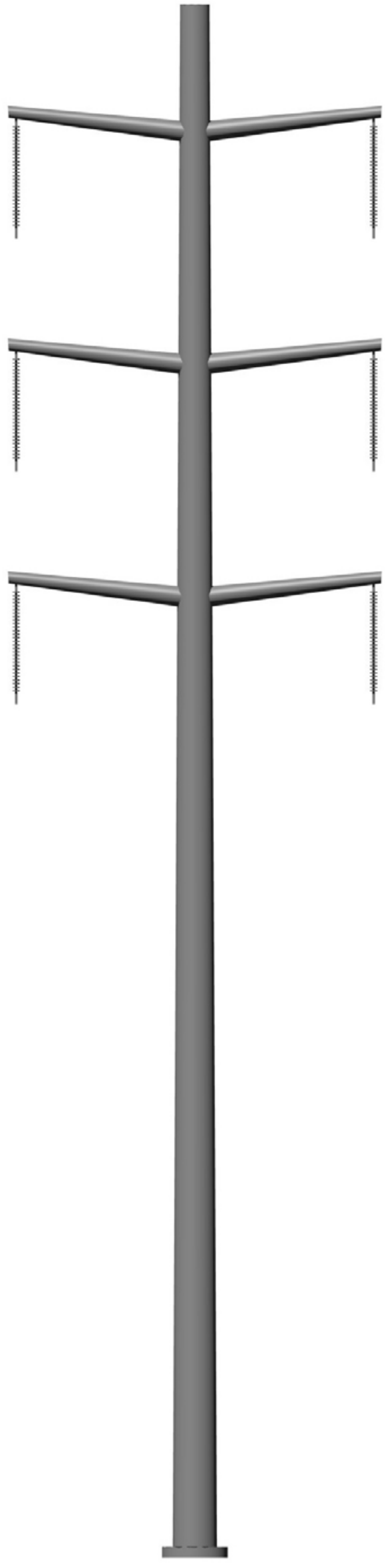

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Figure 4-10. 220 kV DOUBLE-CIRCUIT TUBULAR STEEL POLE

SOUTHERN CALIFORNIA EDISON

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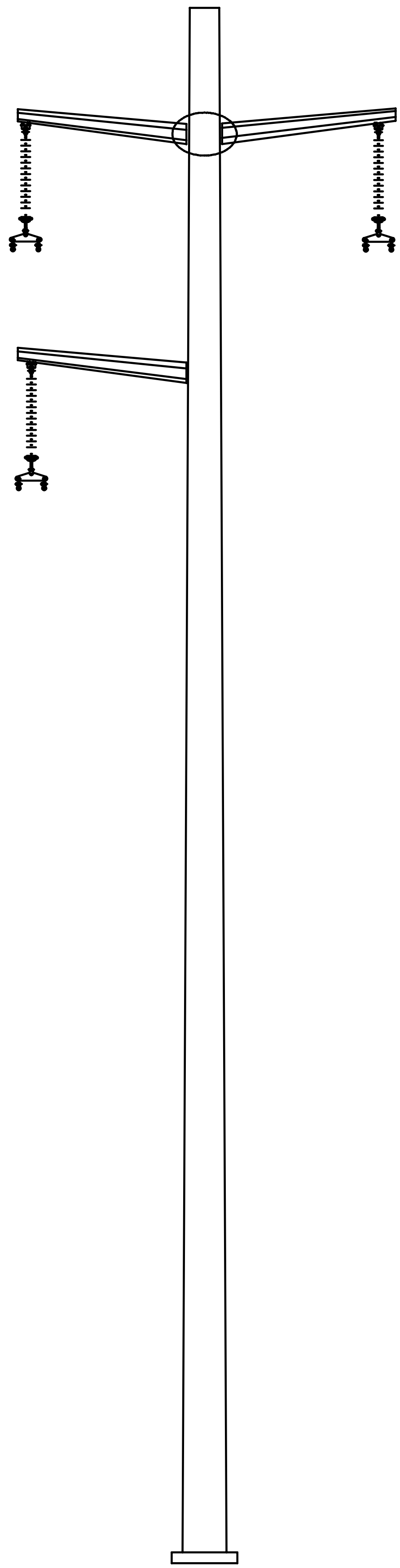

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Figure 4-11. 220 kV SINGLE-CIRCUIT TUBULAR STEEL POLE

SOUTHERN CALIFORNIA EDISON
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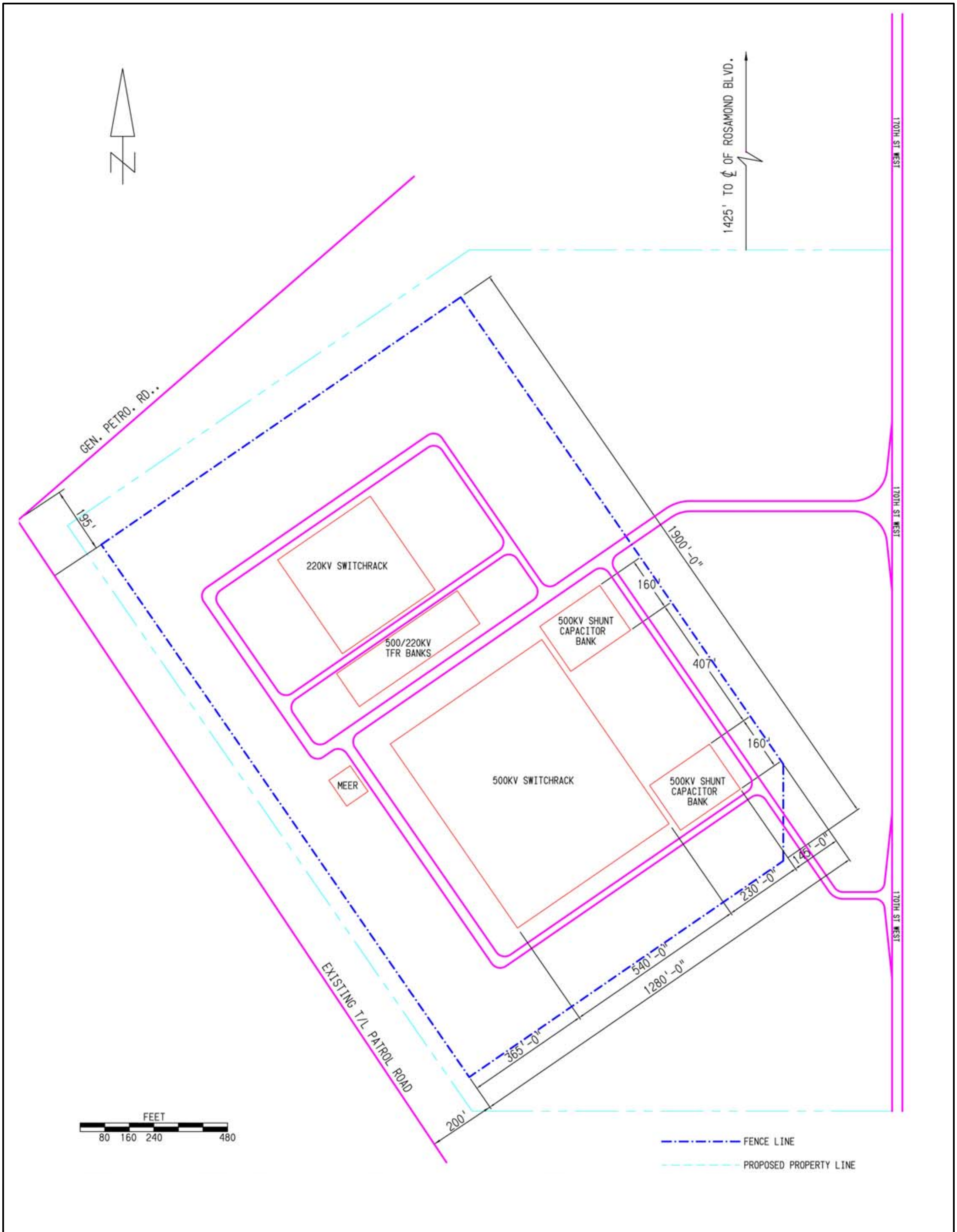

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Figure 4-12. WHIRLWIND SUBSTATION

SOUTHERN CALIFORNIA EDISON
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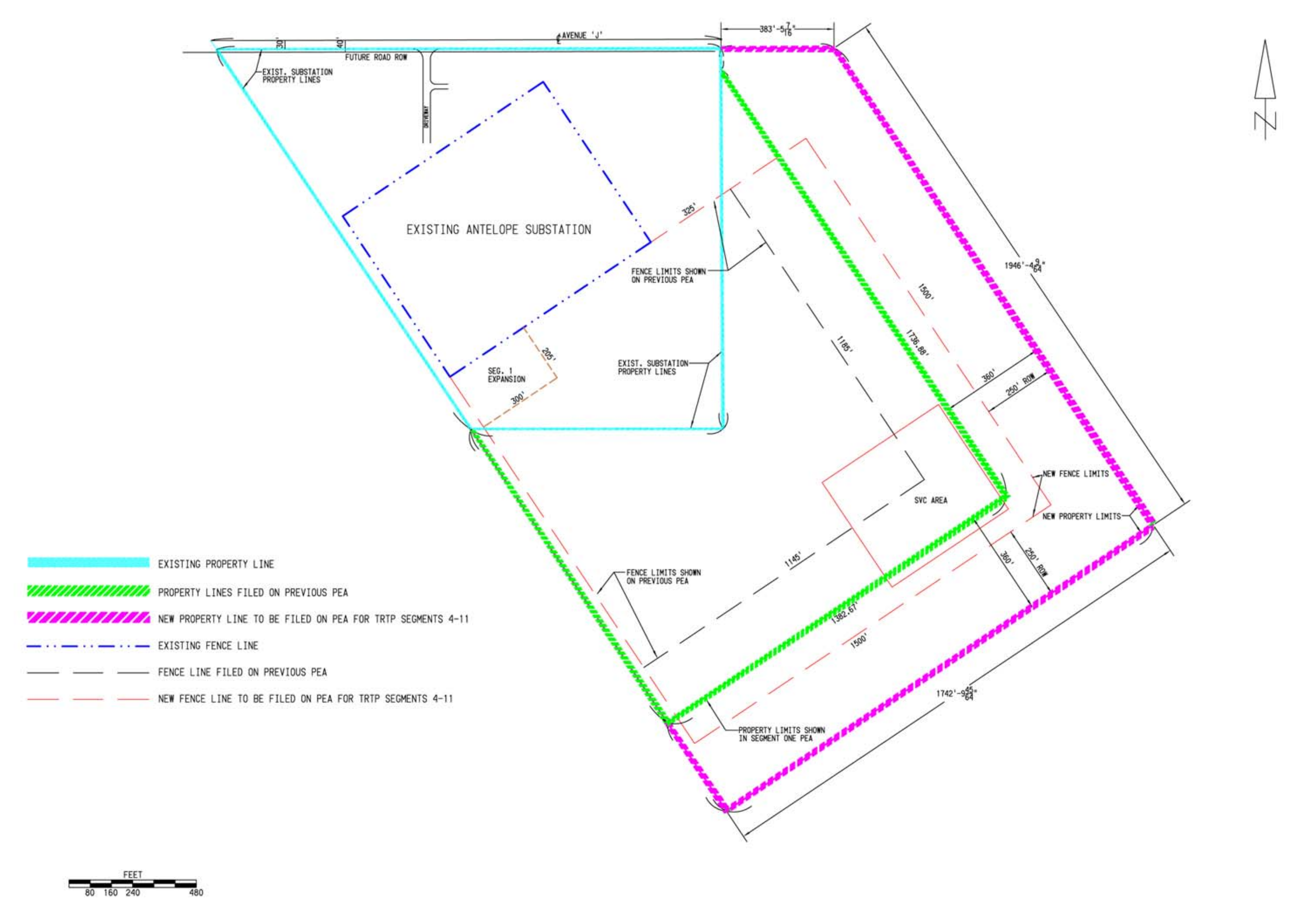

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Figure 4-13. ANTELOPE SUBSTATION

SOUTHERN CALIFORNIA EDISON
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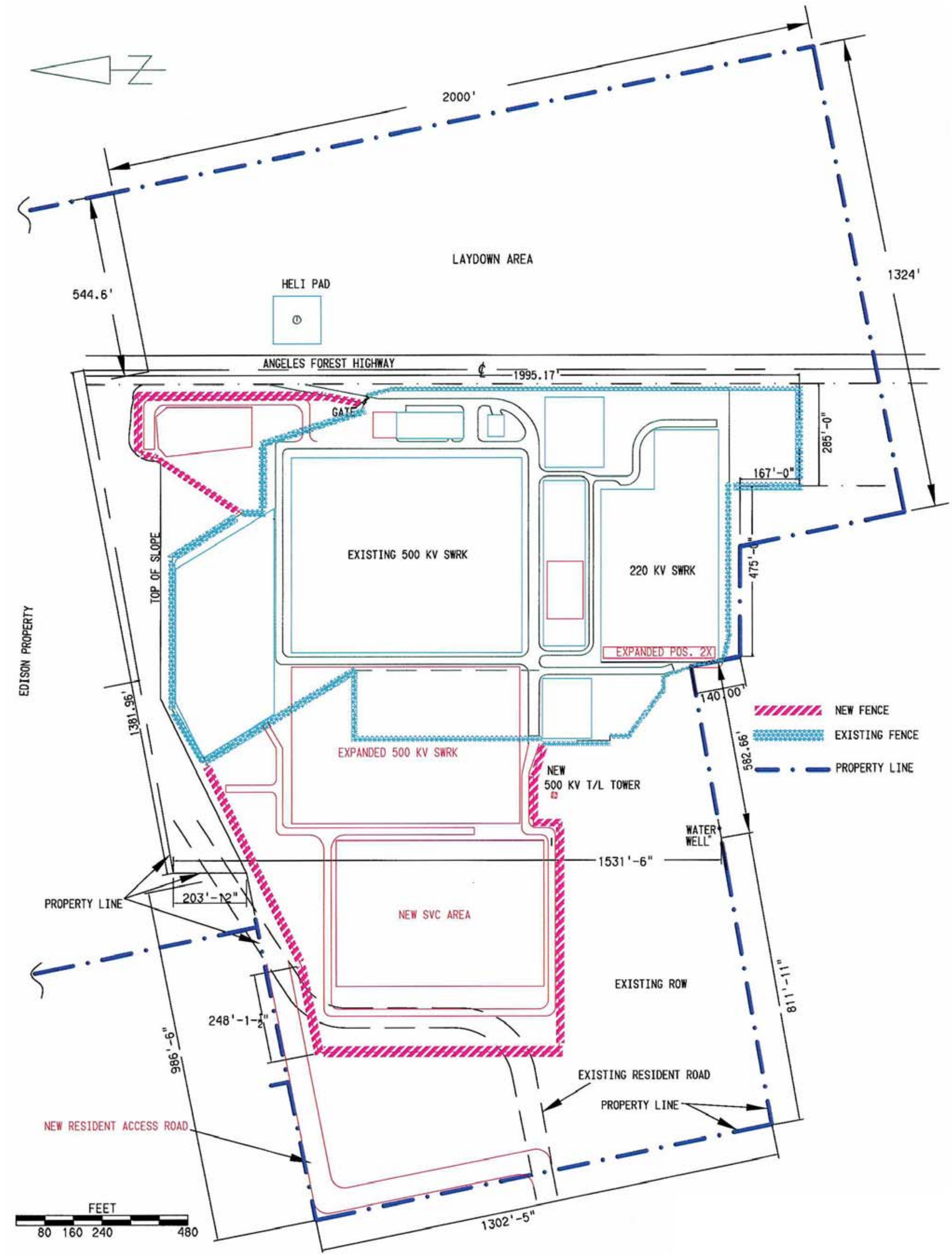

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Figure 4-14. VINCENT SUBSTATION

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL™ Company

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5.0 Existing Noise Environment

5.1 Introduction

This section documents the existing noise conditions in each of the proposed Project segments. The existing noise environments presented in this section are based on the ambient noise surveys and existing corona noise modeling conducted for the TRTP. Figures and tables referenced are included in the text or at the end of the section. Figures 5.1-1 and 5.1-2 depict the noise monitoring locations.

5.2 Ambient Noise Survey

Ambient noise surveys were conducted at 14 representative locations to assess the existing ambient noise levels of the representative locations from July 31, 2007, through August 3, 2007; and from August 13, 2007, through August 15, 2007. Continuous unattended long-term monitoring stations were established at 12 locations from Palmdale to Chino Hills. Because long-term monitoring locations were unavailable in the northern rural area of the proposed Project, short-term attended measurements were collected at two locations in the northern Antelope Valley: (1) the western terminus of the paved portion of Backus Road and (2) the junction of Rosamond Boulevard and 170th Street W (Figure 5.2-1 and Figure 5.2-2). The following range of noise levels were reported at each of the monitoring sites:

Site 1 – Backus Road, Northern Antelope Valley (short-term noise monitoring)

- 45 dBA L_{eq}

Site 2 – Rosamond Boulevard and 170th Street W, near proposed Whirlwind Substation (short-term noise monitoring)

- 40 dBA L_{eq}

Site 3 – Parkwood Drive, Palmdale (long-term noise monitoring, influenced by high winds)

- Minimum Hourly: 57 dBA L_{eq} (12:00 p.m.)
- Maximum Hourly: 78 dBA L_{eq} (6:00 p.m.)

Site 4 – Foreston Road, near Vincent Substation (long-term noise monitoring)

- Minimum Hourly: 45 dBA L_{eq} (1:00 a.m.; 9:00 a.m.; 12:00 p.m.)
- Maximum Hourly: 55 dBA L_{eq} (6:00 a.m.)

Site 5 – Valley View Park, Duarte (long-term noise monitoring)

- Minimum Hourly: 39 dBA L_{eq} (11:18 a.m.)
- Maximum Hourly: 70 dBA L_{eq} (2:18 p.m.)

Site 6 – Rose Hills Memorial Park, Whittier (long-term noise monitoring)

- Minimum Hourly: 45 dBA L_{eq} (10:00 p.m.; 11:00 p.m.; 12:00 a.m.; 1:00 a.m.; 2:00 a.m.; 3:00 a.m.)
- Maximum Hourly: 53 dBA L_{eq} (7:00 a.m.; 2:00 p.m.)

Site 7 – Mesa Substation, Monterey Park (long-term noise monitoring)

- Minimum Hourly: 52 dBA L_{eq} (2:00 a.m.)
- Maximum Hourly: 63 dBA L_{eq} (6:00 a.m.)

Site 8 – Skyline Trail, Hacienda Heights (long-term noise monitoring)

- Minimum Hourly: 43 dBA L_{eq} (12:00 a.m.; 2:00 a.m.; 3:00 a.m.)
- Maximum Hourly: 57 dBA L_{eq} (1:00 p.m.)

Site 9 – Thoroughbred Street, Ontario (long-term noise monitoring)

- Minimum Hourly: 47 dBA L_{eq} (3:00 a.m.; 4:00 a.m.)
- Maximum Hourly: 58 dBA L_{eq} (6:00 a.m.)

Site 10 – Pacific Crest Trail, Angeles National Forest (long-term noise monitoring)

- Minimum Hourly: 26 dBA L_{eq} (5:00 a.m.)
- Maximum Hourly: 49 dBA L_{eq} (10:00 p.m.)

Site 11 – Crossroads Park, Chino Hills (long-term noise monitoring)

- Minimum Hourly: 45 dBA L_{eq} (3:00 a.m.)
- Maximum Hourly: 60 dBA L_{eq} (6:00 p.m.; 7:00 p.m.)

Site 12 – Edam Street and Avila Avenue, Chino (long-term noise monitoring)

- Minimum Hourly: 43 dBA L_{eq} (1:00 a.m.; 2:00 a.m.)
- Maximum Hourly: 60 dBA L_{eq} (9:00 a.m.)

Site 13 – Eaton Blanche, Pasadena (long-term noise monitoring)

- Minimum Hourly: 43 dBA L_{eq} (2:00 p.m.)
- Maximum Hourly: 61 dBA L_{eq} (8:00 a.m.)

Site 14 – Sally Tanner Park, Rosemead (long-term noise monitoring)

- Minimum Hourly: 47 dBA L_{eq} (2:00 a.m.; 3:00 a.m.)
- Maximum Hourly: 57 dBA L_{eq} (7:00 a.m.)

The parameters considered during selection of ambient noise measurement locations are provided in Table 5.2-1 and a description of each site and the date each survey was conducted is presented in Table 5.2-2. A summary of 10-minute noise levels collected at Sites 1 and 2 is presented in Table 5.2-3 and a summary of the continuous data collected at Sites 3 through 14 is provided in Table 5.2-4. Complete survey results for Site 1 through Site 14 are presented in Tables 5.2-5 through 5.2-16 and are graphed in Figures 5.2-3 through 5.2-14. Additionally, photographs of each monitoring location are presented in Figure 5.2-15.

5.3 Modeled Existing Transmission Line Corona Noise Levels

The electrical effects of high-voltage transmission lines fall into two broad categories: corona effects and electric field effects.

Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. 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. Corona typically becomes a design concern for transmission lines at 345 kilovolts (kV) and above and is less noticeable on lines operated at lower voltages. (EPRI, 2005)

The electric field gradient that causes corona is the rate at which the strength of the electric field changes with distance and is directly related to the line voltage. The electric field gradient is greatest at the surface of the conductor. Large-diameter conductors have lower electric field gradients at the conductor surface and, hence, lower corona than smaller conductors. Irregularities (such as nicks and scrapes on the conductor surface) or sharp edges on suspension hardware concentrate the electric field at these locations and, thus, increase the electric field gradient and corona at these spots. Similarly, contamination on the conductor surface, such as dust or insects, can cause irregularities that are a source for corona. Corona also increases at higher elevations where the density of the atmosphere is less than at sea level.

Raindrops, snow, fog, hoarfrost, and condensation accumulated on the conductor surface are sources of surface irregularities that can increase corona. During fair weather, the number of these sources of surface irregularities are fewer and the corona effect is also low. However, during wet weather, the number of these sources of surface irregularities increases (for instance due to rain drops standing on the conductor and energized hardware) and corona effects are greater. During wet conditions or foul weather conditions, the conductor will produce the greatest amount of corona noise. However, during heavy rain the ambient noise generated by the falling raindrops will typically be greater than the noise generated by corona.

Corona generates audible noise (AN) during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming noise. The noise 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 right-of-way (ROW) particularly where the line runs near a source of background noise such as a freeway.

Existing corona noise was evaluated at six representative locations. Parameters considered during selection of corona noise modeling locations are provided in Table 5.3-1; the modeling input parameters (i.e. corridor and design elements) are the same as the input parameters used for electric and magnetic field (EMF) modeling conducted by SCE for the proposed TRTP. The following existing scenarios were modeled for audible noise produced by corona at each location. The results of the modeling are shown in Table 5.3-2.

Location 1 – Segment 10

No existing line is present in the corridor; therefore, there is no corona-related noise, and modeling was not warranted.

Location 2 – Pacific Crest Trail (Segment 11)

The Existing Scenario that was modeled consisted of two 220-kV single-circuit lattice steel towers (LSTs) and one single-circuit LST to be built to 500-kV specifications and operated at 220 kV. Corona modeling inputs included 15 total conductors, of which 9 are energized phases and 6 are ground wires. An elevation of 4,900 feet above mean seal level (msl) was used for Location 2 (Figure 5.3-1).

Location 3 – Chino Hills (Segment 8A)

The existing line in Chino Hills is currently idle (not energized); therefore, there is no corona-related noise, and modeling was not warranted.

Location 4 – Duarte (End of Segment 6/Beginning of Segment 7)

The Location 4 Existing Scenario was modeled with one 220-kV double-circuit LST and one 220-kV single-circuit LST. The corona modeling inputs included 12 total conductors, of which 9 are energized phases and 3 are ground wires. An elevation of 1,400 feet above msl was used for Location 4 (Figure 5.3-2).

Location 5 – South of Vincent Substation

The Location 5 Existing Scenario was modeled with eight 220-kV single-circuit LSTs. The corona modeling inputs included 40 total conductors, of which 24 are energized phases and 16 are ground wires. An elevation of 3,225 feet above msl was used for Location 5 (Figure 5.3-3).

Location 6 – Pathfinder Park (Segment 8)

The Location 6 Existing Scenario was modeled with one 220-kV double-circuit LST and one 220-kV single-circuit LST. The corona modeling inputs included 12 total conductors, of which 9 are energized phases and 3 are ground wires. An elevation of 700 feet above msl was used for Location 6 (Figure 5.3-4).

Location 7 – Segment 4

The Location 7 Existing Scenario was modeled with one 500-kV single-circuit LST and two 220-kV single-circuit LST. Corona modeling inputs included 15 total conductors, of which 9 are energized phases and 6 are ground wires. An elevation of 2,600 feet was used for Location 7 (Figure 5.3-5).

5.4 Noise Sensitive Receptors/Uses

Noise-sensitive land uses generally are defined as locations where people reside or where the presence of unwanted sound could adversely affect the designated use of the land. Typically, noise-sensitive land uses include residential, hospitals, places of worship, libraries, and schools, as well as nature and wildlife preserves and parks. The locations of sensitive receptors within 2,000 feet of the TRTP are shown on Figure 5.4-1 and Figure 5.4-2. A list of sensitive receptors within the 2,000 feet of the proposed TRTP is provided in Table 5.4-1.

5.5 Existing Noise Environment

The existing noise environment, including noise sensitive receptors, ambient noise, and corona noise, for Segments 4 through 11 of the proposed TRTP is described below. The study area for the noise environment is defined as 2,000 feet each side of centerline of the proposed alignment or 2,000 feet from the perimeter of each substation.

5.5.1 Segment 4

Segment 4 starts at the future Cottonwind Substation location and ends at the existing Antelope Substation. There are very few residences within the Segment 4 study area. There are no hospitals, libraries, schools, places of worship, or other facilities in the study area. The setting is rural and undeveloped in nature and includes agricultural farmlands.

The noise measurements taken at the junction of 170th Avenue and Rosamond Boulevard (Site 2) are representative of the noise levels in the Segment 4 study area and other less developed rural locations. Site 2 is located in Segment 10 at a point close to Segment 4. The L_{eq} and L_{90} noise levels measured during one daytime 10-minute period at this site were 40 dBA and 24 dBA, respectively. These levels are consistent with the range typically measured in rural areas.

An estimate of existing transmission line corona noise from this segment of the proposed alignment was made based on modeling conducted at Corona Modeling Location 7 – Segment 4. Existing fair and rainy weather corona noise were estimated to be less than 55 dBA at the edge of the ROW.

5.5.2 Segment 5

Segment 5 starts at the existing Antelope Substation and ends at the existing Vincent Substation. The Segment 5 study area passes through or near the western limits of the cities of Lancaster and Palmdale. Residential areas and a long-term care facility are within the Segment 5 study area. Multiple large-scale residential developments are proposed or under construction along the segment.

The noise measurements taken at the end of Parkwood Drive, in a residential area next to the existing transmission line in the southern portion of the Segment 5 at Site 3, are representative of noise levels in this study area. The hourly L_{eq} noise levels measured over a 24-hour period ranged from 57 to 78 dBA at this site. The hourly L_{90} noise levels measured at this site over the same 24-hour time period ranged from 43 to 72 dBA. The DNL noise level was 75 dBA. The monitoring results were likely elevated by high winds and construction activities in the distance (approximately 1/2 mile away) that were noted during field visits. Under calmer conditions the expected noise level would be lower. The monitoring location was located above the residential area, near the side of a hill. In the vicinity of State Route (SR) 14 near the southerly end of Segment 5, noise levels are louder due to SR 14 traffic. Existing noise levels from SR 14 average between 70 dBA to over 80 dBA. (CPUC, 2006)

An estimate of existing transmission line corona noise from this segment of the proposed alignment was made based on modeling conducted at Corona Modeling Location 4 – Duarte. This modeling location is in Segment 7; however, the characteristics of the transmission lines in both segments are similar. Existing fair weather corona noise was estimated to be less than 20 dBA at 2,000 feet from the line. Rainy weather corona noise was estimated to range from 27 dBA at 50 feet from the transmission line to less than 20 dBA at 2,000 feet from the line.

5.5.3 Segment 6

Segment 6 starts at the existing Vincent Substation and ends at the southern boundary of the Angeles National Forest (ANF) and is located almost entirely within the ANF. Other than residences near the Angeles Forest Highway immediately south of the Vincent Substation, there are no residences, hospitals, libraries, schools, places of worship, or other facilities in the Segment 6 study area. The setting is rural at the north end of the segment and generally undeveloped open space across the ANF. The primary noise receptors along this segment are recreationists in the ANF.

No noise measurements were conducted in Segment 6; however, the noise measurement conducted in the ANF portion of Segment 11 (Site 10) is representative of the noise level in this segment. The hourly L_{eq} noise levels measured over a 24-hour period ranged from 26 to 49 dBA at Site 10. The hourly L_{90} noise levels measured at Site 10 over the same 24-hour time period ranged from 20 to 40 dBA. The DNL noise level was 45 dBA.

An estimate of existing transmission line corona noise from this segment of the proposed alignment was made based on modeling conducted at Corona Modeling Location 2 – Pacific Crest Trail. This modeling location is in Segment 11; however, the characteristics of the existing transmission lines in both segments are similar. Existing fair weather corona noise was estimated to be less than 20 dBA at the transmission line. Rainy weather corona noise was estimated to range from 27 dBA at 50 feet from the transmission line to less than 20 dBA at 2,000 feet from the line.

5.5.4 Segment 7

Segment 7 starts at the northern, undeveloped boundary of Duarte before emerging into the populated residential area of Duarte and ends at the existing Mesa Substation. Noise receptors include residences, schools, healthcare facilities, and nature and wildlife preserves and parks.

A noise measurement was conducted in this segment in a residential area (Site 5) of Duarte. The hourly L_{eq} noise levels measured over a 24-hour period ranged from 43 to 71 dBA at this site. The hourly L_{90} noise levels measured at this site over the same 24-hour time period ranged from 39 to 59 dBA. The DNL noise level was 61 dBA.

An estimate of existing transmission line corona noise from this segment of the proposed alignment was made based on modeling conducted at Corona Modeling Location 4 – Duarte. Existing fair weather corona noise was estimated to be less than 20 dBA at 2,000 feet from the line. Rainy weather corona noise was estimated to range from 27 dBA at 50 feet from the transmission line to less than 20 dBA at 2,000 feet from the line.

5.5.5 Segment 8

Segment 8 starts near the existing Mesa Substation and ends at the existing Mira Loma Substation. It traverses highly developed and densely populated areas of the Los Angeles metropolitan area. Noise receptors include residences, schools, health care facilities, and nature and wildlife preserves and parks.

Noise measurement surveys were conducted in this segment in residential areas (Site 9 – Thoroughbred Street, Ontario; and Site 12 – Edam Street and Avila Avenue, Chino) and in parks and open space areas (Site 6 – Rose Hills Cemetery, Whittier; Site 8 – Skyline Trail, Hacienda Heights; and Site 11- Crossroads Park, Chino Hills). The hourly L_{eq} noise levels measured over 24-hour periods ranged from 43 to 60 dBA at Sites 8, 9, 11, and 12 and from 45 to 53 dBA at Site 6. The hourly L_{90} noise levels measured at these sites over the same 24-hour time periods ranged from 38 to 56 dBA at Sites 8, 9, 11, and 12 and from 41 to 49 dBA at Site 6. The DNL noise level varied from 54 to 58 dBA at Sites 8, 9, 11, and 12 and was 54 dBA at Site 6.

An estimate of existing transmission line corona noise at this segment of the proposed alignment was made based on modeling conducted at Corona Modeling Location 6 – Pathfinder Park. Existing fair weather corona noise was estimated to be less than 20 dBA. Rainy weather corona noise was estimated to range from 27 dBA at 100 feet from the transmission line to less than 20 dBA at 2,000 feet from the line. The existing transmission line in this segment is not energized near Corona Modeling Location 3 – Chino Hills. Therefore, there is no existing corona noise at Location 3 – Chino Hills.

5.5.6 Segment 9 (Substations)

Segment 9 includes construction of the new Whirlwind Substation, expansion of the Antelope and Vincent Substations (the only substations where the proposed Project has the potential to change the noise levels), and minor upgrades of the Mesa, Gould, and Mira Loma Substations. There are several sensitive noise receptors in the general vicinity of the Antelope, Vincent, and Mesa Substations. The area near the Vincent Substation is rural in character, surrounded by scattered residences. Highway 14 is located approximately less than 1 mile from the Vincent Substation. The Mesa Substation is near Highway 60 and Potrero Grande Road and the surrounding area is affected by noise from these roads. A residential area is located to the north of the Mesa Substation.

Noise measurements were conducted next to the Vincent and Mesa substations (Site 4 and Site 7, respectively). The hourly L_{eq} noise levels measured over 24-hour periods ranged from 45 to 55 dBA at the Vincent Substation site and from 52 to 63 dBA at the Mesa Substation site. The hourly L_{90} noise levels measured at these sites over the same 24-hour periods ranged from 41 to 53 dBA at the Vincent Substation site and from 49 to 58 dBA at the Mesa Substation site. The DNL noise levels were 57 dBA at the Vincent Substation site and 64 dBA at the Mesa Substation site.

The modeled existing transformer noise at the Vincent Substation results in 51 dBA at the closest residence. At the Antelope Substation, the modeled existing level at the resident closest to the expansion is 46 dBA. In addition to the substation noise from the transformers, there is existing noise from the transmission lines entering, leaving, and within the substation.

An estimate of existing transmission line corona noise from this segment of the proposed alignment was made based on modeling conducted at Corona Modeling Location 5 – Vincent Substation. Existing fair weather corona noise was estimated to be less than 20 dBA at the transmission line. Rainy weather corona noise was estimated to range from 28 dBA at 50 feet from the transmission line to less than 20 dBA at 2,000 feet from the line.

5.5.7 Segment 10

Segment 10 starts at the Windhub Substation and ends at the proposed new Whirlwind Substation. Few residences are located along Segment 10 and Alternatives 10A and 10B of the proposed alignment. There are no hospitals, libraries, schools, places of worship, or other facilities. The setting is rural and undeveloped in nature and includes agricultural farmlands.

The noise measurements conducted in this segment at the west paved terminus of Backus Road (Site 1) and at the junction of Rosamond Boulevard and 170th Street (Site 2) should be generally representative of the noise levels in Segment 10. The L_{eq} noise levels measured over 10-minute periods were 45 dBA at Site 1 and 40 dBA at Site 2. The L_{90} noise levels measured over these same time periods were 28 dBA at Site 1 and 24 dBA at Site 2.

There are no existing transmission lines in this segment of the proposed alignment and, therefore, there is no existing corona noise.

5.5.8 Segment 11

Segment 11 starts at the existing Vincent Substation and ends at the existing Mesa Substation. Most of the northern portion of Segment 11 is located within the ANF. There are no residences, hospitals, libraries, schools, places of worship, or other facilities near the alignment in the ANF. The setting is rural at the north end of the segment, immediately south of Vincent Substation, and generally undeveloped open space across the ANF. The primary noise receptors along this segment are people hiking or camping in the ANF, and residences located near Vincent Substation.

The southern portion of Segment 11 enters La Cañada Flintridge and the northern end of Pasadena and continues south into populated areas in the San Gabriel Valley. Noise receptors located south of the ANF on this segment include residences, industries, businesses, schools, and hospitals.

The noise measurements conducted in this segment occurred at the Pacific Crest Trail in the ANF (Site 10) and residential areas (Sites 13 – Eaton Blanche Park, Pasadena and 14 – Sally Tanner Park, Rosemead). The hourly L_{eq} noise levels measured over a 24-hour period ranged from 26 to 49 dBA at Site 10, from 43 to 61 dBA at Site 13, and 47 to 57 dBA at Site 14. The hourly L_{90} noise levels measured over the same 24-hour period ranged from less than 20 to 40 dBA at Site 10, from 39 to 46 dBA at Site 13, and from 45 to 51 dBA at Site 14.

An estimate of existing transmission line corona noise at the northern portion of this segment of the proposed alignment to the Gould Substation (the portion of the transmission line on the ANF) was based on modeling conducted at Corona Modeling Location 2 – Pacific Crest Trail. Existing fair weather corona noise was estimated to be less than 20 dBA at the transmission line. Rainy weather corona noise was estimated to range from 27 dBA at 50 feet from the transmission line to less than 20 dBA at 2,000 feet from the line.

An estimate of existing transmission line corona noise at the southern portion of this segment of the proposed alignment from Gould Substation to Mesa Substation was based on modeling conducted at Corona Modeling Location 4 – Duarte. Modeling Location 4 is in Segment 7; however, the characteristics of this segment are similar to Segment 7. Existing fair weather corona noise was estimated to be less than 20 dBA at the transmission line. Rainy weather corona noise was estimated to range from 27 dBA at 50 feet from the transmission line to less than 20 dBA at 2,000 feet from the line.

TABLE 5.2- 1
Ambient Noise Monitoring Locations – Parameters Considered
Tehachapi Renewable Transmission Project

Ambient Noise Monitoring Location	Parameters Considered During Selection of Ambient Noise Location	Segment Along Which Similar Conditions Exist in Portions of the Alignment
1 – Backus Road, Kern County (Segment 10/10A)	Receptors: Scattered residences; rural in nature	4, 5
	Development: Low	
	Existing configuration: none	NA
2 – 170th Avenue and Rosamond Boulevard, Rosamond (Segment 10A)	Receptors: Scattered residences; rural in nature	4, 5
	Development: Low	
	Existing configuration: none	NA
3 – Parkwood Drive, Palmdale (Segment 5)	Receptors: Residential	5, 7, 8A, 8B, 8C, 11
	Development: Moderate	
	Existing configuration: numerous lines	5, 7, 8A, 8B, 8C, 11
4 – Vincent Substation	Receptors: Residential	9
	Development: Moderate	
	Existing configuration: numerous lines	9
5 – Valley View Park, Duarte (Segment 7)	Receptors: Residential/ Outside activities/Recreation	5, 7, 8A, 8B, 8C, 11
	Development: High	
	Existing configuration: 2- 220 kV	5, 7, 8A, 8B, 8C, 11
6 – Rose Hills Memorial Park, Whittier (Segment 8)	Receptors: Outside activities	6, 11
	Development: Low	
	Existing configuration: 2- 220 kV	6, 11
7 – Mesa Substation	Receptors: Residential	9
	Development: Moderate	
	Existing configuration: numerous lines	9
8 – Skyline Trail, Hacienda Heights (Segment 8)	Receptors: Residential, Outside activities/Recreation	5, 7, 8A, 8B, 8C, 11
	Development: Moderate	
	Existing configuration: 2- 220 kV	5, 7, 8A, 8B, 8C, 11
9 – Thoroughbred Street, Ontario (Segment 8B)	Receptors: Residential	5, 7, 8A, 8B, 8C, 11
	Development: Moderate	
	Existing configuration: 2- 220 kV	5, 7, 8A, 8B, 8C, 11
10 – Pacific Crest Trail, Angeles National Forest (Segment 11)	Receptors: Residential, Outside activities/Recreation	6, 11
	Development: Low	
	Existing configuration: High elevation, 2- 220 kV	6, 11
11 – Crossroads Park, Chino Hills (Segment 8A)	Receptors: Residential/ Outside activities/Recreation	5, 7, 8A, 8B, 8C, 11
	Development: Moderate	
	Existing configuration: 1- 220 kV	5, 7, 8A, 8B, 8C, 11

TABLE 5.2- 1
Ambient Noise Monitoring Locations – Parameters Considered
Tehachapi Renewable Transmission Project

Ambient Noise Monitoring Location	Parameters Considered During Selection of Ambient Noise Location	Segment Along Which Similar Conditions Exist in Portions of the Alignment
12 – Edam Street and Avila Avenue, Chino (Segment 8B)	Receptors: Residential	5, 7, 8A, 8B, 8C, 11
	Development: Moderate	
	Existing configuration: 2- 220 kV	5, 7, 8A, 8B, 8C, 11
13 – Eaton Blanche Park, Pasadena (Segment 11)	Receptors: Outside activities/Recreation	5, 7, 8A, 8B, 8C, 11
	Development: Moderate	
	Existing configuration: 1- 220 kV double circuit, 2- 66 kV, 1- 220 kV single circuit	5, 7, 8A, 8B, 8C, 11
14 – Sally Tanner Park, Rosemead (Segment 11)	Receptors: Residential/ Outside activities/Recreation	5, 7, 8A, 8B, 8C, 11
	Development: Moderate	
	Existing configuration: 1- 220 kV double circuit, 2- 66 kV, 1- 220 kV single circuit	5, 7, 8A, 8B, 8C, 11

TABLE 5.2- 2
Monitoring Site Locations – Description and Date(s) Monitored
Tehachapi Renewable Transmission Project

Noise Monitoring Location	Description	Segment	Primary Noise Source	Date(s) Monitored	Weather Conditions[a]
1 – Backus Road, Kern County (Segment 10/10A)	Rural	10	Tehachapi Willow Springs Road	8/1/07	Sky: Clear WS: 10-15 mph Temperature: 85º F RH: 24%
2 – 170th Avenue and Rosamond Boulevard, Rosamond (Segment 10A)	Rural	4	Rosamond Boulevard	8/1/07	Sky: Clear WS: 10-15 mph Temperature: 85º F RH: 24%
3 – Parkwood Drive, Palmdale (Segment 5)	Residential	5	Residential streets	7/31/07-8/1/07	Sky: Clear WS: Calm to 23 mph* Temperature: 70-100º F RH: 8-43%
4 – Vincent Substation	Rural	9 – Vincent Substation	Highway 14	7/31/07-8/1/07	Sky: Clear WS: Calm to 23 mph Temperature: 70-100º F RH: 8-43%
5 – Valley View Park, Duarte (Segment 7)	Residential	7	Residential streets, park activities	8/14/07-8/15/07	Sky: Clear WS: Calm Temperature: 68-86º F RH: 43-78%
6 – Rose Hills Memorial Park, Whittier (Segment 8)	Cemetery	8A	Cemetery activities	8/13/07-8/14/07	Sky: Clear WS: Less than 7 mph Temperature: 67-90º F RH: 30-80%
7 – Mesa Substation	Residential	9 – Mesa Substation	Highway 60 and Potrero Grande Drive	8/13/07-8/14/07	Sky: Clear WS: Less than 7 mph Temperature: 67-90º F RH: 30-80%
8 – Skyline Trail, Hacienda Heights (Segment 8)	Residential	8A	Residential streets	8/14/07-8/15/07	Sky: Clear WS: Calm Temperature: 68-86º F RH: 43-78%
9 – Thoroughbred Street, Ontario (Segment 8B)	Residential	8B/8C	Residential streets	8/2/07-8/3/07	Sky: Hazy with clearing WS: Calm to 15 mph Temperature: 60-90º F RH: 30-96%
10 – Pacific Crest Trail, Angeles National Forest (Segment 11)	Forest	11	Los Angeles County Fire Camp	7/31/07-8/1/07	Sky: Clear WS: Calm to 23 mph Temperature: 70-100º F RH: 8-43%
11 – Crossroads Park, Chino Hills (Segment 8A)	Residential	8A	Chino Hills Parkway, park activities	8/2/07-8/3/07	Sky: Hazy with clearing WS: Calm to 15 mph Temperature: 60-90º F RH: 30-96%

TABLE 5.2- 2
Monitoring Site Locations – Description and Date(s) Monitored
Tehachapi Renewable Transmission Project

Noise Monitoring Location	Description	Segment	Primary Noise Source	Date(s) Monitored	Weather Conditions[a]
12 – Edam Street and Avila Avenue, Chino (Segment 8B)	Residential	8A	Residential streets	8/2/07-8/3/07	Sky: Hazy with clearing WS: Calm to 15 mph Temperature: 60-90º F RH: 30-96%
13 – Eaton Blanche Park, Pasadena (Segment 11)	Residential	11	Residential streets, park activities	8/14/07-8/15/07	Sky: Clear WS: Calm Temperature: 68-86º F RH: 43-78%
14 – Sally Tanner Park, Rosemead (Segment 11)	Residential	11	Mission Drive, Water Bureau maintenance yard	8/14/07-8/15/07	Sky: Clear WS: Calm Temperature: 68-86º F RH: 43-78%

WS – Wind Speed
mph – miles per hour
RH – Relative Humidity
* – Observation of local winds higher.
[a] – Source: www.weatherunderground.com

TABLE 5.2- 3
Summary of Data -10 Minute Noise Levels (dBA)
Tehachapi Renewable Transmission Project

Noise Monitoring Location	Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
1 – Backus Road, Kern County (Segment 10/ 10A) (dBA)	August 1, 2007 9:15 a.m.	45	47	36	28
2 – 170th Avenue and Rosamond Boulevard, Rosamond (Segment 10A)	August 1, 2007 9:52 a.m.	40	40	31	24

TABLE 5.2-4
Summary of Data – Long-term Monitoring Locations (dBA)
Tehachapi Renewable Transmission Project

Noise Monitoring Location	L_{dn}	L_{eq} (24 hr)	Max Hourly (L_{eq})	Min Hourly (L_{eq})
3 – Parkwood Drive, Palmdale (Segment 5)	75	71	78	57
4 – Vincent Substation	57	50	55	45
5 – Valley View Park, Duarte (Segment 7)	61	57	70	39
6 – Rose Hills Memorial Park, Whittier (Segment 8)	54	48	53	45
7 – Mesa Substation	64	59	63	52
8 – Skyline Trail, Hacienda Heights (Segment 8)	54	50	57	43
9 – Thoroughbred Street, Ontario (Segment 8B)	58	52	58	47
10 – Pacific Crest Trail, Angeles National Forest (Segment 11)	49	41	49	26
11 – Crossroads Park, Chino Hills (Segment 8A)	58	55	60	45
12 – Edam Street and Avila Avenue, Chino (Segment 8B)	56	53	60	43
13 – Eaton Blanche Park, Pasadena (Segment 11)	57	51	61	43
14 – Sally Tanner Park, Rosemead (Segment 11)	57	53	57	47

TABLE 5.2-5
Summary of Hourly Noise Levels at Site 3 – Parkwood Drive, Palmdale (Segment 5) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
July 31, 2007 2:00 p.m.	65	69	63	57
July 31, 2007 3:00 p.m.	68	72	66	59
July 31, 2007 4:00 p.m.	71	75	69	62
July 31, 2007 5:00 p.m.	75	78	73	66
July 31, 2007 6:00 p.m.	78	81	78	72
July 31, 2007 7:00 p.m.	76	79	74	68
July 31, 2007 8:00 p.m.	76	79	74	68
July 31, 2007 9:00 p.m.	72	76	71	64
July 31, 2007 10:00 p.m.	69	73	66	60
July 31, 2007 11:00 p.m.	70	74	67	58
August 01, 2007 12:00 a.m.	66	70	63	53
August 01, 2007 1:00 a.m.	69	74	64	52
August 01, 2007 2:00 a.m.	70	74	64	56
August 01, 2007 3:00 a.m.	63	68	61	52
August 01, 2007 4:00 a.m.	69	72	67	61
August 01, 2007 5:00 a.m.	67	71	64	58
August 01, 2007 6:00 a.m.	68	72	66	59
August 01, 2007 7:00 a.m.	65	69	63	57
August 01, 2007 8:00 a.m.	65	69	63	57
August 01, 2007 9:00 a.m.	67	71	64	58
August 01, 2007 10:00 a.m.	66	71	63	57
August 01, 2007 11:00 a.m.	62	66	59	54
August 01, 2007 12:00 p.m.	57	61	53	43
August 01, 2007 1:00 p.m.	60	64	56	48
L_{dn}		**75**		

TABLE 5.2-6
Summary of Hourly Noise Levels at Site 4 – Vincent Substation (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
July 31, 2007 1:00 p.m.	47	49	46	44
July 31, 2007 2:00 p.m.	48	49	47	45
July 31, 2007 3:00 p.m.	48	50	47	46
July 31, 2007 4:00 p.m.	49	51	49	47
July 31, 2007 5:00 p.m.	51	52	50	48
July 31, 2007 6:00 p.m.	51	52	50	48
July 31, 2007 7:00 p.m.	50	52	50	48
July 31, 2007 8:00 p.m.	49	51	48	46
July 31, 2007 9:00 p.m.	46	48	45	41
July 31, 2007 10:00 p.m.	48	50	47	44
July 31, 2007 11:00 p.m.	50	53	49	47
August 01, 2007 12:00 a.m.	49	52	49	45
August 01, 2007 1:00 a.m.	45	47	44	41
August 01, 2007 2:00 a.m.	48	51	46	42
August 01, 2007 3:00 a.m.	50	52	49	45
August 01, 2007 4:00 a.m.	51	53	50	48
August 01, 2007 5:00 a.m.	53	55	53	50
August 01, 2007 6:00 a.m.	55	57	55	53
August 01, 2007 7:00 a.m.	53	55	52	50
August 01, 2007 8:00 a.m.	47	50	47	44
August 01, 2007 9:00 a.m.	45	47	44	42
August 01, 2007 10:00 a.m.	46	48	45	43
August 01, 2007 11:00 a.m.	52	55	45	43
August 01, 2007 12:00 p.m.	45	47	44	41
L_{dn}		**57**		

TABLE 5.2-7
Summary of Hourly Noise Levels at Site 5 – Valley View Park, Duarte (Segment 7) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 14, 2007 12:08 p.m.	43	45	41	40
August 14, 2007 1:08 p.m.	44	46	42	40
August 14, 2007 2:08 p.m.	70	72	54	48
August 14, 2007 3:08 p.m.	43	45	41	39
August 14, 2007 4:08 p.m.	45	47	42	41
August 14, 2007 5:08 p.m.	44	47	41	39
August 14, 2007 6:08 p.m.	43	46	42	39
August 14, 2007 7:08 p.m.	47	48	42	40
August 14, 2007 8:08 p.m.	43	46	41	40
August 14, 2007 9:08 p.m.	51	54	51	45
August 14, 2007 10:08 p.m.	46	48	44	42
August 14, 2007 11:08 p.m.	62	65	61	60
August 15, 2007 12:08 a.m.	45	46	44	43
August 15, 2007 1:08 a.m.	44	46	42	41
August 15, 2007 2:08 a.m.	44	49	42	41
August 15, 2007 3:08 a.m.	45	48	42	41
August 15, 2007 4:08 a.m.	46	50	45	40
August 15, 2007 5:08 a.m.	42	43	42	41
August 15, 2007 6:08 a.m.	45	46	45	44
August 15, 2007 7:08 a.m.	50	48	45	44
August 15, 2007 8:08 a.m.	45	47	43	42
August 15, 2007 9:08 a.m.	42	44	40	39
August 15, 2007 10:08 a.m.	42	44	41	40
August 15, 2007 11:08 a.m.	49	49	41	39
L_{dn}		**61**		

TABLE 5.2-8
Summary of Hourly Noise Levels at Site 6 – Rose Hills Memorial Park, Whittier (Segment 8) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 13, 2007 5:00 p.m.	47	49	46	44
August 13, 2007 6:00 p.m.	46	47	45	44
August 13, 2007 7:00 p.m.	45	46	44	43
August 13, 2007 8:00 p.m.	48	49	47	45
August 13, 2007 9:00 p.m.	47	48	46	44
August 13, 2007 10:00 p.m.	45	47	45	44
August 13, 2007 11:00 p.m.	45	46	44	42
August 14, 2007 12:00 a.m.	45	47	43	42
August 14, 2007 1:00 a.m.	45	47	44	41
August 14, 2007 2:00 a.m.	45	47	44	42
August 14, 2007 3:00 a.m.	45	48	45	42
August 14, 2007 4:00 a.m.	48	50	47	45
August 14, 2007 5:00 a.m.	52	52	51	49
August 14, 2007 6:00 a.m.	51	52	49	48
August 14, 2007 7:00 a.m.	53	55	51	49
August 14, 2007 8:00 a.m.	50	51	47	46
August 14, 2007 9:00 a.m.	49	49	47	46
August 14, 2007 10:00 a.m.	48	49	47	45
August 14, 2007 11:00 a.m.	48	49	47	45
August 14, 2007 12:00 p.m.	46	49	44	41
August 14, 2007 1:00 p.m.	48	49	45	43
August 14, 2007 2:00 p.m.	53	58	48	45
August 14, 2007 3:00 p.m.	48	50	47	43
August 14, 2007 4:00 p.m.	48	48	44	42
L_{dn}		**54**		

TABLE 5.2-9
Summary of Hourly Noise Levels at Site 7 – Mesa Substation (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 13, 2007 3:00 p.m.	61	63	59	57
August 13, 2007 4:00 p.m.	61	63	60	58
August 13, 2007 5:00 p.m.	62	64	61	58
August 13, 2007 6:00 p.m.	61	63	60	57
August 13, 2007 7:00 p.m.	60	62	59	57
August 13, 2007 8:00 p.m.	59	61	57	55
August 13, 2007 9:00 p.m.	58	60	57	54
August 13, 2007 10:00 p.m.	56	59	55	54
August 13, 2007 11:00 p.m.	55	58	54	52
August 14, 2007 12:00 a.m.	55	57	53	51
August 14, 2007 1:00 a.m.	53	55	52	50
August 14, 2007 2:00 a.m.	52	54	51	49
August 14, 2007 3:00 a.m.	53	54	51	50
August 14, 2007 4:00 a.m.	56	59	56	53
August 14, 2007 5:00 a.m.	57	60	55	53
August 14, 2007 6:00 a.m.	63	63	58	55
August 14, 2007 7:00 a.m.	61	64	60	54
August 14, 2007 8:00 a.m.	61	63	59	54
August 14, 2007 9:00 a.m.	61	63	58	55
August 14, 2007 10:00 a.m.	60	62	58	56
August 14, 2007 11:00 a.m.	60	62	59	57
August 14, 2007 12:00 p.m.	60	62	59	57
August 14, 2007 1:00 p.m.	60	62	59	57
August 14, 2007 2:00 p.m.	60	62	59	57
L_{dn}		**64**		

TABLE 5.2-10
Summary of Hourly Noise Levels at Site 8 – Skyline Trail, Hacienda Heights (Segment 8) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 14, 2007 12:00 p.m.	51	52	46	43
August 14, 2007 1:00 p.m.	57	56	47	43
August 14, 2007 2:00 p.m.	48	51	42	39
August 14, 2007 3:00 p.m.	50	53	44	40
August 14, 2007 4:00 p.m.	54	58	46	41
August 14, 2007 5:00 p.m.	48	50	44	41
August 14, 2007 6:00 p.m.	50	54	47	43
August 14, 2007 7:00 p.m.	51	53	47	43
August 14, 2007 8:00 p.m.	50	53	48	45
August 14, 2007 9:00 p.m.	50	53	48	45
August 14, 2007 10:00 p.m.	48	51	46	43
August 14, 2007 11:00 p.m.	46	48	43	42
August 15, 2007 12:00 a.m.	43	45	42	41
August 15, 2007 1:00 a.m.	44	45	43	42
August 15, 2007 2:00 a.m.	43	44	43	42
August 15, 2007 3:00 a.m.	43	44	42	41
August 15, 2007 4:00 a.m.	45	47	45	43
August 15, 2007 5:00 a.m.	47	48	46	45
August 15, 2007 6:00 a.m.	49	51	47	45
August 15, 2007 7:00 a.m.	50	52	47	46
August 15, 2007 8:00 a.m.	51	55	48	46
August 15, 2007 9:00 a.m.	50	54	47	45
August 15, 2007 10:00 a.m.	50	53	47	44
August 15, 2007 11:00 a.m.	50	53	46	43
L_{dn}		**54**		

TABLE 5.2-11
Summary of Hourly Noise Levels at Site 9 – Thoroughbred Street, Ontario (Segment 8B) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 02, 2007 8:00 a.m.	50	51	47	44
August 02, 2007 9:00 a.m.	49	51	46	43
August 02, 2007 10:00 a.m.	49	51	47	44
August 02, 2007 11:00 a.m.	51	53	48	46
August 02, 2007 12:00 p.m.	52	55	50	47
August 02, 2007 1:00 p.m.	51	54	50	47
August 02, 2007 2:00 p.m.	53	55	51	48
August 02, 2007 3:00 p.m.	53	56	52	49
August 02, 2007 4:00 p.m.	54	56	53	49
August 02, 2007 5:00 p.m.	54	56	52	49
August 02, 2007 6:00 p.m.	54	56	53	50
August 02, 2007 7:00 p.m.	55	56	53	50
August 02, 2007 8:00 p.m.	53	56	51	47
August 02, 2007 9:00 p.m.	52	54	49	45
August 02, 2007 10:00 p.m.	50	53	48	44
August 02, 2007 11:00 p.m.	50	53	48	44
August 03, 2007 12:00 a.m.	48	51	47	44
August 03, 2007 1:00 a.m.	49	51	44	42
August 03, 2007 2:00 a.m.	48	48	42	40
August 03, 2007 3:00 a.m.	47	51	44	41
August 03, 2007 4:00 a.m.	47	50	46	42
August 03, 2007 5:00 a.m.	50	51	47	45
August 03, 2007 6:00 a.m.	58	57	51	48
August 03, 2007 7:00 a.m.	56	58	51	48
L_{dn}		**58**		

TABLE 5.2-12
Summary of Hourly Noise Levels at Site 10 – Pacific Crest Trail, Angeles National Forest (Segment 11) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
July 31, 2007 12:00 p.m.	38	37	29	25
July 31, 2007 1:00 p.m.	34	38	31	27
July 31, 2007 2:00 p.m.	38	40	33	28
July 31, 2007 3:00 p.m.	36	40	32	27
July 31, 2007 4:00 p.m.	37	40	30	25
July 31, 2007 5:00 p.m.	37	39	33	28
July 31, 2007 6:00 p.m.	33	33	28	25
July 31, 2007 7:00 p.m.	40	38	33	30
July 31, 2007 8:00 p.m.	43	49	40	27
July 31, 2007 9:00 p.m.	47	49	46	40
July 31, 2007 10:00 p.m.	49	52	48	39
July 31, 2007 11:00 p.m.	43	48	33	29
August 01, 2007 12:00 a.m.	43	46	42	36
August 01, 2007 1:00 a.m.	42	45	41	34
August 01, 2007 2:00 a.m.	42	45	39	29
August 01, 2007 3:00 a.m.	45	44	39	33
August 01, 2007 4:00 a.m.	37	34	27	22
August 01, 2007 5:00 a.m.	26	25	22	20
August 01, 2007 6:00 a.m.	31	33	23	21
August 01, 2007 7:00 a.m.	35	39	26	23
August 01, 2007 8:00 a.m.	37	37	26	23
August 01, 2007 9:00 a.m.	33	34	26	23
August 01, 2007 10:00 a.m.	38	38	28	24
August 01, 2007 11:00 a.m.	36	37	27	24
L_{dn}		**45**		

TABLE 5.2-13
Summary of Hourly Noise Levels at Site 11 – Crossroads Park, Chino Hills (Segment 8A) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 02, 2007 10:00 a.m.	53	56	51	48
August 02, 2007 11:00 a.m.	56	59	55	48
August 02, 2007 12:00 p.m.	58	60	58	56
August 02, 2007 1:00 p.m.	58	60	56	53
August 02, 2007 2:00 p.m.	53	55	51	48
August 02, 2007 3:00 p.m.	54	57	52	48
August 02, 2007 4:00 p.m.	53	55	51	48
August 02, 2007 5:00 p.m.	53	56	53	49
August 02, 2007 6:00 p.m.	60	62	59	52
August 02, 2007 7:00 p.m.	60	62	59	56
August 02, 2007 8:00 p.m.	53	55	51	47
August 02, 2007 9:00 p.m.	54	54	50	47
August 02, 2007 10:00 p.m.	51	53	49	44
August 02, 2007 11:00 p.m.	50	51	46	42
August 03, 2007 12:00 a.m.	47	50	45	41
August 03, 2007 1:00 a.m.	49	51	43	39
August 03, 2007 2:00 a.m.	48	52	41	38
August 03, 2007 3:00 a.m.	45	48	40	38
August 03, 2007 4:00 a.m.	47	51	44	41
August 03, 2007 5:00 a.m.	52	55	50	45
August 03, 2007 6:00 a.m.	56	58	55	50
August 03, 2007 7:00 a.m.	57	59	56	52
August 03, 2007 8:00 a.m.	55	58	53	49
August 03, 2007 9:00 a.m.	55	57	52	48
L_{dn}		**58**		

TABLE 5.2-14
Summary of Hourly Noise Levels at Site 12 – Edam Street and Avila Avenue, Chino (Segment 8B) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 02, 2007 9:00 a.m.	60	57	48	43
August 02, 2007 10:00 a.m.	49	49	44	41
August 02, 2007 11:00 a.m.	47	50	45	41
August 02, 2007 12:00 p.m.	57	51	45	42
August 02, 2007 1:00 p.m.	51	52	47	43
August 02, 2007 2:00 p.m.	50	52	49	46
August 02, 2007 3:00 p.m.	50	52	48	45
August 02, 2007 4:00 p.m.	53	52	48	45
August 02, 2007 5:00 p.m.	51	52	48	45
August 02, 2007 6:00 p.m.	58	53	48	45
August 02, 2007 7:00 p.m.	54	54	49	46
August 02, 2007 8:00 p.m.	50	52	47	44
August 02, 2007 9:00 p.m.	50	53	49	44
August 02, 2007 10:00 p.m.	49	51	49	41
August 02, 2007 11:00 p.m.	46	49	42	40
August 03, 2007 12:00 a.m.	51	49	41	38
August 03, 2007 1:00 a.m.	43	46	39	38
August 03, 2007 2:00 a.m.	43	44	39	38
August 03, 2007 3:00 a.m.	49	43	40	38
August 03, 2007 4:00 a.m.	45	46	43	41
August 03, 2007 5:00 a.m.	46	49	45	41
August 03, 2007 6:00 a.m.	51	51	47	45
August 03, 2007 7:00 a.m.	54	58	48	45
August 03, 2007 8:00 a.m.	55	58	49	46
L_{dn}		**56**		

TABLE 5.2-15
Summary of Hourly Noise Levels at Site 13 – Eaton Blanche Park, Pasadena (Segment 8B) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 14, 2007 10:00 a.m.	47	50	45	43
August 14, 2007 11:00 a.m.	45	47	43	42
August 14, 2007 12:00 p.m.	48	49	43	41
August 14, 2007 1:00 p.m.	44	46	42	40
August 14, 2007 2:00 p.m.	43	45	41	39
August 14, 2007 3:00 p.m.	45	46	41	40
August 14, 2007 4:00 p.m.	45	48	42	40
August 14, 2007 5:00 p.m.	45	47	42	40
August 14, 2007 6:00 p.m.	50	52	44	41
August 14, 2007 7:00 p.m.	46	48	43	41
August 14, 2007 8:00 p.m.	47	50	45	43
August 14, 2007 9:00 p.m.	49	50	48	46
August 14, 2007 10:00 p.m.	48	50	48	45
August 14, 2007 11:00 p.m.	50	49	47	44
August 15, 2007 12:00 a.m.	54	59	46	44
August 15, 2007 1:00 a.m.	56	50	47	45
August 15, 2007 2:00 a.m.	47	48	46	45
August 15, 2007 3:00 a.m.	44	46	44	42
August 15, 2007 4:00 a.m.	44	46	44	42
August 15, 2007 5:00 a.m.	46	47	46	44
August 15, 2007 6:00 a.m.	49	50	48	45
August 15, 2007 7:00 a.m.	54	54	48	46
August 15, 2007 8:00 a.m.	61	65	54	45
August 15, 2007 9:00 a.m.	46	48	45	42
L_{dn}		**57**		

TABLE 5.2-16
Summary of Hourly Noise Levels at Site 14 – Sally Tanner Park, Rosemead (Segment 11) (dBA)
Tehachapi Renewable Transmission Project

Date/Time	L_{eq}	L_{10}	L_{50}	L_{90}
August 14, 2007 9:00 a.m.	53	56	53	50
August 14, 2007 10:00 a.m.	54	56	52	49
August 14, 2007 11:00 a.m.	53	55	51	48
August 14, 2007 12:00 p.m.	52	55	51	48
August 14, 2007 1:00 p.m.	54	55	52	49
August 14, 2007 2:00 p.m.	53	55	52	48
August 14, 2007 3:00 p.m.	53	56	52	49
August 14, 2007 4:00 p.m.	54	57	53	49
August 14, 2007 5:00 p.m.	54	56	53	49
August 14, 2007 6:00 p.m.	55	56	53	50
August 14, 2007 7:00 p.m.	54	56	52	49
August 14, 2007 8:00 p.m.	52	54	51	48
August 14, 2007 9:00 p.m.	52	54	51	49
August 14, 2007 10:00 p.m.	50	52	50	48
August 14, 2007 11:00 p.m.	50	52	49	47
August 15, 2007 12:00 a.m.	49	50	47	46
August 15, 2007 1:00 a.m.	49	50	47	46
August 15, 2007 2:00 a.m.	47	49	46	45
August 15, 2007 3:00 a.m.	47	48	46	45
August 15, 2007 4:00 a.m.	50	51	47	46
August 15, 2007 5:00 a.m.	51	53	49	47
August 15, 2007 6:00 a.m.	54	57	52	49
August 15, 2007 7:00 a.m.	57	59	54	51
August 15, 2007 8:00 a.m.	56	58	54	51
L_{dn}			**57**	

TABLE 5.3-1
Corona Noise Monitoring Locations – Parameters Considered
Tehachapi Renewable Transmission Project

Corona Noise Modeling Location	Parameters Considered During Selection of Corona Noise Modeling Location	Segment Along Which Similar Conditions Exist in Portions of the Alignment
1 – Segment 10	Existing transmission line configuration: none	NA
	Future transmission line configuration: 1- 500 kV	10, 10A, 10B
2 – Pacific Crest Trail (Segment 6)	Existing transmission line configuration: High elevation, 2- 220 kV	6, 11
	Future transmission line configuration: 1- 220 kV, 1- 500 kV	6, 11
3 – Chino Hills (Segment 8A)	Existing transmission line configuration: Adjacent to transmission line corridor. 1- 220 kV	5, 7, 8A, 8B, 8C, 11
	Future transmission line configuration:2- 500 kV	5, 7, 8A, 8B, 8C, 11
4 – Duarte (End Segment 6/Begin Segment 7)	Existing transmission line configuration: Adjacent to transmission line corridor, 2- 220 kV	5, 7, 8A, 8B, 8C, 11
	Future transmission line configuration: 1- 220 kV, 1- 500 kV	5, 7, 8A, 8B, 8C, 11
5 – Vincent Substation	Existing transmission line configuration: Adjacent to transmission line corridor, adjacent to substation, numerous transmission lines	9
	Future transmission line configuration: Upgrade existing substation to accommodate new 500-kV and 220-kV equipment	9
6 – Pathfinder Park, Hacienda Heights (Segment 8)	Existing configuration: 2- 220 kV	6, 11
	Future configuration: 1- 220 kV, 1- 500 kV	6, 11
7 – Segment 4	Existing transmission line configuration: 1- 500 kV, 2- 220 kV	4
	Future configuration: 2- 500 kV, 2- 220 kV	4

TABLE 5.3-2
Summary of Modeled Existing Audible Corona Noise
Tehachapi Renewable Transmission Project

Location	Modeled Existing Audible Corona Noise at Edge of ROW (dBA)
Location 1 – Segment 10	NA
Location 2 – Pacific Crest Trail (Segment 6)	Rain = <20 to 24 Fair = <20
Location 3 – Chino Hills (Segment 8A)	NA
Location 4 – Duarte (End of Segment 6/Beginning of Segment 7)	Rain = 22 to 25 Fair = < 20
Location 5 – South of Vincent Substation	Rain = <20 to 22 Fair = < 20
Location 6 – Pathfinder Park, Hacienda Heights (Segment 8)	Rain = 23 to 25 Fair = < 20
Location 7 – Segment 4	Rain = 50 to 51 Fair = 25 to 26

dBA = A-weighted sound pressure level

TABLE 5.4-1
Sensitive Receptors Within 2,000 Feet of Project
Tehachapi Renewable Transmission Project

Sensitive Receptor	Segment	Label	kV
Churches			
Laird Church (historical)	8B	Chino to Mira Loma No. 1/No. 2 220 kV	220
Healthcare Facilities			
St. Luke Medical Center	11	Vincent to Mesa 500/220 kV (via Gould)	500
Park Marino Convalescent Center	11	Vincent to Mesa 500/220 kV (via Gould)	500
Aurora Las Encinas Hospital, LLC	11	Vincent to Mesa 500/220 kV (via Gould)	500
Mission Care Center	11	Vincent to Mesa 500/220 kV (via Gould)	500
Marlinda Convalescent Hospital at Pasadena	11	Vincent to Mesa 500/220 kV (via Gould)	500
FMC Dialysis Services of Irwindale	7	Vincent to Mesa 500 kV	500
Eaton Canyon Dialysis Center	11	Vincent to Mesa 500/220 kV (via Gould)	500
Interim Healthcare – Parent	11	Vincent to Mesa 500/220 kV (via Gould)	500
Lifecare Solutions, Inc.	11	Vincent to Mesa 500/220 kV (via Gould)	500
Network Providers For Home Health, Inc.	7	Vincent to Mesa 500 kV	500
New Dimension Home Care, Inc.	11	Vincent to Mesa 500/220 kV (via Gould)	500
Outreach Home Health Services, Inc.	11	Vincent to Mesa 500/220 kV (via Gould)	500
Interim Healthcare of Riverside, Inc. – Branch	8A	Mesa to Mira Loma 500 kV	500
A's Home Health Care, Inc.	8A	Mesa to Mira Loma 500 kV	500
Schools			
St Anthony Elementary School	11	Vincent to Mesa 500/220 kV (via Gould)	500
High Point Academy	11	Vincent to Mesa 500/220 kV (via Gould)	500
San Gabriel SDA Academy	11	Vincent to Mesa 500/220 kV (via Gould)	500
Clairbourn School	11	Vincent to Mesa 500/220 kV (via Gould)	500
Little Flower Montessori School	11	Vincent to Mesa 500/220 kV (via Gould)	500
Victory Christian Academy	8A	Mesa to Mira Loma 500 kV	500
Victory Christian Academy	8B	Chino to Mira Loma No. 1/No. 2 220 kV	220
Victory Christian Academy	8C	Chino to Mira Loma No. 3 220 kV	220
Chaim Weizmann Community Day School	11	Vincent to Mesa 500/220 kV (via Gould)	500
Berean Christian School	11	Vincent to Mesa 500/220 kV (via Gould)	500
Rosemary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Rosemead Education Center	11	Vincent to Mesa 500/220 kV (via Gould)	500
San Gabriel Valley Learning CT	11	Vincent to Mesa 500/220 kV (via Gould)	500
Wonder World Pre-School	11	Vincent to Mesa 500/220 kV (via Gould)	500

TABLE 5.4-1
Sensitive Receptors Within 2,000 Feet of Project
Tehachapi Renewable Transmission Project

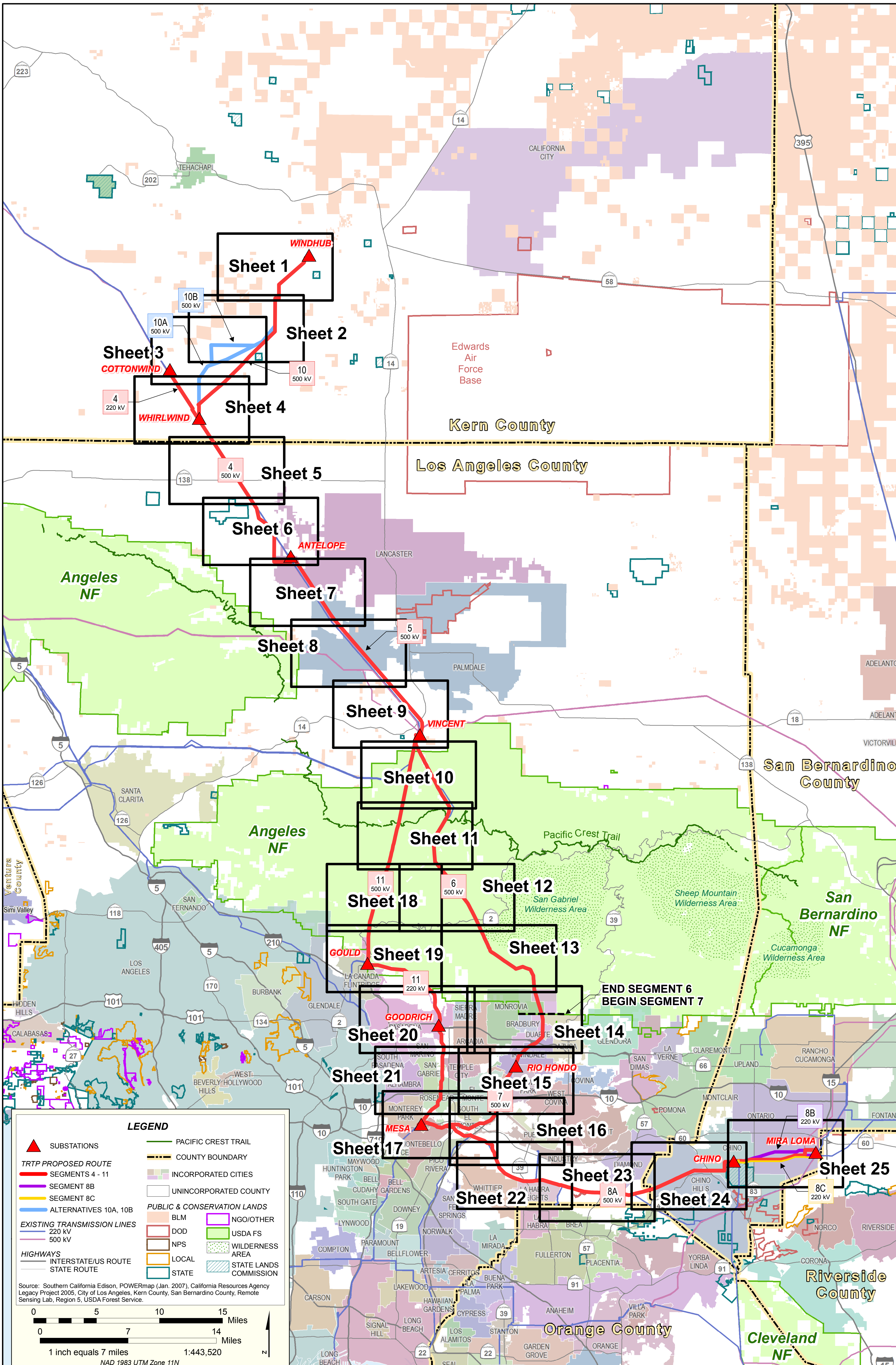
Sensitive Receptor	Segment	Label	kV
Fullerton Christian School	8A	Mesa to Mira Loma 500 kV	500
Joy Christian Preschool	11	Vincent to Mesa 500/220 kV (via Gould)	500
Deanza Elementary	7	Vincent to Mesa 500 kV	500
Litel (Gerald F.) Elementary	8A	Mesa to Mira Loma 500 kV	500
Ayala (Ruben S.) High	8A	Mesa to Mira Loma 500 kV	500
Andres Duarte Elementary	7	Vincent to Mesa 500 kV	500
Valley View Elementary	7	Vincent to Mesa 500 kV	500
Durfee Elementary	7	Vincent to Mesa 500 kV	500
Thompson Elementary (OH)	7	Vincent to Mesa 500 kV	500
South El Monte High	7	Vincent to Mesa 500 kV	500
Mountain View High	7	Vincent to Mesa 500 kV	500
Valle Lindo Continuation High	7	Vincent to Mesa 500 kV	500
Madrid (Alfred S.) Middle	7	Vincent to Mesa 500 kV	500
La Primaria Elementary	7	Vincent to Mesa 500 kV	500
Twin Lakes Elementary	7	Vincent to Mesa 500 kV	500
Ranch View Elementary	8B	Chino to Mira Loma No. 1/No. 2 220 kV	220
Pasadena High	11	Vincent to Mesa 500/220 kV (via Gould)	500
Willard Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Wilson Middle	11	Vincent to Mesa 500/220 kV (via Gould)	500
Janson (Mildred B.) Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Shuey (Emma W.) Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Childrens World Learning Center	8A	Mesa to Mira Loma 500 kV	500
Sunshine Educational Center	11	Vincent to Mesa 500/220 kV (via Gould)	500
Williams (Dan T.) Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Rice (Eldridge) Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Sanchez (George I.) Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Willard (Frances E.) Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Hillcrest Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Temple (Roger W.) Intermediate	11	Vincent to Mesa 500/220 kV (via Gould)	500
Roosevelt Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Wilson Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Clairbourn Elementary School	11	Vincent to Mesa 500/220 kV (via Gould)	500

TABLE 5.4-1
Sensitive Receptors Within 2,000 Feet of Project
Tehachapi Renewable Transmission Project

Sensitive Receptor	Segment	Label	kV
Emperor Elementary School	11	Vincent to Mesa 500/220 kV (via Gould)	500
Valle Lindo Continuation High School	7	Vincent to Mesa 500 kV	500
La Primaria Elementary School	7	Vincent to Mesa 500 kV	500
Twin Lakes Elementary School	7	Vincent to Mesa 500 kV	500
Williams, Dan T Elementary School	11	Vincent to Mesa 500/220 kV (via Gould)	500
Rio Hondo College	8A	Mesa to Mira Loma 500 kV	500
Emperor Elementary	11	Vincent to Mesa 500/220 kV (via Gould)	500
Parks			
Barnes Park	7	Vincent to Mesa 500 kV	500
Pico Rivera Bicentennial Park	7	Vincent to Mesa 500 kV	500
Pico Rivera Bicentennial Park	8A	Mesa to Mira Loma 500 kV	500
Zapopan Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
La Loma Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Valley View Park	7	Vincent to Mesa 500 kV	500
Royal Oaks Park	7	Vincent to Mesa 500 kV	500
Gwinn Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Victory Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Eaton Blanche Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Ruben S Ayala Park	8A	Mesa to Mira Loma 500 kV	500
Encanto Park	7	Vincent to Mesa 500 kV	500
Jess Gonzales Sports Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Hacienda Park	7	Vincent to Mesa 500 kV	500
Otis Gordon Sports Park	7	Vincent to Mesa 500 kV	500
Hahamongna Watershed Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Sally Tanner Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Community Center Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Eaton Wash Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Coral Ridge Park	8A	Mesa to Mira Loma 500 kV	500
Morning Field Park	8A	Mesa to Mira Loma 500 kV	500
Crossroads Park	8A	Mesa to Mira Loma 500 kV	500
Morningside Park	8A	Mesa to Mira Loma 500 kV	500
Cypress Trails	8B	Chino to Mira Loma No. 1/No. 2 220 kV	220

TABLE 5.4-1
Sensitive Receptors Within 2,000 Feet of Project
Tehachapi Renewable Transmission Project

Sensitive Receptor	Segment	Label	kV
Sunnyslope Park	11	Vincent to Mesa 500/220 kV (via Gould)	500
Pico Rivera Bicentennial Park	7	Vincent to Mesa 500 kV	500
Pico Rivera Bicentennial Park	8A	Mesa to Mira Loma 500 kV	500
Ruben S Ayala Park	8A	Mesa to Mira Loma 500 kV	500
Ruben S Ayala Park	8C	Chino to Mira Loma No. 3 220 kV	220
Ruben S Ayala Park	8A	Mesa to Mira Loma 500 kV	500
Ruben S Ayala Park	8B	Chino to Mira Loma No. 1/No. 2 220 kV	220
Ruben S Ayala Park	8C	Chino to Mira Loma No. 3 220 kV	220
Cypress Trails	8A	Mesa to Mira Loma 500 kV	500
Cypress Trails	8B	Chino to Mira Loma No. 1/No. 2 220 kV	220
Cypress Trails	8C	Chino to Mira Loma No. 3 220 kV	220



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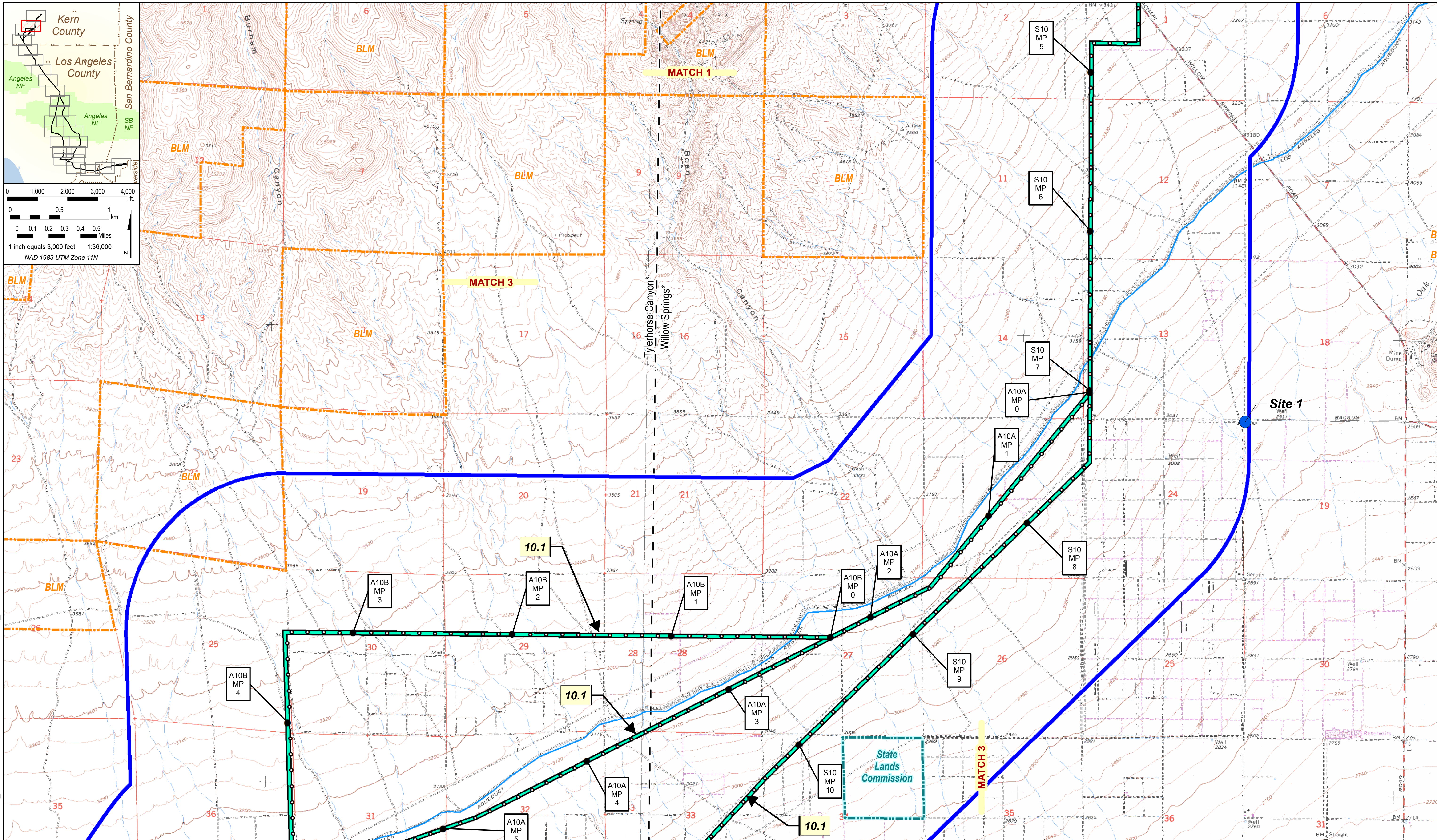
2007	Tehachapi Renewable Transmission Project PEA	Figure 5.1-1. DETAILED PROJECT MAP FOR NOISE MONITORING INDEX	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL Company



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Legend

TRTP Mileposts
- mile
- tenth

TRTP Proposed Subsegments
- Segment 4
- Segment 5
- Segment 6
- Segment 7
- Segments 8A, 8B, & 8C
- Segment 10
- Segment 11

- Reroute 220 kV
- Incorporated City Boundary
- * 7.5 Minute USGS Quad Index
- Study Corridor: 1 mi. Buffer

Existing Transmission Line
- 220 kV
- 500 kV

- New Substation (Part of TRTP)
- Existing Substation - Expansion/ Upgrade (Part of TRTP)
- Permitted Substation (Not Yet Constructed - Not Part of TRTP)
- Existing Substation (No Change Under TRTP)

- Existing Wilderness Area

Public & Conservation Lands
- Bureau of Land Management
- Department of Defense
- State of California
- USDA Forest Service

Noise Monitoring Locations
- 24 Hour
- 10 Minute
- Corona Modeling Location

Source: Southern California Edison / California Resources Agency Legacy Project 2005 / Remote Sensing Lab, Region 5, USDA Forest Service.
Image Source: California Digital Raster Graphics, 7.5 Minute (O) Series, Albers Nad83 Trimmed provided online by the California Spatial Information Library (CaSIL) and produced by the State of California, Stephen P. Teale Data Center, GIS Solutions Group (Teale) from scanned USGS topographic maps.

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Figure 5.2-1. SHORT-TERM NOISE MONITORING LOCATION - SITE 1

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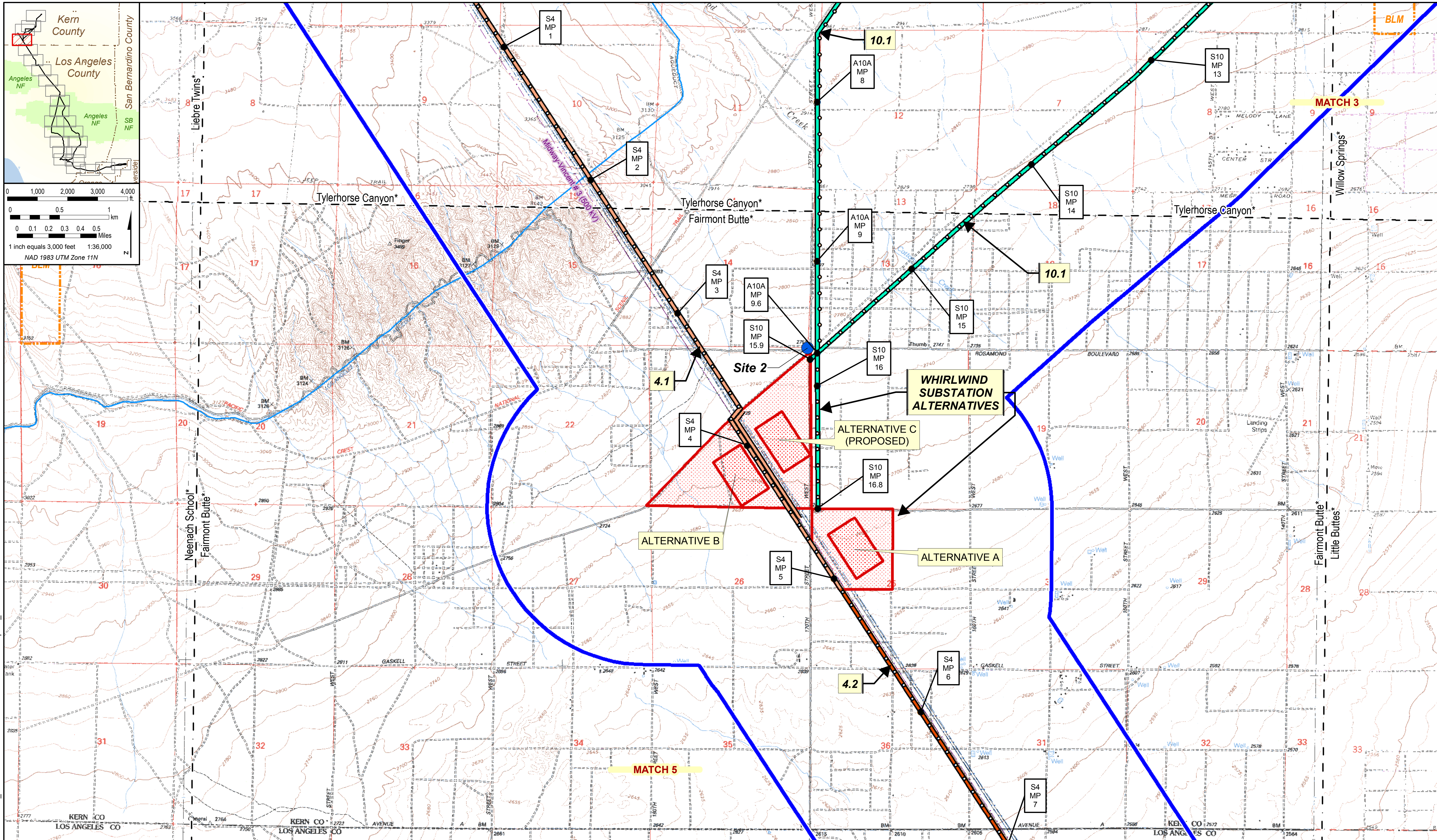

Legend

TRTP Mileposts
- mile
- tenth

TRTP Proposed Subsegments
- Segment 4
- Segment 5
- Segment 6
- Segment 7
- Segments 8A, 8B, & 8C
- Segment 10
- Segment 11

- Reroute 220 kV
- Incorporated City Boundary
- * 7.5 Minute USGS Quad Index
- Study Corridor: 1 mi. Buffer

Existing Transmission Line
- 220 kV
- 500 kV

- New Substation (Part of TRTP)
- Existing Substation - Expansion/ Upgrade (Part of TRTP)
- Permitted Substation (Not Yet Constructed - Not Part of TRTP)
- Existing Substation (No Change Under TRTP)

- Existing Wilderness Area

Public & Conservation Lands
- Bureau of Land Management
- Department of Defense
- State of California
- USDA Forest Service

Noise Monitoring Locations
- 24 Hour
- 10 Minute
- Corona Modeling Location

Source: Southern California Edison / California Resources Agency Legacy Project 2005 / Remote Sensing Lab, Region 5, USDA Forest Service.
Image Source: California Digital Raster Graphics, 7.5 Minute (O) Series, Albers Nad83 Trimmed provided online by the California Spatial Information Library (CaSIL) and produced by the State of California, Stephen P. Teale Data Center, GIS Solutions Group (Teale) from scanned USGS topographic maps.

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Figure 5.2-2. SHORT-TERM NOISE MONITORING LOCATION - SITE 2

SOUTHERN CALIFORNIA EDISON
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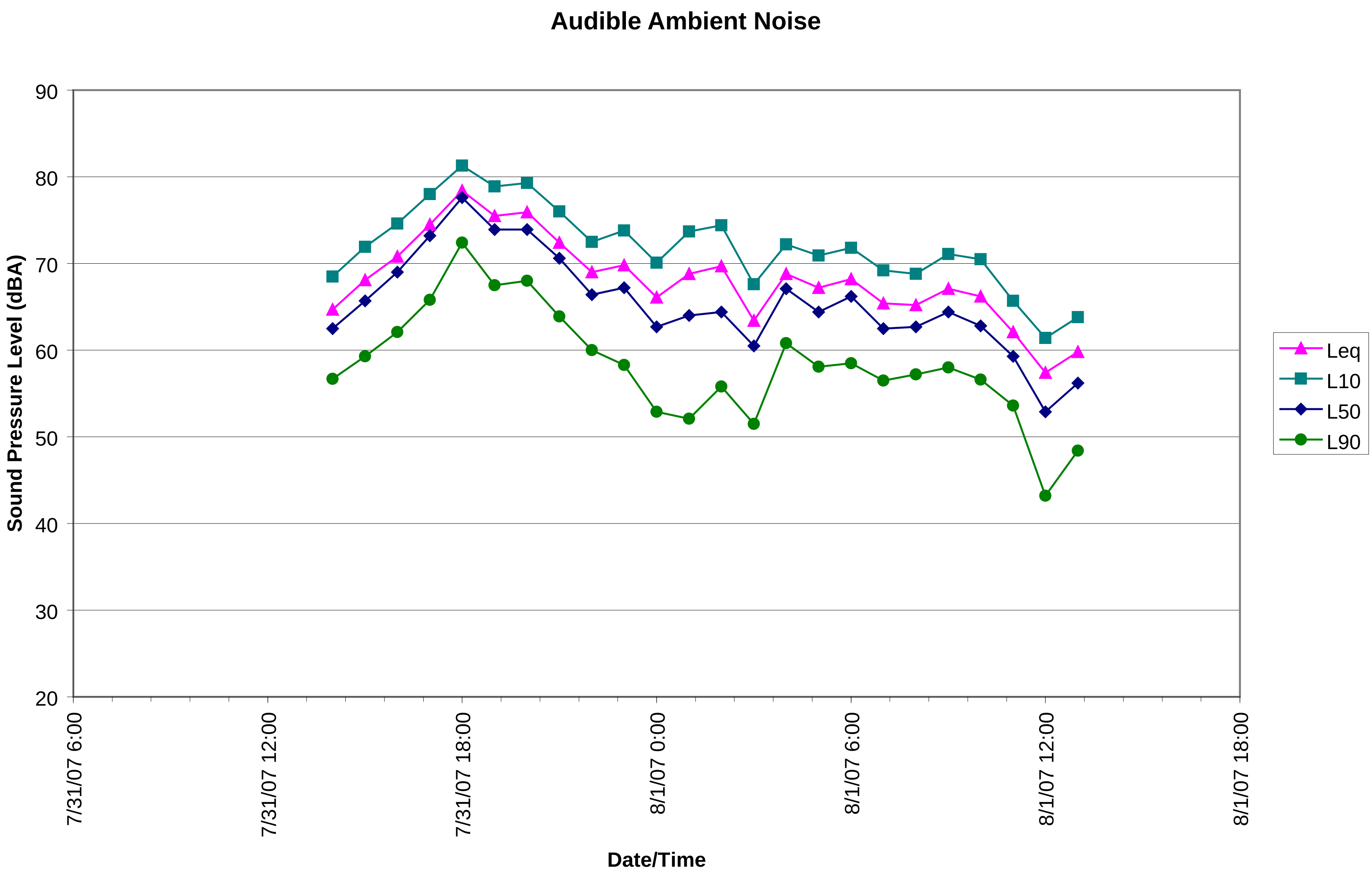

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Figure 5.2-3. SITE 3 - PARKWOOD DRIVE, PALMDALE

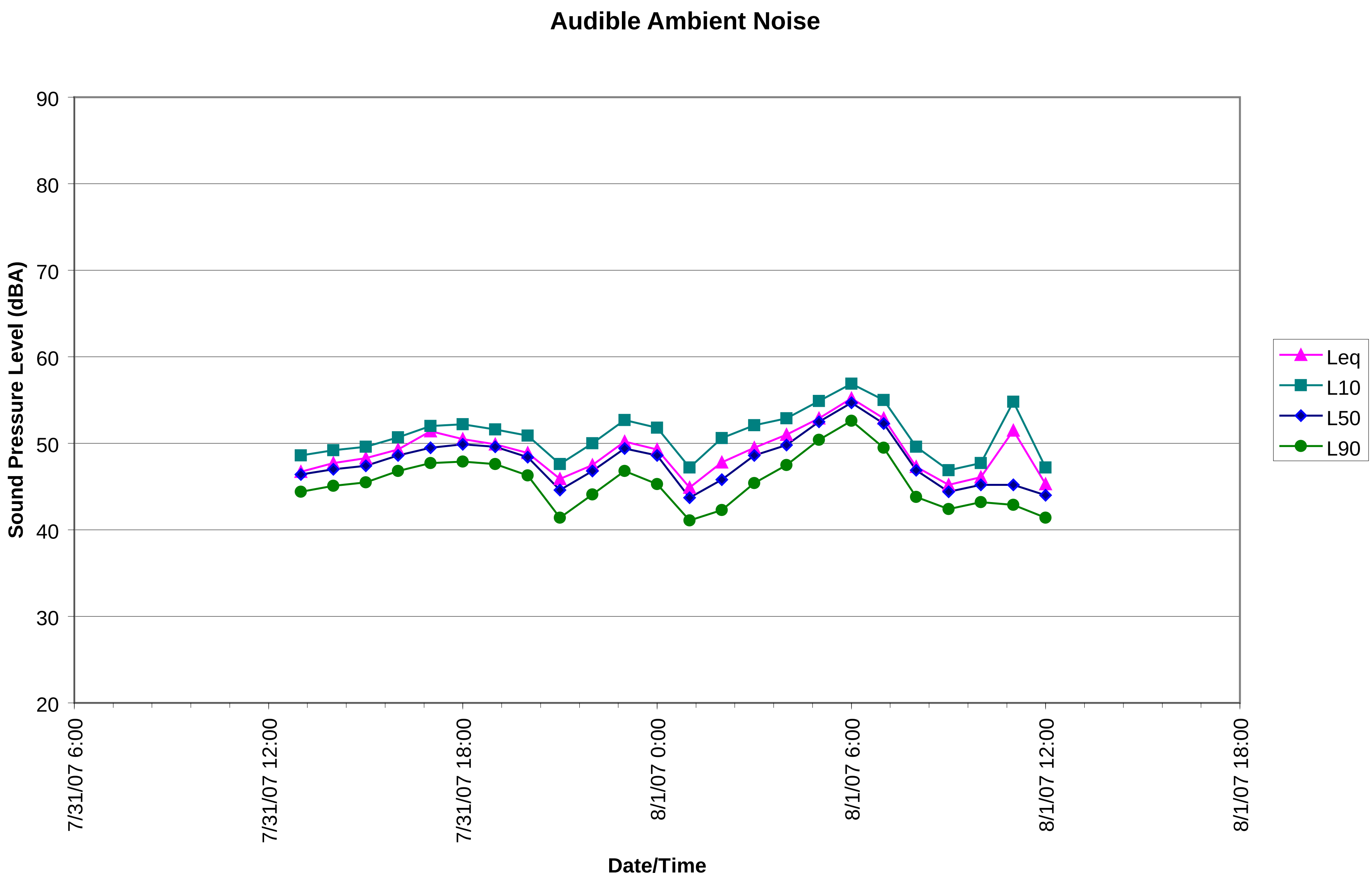

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Figure 5.2-4. SITE 4 - VINCENT SUBSTATION

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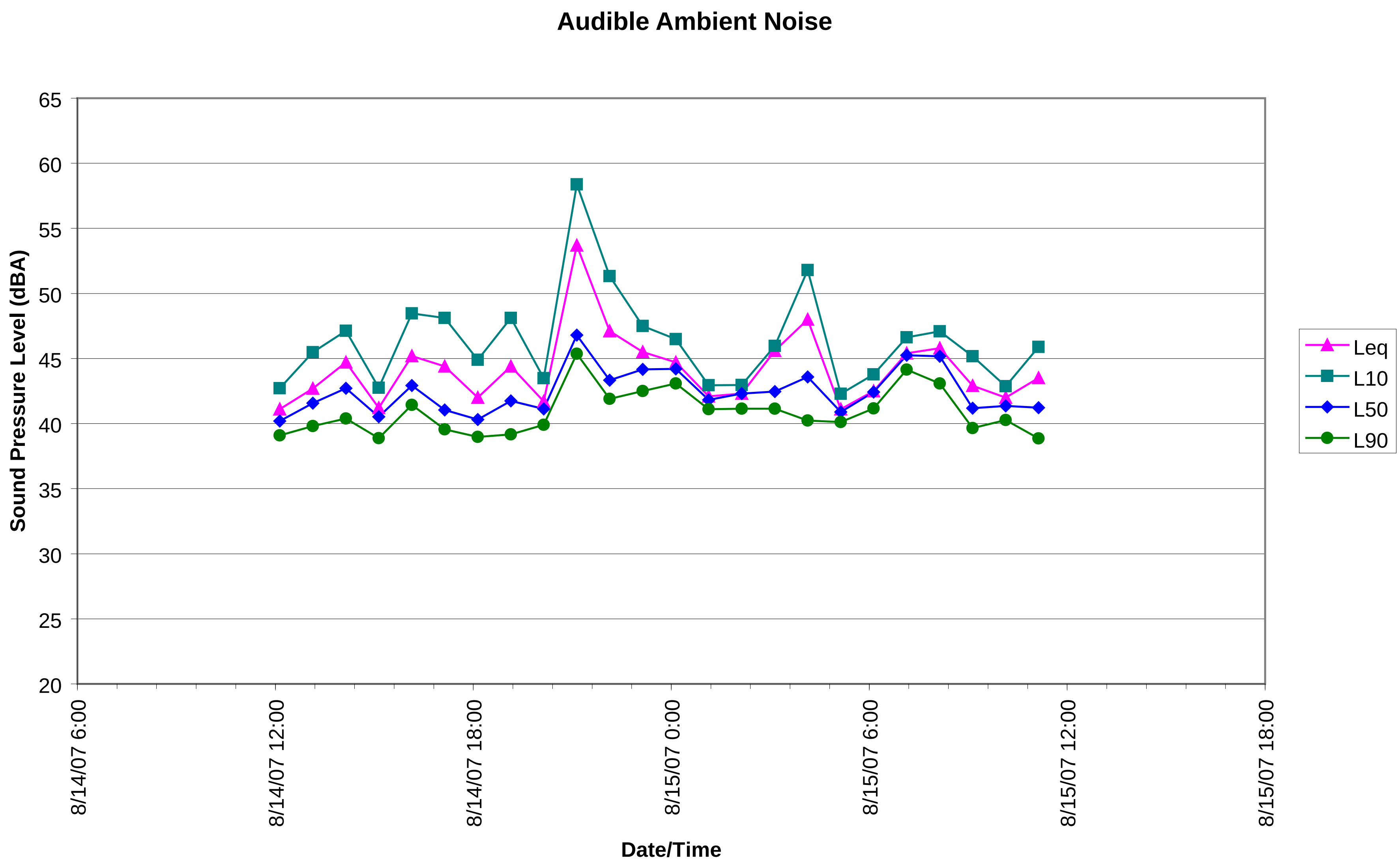

	2007	**Tehachapi Renewable Transmission Project PEA**	Figure 5.2-5. SITE 5 - VALLEY VIEW PARK, DUARTE	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

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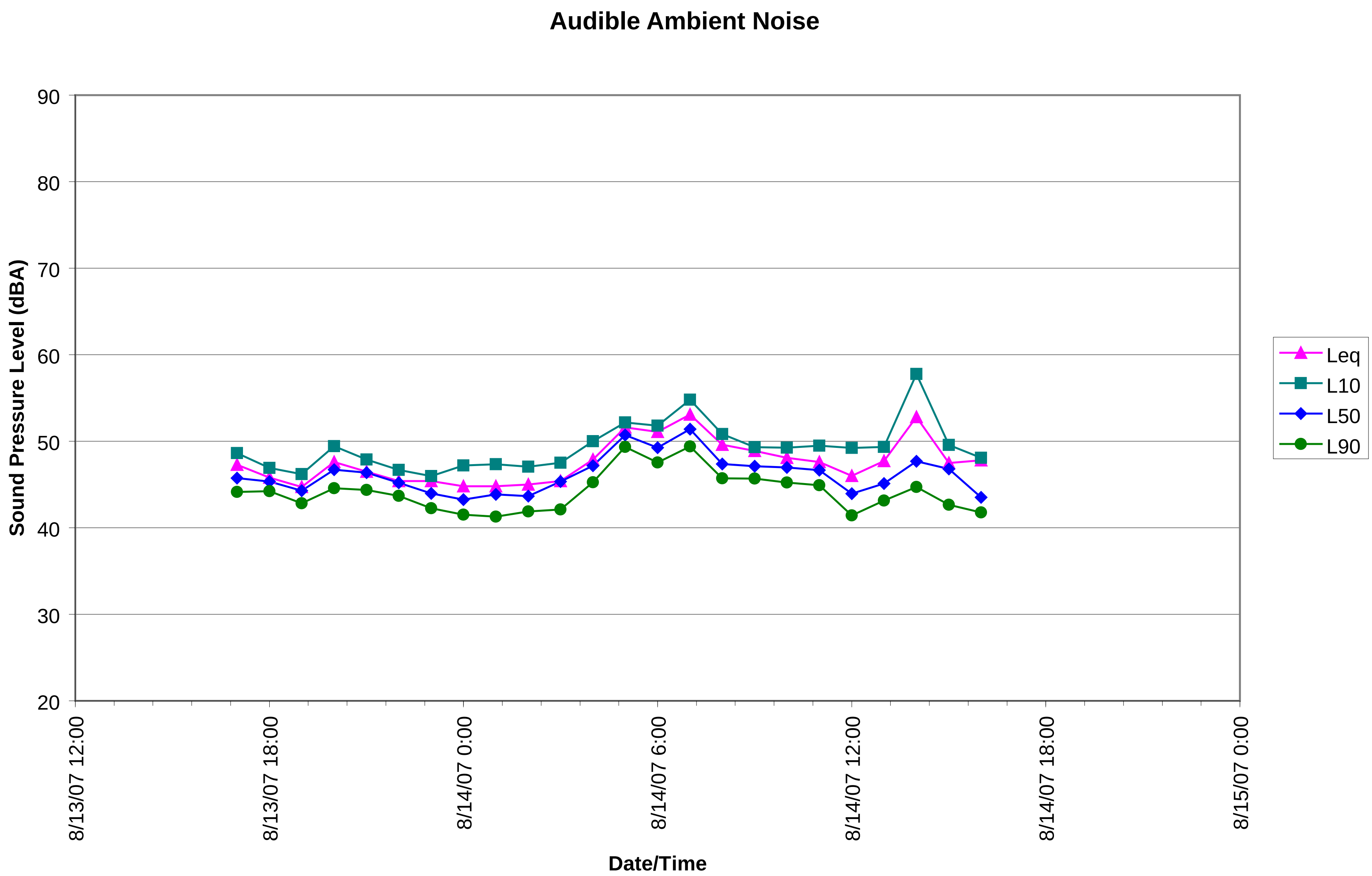

2007	**Tehachapi Renewable Transmission Project PEA**	Figure 5.2-6. SITE 6 - ROSE HILLS MEMORIAL PARK, WHITTIER	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

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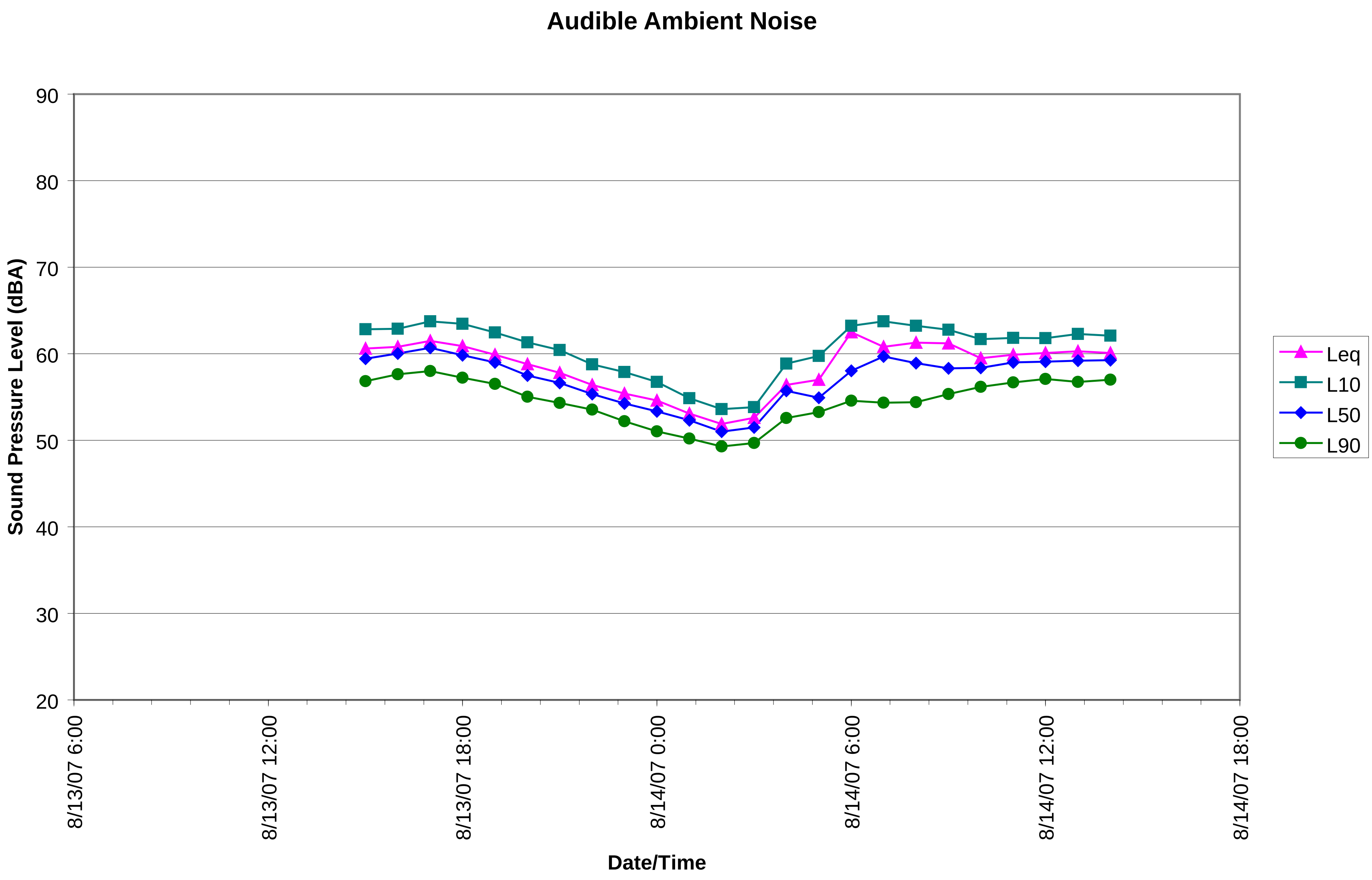

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Figure 5.2-7. SITE 7 - MESA SUBSTATION

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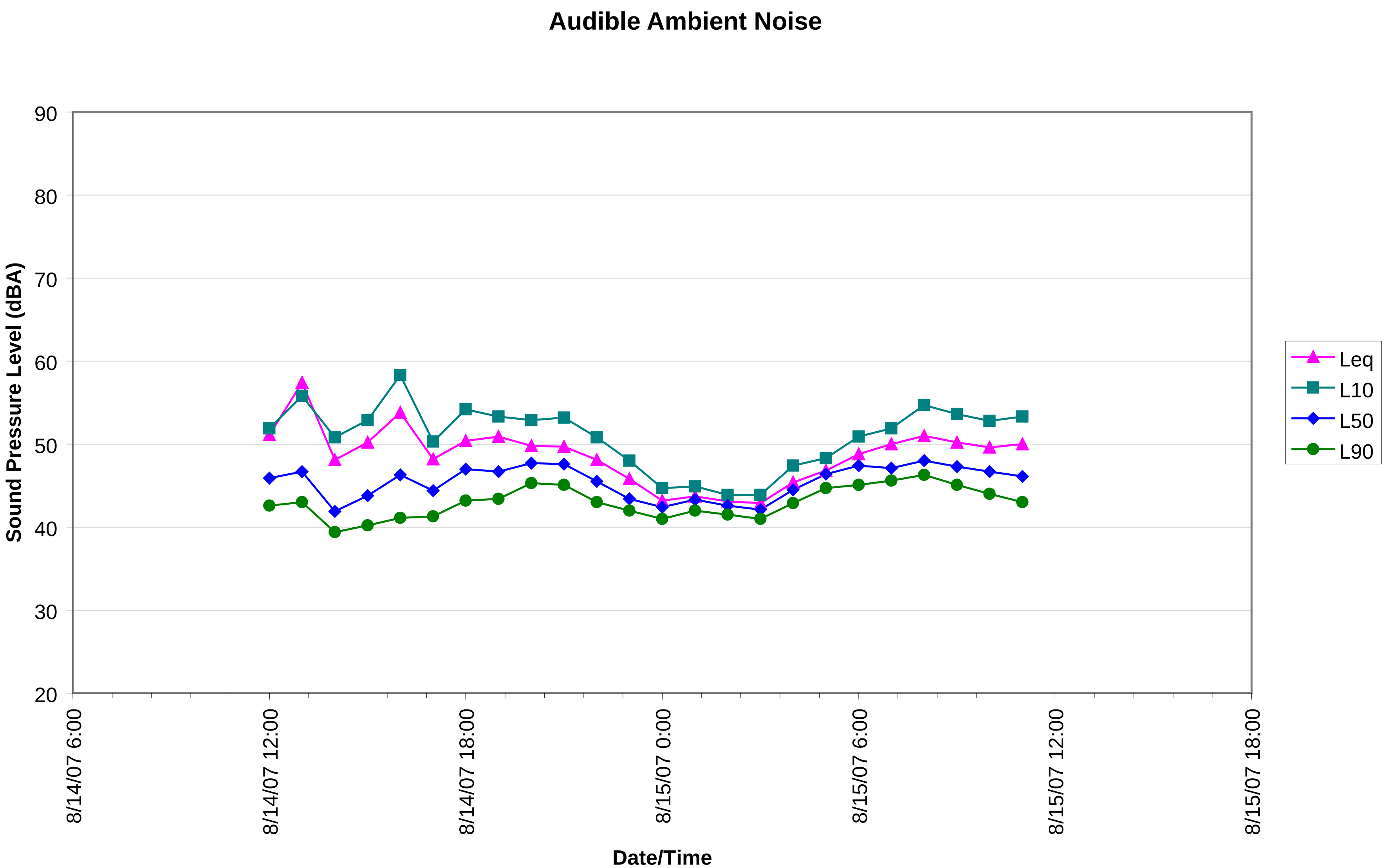

2007	**Tehachapi Renewable Transmission Project PEA**	Figure 5.2-8. SITE 8 - SKYLINE TRAIL, HACIENDA HEIGHTS	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

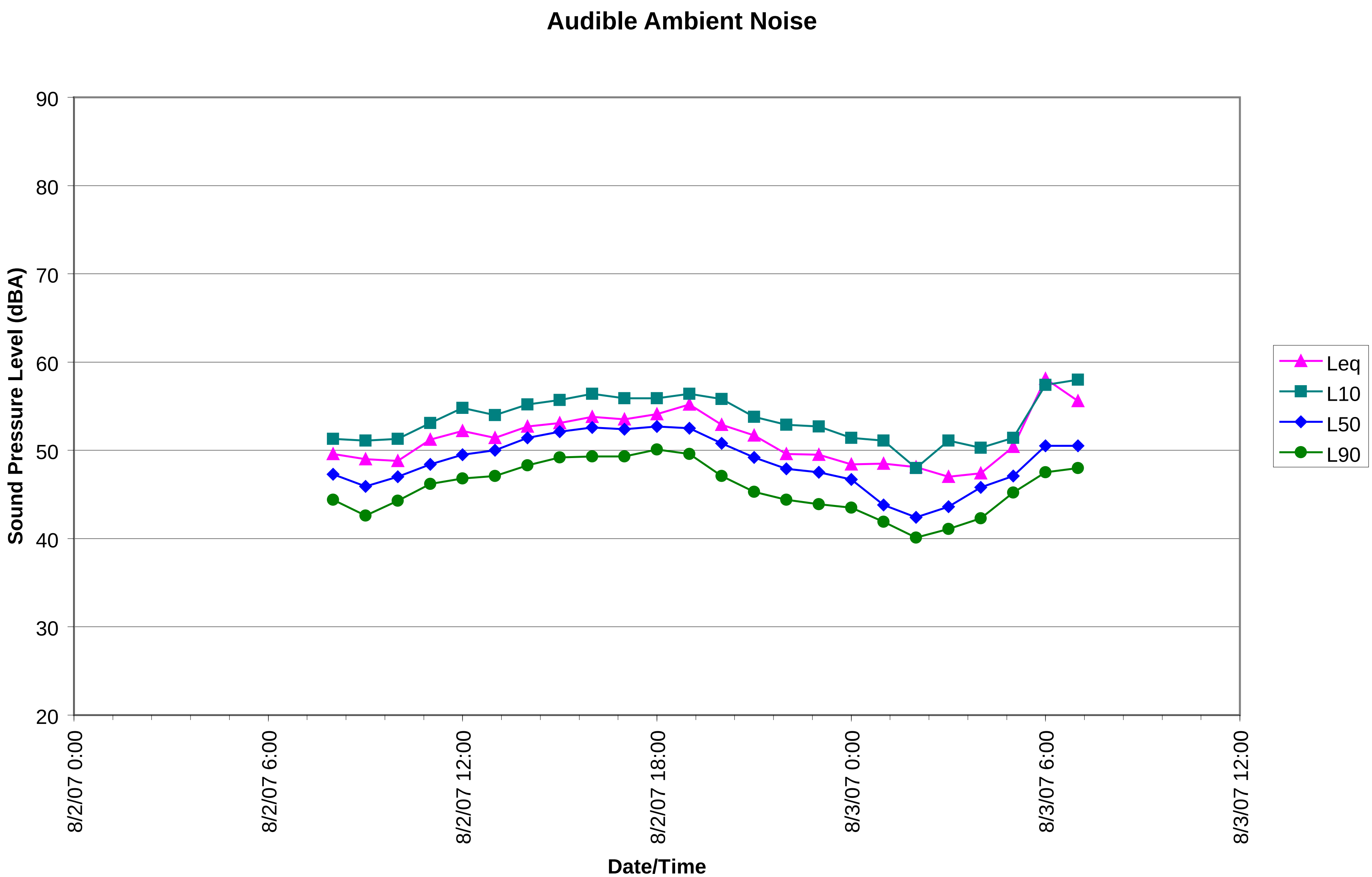

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Figure 5.2-9. SITE 9 - THOROUGHBRED STREET, ONTARIO

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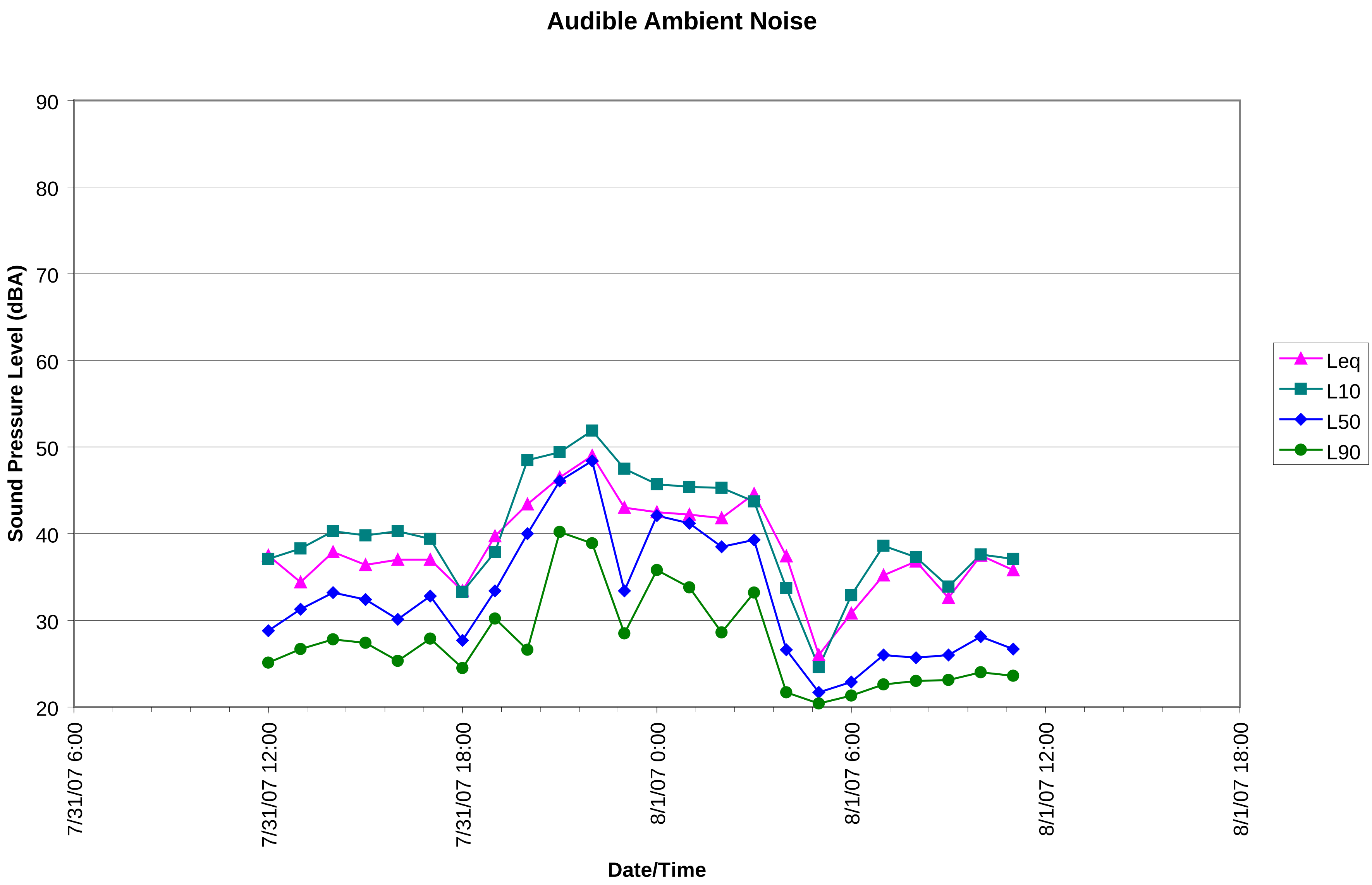

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Figure 5.2-10. SITE 10 - PACIFIC CREST TRAIL, ANGELES NATIONAL FOREST

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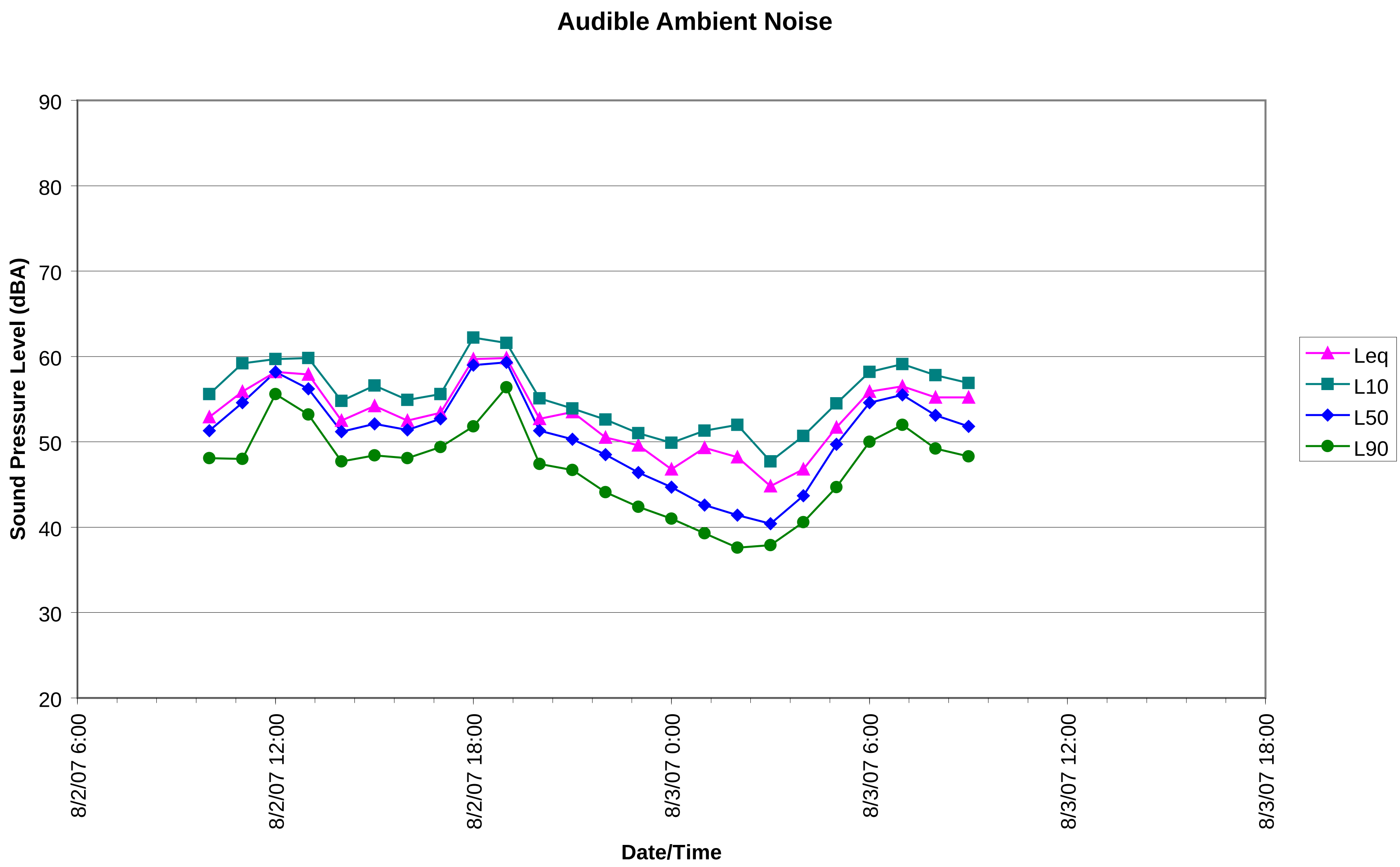

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Figure 5.2-11. SITE 11 - CROSSROADS PARK, CHINO HILLS

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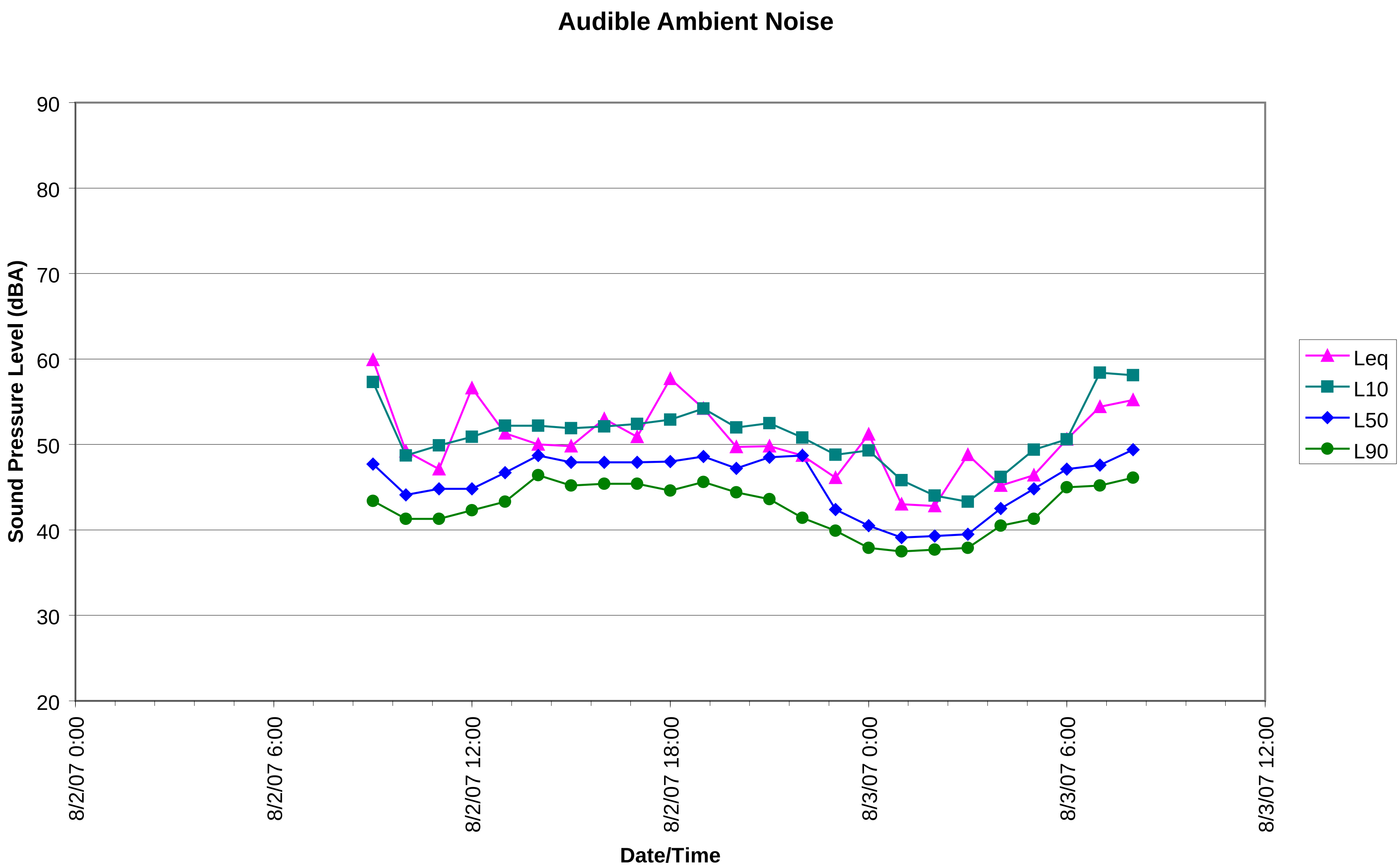

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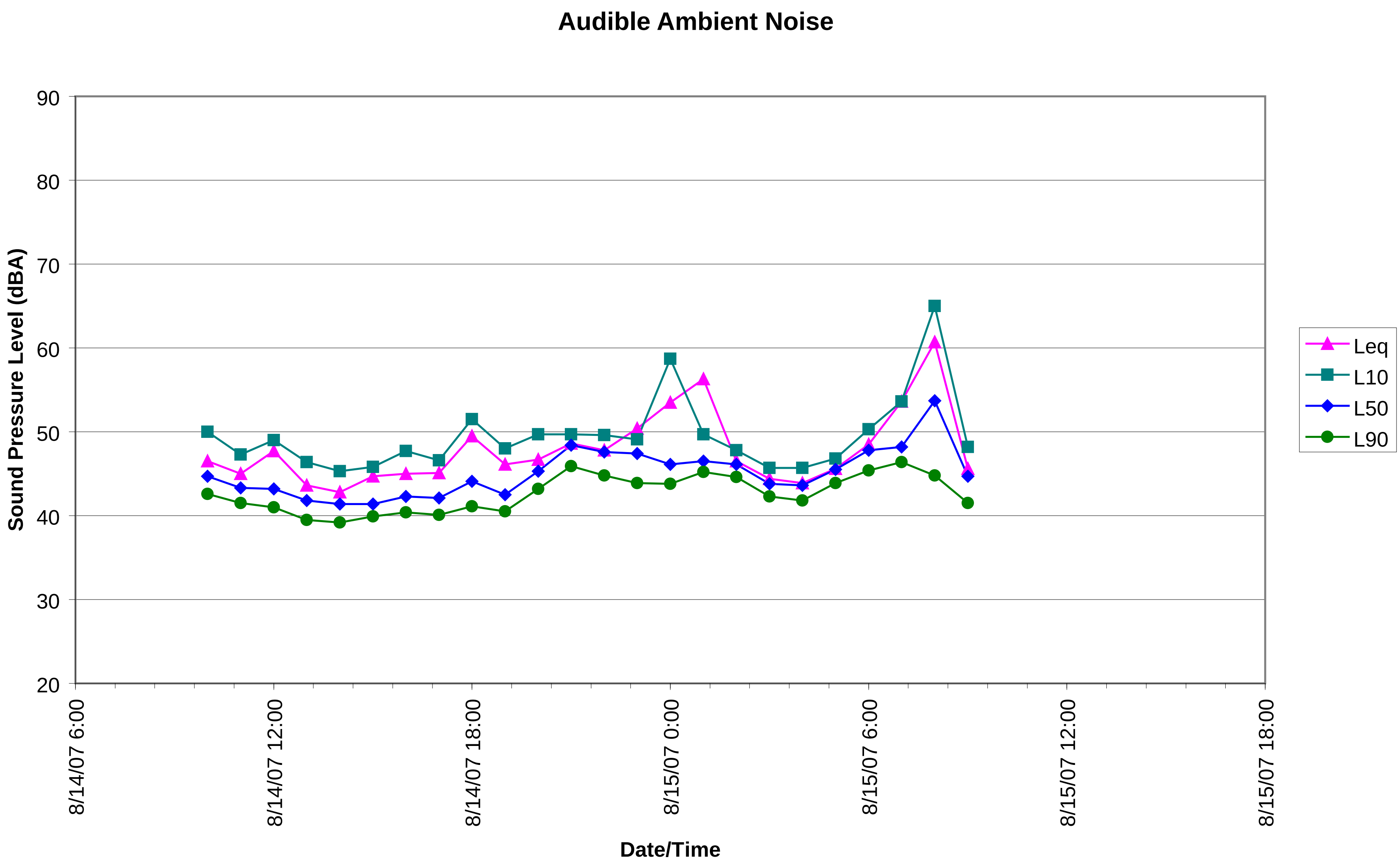

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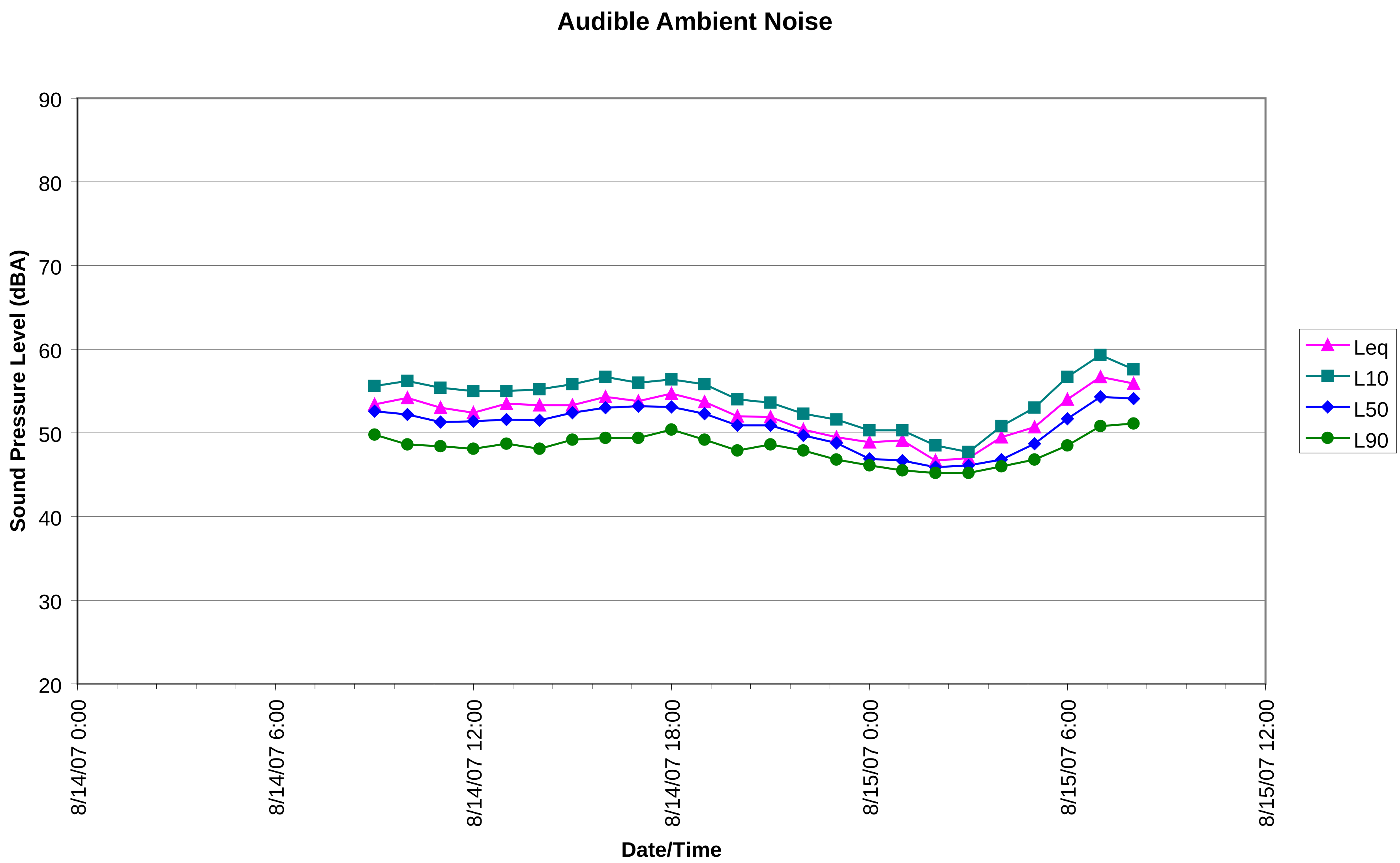

	2007	**Tehachapi Renewable Transmission Project PEA**	Figure 5.2-14. SITE 14 - SALLY TANNER PARK, ROSEMEAD	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

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A. Site 1 - Looking southwest along Backus Road, Kern County.

B. Site 2 - Looking north along 170th Avenue and Rosamond Boulevard, Rosamond.

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Figure 5.2-15. PHOTOGRAPHS OF NOISE MONITORING LOCATION

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C. Site 3 - Looking northwest at end of Parkwood Drive, Palmdale.

D. Site 4 - Looking west from proposed Vincent Substation Expansion Area.

E. Site 5 - Looking west from Valley View Park, Duarte.

F. Site 6 - Looking south from Rose Hills Memorial Park, Whittier.

G. Site 7 - Looking southeast at Mesa Substation, Monterey Park.

H. Site 8 - Looking northwest on Skyline Trail, Hacienda Heights.

2007	**Tehachapi Renewable Transmission Project PEA**	**Figure 5.2-15. PHOTOGRAPHS OF NOISE MONITORING LOCATIONS**	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

I. Site 9 - Looking southwest at end of Thoroughbred Street, Ontario.

J. Site 10 - Looking west from Pacific Crest Trail, Angeles National Forest.

2007	**Tehachapi Renewable Transmission Project PEA**	**Figure 5.2-15. PHOTOGRAPHS OF NOISE MONITORING LOCATIONS**	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

K. Site 11 - Looking southeast from Crossroads Park, Chino Hills.

L. Site 12 - Looking east on southwest corner of Edam Street and Avila Avenue, Chino.

2007	Tehachapi Renewable Transmission Project PEA	Figure 5.2-15. PHOTOGRAPHS OF NOISE MONITORING LOCATIONS	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

M. Site 13 - Looking southwest from Eaton Blanche Park, Pasadena.

N. Site 14 - Looking west from Sally Tanner Park, Rosemead.

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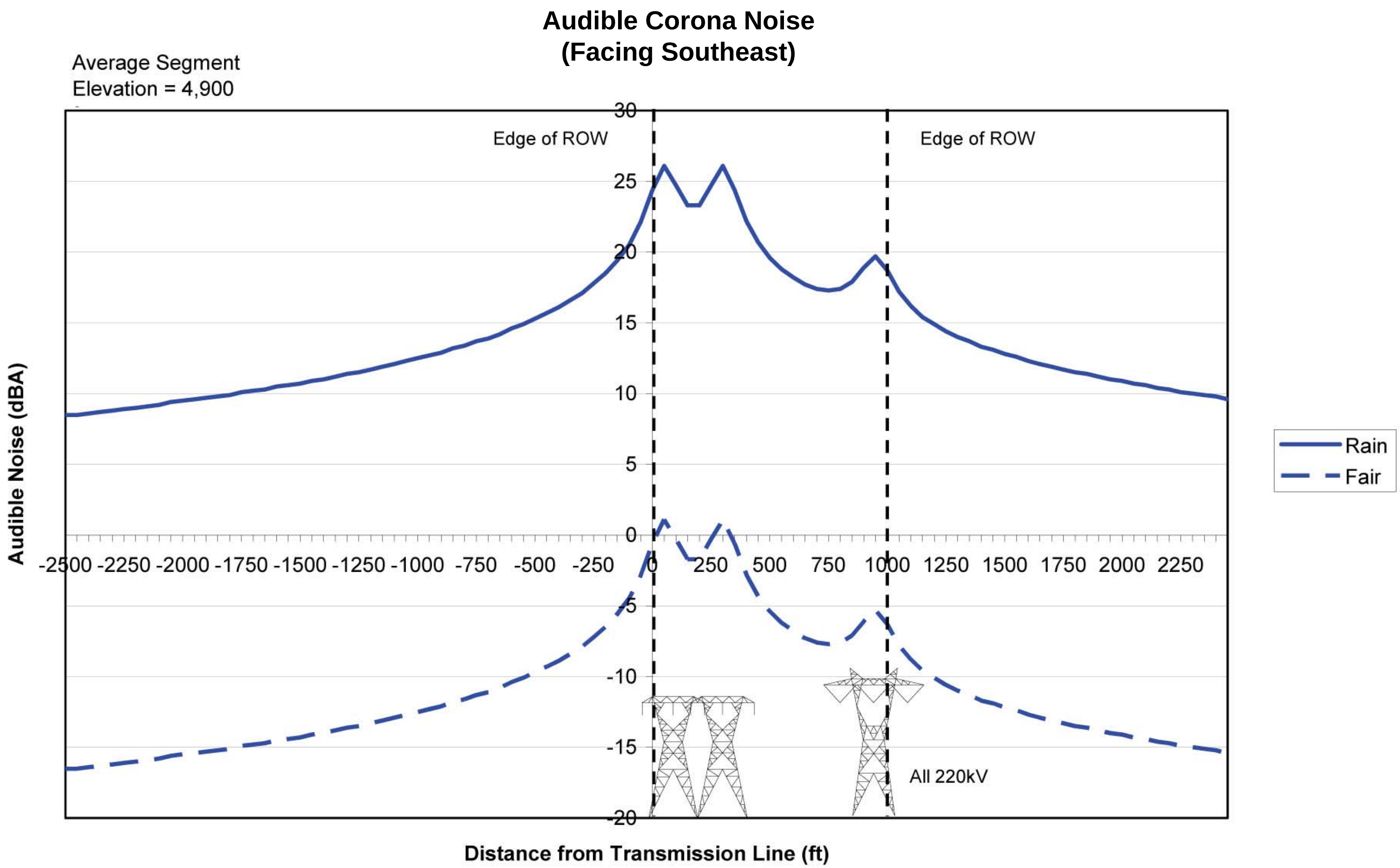

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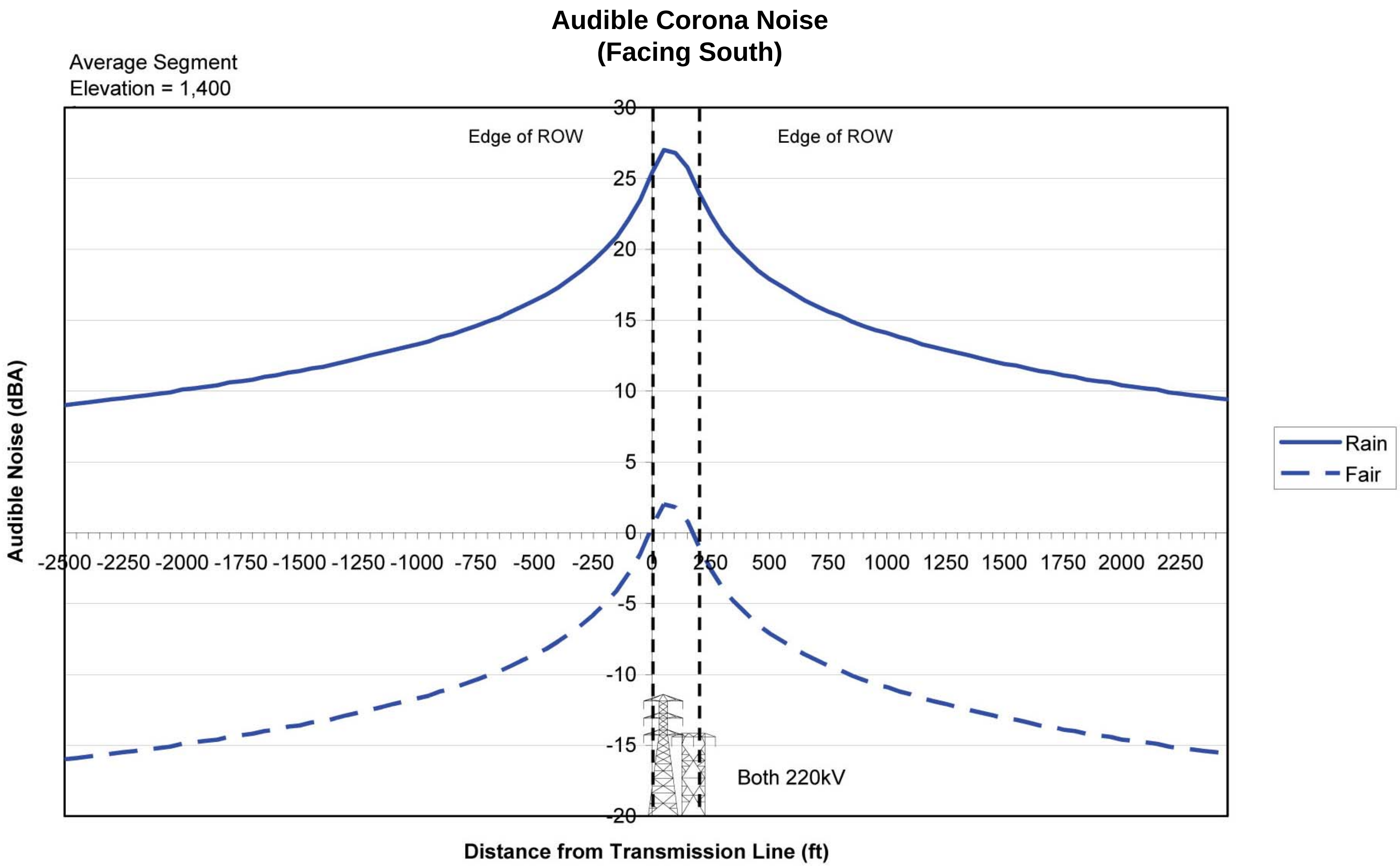
Figure 5.3-1. CORONA MODELING LOCATION 2 - PACIFIC CREST TRAIL EXISTING SCENARIO



	2007	**Tehachapi Renewable Transmission Project PEA**	Figure 5.3-2. CORONA MODELING LOCATION 4 - DUARTE EXISTING SCENARIO

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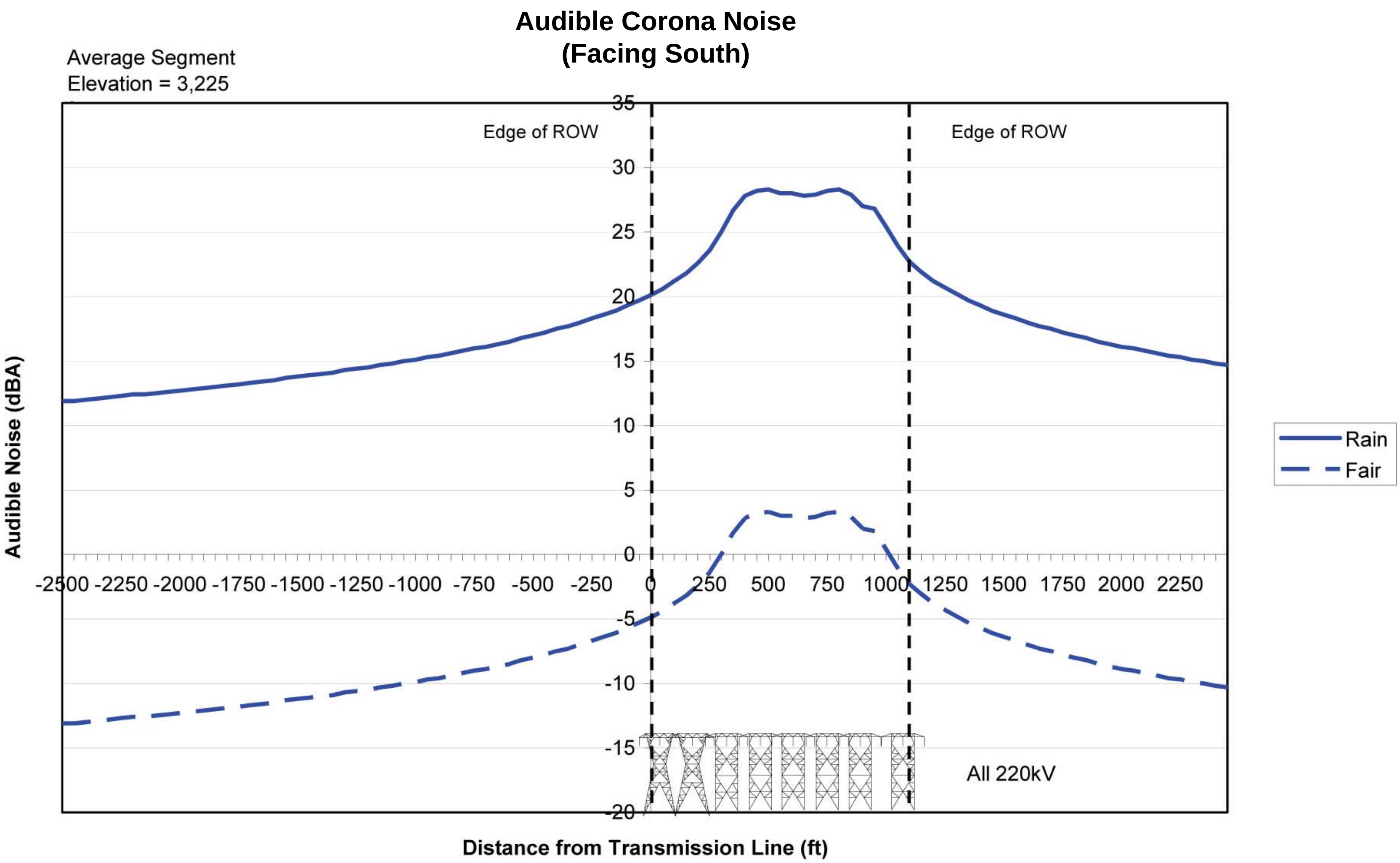

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Figure 5.3-3. CORONA MODELING LOCATION 5 - SOUTH OF VINCENT SUBSTATION EXISTING SCENARIO

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Audible Corona Noise (Facing East)

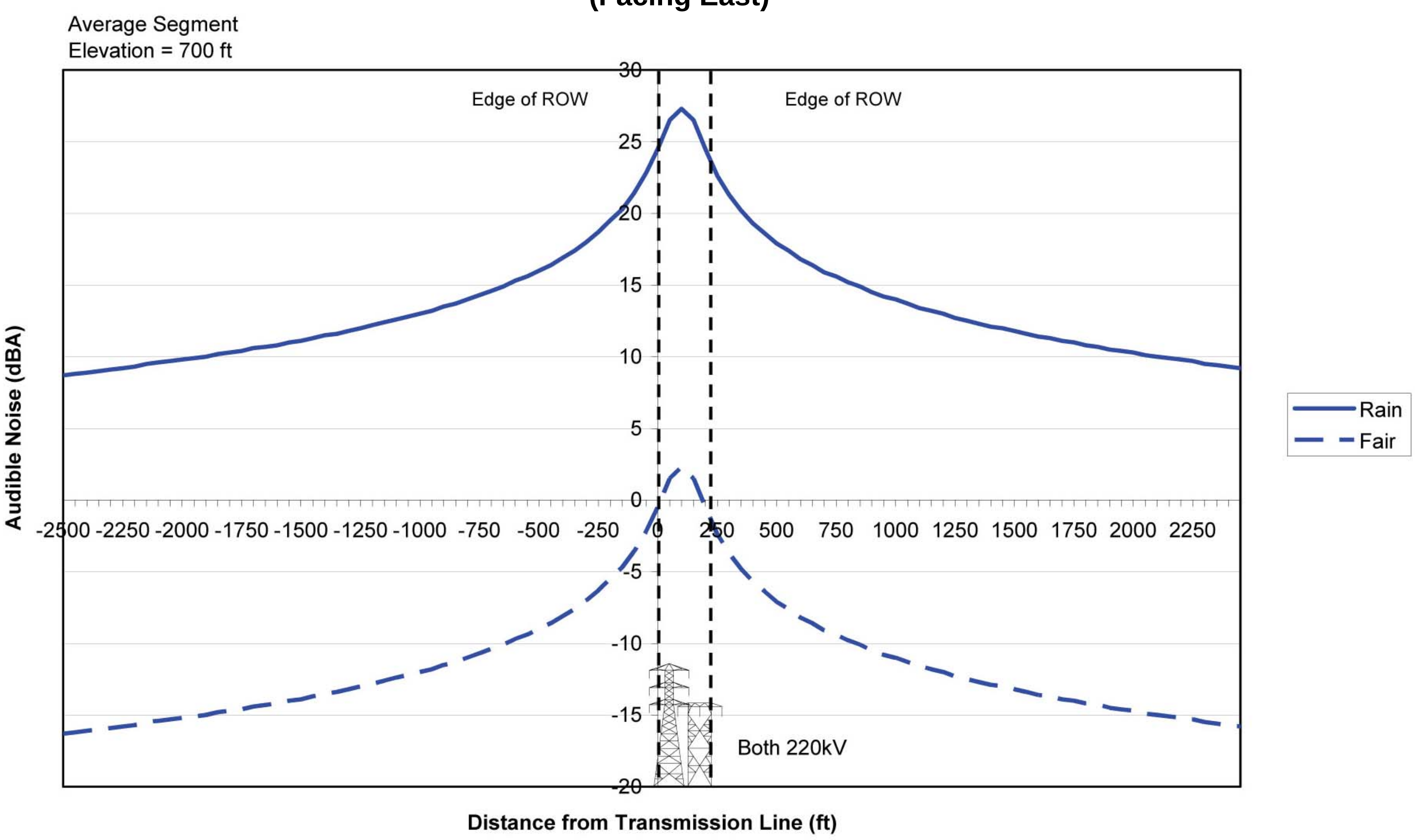

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Figure 5.3-4. CORONA MODELING LOCATION 6 - PATHFINDER PARK EXISTING SCENARIO

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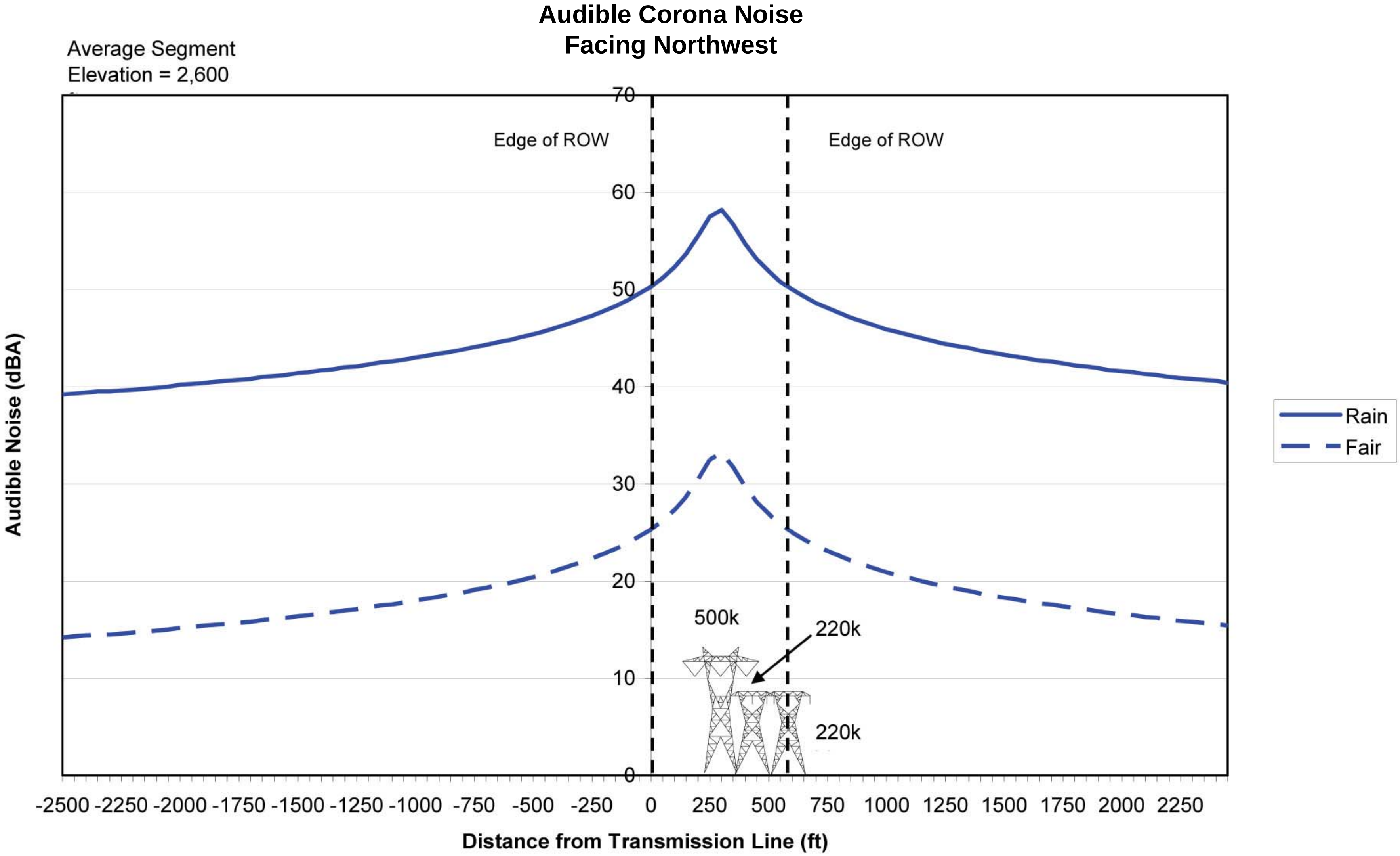

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Figure 5.3-5. CORONA MODELING LOCATION 7 - SEGMENT 4 EXISTING SCENARIO

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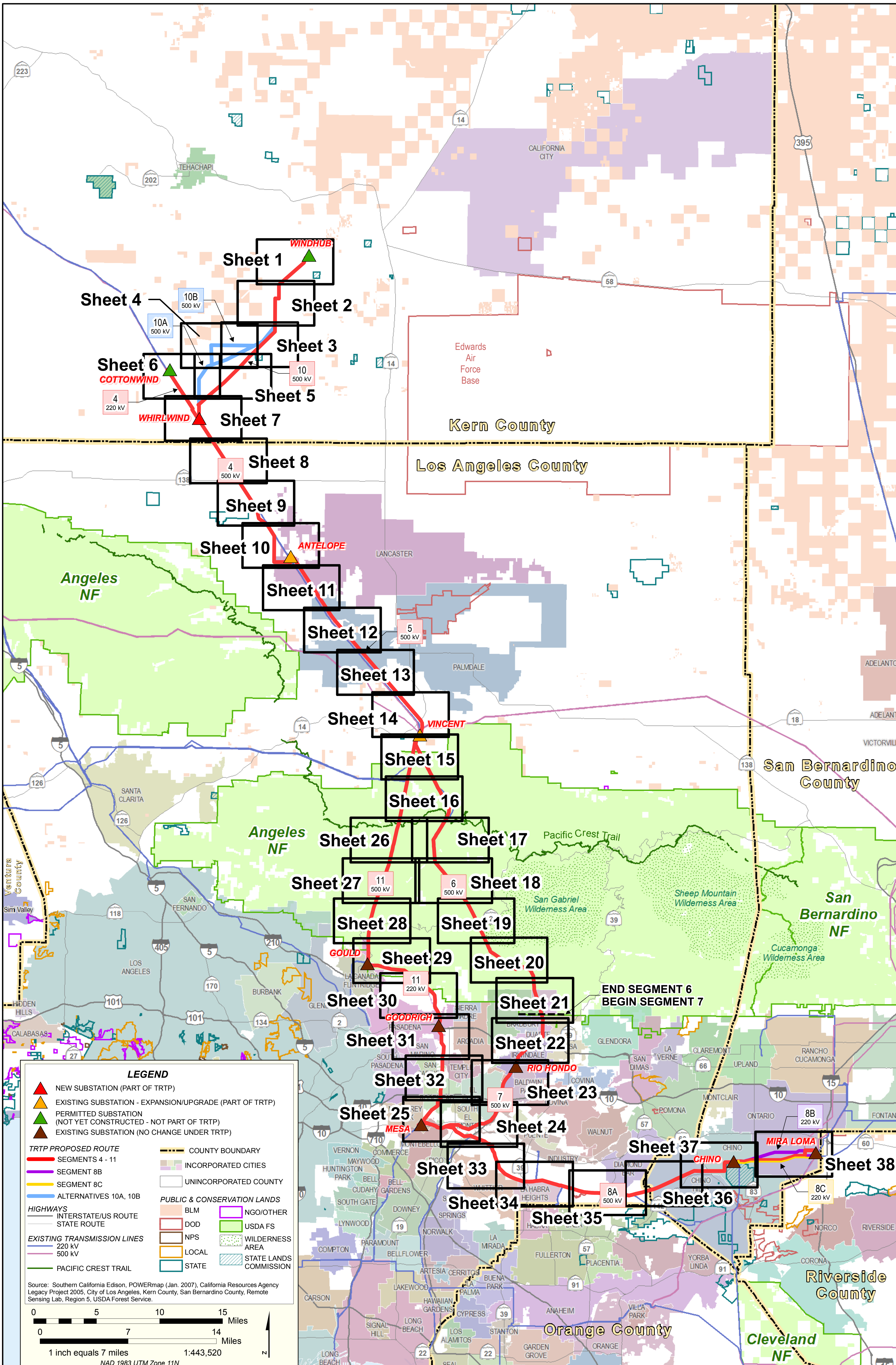

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Figure 5.4-1. NOISE SENSITIVE RECEPTORS INDEX

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6.0 Environmental Consequences

6.1 Introduction

This section discusses the methodology used to model and the results of modeling future noise, including construction noise and operation noise; evaluation criteria; thresholds of significance; and potential noise impacts of implementing Segment 4 through Segment 11 of the TRTP.

6.2 Future Noise Modeling

The methodology used to model future noise associated with construction and operation of the TRTP and the results of the future noise modeling are provided below.

6.2.1 Methodology

6.2.1.1 Construction Noise

Equipment used in the construction of the transmission lines and substations would generate noise. The types of construction equipment to be used have been identified. Section 6.2.2.1 provides additional detail on how this data was used to estimate construction noise levels. The noise levels expected to be generated by construction equipment have been calculated and published in various reference documents. One of the most recent and complete compilation of construction equipment noise is the Roadway Construction Noise Model prepared by the Federal Highway Administration. The *Roadway Construction Noise Model (RCNM) User's Guide* (Final Report, January 2006, FHWA-HEP-05-054, DOT-VNTSC-FHWA-05-01) is one of the most comprehensive ever developed in the U.S. and the expected equipment noise levels listed are used for this evaluation.

Equipment noise levels from Table 1 in the RCNM User's Guide are shown in Figure 6-1. All listed noise levels are maximum A-weighted sound pressure levels at a reference distance of 50 feet. The acoustical usage factor is the fraction of time that the equipment generates noise at the maximum level. The model calculates the total noise level at the receptor by determining the noise from each piece of equipment, taking into account the reduction of noise with distance due to geometric divergence, and logarithmically adding the contribution of each to get the total noise anticipated from all of the construction equipment. Geometric divergence is the primary mechanism of noise reduction close to a noise source. At farther distances, additional attenuation (for example, ground effects and atmospheric attenuation) can be significant. This excess attenuation is not accounted for in the model. Therefore, the model output should be considered conservatively high.

The model output includes the maximum noise level (L_{max}) based on the highest noise levels generated by the construction equipment and the equivalent noise level (L_{eq}) which is the average (on an acoustical energy basis) taking into account the usage factor.

Additionally, helicopters may be used to deliver material to and assist in construction of the transmission lines at some locations. Generally, heavy-duty helicopters are used during construction in remote locations. These locations would be less likely to be near populated areas than locations accessible by truck.

Available data indicate that the sound exposure level (SEL) from the overflight of one heavy-duty helicopter flying at an elevation of 1,000 feet would likely be in the range of 85 dBA to 93 dBA. This corresponds to an hourly L_{eq} of 49 dBA to 57 dBA.

Light-duty helicopters may also be used during construction. Light-duty helicopters would be smaller and generate an SEL of 80 dBA to 85 dBA for an overflight at 1,000 feet elevation. This corresponds to an hourly L_{eq} of 44 dBA to 49 dBA for the light-duty helicopters.

6.2.1.2 Operation Noise

Substations

Standard acoustical engineering methods were used in the noise analysis. The noise model, CADNA/A by DataKustik GmbH of Munich, Germany, enables complex industrial plant modeling. The sound propagation factors used in the model have been adopted from ISO 9613-2, Acoustics—Sound Attenuation during Propagation Outdoors (IOS, 1996) and Verein Dutscher Ingenieure (VDI) 2714, Outdoor Sound Propagation (VDI, 1988). The model divides the proposed facility into a list of individual point and area noise sources representing each piece of equipment that produces a significant amount of noise. The equipment sound power levels are used to calculate the sound pressure level that would occur at each receptor from each source after losses from distance, air absorption, blockages, etc., are considered. The sum of all these individual levels is the total noise level at the modeling point.

Modifications to substations other than Vincent, Antelope, and Whirlwind are not anticipated to alter the substations noise levels and were not modeled. Substation noise levels estimates at Vincent, Antelope, and Whirlwind are primarily based on the estimated noise levels from transformers associated with the TRTP. In addition, noise associated with the Static VAR Compensator (SVC) was taken into consideration at the Antelope and Vincent Substations.

Corona Noise

Various computer models have been written to predict the occurrence of corona on proposed transmission lines. Many of these models are based on research performed at the Bonneville Power Administration in Oregon and Washington in the 1980s and 90s. Much of this research was conducted by Mr. Vernon Chartier and others at Bonneville who took measurements of corona effects from operating transmission lines. These noise measurements were used to develop a computer model called Corona, which is used in the prediction of corona effects from transmission lines.

The Bonneville Corona model was first run on a mainframe computer and was converted to PCs in 1984. The version used for this report is a later, refined version of the model, version 3 (Corona 3 model), prepared in 1991 that is coded in FORTRAN language. The Corona 3 computer code in the model forms the basis of the corona calculations used in many computer models in the electric utility industry.

The Corona 3 model requires inputs for the locations and voltages of the energized and grounded conductors, the conductor diameters and their bundling dimensions and geometry, the elevation of the site, and several other parameters. The Corona 3 model can generate profiles of corona effects for audible noise, radio, and television interference and ozone production, as well as electric and magnetic fields. The tabular output files from the Corona 3 model were plotted for display in the Figures 6-3 through 6-9.

Seven locations from the TRTP were selected for corona modeling. The following scenarios were modeled for audible noise produced by corona at each location.

Location 1 – Segment 10
Proposed scenario (Lattice Steel Tower [LST])

Location 2 – Pacific Crest Trail
Proposed scenario (LST)

Location 3 – Chino Hills
Proposed scenario (LST)

Location 4 – Duarte
Proposed scenario (LST)
Proposed scenario (Tubular Steel Pole [TSP])

Location 5 – South of Vincent Substation
Proposed scenario (TSP)

Location 6 – Pathfinder Park
Proposed scenario (LST)

Location 7 – Segment 4
Proposed scenario (LST)

For the selected locations, the dimensions and phase arrangements for each transmission line were provided by SCE from the EMF modeling performed by SCE. Determinations were made for elevation, ground wires, and conductors, and are described below.

The elevation used in corona modeling for each location is representative of the segment (approximate average taken from topographical maps) (See Table 6-1).

TABLE 6-1
Elevation Assumptions

Location	Segment Name	Elevation (ft)
1	Segment 10	3,150
2	Pacific Crest Trail	4,900
3	Chino Hills	950
4	Duarte	1,400
5	South of Vincent Substation	3,225
6	Pathfinder Park	700
7	Segment 4	2,600

Ground wire assumptions provided by SCE were based on circuitry (double or single circuit), voltage level (220-kV or 500-kV), and structure type (LST or TSP). These include the number of ground wires, height of ground wire above top phase/conductor, horizontal separation of ground wires (if two or more conductors are present), and diameter of ground wire (See Table 6-2).

TABLE 6-2
Ground Wire Assumptions

Type of Transmission Line Structure	Number of Ground Wires	Height of Ground Wire Above Top Phase/ Conductor (ft)	Horizontal Separation of Ground Wires (if 2 or more are present) (ft)	Diameter of Ground Wire (inch)
DC 500-kV LST	2	29	13	0.5
DC 500-kV TSP	2	29	13	0.5
DC 220-kV LST	1	15	NA	0.5
DC 220-kV TSP	1	15	NA	0.5
SC 500-kV LST	2	29	60	0.5
SC 500-kV TSP	2	25	20	0.5
SC 220-kV LST	2	12	34	0.5
SC 220-kV TSP	1	15	NA	0.5

DC = Double Circuit, SC = Single Circuit, LST = Lattice Steel Tower, TSP = Tubular Steel Pole

Conductor assumptions were based on voltage (220-kV or 500-kV). The phased conductors have bundled conductors in a horizontal arrangement. See Table 6-3.

TABLE 6-3
Conductor Assumptions

Type of Transmission Line	Type of Conductor	Diameter of Conductor (inch)	Conductors per Bundle	Horizontal Separation of Conductors in Bundle (inch)
500-kV (DC/SC LST/TSP)	2B-2156 kcmil ACSR	1.762*	2	18
220-kV (DC/SC LST/TSP)	2B-1590 kcmil ACSR	1.545*	2	16

* Conductor diameters were provided by General Cable Company “ACSR/AW Bare Overhead Conductor” tables of conductor characteristics.

ACSR = aluminum conductor steel reinforced

DC = Double Circuit

SC = Single Circuit

LST = Lattice Steel Tower

TSP = Tubular Steel Pole

6.2.1.3 Maintenance

Maintenance activities associated with substations and transmission lines would typically result in noise levels below those associated with construction-related activities, and are anticipated to involve fewer pieces of heavy equipment, occur less frequently, and to be of shorter duration. Maintenance activities are primarily inspection-related (for example, annual inspection of the transmission line from vehicles or helicopters). Other maintenance activities include washing of insulators to ensure proper function and would be conducted on an as-needed basis, but are anticipated to occur less than once per year.

6.2.2 Modeling Results

6.2.2.1 Construction

Review of the table of construction equipment noise levels indicates that the loudest equipment generally emits noise in the range of 80 to 90 dBA at 50 feet with usage factors of 40 percent to 50 percent. Noise at any specific receptor is dominated by the closest and loudest equipment. The types and numbers of construction equipment near any specific receptor location would vary over time. In order to make reasonably conservative estimates of construction noise, it was decided to model a scenario consisting of the following:

- One piece of equipment generating a reference noise level of 85 dBA (at 50 feet distance with a 40 percent usage factor) located on the transmission line ROW or the substation property line
- Two pieces of equipment generating reference 85-dBA noise levels located 50 feet farther away on the transmission line ROW or the substation property line
- Two more pieces of equipment generating reference 85-dBA noise levels located 100 feet farther away on the transmission line ROW or the substation property line

Construction equipment noise levels at various distances, based on this scenario, are presented in Table 6-4.

TABLE 6-4
Construction Equipment Noise Levels versus Distance

Distance from ROW or Substation Property Line (ft)	L_{eq} Noise Level (dBA)
50	83
100	79
200	74
400	69
800	63
1,600	58
3,200	52
6,400	46

The data in Table 6-4 are plotted in Figure 6-2.

The expected construction noise levels at any particular location were estimated using these data.

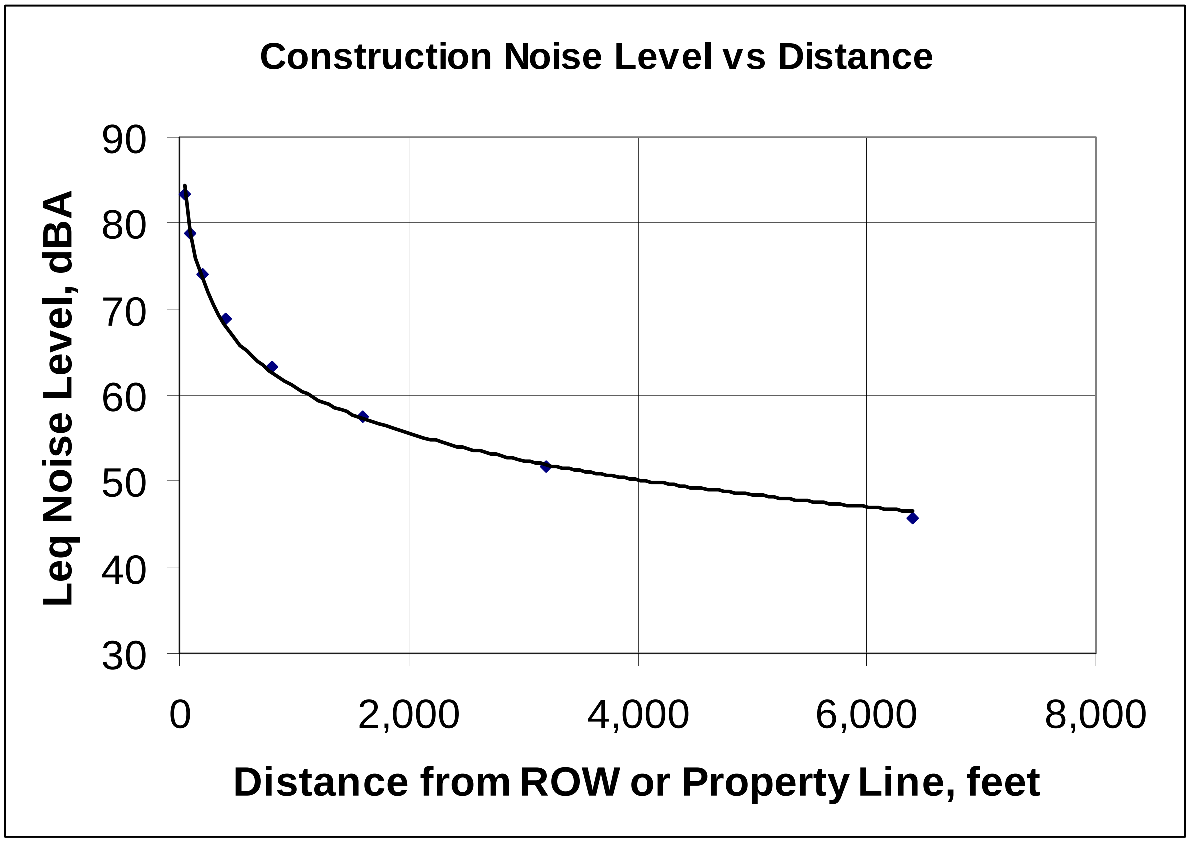


FIGURE 6-2
Construction Noise Level vs. Distance

6.2.2.2 Operation

Substations

The following presents the predicted noise levels from the Vincent, Antelope, and Whirlwind Substations (the only substations where TRTP has the potential to result in a change in noise levels).

Vincent

The TRTP modifications to the Vincent Substation include one new SVC that is anticipated to result in 60 dBA or less at the fence line. The closest residents are located approximately 400 feet from the fence line and at this distance the noise level from the SVC is predicted to be 46 dBA and is anticipated to increase the substation noise level by 2 dBA to 53 dBA.

Antelope

The closest residence to the proposed SVC location is approximately 3,000 feet. The TRTP modifications to the Antelope Substation include one new SVC that is anticipated to result in 65 dBA or less at the fence line. At 3,000 feet from the fence line, the noise level from the

SVC is predicted to be 42 dBA. This is anticipated to result in less than a 2-dBA increase to 48 dBA at the closest residence to the SVC.

Whirlwind

No residences have been identified within 3,000 feet of any of the proposed locations for the Whirlwind Substation. The new Whirlwind Substation would include four single-phase 373-megavolt amperes (MVA) transformers. The predicted noise level from these transformers is 40 dBA at 3,000 feet.

6.2.2.3 Corona Noise

Seven locations from the proposed Project were selected for corona modeling. The following scenarios were modeled for audible noise produced by corona at each location. The results of the modeling are summarized in Table 6-5.

TABLE 6-5
Summary of Modeled Future Audible Corona Noise
Tehachapi Renewable Transmission Project

Location	Audible Future Corona Noise at Edge of ROW (dBA)
Location 1 – Segment 10	Rain = 52 - 55 Fair = 27 - 30
Location 2 – Pacific Crest Trail (Segment 6)	Rain = 47 - 60 Fair = 22 - 35
Location 3 – Chino Hills (Segment 8A)	Rain = 56 - 58 Fair = 32 - 35
Location 4 – Duarte (End of Segment 6/Beginning of Segment 7) – LST	Rain = 51 - 54 Fair = 26 - 29
Location 4 – Duarte (End of Segment 6/Beginning of Segment 7) – TSP	Rain = 52 - 54 Fair = 27 - 29
Location 5 – South of Vincent Substation	Rain = 49 Fair = 24
Location 6 – Pathfinder Park, Hacienda Heights (Segment 8)	Rain = 51 - 52 Fair = 26 - 27
Location 7 – Segment 4	Rain = 52 - 56 Fair = 26 - 31

dBA = A-weighted sound pressure level

Location 1 – Segment 10

One 500-kV single-circuit LST was modeled for the Location 1 proposed scenario. The corona modeling inputs included five total conductors, of which three are energized phases and two are ground wires. The elevation used in the corona modeling for Location 1 was 3,150 feet (Figure 6-3).

Location 2 – Pacific Crest Trail

The Location 2 proposed scenario was modeled with one 220-kV single-circuit LST, one single-circuit LST to be built to 500-kV specifications and operated at 220-kV, and one 500-kV single-circuit LST. Corona modeling inputs included 15 total conductors, of which 9 are energized phases and 6 are ground wires. An elevation of 4,900 feet was used for Location 2 (Figure 6-4).

Location 3 – Chino Hills

The Location 3 proposed scenario was modeled with one split-phased 500-kV double-circuit TSP, with both circuits energized. Corona modeling inputs included eight total conductors, of which six are energized phases and two are ground wires. The elevation used in the Corona modeling for Location 3 was 950 feet (Figure 6-5).

Location 4 – Duarte

The Location 4 LST proposed scenario was modeled with one 220-kV double-circuit LST, with the right side de-energized, and one 500-kV double-circuit LST. The 500-kV double-circuit LST is to be built to 500-kV specifications, and operated at 220-kV on the left and operated at 500-kV on the right. The corona modeling inputs included 15 total conductors, of which 9 are energized phases, 3 are de-energized phases, and 3 are ground wires. An elevation of 1,400 feet was used for Location 4 (Figure 6-6).

The Location 4 TSP proposed scenario was modeled with one 220-kV double-circuit LST, with the right side de-energized, and one 500-kV double-circuit TSP. The 500-kV double-circuit TSP is to be built to 500-kV specifications, and operated at 220-kV on the left and operated at 500-kV on the right. The corona modeling inputs included 15 total conductors, of which 9 are energized phases, 3 are de-energized phases, and 3 are ground wires. An elevation of 1,400 feet was used for Location 4 (Figure 6-7).

Location 5 – South of Vincent Substation

The Location 5 proposed scenario was modeled with the following eight transmission lines:

- Six 220-kV single-circuit LSTs
- One single-circuit TSP, to be built to 500-kV specifications and operated at 220-kV
- One 500-kV single-circuit TSP

The corona modeling inputs included 38 total conductors, of which 24 are energized phases and 14 are ground wires. An elevation of 3,225 feet was used for Location 5 (Figure 6-8).

Location 6 – Pathfinder Park

One 220-kV double-circuit LST and one 500-kV double-circuit LST, with the right side de-energized, were modeled for the Location 6 proposed scenario. The corona modeling inputs included 15 total conductors, of which 9 are energized phases, 3 are de-energized phases, and 3 are ground wires. The elevation used in the corona modeling for Location 6 was 700 feet (Figure 6-9).

Location 7 – Segment 4

The Location 7 proposed scenario was modeled with two 500-kV single-circuit LST and two 220-kV single-circuit LST. Corona modeling inputs included 20 total conductors, of which 12 are energized phases and 8 are ground wires. An elevation of 2,600 feet was used for Segment 4 (Figure 6-10).

6.2.2.4 Maintenance

Maintenance activities associated with substations and transmission lines would typically result in noise levels below those associated with construction-related activities, and are anticipated to involve fewer pieces of heavy equipment, occur less frequently, and to be of shorter duration. Maintenance activities are primarily inspection-related (for example, annual inspection of the transmission line from vehicles or helicopters). Other maintenance activities include washing of insulators to ensure proper function and would be conducted on an as-needed basis, but are anticipated to occur less than once per year.

6.3 Evaluation Criteria

The California Public Utilities Commission (CPUC) will evaluate the proposed Project's noise impacts in light of the requirements of CEQA, while the Angeles National Forest (ANF) will evaluate the Project's noise effects under NEPA. Findings under CEQA include: (1) no impact, (2) less than significant impact, (3) less than significant with mitigation, or (4) potentially significant impact. Findings under NEPA will be determined by the ANF and include: (1) no adverse effect or (2) adverse effect.

Appendix G of the CEQA Guidelines, under Noise, lists six questions to be addressed during analysis of a proposed project and alternatives to determine if the potential impacts of a project are significant. The six questions are as follows:

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?
3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?
6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

6.4 Thresholds of Significance

The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...ambient noise" (California Code of Regulations [CCR], Title 14, § 15382).

For purposes of evaluating potential noise impacts, the following thresholds of significance were used during the evaluation of noise during construction and operation of the TRTP.

6.4.1 Construction

Noise associated with construction would be potentially significant if: (1) the construction activity is permanent, (2) use of heavy equipment will occur outside of daytime hours; and (3) no feasible noise abatement measures can be implemented for noise-producing equipment.

The CPUC General Order (GO) No. 131-D, Section XIV B, clarifies that "[l]ocal jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the Commission's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Due to this GO, the public utilities are directed to consider local regulations and consult with local agencies, but the regulations and general plans of the counties and cities are not applicable, as the counties and cities do not have jurisdiction over the proposed Project.

6.4.2 Operation

The level of noise associated with the corona effect strongly depends on weather conditions. The TRTP location is generally considered to have fair weather during most of the year; however, foul weather, or rain conditions, occurs periodically and seasonally. Therefore, CEQA Checklist questions regarding "permanent increase" focus on the impacts associated with fair weather conditions and questions regarding "temporary or periodic increase" focus on the impacts associated rain conditions.

For "permanent increases" associated with fair weather corona noise or substation noise, the threshold for a potentially significant increase is 5 dBA resulting in a level that exceeds 40 dBA. Permanent increases of any magnitude that do not result in levels above 40 dBA are considered less than significant. In addition, increases that result in permanent noise levels greater than 50 dBA are considered potentially significant.

For "temporary or periodic increases" associated with corona noise under rain conditions, the threshold for a potentially significant increase is 5 dBA resulting in a level above 50 dBA. Temporary or periodic increases of any magnitude that do not result in levels above 50 dBA are considered less than significant. In addition, increases that result in temporary or periodic noise levels greater than 50 dBA are considered potentially significant.

However, as mentioned above, the CPUC GO No. 131-D, Section XIV B, clarifies that "[l]ocal jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the Commission's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Due to this GO, the public utilities are directed to consider local regulations and consult with local agencies, but the regulations and general plans of the counties and cities are not applicable, as the counties and cities do not have jurisdiction over the proposed Project.

6.5 Environmental Impacts

As part of constructing the TRTP, the following noise abatement measures would be implemented, and they are considered during evaluation of the potential noise impacts:

- All construction and operations activities will be in compliance with noise regulations, to the extent practicable.
- All construction equipment will be in good working order.
- All construction equipment will be maintained per manufacturer's recommendations.
- All construction equipment will be adequately muffled.
- Idling of construction equipment and vehicles will be minimized during the construction.
- Workers would be provided appropriate hearing protection, if necessary.

The construction and operation activities associated with implementing each of the segments of the TRTP that may result in noise impacts are discussed below.

6.5.1 Summary of Project-Related Construction Activities

Construction of TRTP Segments 4 through 11 would involve the use of heavy equipment to transport material and accomplish installation of transmission line towers, conductors, and substation facilities or electrical tie-ins. Cranes and other heavy equipment would be used in the erection of towers and for installing conductors. Grading would be required for creating staging areas, transmission line tower foundation pads, conductor pull areas, and in creating spur roads and/or improving access along roads. In addition, grading would be required at proposed new (Whirlwind) or expanded substations (Antelope and Vincent). To a large extent, these types of noises are common and associated with any development and building activities.

The Project would also involve the use of helicopters to move construction materials to specific Project sites from staging areas. Additionally, helicopters may be used during construction. While only a minor component of the overall project, the helicopter operations would result in localized noise conditions for short-term periods.

6.5.2 Summary of Project-Related Operation Activities

Noise from operation of the TRTP would come from two primary sources: electrical and related equipment (e.g., transformers and fans) at the substations, and corona discharge associated with the 500-kV and 220-kV transmission lines (T/Ls).

In addition, periodic maintenance and inspection activities requiring the use of helicopters and/or trucks would occur.

6.5.3 Segment 4

6.5.3.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 4 include unincorporated Kern and Los Angeles Counties and the city of Lancaster.

Construction

Kern County has established a 65-L_{dn} (59-dBA continuous) residential noise standard, Los Angeles County has established a 55-dBA limit, and the city of Lancaster has established a 65-dBA CNEL (58-dBA continuous) limit for construction noise (see Section 7.0). The closest sensitive receptors in Segment 4 are located at edge of the TRTP ROW. Average levels of construction noise at this distance would be greater than approximately 83 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher noise than existing levels. This potential noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and the impacts from construction noise due to implementation of Segment 4 would be less than significant under this criterion.

Operation

Kern County has established a 65-L_{dn} (59-dBA continuous) residential noise standard, Los Angeles County has established a 45-dBA limit, and the city of Lancaster has established a 65-dBA CNEL (58-dBA continuous) limit for operation noise (see Section 7.0). The operational noise for Segment 4 is represented by the corona modeling Location 7.

The results of corona modeling at Location 7 determined that the Kern County 59-dBA and city of Lancaster 65-dBA CNEL (58-dBA continuous) noise levels would not be exceeded at the edge of the ROW during fair weather conditions. The results of corona modeling at Location 7 determined that the Los Angeles County 45-dBA level is only exceeded under rain conditions at distances within approximately 850 feet of the ROW. Under the more typical fair weather conditions, the predicted corona noise levels at the ROW do not exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Under rain conditions, at distances less than approximately 850 feet from the edge of the ROW, corona noise would exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 4 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 4 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The noise measurements taken at the junction of 170th Avenue and Rosamond Boulevard (Site 2 measurements) are representative of the noise levels in the Segment 4 study area and other less developed and rural locations. The measurement was conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured noise level representative of this area was 40 dBA (Site 2 measurement).

Fair weather conditions occur during most of the year along the proposed TRTP alignment and are considered the permanent condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 4 is characterized by future corona modeling at Location 7.

Under the future fair weather conditions, the range in permanent corona noise at the ROW would be 27 to 30 dBA. Under the generally persistent fair weather conditions, the predicted future levels of corona noise at the ROW would not exceed 40 dBA. Therefore, the permanent increase in corona noise levels due to operation of this segment would result in a less than significant impact under this criterion.

4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction noise would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

The noise measurements taken at the junction of 170th Avenue and Rosamond Boulevard (Site 2 measurements) are representative of the noise levels in the Segment 4 study area and other less developed and rural locations. The measurement was conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured noise level representative of this area was 40 dBA (Site 2 measurement).

Foul weather, or rainy, conditions occur periodically and seasonally each year along the proposed TRTP alignment and are considered the temporary and periodic condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 4 is characterized by corona modeling at Location 7. Under the future foul weather conditions, the range in periodic corona noise at the ROW would be 52 to 55 dBA.

During the periodic inclement or rainy weather, the predicted future levels of corona noise at the ROW would exceed the existing levels by 5 dBA as well as exceed 50 dBA. Therefore, the periodic increase in corona noise levels due to operation of this segment would potentially result in a potentially significant impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 4 is not located within a designated airport land use plan or within 2 miles of a public airport or public use airport. Therefore, implementation of Segment 4 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Segment 4 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 4 would result in less than significant impact during construction and operation under this criterion.

6.5.4 Segment 5

6.5.4.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 5 include unincorporated Los Angeles County and the cities of Lancaster and Palmdale.

Construction

Los Angeles County has established a 55-dBA residential noise standard and the cities of Lancaster and Palmdale have established a 65-dBA CNEL (58-dBA continuous) limit for construction noise. The closest sensitive receptors in Segment 5 are approximately 200 feet from the edge of the TRTP ROW. Average levels of construction noise at this distance would be approximately 74 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher noise than existing levels. This potential noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from construction of Segment 5 would be less than significant under this criterion.

Operation

Los Angeles County has established a 45-dBA residential noise standard and the cities of Lancaster and Palmdale have established a 65-dBA CNEL (58-dBA continuous) limit for operation noise. The operational noise for Segment 5 is best represented by the corona modeling conducted for Segments 7 and 8A at modeling Locations 3, 4, and 6.

The results of corona modeling at Locations 3, 4, and 6 determined that the Los Angeles County 45-dBA noise level is only exceeded under rainy conditions at distances within approximately 600 feet of the ROW. Additionally, the results of corona modeling at Locations 3, 4, and 6 determined that the city of Lancaster 65-dBA CNEL (58-dBA continuous) noise level would not be exceeded at the edge of the ROW. Under the more typical fair weather conditions, the predicted corona noise levels at the ROW do not exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 5 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 5 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from 39 to 70 dBA (Sites 3, 5, 8, 9, 11, 12, 13, and 14 measurements).

Fair weather conditions occur during most of the year along the proposed TRTP alignment and are considered the permanent condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 5 is characterized by corona modeling at Locations 3 (future), 4 (existing and future), and 6 (existing and future).

The modeling of fair weather existing corona noise at Locations 4 and 6 shows noise levels less than 20 dBA for both locations; the existing line at Location 3 is currently de-energized and, therefore, no existing corona noise was modeled at this location.

The modeling of fair weather future corona noise for Locations 3, 4, and 6 shows noise levels between 26 and 29 dBA. Under the future fair weather conditions, this represents an increase of 6 or more dBA. Under the generally persistent fair weather conditions, the predicted future levels of corona noise at the ROW would not exceed 40 dBA. Therefore, the permanent increase in corona noise levels due to operation of this segment would result in a less than significant impact under this criterion.

4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from 39 to 70 dBA (Sites 3, 5, 8, 9, 11, 12, 13, and 14 measurements).

Foul weather, or rainy, conditions occur periodically and seasonally each year along the proposed TRTP alignment and are considered the temporary, periodic, and seasonal condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 5 is characterized by corona modeling at Locations 3 (future), 4 (existing and future), and 6 (existing and future). Under the existing foul weather conditions, the range of periodic corona noise at the ROW for Locations 4 and 6 is between 22 and 25 dBA. Under future rainy weather conditions, the range of periodic corona noise at the ROW for Locations 3, 4, and 6 would be between 51 and 54 dBA. This represents a modeled increase of 6 or more dBA.

During the foul, or rainy, weather the predicted future levels of corona noise at the ROW may exceed the existing levels by 5 dBA as well as exceed 50 dBA in the future. Therefore, the periodic increase in corona noise levels due to operation of this segment would result in a potentially significant impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 5 is not located within a designated airport land use plan or within 2 miles of a public airport or public use airport. Therefore, implementation of Segment 5 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Segment 5 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 5 would result in no impact during construction and operation under this criterion.

6.5.5 Segment 6

6.5.5.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 6 include the Angeles National Forest, unincorporated Los Angeles County, and the communities of Duarte and Monrovia.

Construction

No specific noise standard has been developed for the ANF. The ANF considers projects on a case-by-case basis and may require specific construction activity restrictions. Los Angeles County and the city of Duarte have established a 45-dBA residential noise standard. Monrovia has a noise standard of 50 dBA for construction noise. The closest noise sensitive receptors in Segment 6 are at the edge of the TRTP ROW, where the Pacific Crest Trail crosses the segment alignment. Average levels of construction noise at this distance would be greater than approximately 83 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher than existing noise levels. This noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and the impacts from construction noise due to implementation of Segment 6 would be less than significant under this criterion.

Operation

No specific noise standard has been developed for the ANF. Los Angeles County and the city of Duarte have established a 45-dBA residential noise standard. The city of Monrovia has a noise standard of 50 dBA for operation noise. The operational noise for Segment 6 is best represented by the corona modeling conducted for Segment 6 at Location 2 and Location 5.

The results of modeling at Locations 2 and 5 determined that the lower 45-dBA level is not exceeded at the edge of the ROW during fair weather conditions. Modeling of corona noise also determined that 45 dBA is only exceeded within approximately 1,350 feet of the ROW and 50 dBA is exceeded within approximately 500 feet of the ROW under foul weather conditions. Under the more typical fair weather conditions, the predicted corona noise levels at the ROW do not exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Under the periodic rain conditions, at the edge of the ROW, corona noise would exceed standards established in the local general plans or noise ordinances, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 6 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 6 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from 26 to 55 dBA (Sites 4 and 10 measurements).

Fair weather conditions occur during most of the year along the proposed TRTP alignment and are considered the permanent condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 6 is characterized by corona modeling at Locations 2 and 5. The modeling of fair weather existing corona noise at Locations 2 and 5 from the existing transmission lines at the ROW shows noise levels less than 20 dBA for both locations. The modeling of fair weather future corona noise for Locations 2 and 5 shows noise levels between 22 to 35 dBA.

Under the future fair weather conditions, this represents an increase of 6 or more dBA. Under the generally persistent fair weather conditions, the predicted future levels of corona noise at the ROW would not exceed 40 dBA. Therefore, the permanent increase in corona noise levels due to operation of this segment would result in a less than significant impact under this criterion.

4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from 26 to 55 dBA (Sites 4 and 10 measurements).

Foul weather, or rainy, conditions occur periodically and seasonally each year along the proposed TRTP alignment and are considered the temporary, periodic, and seasonal condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 6 is characterized by corona modeling at Locations 2 and 5. Under the existing foul weather conditions, the range of periodic corona noise at the ROW for Locations 2 and 5 is between less than 20 to 24 dBA. Under future rainy weather conditions, the range of periodic corona noise at the ROW for Locations 2 and 5 would be between 47 and 60 dBA. This represents a modeled increase of 6 or more dBA.

During the foul, or rainy, weather the predicted future levels of corona noise at the ROW may exceed the existing levels by 5 dBA as well as exceed 50 dBA in the future. Therefore, the periodic increase in corona noise levels due to operation of this segment would result in a potentially significant impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 6 is not located within a designated airport land use plan or within 2 miles of a public airport or public use airport. Therefore, implementation of Segment 6 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Segment 6 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 6 would result in no impact during construction and operation under this criterion.

6.5.6 Segment 7

6.5.6.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 7 include unincorporated Los Angeles County and the communities of Duarte, Irwindale, Baldwin Park, Industry, South El Monte, Montebello, and Monterey Park.

Construction

Los Angeles County and the city of Duarte have established a 55-dBA residential noise standard for construction. The cities of Irwindale, Baldwin Park, and South El Monte have established a 45-dBA residential noise standard for construction. The city of Monterey Park has established a 65-dBA noise standard for construction; and, the cities of Industry and Montebello have no specific noise standard for construction. The closest noise sensitive receptors in Segment 7 are approximately at the edge of the TRTP ROW. Average levels of construction noise at this distance would be greater than approximately 83 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher than existing noise levels. This noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and the impacts from construction noise due to implementation of Segment 7 would be less than significant under this criterion.

Operation

Los Angeles County and the cities of Irwindale, Baldwin Park, and South El Monte have established a 45-dBA residential noise standard for operation. The city of Duarte has established a 55-dBA residential noise standard for operation. The city of Monterey Park has established a 65-dBA noise standard for operation; and, the cities of Industry and Montebello have no specific noise standard for operation. The operational noise for Segment 7 is best represented by the corona modeling conducted for Segment 7 at Locations 3 and 4.

The results of modeling at Locations 3 and 4 determined that the lower 45-dBA level is not exceeded at the edge of the ROW during fair weather conditions. Modeling of corona noise also determined that 45 dBA is only exceeded within approximately 600 feet of the ROW under foul weather conditions. Both the 55- and 65-dBA levels are not exceeded at the ROW under foul weather conditions. Under the more typical fair weather conditions, the predicted corona noise levels at the ROW do not exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Under the periodic rain conditions, at the edge of the ROW, corona noise would exceed standards established in the local general plans or noise ordinances, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 7 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 7 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from approximately 39 to 70 dBA (Sites 5 and 13 measurements).

Fair weather conditions occur during most of the year along the proposed TRTP alignment and are considered the permanent condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 7 is characterized by corona modeling at Locations 3 and 4. The modeling of fair weather existing corona noise at modeling Location 4 shows noise levels less than 20 dBA. The modeling of fair weather future corona noise shows noise levels between 26 and 29 dBA.

Under the future fair weather conditions, this represents an increase of 6 or more dBA. Under the generally persistent fair weather conditions, the predicted future levels of corona noise at the ROW would not exceed 40 dBA. Therefore, the permanent increase in corona noise levels due to operation of this segment would result in a less than significant impact under this criterion.

4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from approximately 39 to 70 dBA (Sites 5 and 13 measurements).

Foul weather, or rainy, conditions occur periodically and seasonally each year along the proposed TRTP alignment and are considered the temporary, periodic, and seasonal condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 7 is characterized by corona modeling at Locations 3 and 4. Under the existing foul weather conditions, periodic corona noise at the ROW for Location 4 ranges from approximately 22 to 25 dBA. Under future rainy weather conditions, the range of periodic corona noise at the ROW for Location 4 would be between 51 and 54 dBA. This represents a modeled increase of 6 or more dBA.

During the foul, or rainy, weather the predicted future levels of corona noise at the ROW may exceed the existing levels by 5 dBA as well as exceed 50 dBA in the future. Therefore, the periodic increase in corona noise levels due to operation of this segment would result in a potentially significant impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 7 is located within a designated airport land use plan or within 2 miles of the El Monte Airport, which is a public airport or public use airport. Workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 7 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Segment 7 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 7 would result in no impact during construction and operation under this criterion.

6.5.7 Segment 8

6.5.7.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 8 include unincorporated Los Angeles County, Riverside County, and San Bernardino County; and the communities of Montebello, Whittier, South El Monte, Pico Rivera, Industry, La Habra Heights, Diamond Bar, Monterey Park, Chino Hills, Chino, and Ontario.

Construction

Los Angeles County has established a 55-dBA noise standard for construction. Riverside County and the cities of South El Monte, Whittier, and Ontario have established a 45-dBA noise standard for construction. Additionally, the cities of La Habra Heights, Diamond Bar, and Chino have established a 50-dBA noise standard for construction. The County of San Bernardino has established that construction is exempt from noise standards and the cities of Montebello, Pico Rivera, Industry, and Chino Hills do not have established noise standards for construction. The closest noise sensitive receptors in Segment 8 are approximately at the edge of the TRTP ROW. Average levels of construction noise at this distance would be greater than approximately 83 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher than existing noise levels. This noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and the impacts from construction noise due to implementation of Segment 8 would be less than significant under this criterion.

Operation

Los Angeles and Riverside counties and the cities of Whittier, Diamond Bar, and Ontario have established a 45-dBA residential noise standard for operation. The cities of La Habra Heights and Chino have established a 50-dBA residential noise standard for operation. Additionally, the city of Monterey Park has established a 65-dBA residential noise standard. No noise standards have been established for operation for the cities of South El Monte, Montebello, Pico Rivera, Industry, and Chino Hills. The County of San Bernardino has an established noise standard of 45 dBA. The operational noise for Segment 8 is best represented by the corona modeling conducted at modeling Locations 3 and 4.

The results of corona modeling at Locations 3, 4, and 6 determined that the 45-dBA level is only exceeded under rainy conditions at distances within approximately 600 feet of the ROW. Corona modeling determined that the 50-dBA level would be exceeded within approximately 150 feet of the TRTP ROW under rainy conditions. Additionally, the results of corona modeling at Locations 3, 4, and 6 determined that the 65-dBA level would not be exceeded at the edge of the ROW. Under the more typical fair weather conditions, the predicted corona noise levels at the ROW do not exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 8 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 8 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from approximately 43 to 63 dBA (Sites 6, 7, 8, 9, 11, 12, and 14 measurements).

Fair weather conditions occur during most of the year along the proposed TRTP alignment and are considered the permanent condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 8 is characterized by corona modeling at Locations 3, 4, and 6. The modeling of fair weather existing corona noise at Locations 4 and 6 from the existing transmission lines at the ROW shows noise levels less than 20 dBA; the existing line at Location 3 is currently de-energized and no corona noise is generated. The modeling of fair weather future corona noise shows noise levels from 26 to 29 dBA.

Under the future fair weather conditions, this represents an increase of 6 or more dBA. Under the generally persistent fair weather conditions, the predicted future levels of corona noise at the ROW would not exceed 40 dBA. Therefore, the permanent increase in corona noise levels due to operation of this segment would result in a less than significant impact under this criterion.

4. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise level representative of this area varied from approximately 43 to 63 dBA (Sites 6, 7, 8, 9, 11, 12, and 14 measurements).

Foul weather, or rainy, conditions occur periodically and seasonally each year along the proposed TRTP alignment and are considered the temporary, periodic, and seasonal condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 8 is characterized by corona modeling at Locations 3, 4, and 6. Under the existing foul weather conditions, periodic corona noise at the ROW for Locations 4 and 6 ranges from approximately 22 to 25 dBA; the existing line at Location 3 is currently de-energized and no corona noise is generated. Under future rainy weather conditions, the range of periodic corona noise at the ROW for Location 4 would be between 51 and 54 dBA. This represents a modeled increase of 26 or more dBA.

During the foul, or rainy, weather the predicted future levels of corona noise at the ROW may exceed the existing levels by 5 dBA as well as exceed 50 dBA in the future. Therefore, the periodic increase in corona noise levels due to operation of this segment would potentially result in a significant impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 8 is located within 2 miles of Chino Airport, which is a public airport or public use airport. Workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 8 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Segment 8 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 8 would result in no impact during construction and operation under this criterion.

6.5.8 Segment 9 (Substations)

6.5.8.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 9 include unincorporated Kern and Los Angeles counties and the city of Lancaster.

Construction

The closest noise sensitive receptors in Segment 9 are approximately 400 feet from the TRTP ROW. Average levels of construction noise at this distance would be approximately 69 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher than existing noise levels. This noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and the impacts from construction noise due to implementation of Segment 9 would be less than significant under this criterion.

Operation

The proposed Whirlwind Substation is located in Kern County, which has an established a 65-L_{dn} (59-dBA continuous) residential noise standard. The existing Antelope Substation is located in the city of Lancaster, which also has an established 65-dBA CNEL (58-dBA continuous) noise limit. Vincent Substation in located in Los Angeles County, which has an established 45-dBA noise limit (see Section 7.0).

The predicted noise level from transformers at the proposed Whirlwind Substation would be 40 dBA at 3,000 feet. No residents have been identified within approximately 3,000 feet of any of the proposed locations for the Whirlwind Substation.

The closest residents to the Antelope Substation are approximately 3,000 feet from the location of the proposed SVC. At this distance, the noise level from the SVC to be constructed as part of the Antelope Substation expansion would be approximately 42 dBA. Implementation of the Antelope Substation expansion would result in less than a 2-dBA increase of the noise level to 48 dBA at the closest residence to the SVC.

The closest residents to Vincent Substation are located approximately 400 feet from the fence line. At this distance, the operational noise level from the SVC would be 46 dBA and is anticipated to increase the substation noise level by 2 dBA to 53 dBA.

Implementation of the Whirlwind Substation would not exceed the Kern County 65-dBA L_{dn} noise level at 3,000 feet from the proposed and alternative location. No residences are located within 3,000 feet of the proposed location, and the two alternative locations. At the Antelope Substation, the city of Lancaster 65-dBA CNEL (58-dBA continuous) noise limit standard would not be exceeded at residences located approximately 1,500 feet from the location of the SVC. At the Vincent Substation, the Los Angeles County 45-dBA noise standard would be exceeded at residences located approximately 400 feet from the expanded substation. Implementation of Segment 9 would exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 9 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 9 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The following presents the predicted noise levels from the Whirlwind, Antelope, and Vincent Substations (the only substations where TRTP has the potential to change the noise levels perceptible beyond the fence lines of the substation).

The new Whirlwind Substation would include four single-phase 373-MVA transformers. The predicted noise level from these transformers is 40 dBA at 3,000 feet. No residents located within 3,000 feet of any of the proposed locations for the Whirlwind Substation.

The TRTP modifications to the Antelope Substation include one new SVC that is anticipated to result in noise levels of approximately 65 dBA or less at the fence line. The closest residents are approximately 1,500 feet from the location of the proposed SVC. At this distance, the noise level from the SVC is anticipated to be approximately 42 dBA. Implementation of the Antelope substation expansion would result in a less than a 2-dBA increase of the noise level to 48 dBA at the closest residence to the SVC.

The TRTP modifications to the Vincent Substation include one new SVC that is anticipated to result in noise levels of approximately 60 dBA or less at the fence line. The closest residents are located approximately 400 feet from the fence line. At this distance, the noise level from the SVC is predicted to be 46 dBA and is anticipated to increase the substation noise level by 2 dBA to 53 dBA.

The permanent increase in noise associated with operation of Segment 9 would be approximately 2 dBA or less; however, the operation of Segment 9 would result in permanent noise levels greater than 50 dBA. Therefore, operation of Segment 9 would result in a potentially significant impact under this criterion

4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

Substation noise is generally constant and would not be expected to fluctuate during operation. Therefore, implementation of Segment 9 would result in no impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 9 is not located within a designated airport land use plan or within 2 miles of a public airport or public use airport. Therefore, implementation of Segment 9 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Segment 9 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 9 would result in no impact during construction and operation under this criterion.

6.5.9 Segment 10

6.5.9.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 10 include unincorporated Kern County.

Construction

The closest noise sensitive receptors in Segment 10 are approximately 1,000 feet from the TRTP ROW. Average levels of construction noise at this distance would be approximately 61 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher than existing noise levels. This noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and the impacts from construction noise due to implementation of Segment 10 would be less than significant under this criterion.

Operation

Kern County has established a 65-L_{dn} (59-dBA continuous) residential noise standard. The operational noise for Segment 10 is best represented by the modeling conducted for Segment 10 at modeling Location 1.

The results of modeling at Location 1 determined that the 59-dBA level is not exceeded at the edge of the ROW under both fair weather and foul weather conditions. Therefore, under both fair and foul weather conditions, corona noise not would exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 10 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary.

Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 10 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area was approximately 45 dBA (Site 1 measurement).

Fair weather conditions occur during most of the year along the proposed TRTP alignment and are considered the permanent condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 10 is characterized by corona modeling at Location 1. No modeling of fair weather existing corona noise was conducted at this location because there are no existing transmission lines. The modeling of fair weather future corona noise for Location 1 shows noise levels from 27 to 30 dBA. Under the future fair weather conditions, this represents an increase of 6 or more dBA.

Under the generally persistent fair weather conditions, the predicted future levels of corona noise at the ROW would not exceed 40 dBA. Therefore, the permanent increase in corona noise levels due to operation of this segment would result in a less than significant impact under this criterion.

4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise level representative of this area was approximately 40 dBA (Site 1 measurement).

Foul weather, or rainy, conditions occur periodically and seasonally each year along the proposed TRTP alignment and are considered the temporary, periodic, and seasonal condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 10 is characterized by corona modeling at Location 1. No modeling of existing foul weather existing corona noise was conducted at this location because there are no existing transmission lines. Under future rainy weather conditions, the range of periodic corona noise at the ROW for Location 1 would be between 52 and 55 dBA. Under the future foul weather conditions, this represents a modeled increase of 6 or more dBA.

During the foul, or rainy, weather the predicted future levels of corona noise at the ROW may exceed the existing levels by 5 dBA as well as exceed 50 dBA. Therefore, the periodic increase in corona noise levels due to operation of this segment would result in a potentially significant impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 10 is not located within a designated airport land use plan or within 2 miles of a public airport or public use airport. Therefore, implementation of Segment 10 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Segment 10 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 10 would result in no impact during construction and operation under this criterion.

6.5.10 Segment 11

6.5.10.1 Impact Analysis

1. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Jurisdictions located within 1 mile of the centerline of the TRTP in Segment 11 include the Angeles National Forest, unincorporated Los Angeles County, and the communities of La Cañada Flintridge, Pasadena, Temple City, Rosemead, and Monterey Park.

Construction

The closest noise sensitive receptors in Segment 11 are approximately at the edge of the TRTP ROW. Average levels of construction noise at this distance would be greater than approximately 83 dBA, which would exceed the noise standards for the jurisdictions along this segment. Additionally, the potential use of helicopters to deliver construction materials and assist with construction of the segment would result in higher than existing noise levels. This noise level would be perceptible to the sensitive receptors. The anticipated construction noise would occur during the daytime and be short-term and temporary.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and the impacts from construction noise due to implementation of Segment 11 would be less than significant under this criterion.

Operation

No specific noise standard has been developed for the ANF and Temple City. Los Angeles County and the cities of Pasadena and Rosemead have established a 45-dBA residential noise standard for operation. The cities of La Cañada Flintridge and Monterey Park have established a 65-dBA residential noise standard for operation. The operational noise for Segment 11 is best represented by the modeling conducted for Segments 6, 7, 8, and 10 at modeling Locations 2, 3, 4, and 6.

The results of corona modeling at modeling Locations 2, 3, 4, and 6 determined that the 45-dBA level is only exceeded under rain conditions at distances within approximately 1,350 feet of the ROW. The 51-dBA level is exceeded under rain conditions at distances within approximately 400 feet of the ROW. The 40-dBA level is only exceeded under rain conditions at distances within approximately 3,500 feet of the ROW. Under the more typical fair weather conditions, the predicted corona noise levels at the ROW do not exceed standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the TRTP is under the jurisdiction of the CPUC, and therefore the impacts from operation of Segment 11 would be less than significant under this criterion.

2. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Construction activities (e.g., ground disturbing activities, including grading and foundation excavation, and movement of heavy construction equipment) may generate groundborne vibration and noise. Pile driving activities are typically the construction activity with the greatest potential to create groundborne vibration and noise, and pile driving is not currently anticipated as part of this project. The groundborne vibration and noise associated with construction of this segment would not be excessive. Additionally, both groundborne vibration and noise would occur during daytime hours and be short-term and temporary. Therefore, implementation of this segment would result in a less than significant impact under this criterion.

Operation

No groundborne vibration or noise would be generated by the activities associated with the operation, including maintenance, of this proposed TRTP segment. Therefore, implementation of Segment 11 would result in no impact under this criterion.

3. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Noise associated with construction activities would be temporary and would result in no permanent increase in ambient noise levels; therefore, implementation of this segment would result in no impact due to construction noise under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise level representative of this area varied from approximately 26 to 70 dBA (Sites 4, 5, 10, and 13 measurements).

Fair weather conditions occur during most of the year along the proposed TRTP alignment and are considered the permanent condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 11 is characterized by corona modeling at Locations 2, 3, 4, and 6. The modeling of fair weather existing corona noise at Locations 2 and 5 shows noise levels less than 20 dBA for both locations. No modeling of fair weather existing corona noise was conducted for the segment south of the Gould Substation, represented by modeling Location 4, because the TRTP would be implemented in a currently empty position on existing structures.

The modeling of fair weather future corona noise for Locations 2, 3, 4, and 6 shows noise levels varying from approximately 22 to 35 dBA. Under the future fair weather conditions, this represents an increase of 6 or more dBA.

Under the generally persistent fair weather conditions, the predicted future levels of corona noise at the ROW would not exceed 40 dBA. Therefore, the permanent increase in corona noise levels due to operation of this segment would result in a less than significant impact under this criterion.

4. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Construction

Use of heavy equipment during construction of this segment would result in noise levels (L_{eq}) ranging from greater than 83 dBA to 52 dBA from the edge of the ROW to approximately 3,200 feet from the edge of the ROW, respectively.

Construction would be temporary and occur during daytime hours. Additionally, noise abatement measures (listed at the beginning of Section 6.5) would be implemented during construction of this segment, as needed. Therefore, the temporary increase in equipment noise levels associated with construction of this segment would be less than significant under this criterion.

Operation

The measured ambient noise levels representative of this area were conducted under fair weather conditions, and higher levels would generally be expected under rainy conditions. The measured ambient noise levels representative of this area varied from approximately 26 to 70 dBA (Sites 4, 5, 10, and 13 measurements).

Foul weather, or rainy, conditions occur periodically and seasonally each year along the proposed TRTP alignment and are considered the temporary, periodic, and seasonal condition for this evaluation. Corona noise from the transmission lines constructed as part of Segment 11 is characterized by corona modeling at Locations 2, 3, 4, and 6. The modeling of existing foul weather existing corona noise shows noise levels varying between less than 20 to 24 dBA. No modeling of existing foul weather existing corona noise was conducted for the segment south of the Gould Substation represented by modeling Location 4 because the TRTP would be implemented in a currently empty position on existing structures. Under future rainy weather conditions, the range of periodic corona noise at the ROW would be between 47 and 60 dBA. Under the future foul weather conditions, this represents a modeled increase of 6 or more dBA.

During the foul, or rainy, weather the predicted future levels of corona noise at the ROW may exceed the existing levels by 5 dBA as well as exceed 50 dBA. Therefore, the periodic increase in corona noise levels due to operation of this segment would result in a potentially significant impact under this criterion.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Segment 11 is not located within a designated airport land use plan or within 2 miles of a public airport or public use airport. Therefore, implementation of Segment 11 would result in no impact during construction and operation under this criterion.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

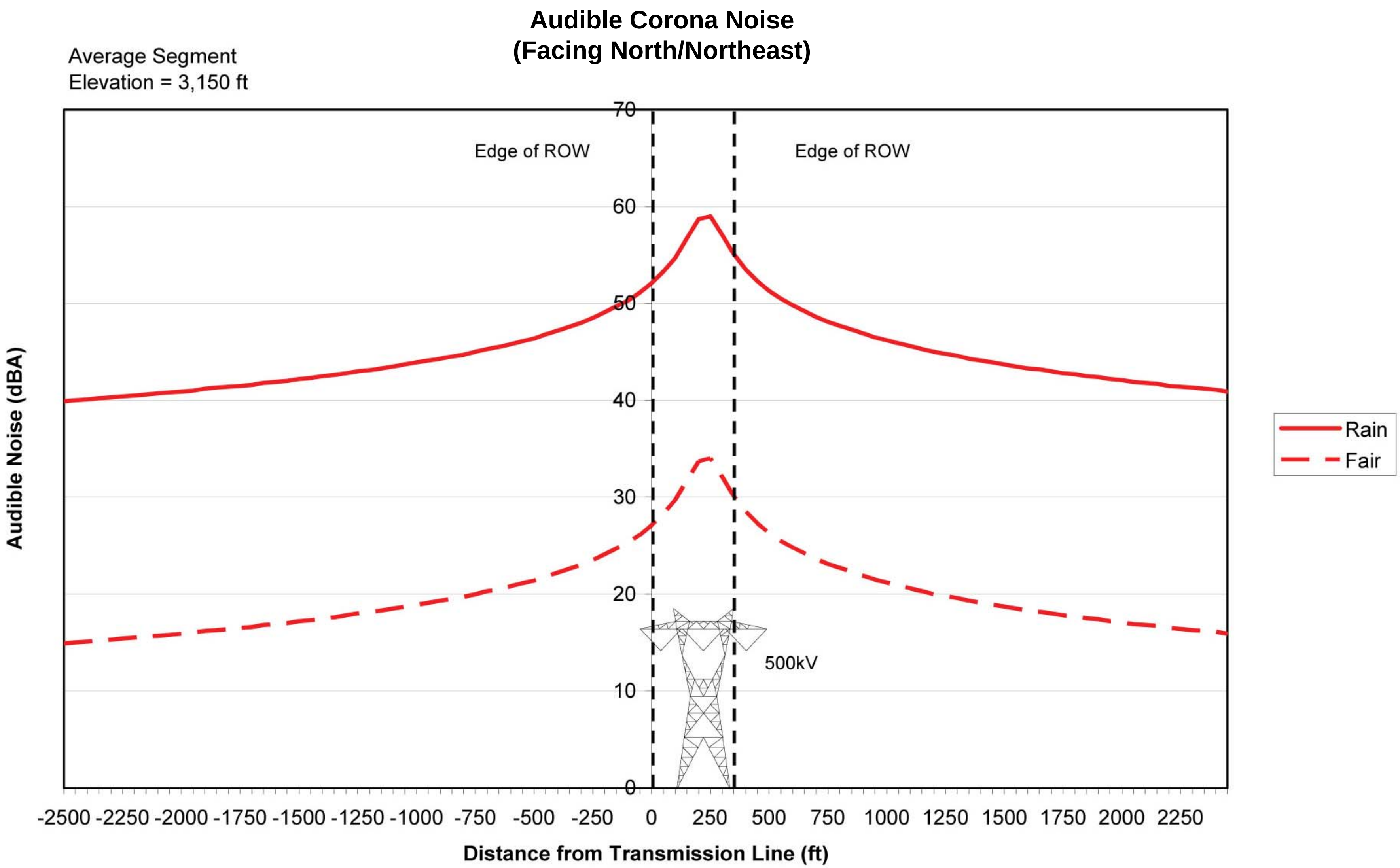
Segment 11 may be located within the vicinity of a private airstrip. However, workers would be provided appropriate hearing protection, if necessary. Therefore, implementation of Segment 11 would result in no impact during construction and operation under this criterion.

CA/T Noise Emission Reference Levels and Usage Factors

filename: EQUIPLST.xls
revised: 7/26/05

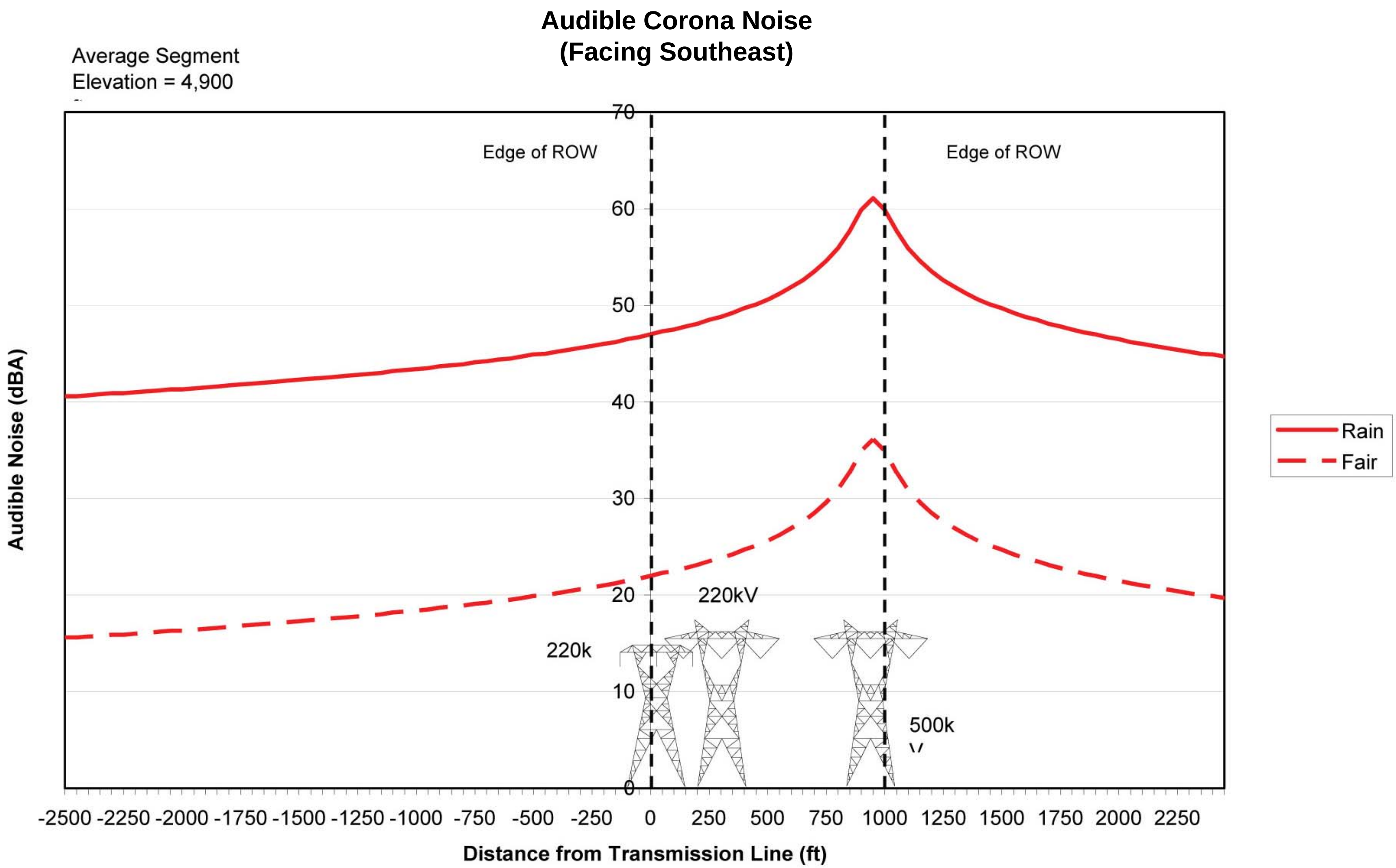
Equipment Description	Impact Device ?	Acoustical Use Factor (%)	Spec 721.560 Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow) (samples averaged)	No. of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	-- N/A --	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-- N/A --	0
Blasting	Yes	-- N/A --	94	-- N/A --	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-- N/A --	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-- N/A --	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-- N/A --	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-- N/A --	0
Tractor	No	40	84	-- N/A --	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder / Torch	No	40	73	74	5

Figure 6-1. TABLE OF EQUIPMENT NOISE EMISSIONS



2007	**Tehachapi Renewable Transmission Project PEA**	Figure 6-3. CORONA MODELING LOCATION 1 - SEGMENT 10 PROPOSED SCENARIO	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

ES082007010SCO346851.KK.01.06 TRTP_NTR.site16.ai 9/07



2007

Tehachapi Renewable Transmission Project PEA

Figure 6-4. CORONA MODELING LOCATION 2 - PACIFIC CREST TRAIL PROPOSED SCENARIO

SOUTHERN CALIFORNIA EDISON
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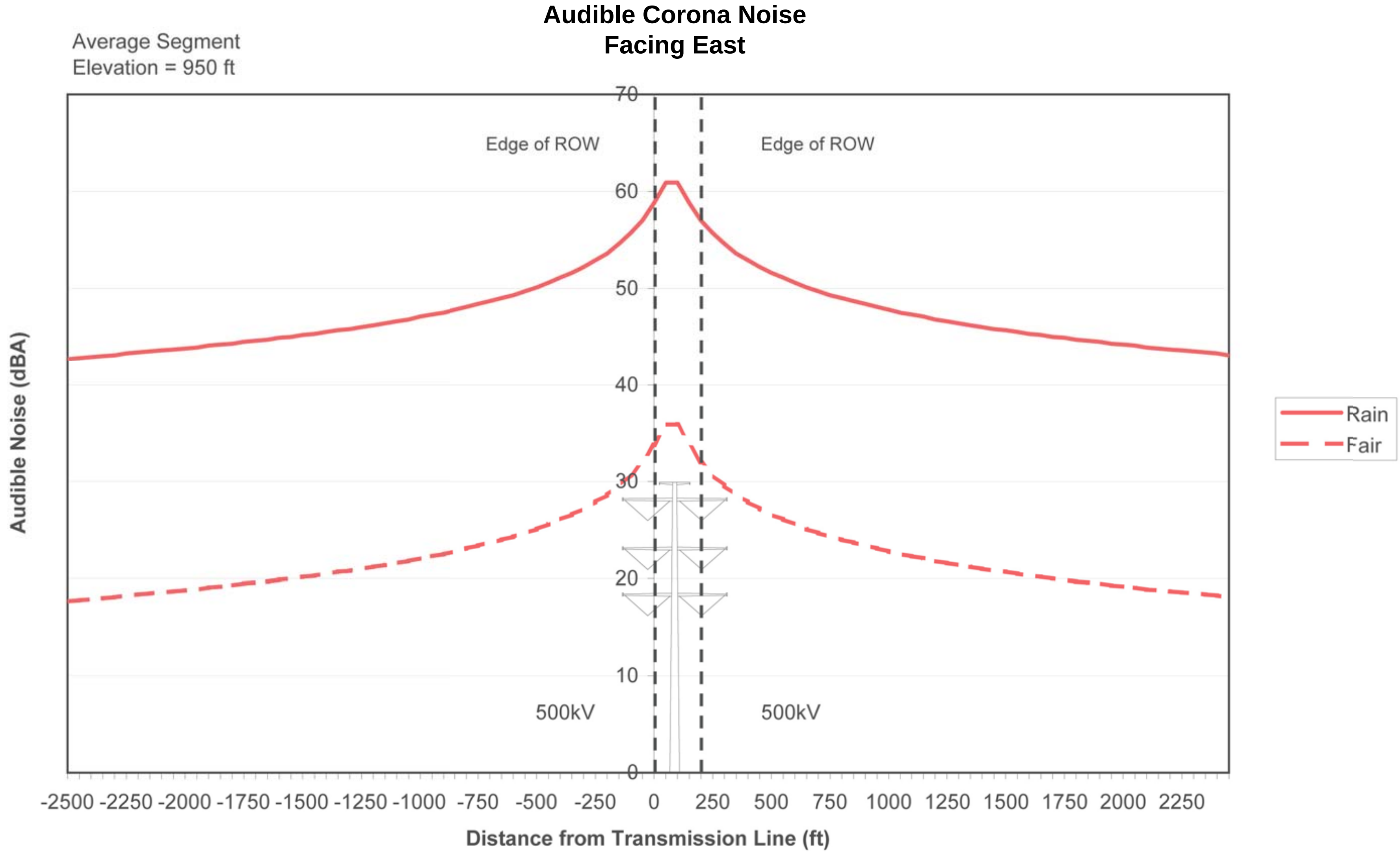

2007

Tehachapi Renewable Transmission Project PEA

Figure 6-5. CORONA MODELING LOCATION - 3 CHINO HILLS PROPOSED SCENARIO

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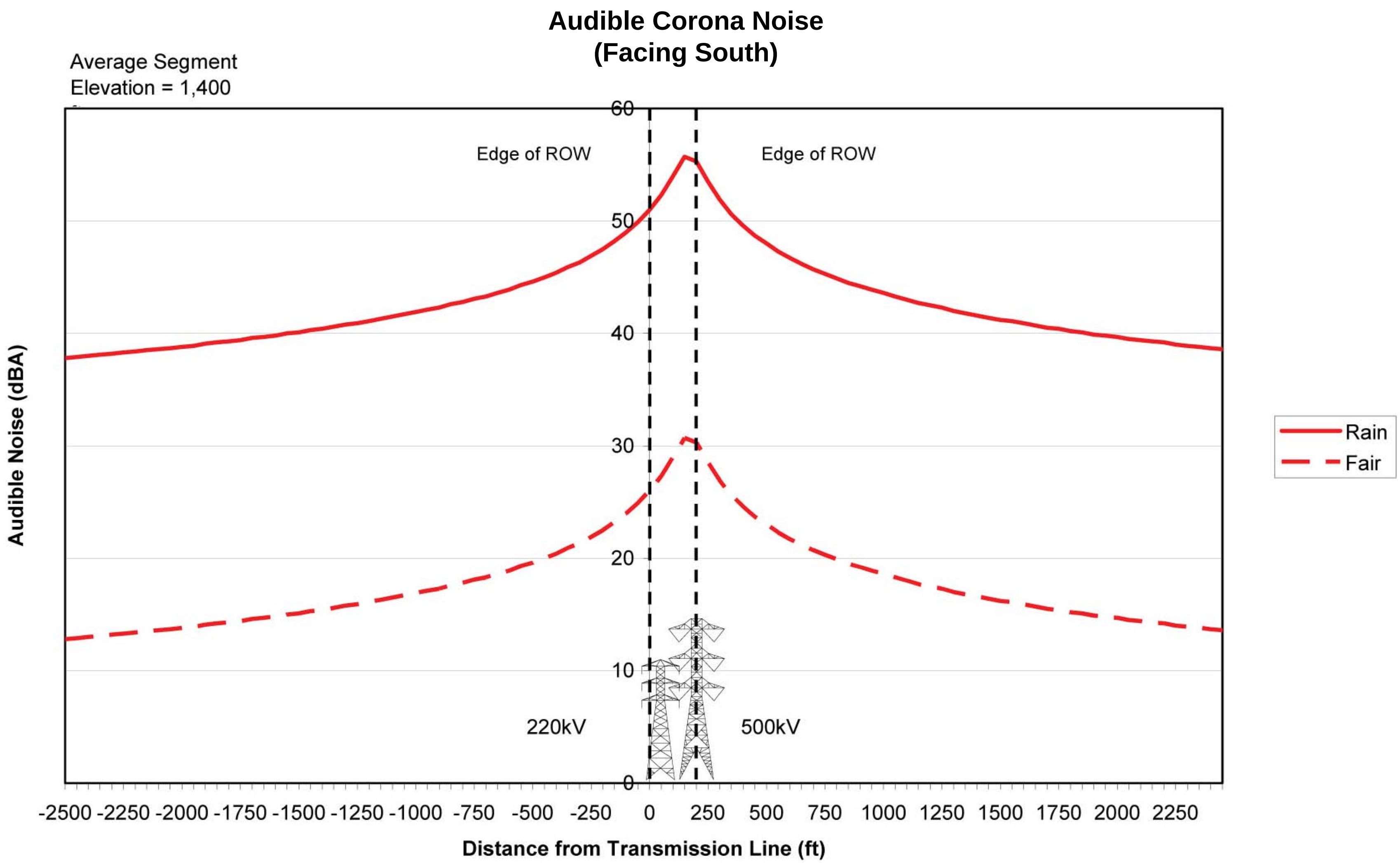

2007

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Figure 6-6. CORONA MODELING LOCATION 4 - DUARTE LST PROPOSED SCENARIO

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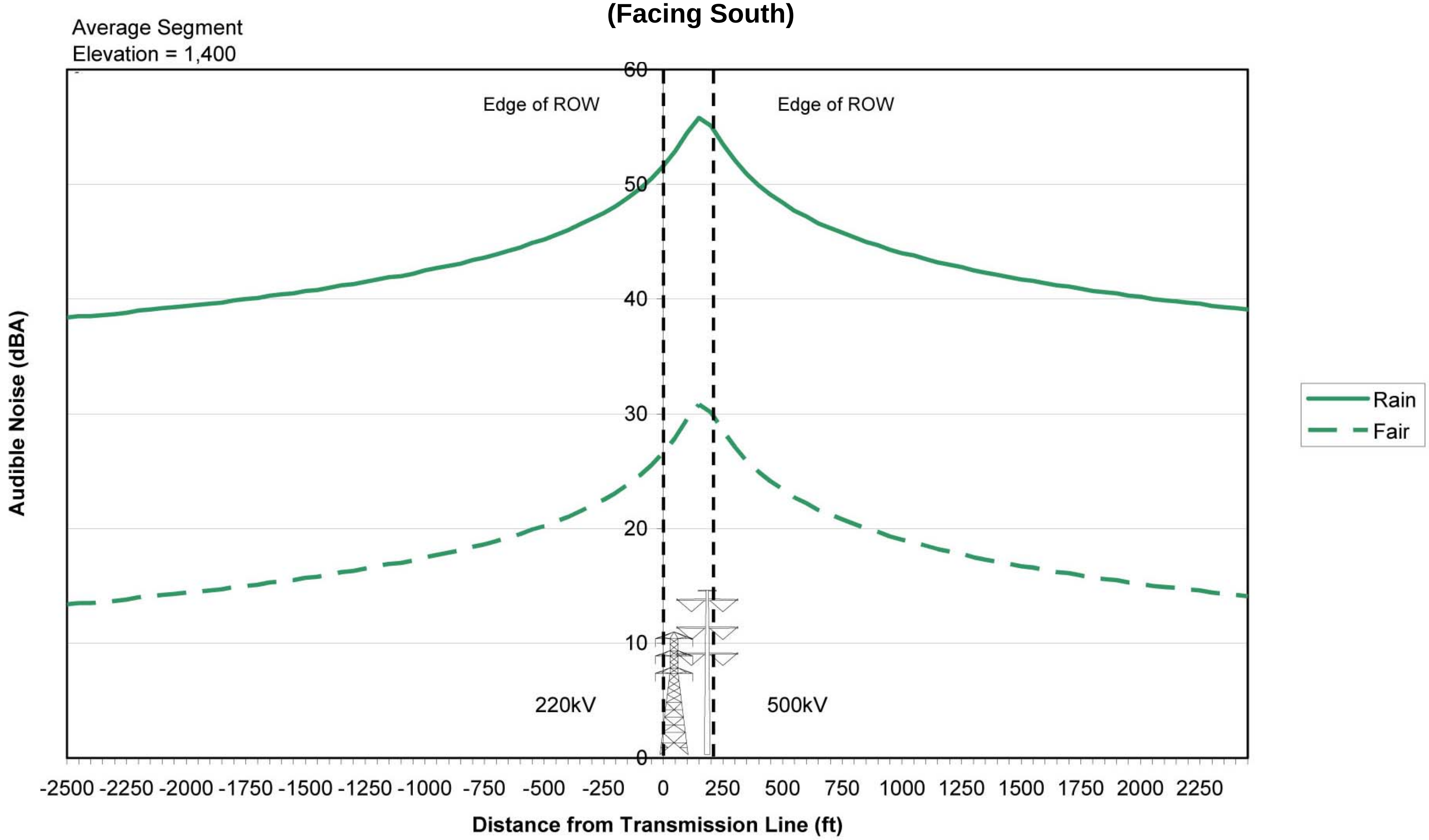
Audible Corona Noise
(Facing South)



2007

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Figure 6-7. CORONA MODELING LOCATION 4 - DUARTE TSP PROPOSED SCENARIO

SOUTHERN CALIFORNIA EDISON
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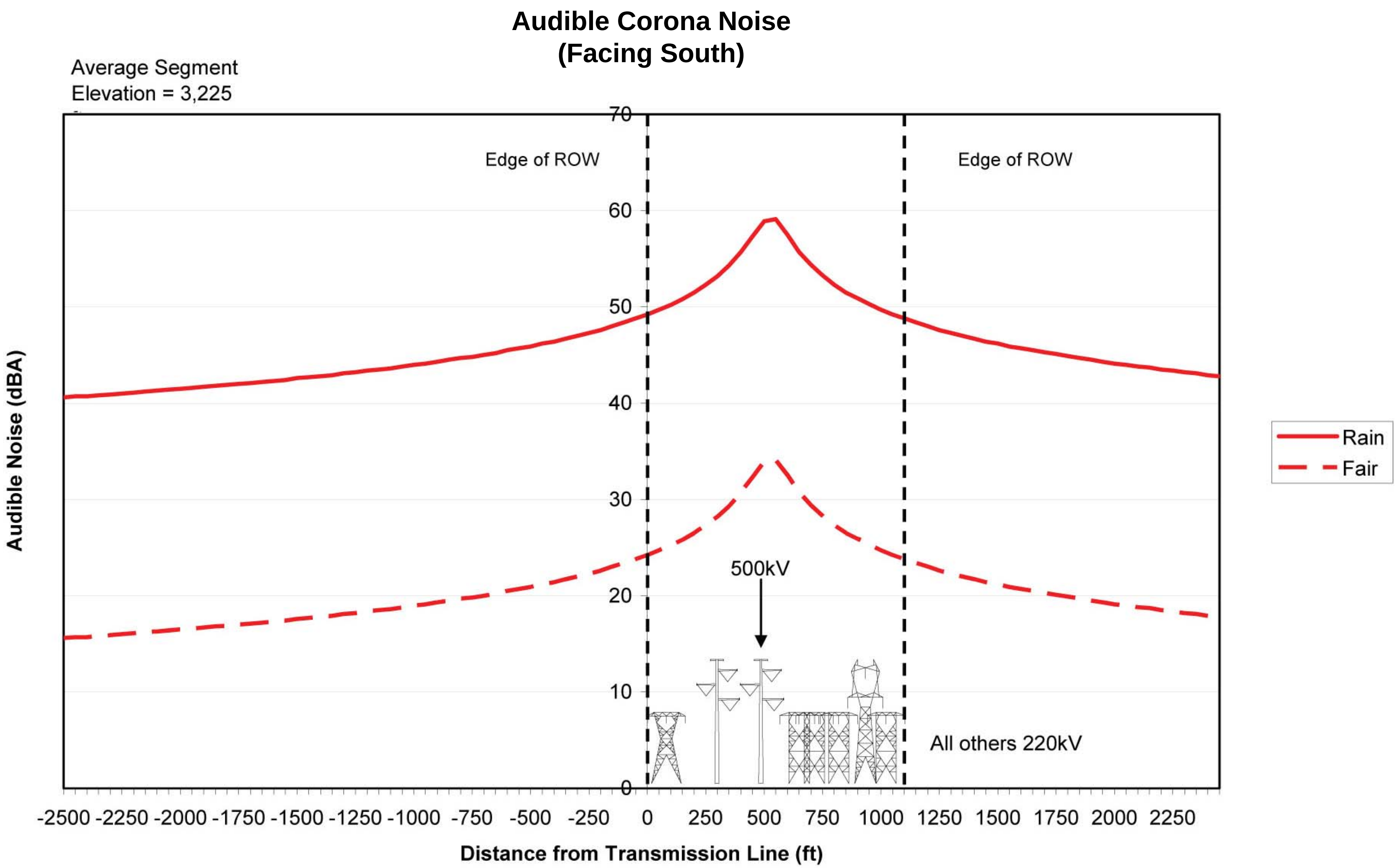
ES082007010SCO346851.KK.01.06 TRTP_NTR.site23.ai 9/07



2007

Tehachapi Renewable Transmission Project PEA

Figure 6-8. CORONA MODELING LOCATION 5 - SOUTH OF VINCENT SUBSTATION PROPOSED SCENARIO

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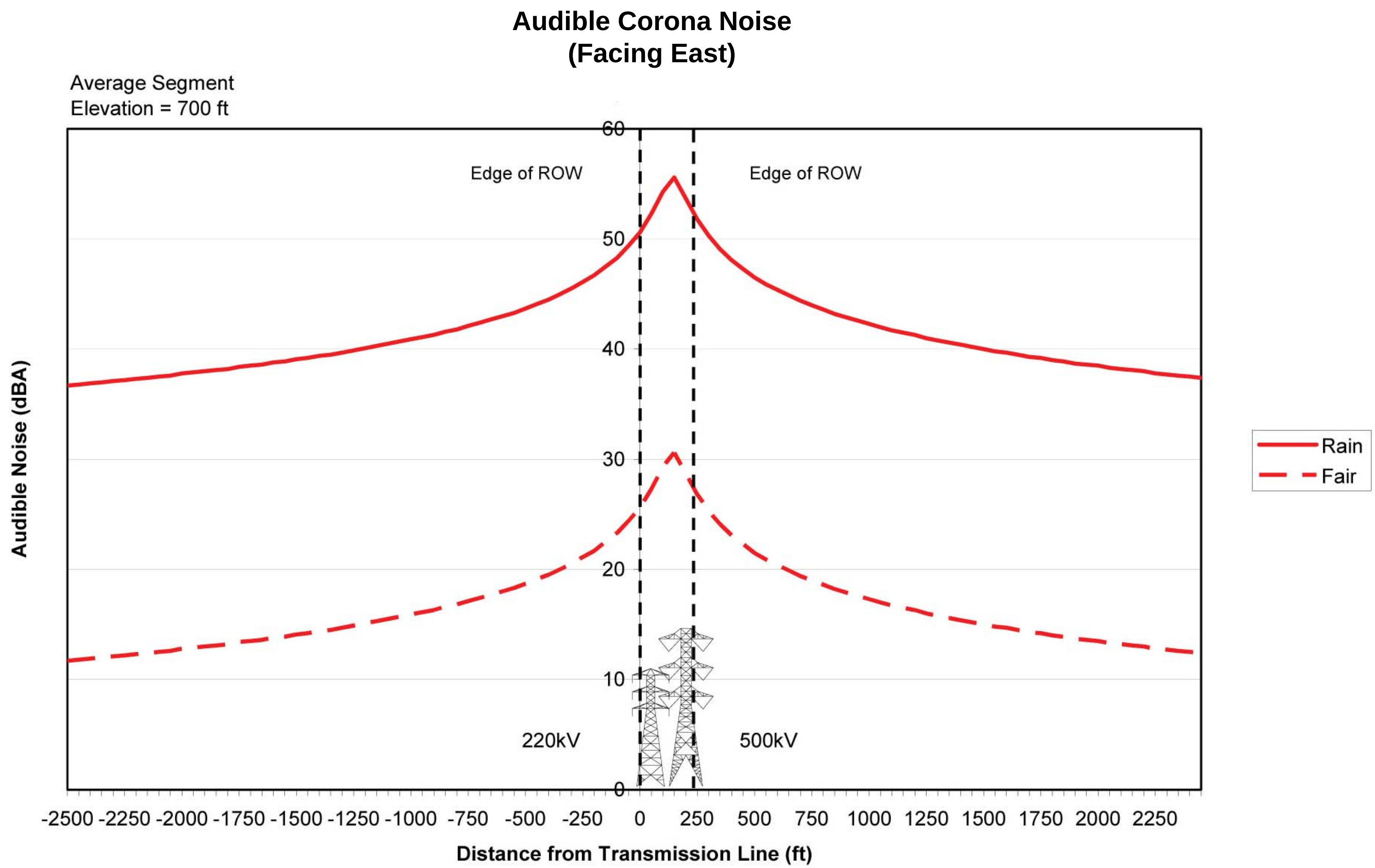
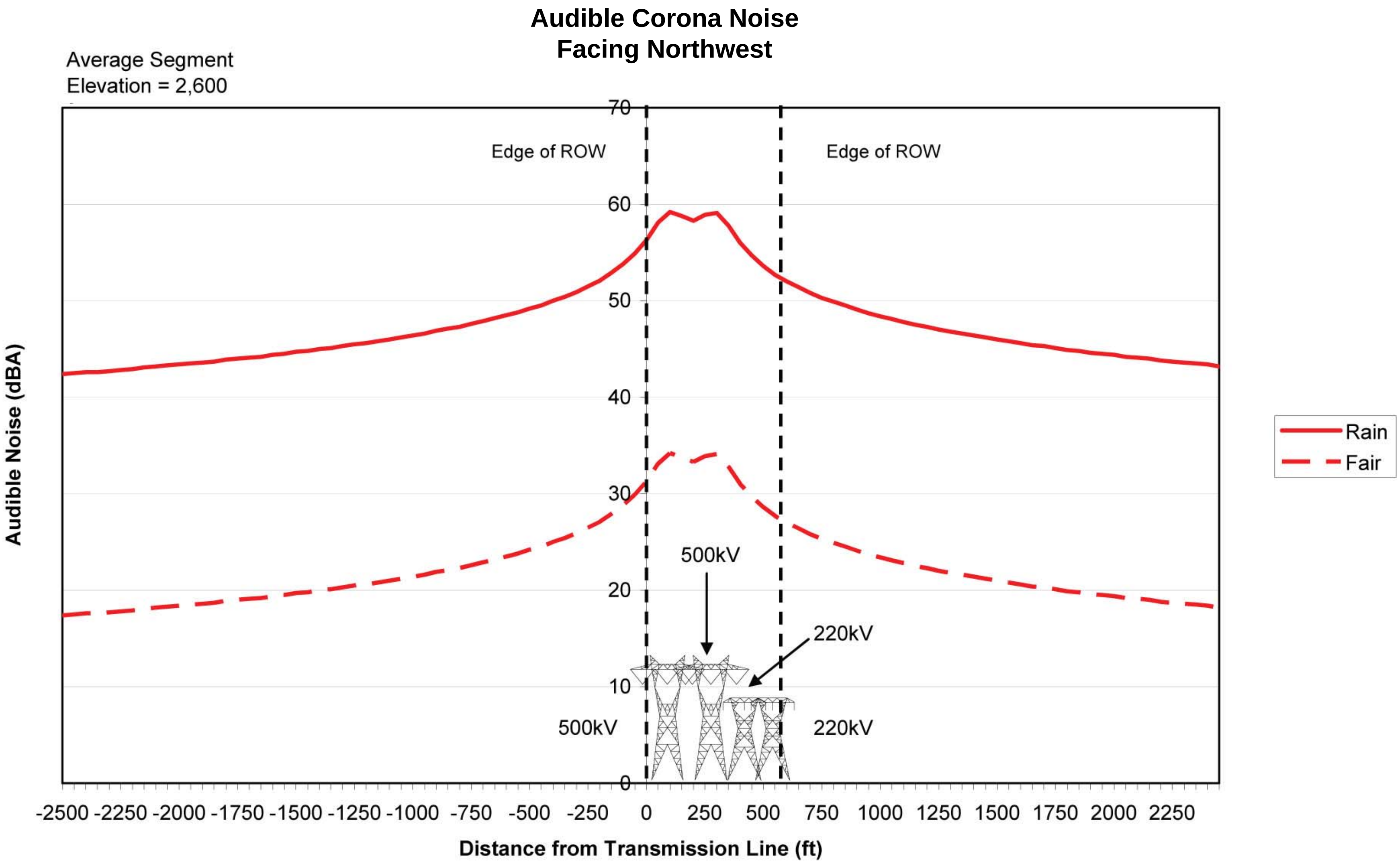
ES082007010SCO346851.KK.01.06 TRTP_NTR.site26.ai 9/07



2007	**Tehachapi Renewable Transmission Project PEA**	Figure 6-9. CORONA MODELING LOCATION 6 - PATHFINDER PARK PROPOSED SCENARIO	SOUTHERN CALIFORNIA EDISON An EDISON INTERNATIONAL℠ Company

ES082007010SCO346851.KK.01.06 TRTP_NTR.site29.ai 9/07



2007

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Figure 6-10. CORONA MODELING LOCATION 7-SEGMENT 4 PROPOSED SCENARIO

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7.0 Compliance with Laws, Ordinances, Regulations, and Standards

This section identifies the plans, laws, ordinances, regulations, and standards (LORS) related to construction and operation noise for the jurisdictions through which the proposed Project would pass and adjacent to the proposed alignment. Jurisdictions located within 1 mile of the centerline of the TRTP are provided in Table 7-1 and Table 7-2. These LORS are presented for informational purposes only. The California Public Utilities Commission (CPUC) General Order (GO) No. 131-D, Section XIV B, clarifies that "[l]ocal jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the Commission's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Due to this GO, the public utilities are directed to consider local regulations and consult with local agencies and SCE would use noise reduction measures to be compatible with local plans and zoning to the extent practicable; however, the regulations and general plans of the counties and cities are not applicable, as the counties and cities do not have jurisdiction over the proposed Project.

Construction noise LORS varies by jurisdiction for the different segments of the proposed Project. The daytime limits range from 45 dBA to 85 dBA. Operation noise LORS also vary by jurisdiction for the different segments of the proposed TRTP. Operation noise limits range from 45 dBA to 65 dBA. Some jurisdictions have not designated applicable construction or operation noise numerical limits.

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
County						
Kern County (Kern County Municipal Code 2007)	Chapter 3 Sec. 2. Noise Sensitive Areas.	Not Specified	Residences, Schools, Hospitals, Parks, Churches	Anytime	65Ldn	45Ldn
			All Other	Anytime	Not Specified	Not Specified
Los Angeles (Los Angeles Municipal Code 2007)	Sec. 12.08.440 Construction noise. [Construction work] between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays...is prohibited.	Mon-Sat: 7:00 a.m.-8:00 p.m. none on Sundays and Holidays - except in industrial zones	---	---	---	---
	Sec. 12.08.440. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment:	Mon-Sat: 7:00 a.m.-8:00 p.m. none on Sundays and Holidays - except in industrial zones	Single Family Residential	7:00 a.m.-8:00 p.m.	75	---
				8:00 p.m.-7:00 a.m.	60	---
			Multi Family Residential	7:00 a.m.-8:00 p.m.	80	---
				8:00 p.m.-7:00 a.m.	64	---
			Semi residential/ Commercial	7:00 a.m.-8:00 p.m.	85	---
				8:00 p.m.-7:00 a.m.	70	---
			All Other	Anytime	Not Specified	Not Specified
	Sec. 12.08.440.Maximum noise level for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment:	Mon-Sat: 7:00 a.m.-8:00 p.m. none on Sundays and Holidays - except in industrial zones	Single Family Residential	7:00 a.m.-8:00 p.m.	60	Not Specified
				8:00 p.m.-7:00 a.m.	50	Not Specified
			Multi Family Residential	7:00 a.m.-8:00 p.m.	65	Not Specified
				8:00 p.m.-7:00 a.m.	55	Not Permitted

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Land Use	Permissible Noise Levels: Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
			Semi-Residential/Commercial	7:00 a.m.- 8:00 p.m.	70	Not Specified
				8:00 p.m.- 7:00 a.m.	60	Not Specified
			All Other	Anytime	Not Specified	Not Specified
Riverside County (Riverside County General Plan 2003)	Chapter 9.52. Sec. 9.52.040 General sound level standards. No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1.	Not Specified	Residential	7:00 a.m.- 10:00 p.m.	55	Not Specified
				10:00 p.m.- 7:00 a.m.	45	Not Specified
			Rural Residential, Agriculture, Conservation, Recreation	Anytime	45	Not Specified
			Retail, Office, Tourist, Community Center	7:00 a.m.- 10:00 p.m.	65	Not Specified
	Sec. 9.52.020 Exemptions. Sound emanating from the following sources is exempt from the provisions of this chapter: A. Facilities owned or operated by or for a governmental agency; B. Capital improvement projects of a governmental agency; C. The maintenance or repair of public properties;			10:00 p.m.- 7:00 a.m.	55	Not Specified
			Light Industrial	7:00 a.m.- 10:00 p.m.	75	Not Specified
				10:00 p.m.- 7:00 a.m.	55	Not Specified
			Heavy Industrial	Anytime	75	Not Specified
			Business Park, Public Facility	7:00 a.m.- 10:00 p.m.	65	Not Specified
				10:00 p.m.- 7:00 a.m.	45	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
San Bernardino County (County of San Bernardino 2007 General Plan 2007)	Sec. 83.01.080 (g) Exempt noise. The following sources of noise shall be exempt from the regulations of this Section [see operational table]: Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.	Mon-Sat: 7:00 a.m.-7:00 p.m.	Any	Mon-Sat: 7:00 a.m.-7:00 p.m.	Exempt	Exempt
City						
Baldwin Park (Baldwin Park Code of Ordinances 2006)	Sec. 130.34. Ambient Base Noise Levels	7:00 a.m.-7:00 p.m.	Residential R-I	7:00 a.m.-7:00 p.m.	55	Not Specified
	Sec. 130.37 (E).Construction of buildings and projects. It is unlawful for any person within a residential zone, or within a radius of 500 feet therefrom, [to perform construction] (between the hours of 7:00 p.m. - 7:00 a.m.) in such a manner that a reasonable person of normal sensitiveness residing in the area is caused discomfort or annoyance unless beforehand a permit therefore has been duly obtained from the Department of Public Works.			7:00 p.m.-7:00 a.m.	45	Not Specified
			Residential RG & R-3	7:00 a.m.-7:00 p.m.	60	Not Specified
				7:00 p.m.-7:00 a.m.	55	Not Specified
			Commercial	7:00 a.m.-7:00 p.m.	65	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
	Sec. 130.34 (B) Corrections to noise limits. -5 db for impulsive noise, pure tones, or cyclically varying amplitude, steady wine, schreech, or hum. +2 dB for noise 5-15 min/hr, +5 dB for noise 1-5 min/hr, +7 dB for noise <1 min/hr.			7:00 p.m.- 7:00 a.m.	60	Not Specified
			Industrial	Anytime	70	Not Specified
Chino (Chino Municipal Code 1978)	Sec. 9.40.040-050. Exterior noise standards. [Exceptions:] +5 dBA for <15 min/hr; +10 dBA for <5 min/hr; +15 dBA for <1 min/hr.	Mon-Sat: 7:00 a.m.- 8:00 p.m.	Residential	7:00 a.m.- 10:00 p.m.	55	50
	Sec. 9.40.060 (D). The following activities shall be exempted from the provisions of this Chapter: Noise sources associated with or vibration created by construction... provided said activities do not take place outside the hours for construction as defined in Sec. 15.44.030 of this code, and provided the noise standard of 65 dBA plus the limits specified in Sec. 9.40.040(B) as measured on residential property.			10:00 p.m.- 7:00 a.m.	50	45
			All Other	Any	65	65

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Chino Hills (Chino Hills Municipal Code 2007)	Chapter 8.08. Sec. 8.08.020. No person shall construct… [any] structures thereon at any time other than between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays, excluding federal holidays.	Mon-Fri: 7:00 a.m.-7:00 p.m.; Sat 8:00 a.m.-6:00 p.m.; None on Sun and Holidays	Any	Any	Not Specified	Not Specified
City of Industry	No construction noise guidelines					
Diamond Bar	Chapter 22. Sec. 22.28.120(1)a.1(a). The following acts are a violation of this Chapter: operating or causing the operation of any tools or equipment used in construction ... between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays.	Mon-Sat: 7:00 a.m.-7:00 p.m.	---	---	---	---
	Sec. 22.28.120(1). Construction activities shall be conducted in a manner that the maximum noise levels at the affected structures will not exceed those listed in the following schedule: 1. <u>Residential structures</u>: (a) Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (<u>less than ten days</u>) of mobile equipment shall be as follows:	Mon-Sat: 7:00 a.m.-7:00 p.m.	Single Family Residential	7:00 a.m.-8:00 p.m.	75	Not Specified
				8:00 p.m.-7:00 a.m.	60	Not Specified
			Multi Family Residential	7:00 a.m.-8:00 p.m.	80	Not Specified
				8:00 p.m.-7:00 a.m.	64	Not Permitted
			Semi-Residential/Commercial	7:00 a.m.-8:00 p.m.	85	Not Specified
				8:00 p.m.-7:00 a.m.	70	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Land Use	Permissible Noise Levels: Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
	Sec. 22.28.120(1). Construction activities shall be conducted in a manner that the maximum noise levels at the affected structures will not exceed those listed in the following schedule: 1. <u>Residential structures</u>: (b) Stationary equipment. Maximum noise level for repetitively scheduled and relatively long-term operation (<u>periods of 10 days or more</u>) of stationary equipment shall be as follows:	Mon-Sat: 7:00 a.m.-7:00 p.m.	Single Family Residential	7:00 a.m.-8:00 p.m.	60	Not Specified
				8:00 p.m.-7:00 a.m.	50	Not Specified
			Multi Family Residential	7:00 a.m.-8:00 p.m.	65	Not Specified
				8:00 p.m.-7:00 a.m.	55	Not Permitted
			Semi-Residential/Commercial	7:00 a.m.-8:00 p.m.	70	Not Specified
				8:00 p.m.-7:00 a.m.	60	Not Specified
	Sec. 22.28.120(1). Maximum noise levels for nonscheduled, intermittent, short-term operation of mobile equipment. Daily, including Sundays and legal holidays, all hours: Maximum of 85 dBA.	Mon-Sat: 7:00 a.m.-7:00 p.m.	All nonresidential	Any	85	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
Duarte (Duarte Municipal Code 2006)	Sec. 9.68.050 Ambient base noise levels. Sec. 9.68.050 [Noise Exceptions]: -5 dB for repetitive impulsive noise, pure tones and steady whine, screech or hum. For daytime: +5 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +15 dB for noise <1 min/hr. Sec. 9.68.120 It is unlawful for any person within a residential zone, or within a radius of five hundred feet therefrom, to operate equipment or perform any outside construction ... (between the hours of 10:00 p.m. of one day and 7:00 a.m. of the next day) [unless permit is obtained].	7:00 a.m.-10:00 p.m.	R-1 and R-2	7:00 a.m.-9:00 p.m.	55	Not Specified
				9:00 p.m.-7:00 a.m.	45	Not Specified
			R-3 and R-4	7:00 a.m.-9:00 p.m.	55	Not Specified
				9:00 p.m.-7:00 a.m.	50	Not Specified
			Commercial	7:00 a.m.-9:00 p.m.	60	Not Specified
				9:00 p.m.-7:00 a.m.	55	Not Specified
			Industrial and Light Manufacturing	7:00 a.m.-9:00 p.m.	70	Not Specified
				9:00 p.m.-7:00 a.m.	70	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

			Permissible Noise Levels			
Jurisdiction	**Source**	**Standard Construction Hours**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Irwindale (City of Irwindale Municipal Code 1976)	Chapter 9.28. Sec. 9.28.030. Ambient base noise levels designated. Any noise at a level which exceeds the ambient or the ambient base level ... by more than 10 dB when measured at any boundary line of the property from which the noise emanates shall constitute sufficient proof of a violation. Sec. 9.28.110 Construction of building and projects. It is unlawful for any person within a residential zone, or within a radius of five hundred feet therefrom, to operate equipment or perform any outside construction [which violates] Sec. 9.28.030, unless beforehand authorization therefore has been duly obtained from the building inspector. Such activity is unlawful without a permit during all hours on Sunday. Sec. 15.44.030.	Mon-Sat: 7:00 a.m.-7:00 p.m.	Residential	7:00 a.m.-10:00 p.m.	50	Not Specified
				10:00 p.m.-7:00 a.m.	45	Not Specified
		Not Specified	Commercial	7:00 a.m.-10:00 p.m.	55	Not Specified
				10:00 p.m.-7:00 a.m.	50	Not Specified
			Industrial	7:00 a.m.-10:00 p.m.	70	Not Specified
				10:00 p.m.-7:00 a.m.	60	Not Specified
La Canada Flintridge (La Canada Flintridge, 2007)	Chapter 5.36 Sec. 5.36.010. Construction noise prohibited in residential zones when: [permit required for exceptions].	Mon-Fri: 7:00 a.m.-6:00 p.m. (Daylight Savings Time 7:00 a.m.-7:00 p.m.) Sat 9:00 a.m.-5:00 p.m.; None Sunday and Holidays	Residential	7:00 a.m.-6:00 p.m.	>65	Not Specified
				6:00 p.m.-7:00 a.m.	<65	Not Specified
			All Other	Any	Not Specified	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
City of La Habra (La Habra Heights Municipal Code 2007)	9.32 Construction Noise. The operation of construction equipment or conducting construction-related activities (including demolition, grading, site preparation, etc.) is prohibited weekdays and Saturdays between the hours of from this restriction in writing by the City Manager in response to exigent circumstances. 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays unless such is specifically exempted	Mon-Sat: 7:00 a.m.-7:00 p.m., none on Sun and Holidays	Any	Any	Not Specified	Not Specified
Lancaster (Lancaster Municipal Code, 2007)	Chapter 8.24, Sec. 8.24.040: A person at any time on Sunday or any day between the hours of 8:00 p.m. and sunrise shall not perform any construction... which makes loud noises within five hundred (500) feet of … residence. [permit required for exceptions].	Mon-Sat: from Sunrise-8:00 p.m.	Residential	Mon-Sat: from Sunrise-8:00 p.m.	Not Specified	Not Specified
				Other times	Not Specified	Not Specified
			All Other	Any	Not Specified	Not Specified
Monrovia (Monrovia Code of Ordinances 2007)	Chapter 9.44 Sec. 9.44.040 Allowable noise levels	Mon-Fri: 7:00 a.m.-7:00 p.m.; Weekends and Holidays: 9:00 a.m.-6:00 p.m.	Any	7:00 a.m.-9:00 p.m.	No Limit	Not Specified
	Sec. 9.44.080(F) [Exempt from provisions above] Construction or demolition work conducted between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and the hours of 9:00 a.m. and 6:00 p.m. on weekends and holidays.		Residential	9:00 p.m.-7:00 a.m.	50	Not Specified
			All Other	Anytime	Not Specified	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
Montebello (Montebello Municipal Code 2006)	Chapter 9.08. Sec. 9.08.050 I. [The following not permitted] Noise sources associated with construction… other than between the hours of 7:00 a.m. and 8:00 p.m. on weekdays and 9:00 a.m. to 6:00 p.m. on Saturdays, Sundays and holidays	Mon-Fri 7:00 a.m.-8:00 p.m.; Sat, Sun, and Holidays 9:00 a.m.-6:00 p.m.	Any	Mon-Fri 7:00 a.m.-8:00 p.m.; Sat, Sun, and Holidays 9:00 a.m.-6:00 p.m.	Not Specified	Not Specified
Monterey Park (Monterey Park Municipal Code 2006)	Chapter 9.53. Sec. 9.53.070. The following activities shall be exempt from the provisions of this Chapter: (6) Construction...conducted between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and the hours of 9:00 a.m. and 6:00 p.m. on Saturdays, Sundays and holidays.	Mon-Fri 7:00 a.m.-7:00 p.m.; Sat, Sun, and Holidays 9:00 a.m.-6:00 p.m.	Any	Mon-Fri 7:00 a.m.-7:00 p.m.; Sat, Sun, and Holidays 9:00 a.m.-6:00 p.m.	Not Specified	Not Specified
Ontario (Ontario Code of Ordinances 2005)	Sec. 9-1.3305. Maximum Noise Levels. [Interior Multifamily Residential noise levels may be exceeded by +5 dBA if noise is <1 min/hr.]	Not Specified	Single Family Residential	7:00 a.m.-10:00 p.m.	65	Not Specified
				10:00 p.m.-7:00 a.m.	45	Not Specified
			Multi Family Residential	7:00 a.m.-10:00 p.m.	65	45
				10:00 p.m.-7:00 a.m.	50	35
			Commercial	7:00 a.m.-10:00 p.m.	65	Not Specified
				10:00 p.m.-7:00 a.m.	60	Not Specified
			Industrial	Anytime	70	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

			Permissible Noise Levels			
Jurisdiction	**Source**	**Standard Construction Hours**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Palmdale (Palmdale Municipal Code, 2007)	Sec. 9.18.015(c): [It is prohibited] to make noise adjacent to a hospital, school, library, rest home, or long-term medical or mental care facility, which noise unreasonably interferes with the workings of such institutions or which disturbs or unduly annoys occupants.	Not Specified	Hospitals, Schools, Libraries	Not Specified	Must not be "unreasonably interfering or … disturb[ing]"	Must not be "unreasonably interfering or … disturb[ing]"
			All Other	Not Specified	65 CNEL	Not Specified
Pasadena (Pasadena General Plan, Noise Element 2006)	Sec. 9.36.110. No ... [construction] within a residential district or within a radius of 500 feet therefrom at any time other than as listed. [Construction work prohibited Sundays and Holidays]	Mon-Fri: 7:00 a.m.-7:00 p.m.; Sat 8:00 a.m.-5:00 p.m.; None on Sun and Holidays	Residential	Mon-Fri: 7:00 a.m.-7:00 p.m.; Sat 8:00 a.m.-5:00 p.m.	85	Not Specified
		Not Specified	All Other	Any	85	Not Specified
	Sec. 9.36.030. Noise districts. [Exceptions: Day noise maxes vary 50-60; night from 40-50. Any steady tone +5, repeated impulsive noise +5, Noise occurring more than 5 but less than 15 minutes per hour: - 5, Noise occurring more than 1 but less than 5 minutes per hour: - 10, Noise occurring less than 1 minute per hour: -20]	---	Noise District I	6:00 a.m.-11:00 p.m.	50	Not Specified
				11:00 p.m.-6:00 a.m.	40	Not Specified
		---	Noise District II	6:00 a.m.-11:00 p.m.	55	Not Specified
				11:00 p.m.-6:00 a.m.	45	Not Specified
		---	Noise District III	6:00 a.m.-11:00 p.m.	60	Not Specified
				11:00 p.m.-6:00 a.m.	50	Not Specified
Pico Rivera (City of Pico Rivera Municipal Code 2007)	No construction noise guidelines					

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels: Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
Rosemead	Sec. 130.37 (E) [No construction from 7:00 p.m.-7:00 a.m.] within a residential zone, or within a radius of 500 feet therefrom... unless beforehand a permit therefore has been duly obtained.	7:00 a.m.-7:00 p.m.	R-I	7:00 a.m.- 7:00 p.m.	55	Not Specified
				7:00 p.m.- 7:00 a.m.	45	Not Specified
			RG and R-3	7:00 a.m.- 7:00 p.m.	60	Not Specified
	Sec. 130.34 Ambient Base Noise Levels Corrections to noise limits: The numerical limits given in this Sec. shall be adjusted by the following corrections, where appropriate: -5 dB for impulsive sounds with varying amplitude, -5 dB for steady screech wine or hum, +2 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +7 dB for noise <1 min/hr			7:00 p.m.- 7:00 a.m.	55	Not Specified
			Commercial	7:00 a.m.- 7:00 p.m.	65	Not Specified
				7:00 p.m.- 7:00 a.m.	60	Not Specified
			Industrial	Anytime	70	Not Specified
South El Monte (South El Monte General Plan, Public Safety Element 2007)	[General Plan Table PS-1 has established guidelines of noise limits above which detailed analysis must be undergone for construction projects.	Not Specified	Residential	Not Specified	>55 CNEL need analysis	Not Specified
			Mixed Residential and Commercial	Not Specified	>55 CNEL need analysis	Not Specified
			Hotel	Not Specified	>60 CNEL need analysis	Not Specified
			Retail, Restaurant, Entertainment	Not Specified	>65 CNEL need analysis	Not Specified
			Offices, R&D, City Hall	Not Specified	>65 CNEL need analysis	Not Specified
			Auto Sales, Manufacturing, Warehousing, Utilities	Not Specified	>75 CNEL need analysis	Not Specified

TABLE 7-1 Noise LORS by Jurisdiction During Construction

			Permissible Noise Levels			
Jurisdiction	**Source**	**Standard Construction Hours**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
			Schools, Hospital, Library	Not Specified	>55 CNEL need analysis	Not Specified
			Parks	Not Specified	>65 CNEL need analysis	Not Specified
South San Gabriel (South San Gabriel Community Standards and District 1993)	No construction noise guidelines	---	---	---	---	---
Temple City	Art 1. Part 5. Sec. 9284 (E). Noise Provision, Exceptions. The provisions of this Art shall not apply to: Construction operation, maintenance, and repairs of equipment, apparatus, or facilities of parks and recreation department, public works projects, or essential public services and facilities, including those of public utilities subject to the regulatory jurisdiction of the California public utilities commission. [see operational table]	Not Specified	---	---	---	---

TABLE 7-1 Noise LORS by Jurisdiction During Construction

Jurisdiction	Source	Standard Construction Hours	Permissible Noise Levels			
			Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
Whittier (Whittier Municipal Code 2007)	Sec. 8.32.080. The following acts... are declared to be in violation of this Chapter: F. Construction... between weekday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by the city or other governmental entity. 1. Where technically and economically feasible, such construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following tables [not mandatory so did not include].	Mon-Sat: 7:00 a.m.-7:00 p.m.				

TABLE 7-2
Noise LORS by Jurisdiction during Operation

Jurisdiction	Permissible Noise Levels				
	Source	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
County					
Kern County (Kern County Municipal Code 2007)	Chapter 3 Sec. 2. Noise Sensitive Areas.	Residences, Schools, Hospitals, Parks, Churches	Any	65Ldn	45Ldn
		All Other	Any	Not Specified	Not Specified
Los Angeles County (Los Angeles Municipal Code 2007)	Chapter. 12.08.380 Noise zones designated.	Noise Sensitive Area	Anytime	45	Not Specified
		Single Family Residential	7:00 a.m.- 10:00 p.m.	50	45
			10:00 p.m.- 7:00 a.m.	45	45
	12.08.390 Exterior noise standards: [Exceptions] +5 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +15 dB for noise <1 min/hr.	Multi-family Residential	7:00 a.m.- 10:00 p.m.	50	40
			10:00 p.m.- 7:00 a.m.	45	40
		Commercial	7:00 a.m.- 10:00 p.m.	60	Not Specified
	12.08.400 Interior noise standards. [Exceptions] +5 dB for noise <1 min/hr		10:00 p.m.- 7:00 a.m.	55	Not Specified
		Industrial	Anytime	70	Not Specified

TABLE 7-2
Noise LORS by Jurisdiction during Operation

	Permissible Noise Levels				
Jurisdiction	**Source**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Riverside County (Riverside County General Plan 2003)	Chapter 9.52. Sec. 9.52.040 General sound level standards. No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1.	Residential	7:00 a.m.-10:00 p.m.	55	Not Specified
			10:00 p.m.-7:00 a.m.	45	Not Specified
		Rural Residential, Agriculture, Conservation, Recreation	Anytime	45	Not Specified
		Retail, Office, Tourist, Community Center	7:00 a.m.-10:00 p.m.	65	Not Specified
	Sec. 9.52.020 Exemptions. Sound emanating from the following sources is exempt from the provisions of this chapter: A. Facilities owned or operated by or for a governmental agency; B. Capital improvement projects of a governmental agency; C. The maintenance or repair of public properties;		10:00 p.m.-7:00 a.m.	55	Not Specified
		Light Industrial	7:00 a.m.-10:00 p.m.	75	Not Specified
			10:00 p.m.-7:00 a.m.	55	Not Specified
		Heavy Industrial	Anytime	75	Not Specified
		Business Park, Public Facility	7:00 a.m.-10:00 p.m.	65	Not Specified
			10:00 p.m.-7:00 a.m.	45	Not Specified

TABLE 7-2
Noise LORS by Jurisdiction during Operation

	Permissible Noise Levels				
Jurisdiction	**Source**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
San Bernardino County	Sec. 82.18.030 (c) Exterior noise levels in all single-family residential land use areas and multi-family residential land use areas should not exceed 65 dBA Ldn. Exterior noise levels shall not exceed 70 dBA Ldn for any residential use areas. Ability to mitigate exterior noises to the levels of 65 dBA Ldn and 70 dBA Ldn shall be considered by the review authority when determining the actual Ldn level with which the land uses must comply. Sce 82.18.030 (b) Interior noise levels. Interior noise levels in all single-family and multi-family residences and educational institutions shall not exceed 45 dBA Ldn emanating from sources outside of the residential building.	Residential	7:00 a.m.- 10:00 p.m.	55Leq	45Ldn
			10:00 p.m.- 7:00 a.m.	45Leq	45Ldn
		Professional Services	Anytime	55Leq	Not Specified
	Sec. 83.01.080 (c) [Exception to Exterior Noise Limits] +5 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +15 dB for noise <1 min/hr	Other Commercial	Anytime	60Leq	Not Specified
		Industrial	Anytime	70Leq	Not Specified
	Sec. 83.01.080 (h) Noise standards for other structures. All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria:	Schools, Libraries, Meeting Facilities, etc.	Not Specified	Not Specified	45Ldn
		Offices	Not Specified	Not Specified	50Ldn
		Retail Stores, Restaurants	Not Specified	Not Specified	55Ldn
		Manufacturing, Testing, Warehousing	Not Specified	Not Specified	65Ldn

TABLE 7-2
Noise LORS by Jurisdiction during Operation

	Permissible Noise Levels				
Jurisdiction	**Source**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
City					
Baldwin Park (Baldwin Park Code of Ordinances 2006)	Sec. 130.34. Ambient Base Noise Levels	R-I	7:00 a.m.- 7:00 p.m.	55	Not Specified
	Sec. 130.34 (B) Corrections to noise limits. -5 db for impulsive noise, pure tones, or cyclically varying amplitude, steady wine, schreech, or hum. +2 dB for noise 5-15 min/hr, +5 dB for noise 1-5 min/hr, +7 dB for noise <1 min/hr.		7:00 p.m.- 7:00 a.m.	45	Not Specified
		RG and R-3	7:00 a.m.- 7:00 p.m.	60	Not Specified
			7:00 p.m.- 7:00 a.m.	55	Not Specified
		Commercial	7:00 a.m.- 7:00 p.m.	65	Not Specified
			7:00 p.m.- 7:00 a.m.	60	Not Specified
		Industrial	Anytime	70	Not Specified
Chino (Chino Municipal Code 1978)	Sec. 9.40.040-050. Exterior noise standards. [Exceptions]: +5 dBA for <15 min/hr; +10 dBA for <5 min/hr; +15 dBA for <1 min/hr.	Residential	7:00 a.m.- 10:00 p.m.	55	50
			10:00 p.m.- 7:00 a.m.	50	45
		All Other	Any	65	65
Chino Hills (Chino Hills Municipal Code 2007)	No noise guidelines				
City of Industry	No noise guidelines				

TABLE 7-2
Noise LORS by Jurisdiction during Operation

	Permissible Noise Levels				
Jurisdiction	**Source**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Diamond Bar	Chapter 22. Sec. 22.28.080. Exterior noise standards. Unless otherwise provided in this Chapter, the following exterior noise standards shall apply to all receptor properties within a designated noise zone:	Noise-Sensitive	Anytime	45	Not Specified
		Residential	7:00 a.m.-10:00 p.m.	50	40
			10:00 p.m.-7:00 a.m.	45	40
	Sec. 22.28.080. [Exception to Exterior Noise Limits] +5 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +15 dB for noise <1 min/hr	Commercial	7:00 a.m.-10:00 p.m.	60	Not Specified
			10:00 p.m.-7:00 a.m.	55	Not Specified
	Sec. 22.28.090. [Exception to Interior Noise Limits] +5 dB for noise <1 min/hr	Industrial	Anytime	70	Not Specified
Duarte (Duarte Municipal Code 2006)	Sec. 9.68.050 Ambient base noise levels.	R-1 and R-2	7:00 a.m.-9:00 p.m.	55	Not Specified
			9:00 p.m.-7:00 a.m.	45	Not Specified
	Sec. 9.68.050 [Noise Exceptions]: -5 dB for repetitive impulsive noise, pure tones and steady whine, screech or hum. For daytime: +5 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +15 dB for noise <1 min/hr.	R-3 and R-4	7:00 a.m.-9:00 p.m.	55	Not Specified
			9:00 p.m.-7:00 a.m.	50	Not Specified
		Commercial	7:00 a.m.-9:00 p.m.	60	Not Specified
			9:00 p.m.-7:00 a.m.	55	Not Specified
		Industrial, Light Manufacturing	7:00 a.m.-9:00 p.m.	70	Not Specified
			9:00 p.m.-7:00 a.m.	70	Not Specified

TABLE 7-2
Noise LORS by Jurisdiction during Operation

	Permissible Noise Levels				
Jurisdiction	**Source**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Irwindale (City of Irwindale Municipal Code 1976)	Chapter 9.28. Sec. 9.28.030. Ambient base noise levels designated. Any noise at a level which exceeds the ambient or the ambient base level ... by more than 10 dB when measured at any boundary line of the property from which the noise emanates shall constitute sufficient proof of a violation.	Residential	7:00 a.m.-10:00 p.m.	50	Not Specified
			10:00 p.m.-7:00 a.m.	45	Not Specified
		Commercial	7:00 a.m.-10:00 p.m.	55	Not Specified
			10:00 p.m.-7:00 a.m.	50	Not Specified
		Industrial	7:00 a.m.-10:00 p.m.	70	Not Specified
			10:00 p.m.-7:00 a.m.	60	Not Specified
La Canada Flintridge (La Canada Flintridge, 2007)	No noise guidelines.	---	---	---	---
City of La Habra (La Habra Heights Municipal Code 2007)		Residential	7:00 a.m.-10:00 p.m.	55	55
			10:00 p.m.-7:00 a.m.	50	45
Lancaster (City of Lancaster 2020 General Plan)	Chapter 8.24 Sec. 8.24.030 No person shall make, cause or suffer, or permit to be made upon any premises owned, occupied or controlled by him/her any unnecessary noises or sounds which are physically annoying to persons of ordinary sensitiveness which are so harsh or so prolonged or unnatural or unusual in their use, time, or place as to occasion physical discomfort to the inhabitants of any neighborhood.	Residential Schools (Classroom/ Playground)		65 CNEL 65 CNEL	45 CNEL 70 CNEL
		Hospital/Covalent Facility Living Area Sleeping			 50 40
		Commercial/Industrial Office Area		70 CNEL	50 CNEL

TABLE 7-2
Noise LORS by Jurisdiction during Operation

Jurisdiction	Permissible Noise Levels				
	Source	Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
Monrovia (Monrovia Code of Ordinances 2007)	Chapter 9.44 Sec. 9.44.040 Allowable noise levels Chapter 9.44 Sec. 9.44.060 and 070 [Noise Exceptions]: +5 dB for noise 15 min/hr, +10 dB for noise 5 min/hr, +15 dB for noise 1 min/hr, +20 dB for noise <1 min/hr. -5 dB for impulsive sound.	Residential property within any zone	7:00 a.m.- 9:00 p.m.	55	Not Specified
			9:00 p.m.- 7:00 a.m.	50	Not Specified
Montebello (Montebello Municipal Code 2006)	No operational noise guidelines	---	---	---	---
Monterey Park (Monterey Park Municipal Code 2006)	Chapter 9.53. 9.53.040 Noise standards. 9.53.050 Permitted increases in noise levels. +5 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +15 dB for noise 1 min/hr, +20 dB for noise <1 min/hr	Residential	7:00 a.m.- 10:00 p.m.	55	Not Specified
			10:00 p.m.- 7:00 a.m.	50	Not Specified
		Commercial	7:00 a.m.- 10:00 p.m.	65	Not Specified
			10:00 p.m.- 7:00 a.m.	55	Not Specified
		Industrial	Anytime	70	Not Specified

TABLE 7-2
Noise LORS by Jurisdiction during Operation

	Permissible Noise Levels				
Jurisdiction	**Source**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Ontario (Ontario Code of Ordinances 2005)	Sec. 9-1.3305. Maximum Noise Levels [Interior Multifamily Residential noise levels may be exceeded by +5 dBA if noise is <1 min/hr.]	Single Family Residential	7:00 a.m.-10:00 p.m.	65	Not Specified
			10:00 p.m.-7:00 a.m.	45	Not Specified
		Multi Family Residential	7:00 a.m.-10:00 p.m.	65	45
			10:00 p.m.-7:00 a.m.	50	35
		Commercial	7:00 a.m.-10:00 p.m.	65	Not Specified
			10:00 p.m.-7:00 a.m.	60	Not Specified
		Industrial	Anytime	70	Not Specified
Palmdale (Palmdale General Plan)	Chapter 9.18. Sec. 9.18.015(c): [It is prohibited] to make noise adjacent to a hospital, school, library, rest home, or long-term medical or mental care facility, which noise unreasonably interferes with the workings of such institutions or which disturbs or unduly annoys occupants.	Residential		65 CNEL	--
Pasadena (Pasadena General Plan, Noise Element 2006)	Sec. 9.36.030. Noise districts. [Exceptions: Day noise maxes vary 50-60; night from 40-50. Any steady tone +5, repeated impulsive noise +5, Noise occurring more than 5 but less than 15 minutes per hour: - 5, Noise occurring more than 1 but less than 5 minutes per hour: - 10, Noise occurring less than 1 minute per hour: -20]	Noise District I	6:00 a.m.-11:00 p.m.	50	Not Specified
			11:00 p.m.-6:00 a.m.	40	Not Specified
		Noise District II	6:00 a.m.-11:00 p.m.	55	Not Specified
			11:00 p.m.-6:00 a.m.	45	Not Specified
		Noise District III	6:00 a.m.-11:00 p.m.	60	Not Specified
			11:00 p.m.-6:00 a.m.	50	Not Specified

TABLE 7-2
Noise LORS by Jurisdiction during Operation

	Permissible Noise Levels				
Jurisdiction	**Source**	**Land Use**	**Hours**	**Exterior Noise Level Limits - dBA**	**Interior Noise Level Limits - dBA**
Pico Rivera (City of Pico Rivera Municipal Code 2007)	No noise guidelines				
Rosemead	Sec. 130.34 Ambient Base Noise levels Sec. 130.34 (B) Corrections to noise limits: The numerical limits given in this Sec. shall be adjusted by the following corrections, where appropriate: -5 d B for impulsive sounds with varying amplitude, -5d B for steady screech wine or hum, +2 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +7 dB for noise <1 min/hr	R-I	7:00 a.m.- 7:00 p.m.	55	Not Specified
			7:00 p.m.- 7:00 a.m.	45	Not Specified
		RG and R-3	7:00 a.m.- 7:00 p.m.	60	Not Specified
			7:00 p.m.- 7:00 a.m.	55	Not Specified
		Commercial	7:00 a.m.- 7:00 p.m.	65	Not Specified
			7:00 p.m.- 7:00 a.m.	60	Not Specified
		Industrial	Anytime	70	Not Specified
South El Monte (South El Monte General Plan, Public Safety Element 2007)	No operational noise guidelines	Low Density	7:00 a.m.- 10:00 p.m.	55	
		Residential	10:00 p.m.- 7:00 a.m.	45	
		Multifamily	7:00 a.m.- 10:00 p.m.	60	
			10:00 p.m.- 7:00 a.m.	50	
		Commercial	7:00 a.m.- 10:00 p.m.	60	
			10:00 p.m.- 7:00 a.m.	55	
		Manufacturing	anytime	70	

TABLE 7-2
Noise LORS by Jurisdiction during Operation

Jurisdiction	Source	Land Use	Hours	Exterior Noise Level Limits - dBA	Interior Noise Level Limits - dBA
	Permissible Noise Levels				
Temple City	Art 1. Part 2. Sec. 9281. Noise Limits: It shall be unlawful for any person within the city to produce... noise which is received on property occupied by another person within the designated region, in excess of the following levels, except as expressly provided otherwise or exempted hereinafter:	Residential	7:00 a.m.-10:00 p.m.	57	Not Specified
			10:00 p.m.-7:00 a.m.	51	Not Specified
		Commercial	7:00 a.m.-10:00 p.m.	66	Not Specified
	Sec. 9281. Corrections To Noise Limits: +6 dB for noise 5-15 min/hr, +9 dB for noise 1-5 min/hr, +12 dB for noise <1 min/hr, -6 for impulsive sounds		10:00 p.m.-7:00 a.m.	60	Not Specified
		Industrial	Anytime	72	Not Specified
Whittier (Whittier Municipal Code 2007)	Chapter 8.32. Sec. 8.32.060. Exterior noise limits.	1-2 Family Residential	7:00 a.m.-10:00 p.m.	50	Not Specified
			10:00 p.m.-7:00 a.m.	45	Not Specified
	Sec. 8.32.060. [Exceptions] +5 dB for noise 5-15 min/hr, +10 dB for noise 1-5 min/hr, +15 dB for noise <1 min/hr	Multi-Family Residential	7:00 a.m.-10:00 p.m.	55	Not Specified
			10:00 p.m.-7:00 a.m.	50	Not Specified
		Commercial	7:00 a.m.-10:00 p.m.	65	Not Specified
			10:00 p.m.-7:00 a.m.	60	Not Specified
		Industrial	Anytime	70	Not Specified

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Final Report

Tehachapi Renewable Transmission Project Noise Technical Report –

Appendix A: Corona Modeling Results

Prepared for

Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, CA 91770

December 2007

Prepared by

CH2MHILL

3 Hutton Centre Drive
Suite 200
Santa Ana, CA 92707

Tehachapi Renewable Transmission Project

Corona Modeling Location 1 - Segment 10

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	39.9	14.9
-2450	40.0	15.0
-2400	40.1	15.1
-2350	40.2	15.2
-2300	40.3	15.3
-2250	40.4	15.4
-2200	40.5	15.5
-2150	40.6	15.6
-2100	40.7	15.7
-2050	40.8	15.8
-2000	40.9	15.9
-1950	41.0	16.0
-1900	41.2	16.2
-1850	41.3	16.3
-1800	41.4	16.4
-1750	41.5	16.5
-1700	41.6	16.6
-1650	41.8	16.8
-1600	41.9	16.9
-1550	42.0	17.0
-1500	42.2	17.2
-1450	42.3	17.3
-1400	42.5	17.5
-1350	42.6	17.6
-1300	42.8	17.8
-1250	43.0	18.0
-1200	43.1	18.1
-1150	43.3	18.3
-1100	43.5	18.5
-1050	43.7	18.7
-1000	43.9	18.9
-950	44.1	19.1
-900	44.3	19.3
-850	44.5	19.5
-800	44.7	19.7
-750	45.0	20.0
-700	45.3	20.3
-650	45.5	20.5
-600	45.8	20.8
-550	46.1	21.1
-500	46.4	21.4
-450	46.8	21.8
-400	47.2	22.2
-350	47.6	22.6
-300	48.0	23.0
-250	48.5	23.5
-200	49.1	24.1
-150	49.7	24.7
-100	50.3	25.3
-50	51.1	26.1
0	52.1	27.1
50	53.3	28.3
100	54.7	29.7
150	56.7	31.7
200	58.7	33.7
250	59.0	34.0
300	57.1	32.1
350	55.1	30.1
400	53.5	28.5
450	52.3	27.3
500	51.3	26.3
550	50.5	25.5
600	49.8	24.8
650	49.2	24.2
700	48.6	23.6
750	48.1	23.1
800	47.7	22.7

Tehachapi Renewable Transmission Project

Corona Modeling Location 1 - Segment 10

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	47.3	22.3
900	46.9	21.9
950	46.5	21.5
1000	46.2	21.2
1050	45.9	20.9
1100	45.6	20.6
1150	45.3	20.3
1200	45.0	20.0
1250	44.8	19.8
1300	44.6	19.6
1350	44.3	19.3
1400	44.1	19.1
1450	43.9	18.9
1500	43.7	18.7
1550	43.5	18.5
1600	43.3	18.3
1650	43.2	18.2
1700	43.0	18.0
1750	42.8	17.8
1800	42.7	17.7
1850	42.5	17.5
1900	42.4	17.4
1950	42.2	17.2
2000	42.1	17.1
2050	41.9	16.9
2100	41.8	16.8
2150	41.7	16.7
2200	41.5	16.5
2250	41.4	16.4
2300	41.3	16.3
2350	41.2	16.2
2400	41.1	16.1
2450	40.9	15.9

Tehachapi Renewable Transmission Project

Corona Modeling Location 2 - Pacific Crest Trail

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	8.5	-16.5
-2450	8.5	-16.5
-2400	8.6	-16.4
-2350	8.7	-16.3
-2300	8.8	-16.2
-2250	8.9	-16.1
-2200	9.0	-16.0
-2150	9.1	-15.9
-2100	9.2	-15.8
-2050	9.4	-15.6
-2000	9.5	-15.5
-1950	9.6	-15.4
-1900	9.7	-15.3
-1850	9.8	-15.2
-1800	9.9	-15.1
-1750	10.1	-14.9
-1700	10.2	-14.8
-1650	10.3	-14.7
-1600	10.5	-14.5
-1550	10.6	-14.4
-1500	10.7	-14.3
-1450	10.9	-14.1
-1400	11.0	-14.0
-1350	11.2	-13.8
-1300	11.4	-13.6
-1250	11.5	-13.5
-1200	11.7	-13.3
-1150	11.9	-13.1
-1100	12.1	-12.9
-1050	12.3	-12.7
-1000	12.5	-12.5
-950	12.7	-12.3
-900	12.9	-12.1
-850	13.2	-11.8
-800	13.4	-11.6
-750	13.7	-11.3
-700	13.9	-11.1
-650	14.2	-10.8
-600	14.6	-10.4
-550	14.9	-10.1
-500	15.3	-9.7
-450	15.7	-9.3
-400	16.1	-8.9
-350	16.6	-8.4
-300	17.1	-7.9
-250	17.8	-7.2
-200	18.5	-6.5
-150	19.4	-5.6
-100	20.5	-4.5
-50	22.1	-2.9
0	24.4	-0.6
50	26.1	1.1
100	24.7	-0.3
150	23.3	-1.7
200	23.3	-1.7
250	24.7	-0.3
300	26.1	1.1
350	24.4	-0.6
400	22.2	-2.8
450	20.7	-4.3
500	19.6	-5.4
550	18.8	-6.2
600	18.2	-6.8
650	17.7	-7.3
700	17.4	-7.6
750	17.3	-7.7
800	17.4	-7.6

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	40.6	15.6
-2450	40.6	15.6
-2400	40.7	15.7
-2350	40.8	15.8
-2300	40.9	15.9
-2250	40.9	15.9
-2200	41.0	16.0
-2150	41.1	16.1
-2100	41.2	16.2
-2050	41.3	16.3
-2000	41.3	16.3
-1950	41.4	16.4
-1900	41.5	16.5
-1850	41.6	16.6
-1800	41.7	16.7
-1750	41.8	16.8
-1700	41.9	16.9
-1650	42.0	17.0
-1600	42.1	17.1
-1550	42.2	17.2
-1500	42.3	17.3
-1450	42.4	17.4
-1400	42.5	17.5
-1350	42.6	17.6
-1300	42.7	17.7
-1250	42.8	17.8
-1200	42.9	17.9
-1150	43.0	18.0
-1100	43.2	18.2
-1050	43.3	18.3
-1000	43.4	18.4
-950	43.5	18.5
-900	43.7	18.7
-850	43.8	18.8
-800	43.9	18.9
-750	44.1	19.1
-700	44.2	19.2
-650	44.4	19.4
-600	44.5	19.5
-550	44.7	19.7
-500	44.9	19.9
-450	45.0	20.0
-400	45.2	20.2
-350	45.4	20.4
-300	45.6	20.6
-250	45.8	20.8
-200	46.0	21.0
-150	46.2	21.2
-100	46.5	21.5
-50	46.7	21.7
0	47.0	22.0
50	47.3	22.3
100	47.5	22.5
150	47.8	22.8
200	48.1	23.1
250	48.5	23.5
300	48.8	23.8
350	49.2	24.2
400	49.7	24.7
450	50.1	25.1
500	50.6	25.6
550	51.2	26.2
600	51.9	26.9
650	52.6	27.6
700	53.5	28.5
750	54.6	29.6
800	55.9	30.9

Tehachapi Renewable Transmission Project

Corona Modeling Location 2 - Pacific Crest Trail

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	17.9	-7.1
900	18.9	-6.1
950	19.7	-5.3
1000	18.7	-6.3
1050	17.2	-7.8
1100	16.2	-8.8
1150	15.4	-9.6
1200	14.9	-10.1
1250	14.4	-10.6
1300	14.0	-11.0
1350	13.7	-11.3
1400	13.3	-11.7
1450	13.1	-11.9
1500	12.8	-12.2
1550	12.6	-12.4
1600	12.3	-12.7
1650	12.1	-12.9
1700	11.9	-13.1
1750	11.7	-13.3
1800	11.5	-13.5
1850	11.4	-13.6
1900	11.2	-13.8
1950	11.0	-14.0
2000	10.9	-14.1
2050	10.7	-14.3
2100	10.6	-14.4
2150	10.4	-14.6
2200	10.3	-14.7
2250	10.1	-14.9
2300	10.0	-15.0
2350	9.9	-15.1
2400	9.8	-15.2
2450	9.6	-15.4

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	57.7	32.7
900	59.9	34.9
950	61.1	36.1
1000	59.9	34.9
1050	57.7	32.7
1100	55.9	30.9
1150	54.6	29.6
1200	53.5	28.5
1250	52.6	27.6
1300	51.9	26.9
1350	51.2	26.2
1400	50.6	25.6
1450	50.1	25.1
1500	49.7	24.7
1550	49.2	24.2
1600	48.8	23.8
1650	48.5	23.5
1700	48.1	23.1
1750	47.8	22.8
1800	47.5	22.5
1850	47.2	22.2
1900	47.0	22.0
1950	46.7	21.7
2000	46.5	21.5
2050	46.2	21.2
2100	46.0	21.0
2150	45.8	20.8
2200	45.6	20.6
2250	45.4	20.4
2300	45.2	20.2
2350	45.0	20.0
2400	44.9	19.9
2450	44.7	19.7

Tehachapi Renewable Transmission Project

Corona Modeling Location 3 - Chino Hills

Proposed Scenario - split phased and both circuits energized.

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	42.7	17.7
-2450	42.8	17.8
-2400	42.9	17.9
-2350	43.0	18.0
-2300	43.1	18.1
-2250	43.3	18.3
-2200	43.4	18.4
-2150	43.5	18.5
-2100	43.6	18.6
-2050	43.7	18.7
-2000	43.8	18.8
-1950	43.9	18.9
-1900	44.1	19.1
-1850	44.2	19.2
-1800	44.3	19.3
-1750	44.5	19.5
-1700	44.6	19.6
-1650	44.7	19.7
-1600	44.9	19.9
-1550	45.0	20.0
-1500	45.2	20.2
-1450	45.3	20.3
-1400	45.5	20.5
-1350	45.7	20.7
-1300	45.8	20.8
-1250	46.0	21.0
-1200	46.2	21.2
-1150	46.4	21.4
-1100	46.6	21.6
-1050	46.8	21.8
-1000	47.1	22.1
-950	47.3	22.3
-900	47.5	22.5
-850	47.8	22.8
-800	48.1	23.1
-750	48.4	23.4
-700	48.7	23.7
-650	49.0	24.0
-600	49.3	24.3
-550	49.7	24.7
-500	50.1	25.1
-450	50.6	25.6
-400	51.1	26.1
-350	51.6	26.6
-300	52.2	27.2
-250	52.9	27.9
-200	53.6	28.6
-150	54.6	29.6
-100	55.7	30.7
-50	57.0	32.0
0	58.8	33.8
50	60.9	35.9
100	60.9	35.9
150	58.8	33.8
200	57.0	32.0
250	55.7	30.7
300	54.6	29.6
350	53.6	28.6
400	52.9	27.9
450	52.2	27.2
500	51.6	26.6
550	51.1	26.1
600	50.6	25.6
650	50.1	25.1
700	49.7	24.7
750	49.3	24.3
800	49.0	24.0

Tehachapi Renewable Transmission Project

Corona Modeling Location 3 - Chino Hills

Proposed Scenario - split phased and both circuits energized.

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	48.7	23.7
900	48.4	23.4
950	48.1	23.1
1000	47.8	22.8
1050	47.5	22.5
1100	47.3	22.3
1150	47.1	22.1
1200	46.8	21.8
1250	46.6	21.6
1300	46.4	21.4
1350	46.2	21.2
1400	46.0	21.0
1450	45.8	20.8
1500	45.7	20.7
1550	45.5	20.5
1600	45.3	20.3
1650	45.2	20.2
1700	45.0	20.0
1750	44.9	19.9
1800	44.7	19.7
1850	44.6	19.6
1900	44.5	19.5
1950	44.3	19.3
2000	44.2	19.2
2050	44.1	19.1
2100	43.9	18.9
2150	43.8	18.8
2200	43.7	18.7
2250	43.6	18.6
2300	43.5	18.5
2350	43.4	18.4
2400	43.3	18.3
2450	43.1	18.1

Tehachapi Renewable Transmission Project

Corona Modeling Location 4 - Duarte

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	9.0	-16.0
-2450	9.1	-15.9
-2400	9.2	-15.8
-2350	9.3	-15.7
-2300	9.4	-15.6
-2250	9.5	-15.5
-2200	9.6	-15.4
-2150	9.7	-15.3
-2100	9.8	-15.2
-2050	9.9	-15.1
-2000	10.1	-14.9
-1950	10.2	-14.8
-1900	10.3	-14.7
-1850	10.4	-14.6
-1800	10.6	-14.4
-1750	10.7	-14.3
-1700	10.8	-14.2
-1650	11.0	-14.0
-1600	11.1	-13.9
-1550	11.3	-13.7
-1500	11.4	-13.6
-1450	11.6	-13.4
-1400	11.7	-13.3
-1350	11.9	-13.1
-1300	12.1	-12.9
-1250	12.3	-12.7
-1200	12.5	-12.5
-1150	12.7	-12.3
-1100	12.9	-12.1
-1050	13.1	-11.9
-1000	13.3	-11.7
-950	13.5	-11.5
-900	13.8	-11.2
-850	14.0	-11.0
-800	14.3	-10.7
-750	14.6	-10.4
-700	14.9	-10.1
-650	15.2	-9.8
-600	15.6	-9.4
-550	16.0	-9.0
-500	16.4	-8.6
-450	16.8	-8.2
-400	17.3	-7.7
-350	17.9	-7.1
-300	18.5	-6.5
-250	19.2	-5.8
-200	20.0	-5.0
-150	20.9	-4.1
-100	22.1	-2.9
-50	23.5	-1.5
0	25.4	0.4
50	27.0	2.0
100	26.8	1.8
150	25.8	0.8
200	24.0	-1.0
250	22.4	-2.6
300	21.1	-3.9
350	20.1	-4.9
400	19.3	-5.7
450	18.5	-6.5
500	17.9	-7.1
550	17.4	-7.6
600	16.9	-8.1
650	16.4	-8.6
700	16.0	-9.0
750	15.6	-9.4
800	15.3	-9.7

LST Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	37.8	12.8
-2450	37.9	12.9
-2400	38.0	13.0
-2350	38.1	13.1
-2300	38.2	13.2
-2250	38.3	13.3
-2200	38.4	13.4
-2150	38.5	13.5
-2100	38.6	13.6
-2050	38.7	13.7
-2000	38.8	13.8
-1950	38.9	13.9
-1900	39.1	14.1
-1850	39.2	14.2
-1800	39.3	14.3
-1750	39.4	14.4
-1700	39.6	14.6
-1650	39.7	14.7
-1600	39.8	14.8
-1550	40.0	15.0
-1500	40.1	15.1
-1450	40.3	15.3
-1400	40.4	15.4
-1350	40.6	15.6
-1300	40.8	15.8
-1250	40.9	15.9
-1200	41.1	16.1
-1150	41.3	16.3
-1100	41.5	16.5
-1050	41.7	16.7
-1000	41.9	16.9
-950	42.1	17.1
-900	42.3	17.3
-850	42.6	17.6
-800	42.8	17.8
-750	43.1	18.1
-700	43.3	18.3
-650	43.6	18.6
-600	43.9	18.9
-550	44.3	19.3
-500	44.6	19.6
-450	45.0	20.0
-400	45.4	20.4
-350	45.9	20.9
-300	46.3	21.3
-250	46.9	21.9
-200	47.5	22.5
-150	48.2	23.2
-100	49.0	24.0
-50	49.9	24.9
0	51.0	26.0
50	52.3	27.3
100	54.0	29.0
150	55.7	30.7
200	55.3	30.3
250	53.5	28.5
300	51.9	26.9
350	50.6	25.6
400	49.6	24.6
450	48.7	23.7
500	48.0	23.0
550	47.3	22.3
600	46.7	21.7
650	46.2	21.2
700	45.7	20.7
750	45.3	20.3
800	44.9	19.9

TSP Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	38.4	13.4
-2450	38.5	13.5
-2400	38.5	13.5
-2350	38.6	13.6
-2300	38.7	13.7
-2250	38.8	13.8
-2200	39.0	14.0
-2150	39.1	14.1
-2100	39.2	14.2
-2050	39.3	14.3
-2000	39.4	14.4
-1950	39.5	14.5
-1900	39.6	14.6
-1850	39.7	14.7
-1800	39.9	14.9
-1750	40.0	15.0
-1700	40.1	15.1
-1650	40.3	15.3
-1600	40.4	15.4
-1550	40.5	15.5
-1500	40.7	15.7
-1450	40.8	15.8
-1400	41.0	16.0
-1350	41.2	16.2
-1300	41.3	16.3
-1250	41.5	16.5
-1200	41.7	16.7
-1150	41.9	16.9
-1100	42.0	17.0
-1050	42.2	17.2
-1000	42.5	17.5
-950	42.7	17.7
-900	42.9	17.9
-850	43.1	18.1
-800	43.4	18.4
-750	43.6	18.6
-700	43.9	18.9
-650	44.2	19.2
-600	44.5	19.5
-550	44.9	19.9
-500	45.2	20.2
-450	45.6	20.6
-400	46.0	21.0
-350	46.5	21.5
-300	47.0	22.0
-250	47.5	22.5
-200	48.1	23.1
-150	48.8	23.8
-100	49.6	24.6
-50	50.5	25.5
0	51.6	26.6
50	52.9	27.9
100	54.5	29.5
150	55.8	30.8
200	55.1	30.1
250	53.5	28.5
300	52.1	27.1
350	50.9	25.9
400	49.9	24.9
450	49.1	24.1
500	48.4	23.4
550	47.7	22.7
600	47.2	22.2
650	46.6	21.6
700	46.2	21.2
750	45.8	20.8
800	45.4	20.4

Tehachapi Renewable Transmission Project

Corona Modeling Location 4 - Duarte

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	14.9	-10.1
900	14.6	-10.4
950	14.3	-10.7
1000	14.1	-10.9
1050	13.8	-11.2
1100	13.6	-11.4
1150	13.3	-11.7
1200	13.1	-11.9
1250	12.9	-12.1
1300	12.7	-12.3
1350	12.5	-12.5
1400	12.3	-12.7
1450	12.1	-12.9
1500	11.9	-13.1
1550	11.8	-13.2
1600	11.6	-13.4
1650	11.4	-13.6
1700	11.3	-13.7
1750	11.1	-13.9
1800	11.0	-14.0
1850	10.8	-14.2
1900	10.7	-14.3
1950	10.6	-14.4
2000	10.4	-14.6
2050	10.3	-14.7
2100	10.2	-14.8
2150	10.1	-14.9
2200	9.9	-15.1
2250	9.8	-15.2
2300	9.7	-15.3
2350	9.6	-15.4
2400	9.5	-15.5
2450	9.4	-15.6

LST Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	44.5	19.5
900	44.2	19.2
950	43.9	18.9
1000	43.6	18.6
1050	43.3	18.3
1100	43.0	18.0
1150	42.7	17.7
1200	42.5	17.5
1250	42.3	17.3
1300	42.0	17.0
1350	41.8	16.8
1400	41.6	16.6
1450	41.4	16.4
1500	41.2	16.2
1550	41.1	16.1
1600	40.9	15.9
1650	40.7	15.7
1700	40.5	15.5
1750	40.4	15.4
1800	40.2	15.2
1850	40.1	15.1
1900	39.9	14.9
1950	39.8	14.8
2000	39.7	14.7
2050	39.5	14.5
2100	39.4	14.4
2150	39.3	14.3
2200	39.2	14.2
2250	39.0	14.0
2300	38.9	13.9
2350	38.8	13.8
2400	38.7	13.7
2450	38.6	13.6

TSP Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	45.0	20.0
900	44.7	19.7
950	44.3	19.3
1000	44.0	19.0
1050	43.8	18.8
1100	43.5	18.5
1150	43.2	18.2
1200	43.0	18.0
1250	42.8	17.8
1300	42.5	17.5
1350	42.3	17.3
1400	42.1	17.1
1450	41.9	16.9
1500	41.7	16.7
1550	41.6	16.6
1600	41.4	16.4
1650	41.2	16.2
1700	41.1	16.1
1750	40.9	15.9
1800	40.7	15.7
1850	40.6	15.6
1900	40.5	15.5
1950	40.3	15.3
2000	40.2	15.2
2050	40.0	15.0
2100	39.9	14.9
2150	39.8	14.8
2200	39.7	14.7
2250	39.6	14.6
2300	39.4	14.4
2350	39.3	14.3
2400	39.2	14.2
2450	39.1	14.1

Tehachapi Renewable Transmission Project

Corona Modeling Location 5 - South of Vincent Substation

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	11.9	-13.1
-2450	11.9	-13.1
-2400	12.0	-13.0
-2350	12.1	-12.9
-2300	12.2	-12.8
-2250	12.3	-12.7
-2200	12.4	-12.6
-2150	12.4	-12.6
-2100	12.5	-12.5
-2050	12.6	-12.4
-2000	12.7	-12.3
-1950	12.8	-12.2
-1900	12.9	-12.1
-1850	13.0	-12.0
-1800	13.1	-11.9
-1750	13.2	-11.8
-1700	13.3	-11.7
-1650	13.4	-11.6
-1600	13.5	-11.5
-1550	13.7	-11.3
-1500	13.8	-11.2
-1450	13.9	-11.1
-1400	14.0	-11.0
-1350	14.1	-10.9
-1300	14.3	-10.7
-1250	14.4	-10.6
-1200	14.5	-10.5
-1150	14.7	-10.3
-1100	14.8	-10.2
-1050	15.0	-10.0
-1000	15.1	-9.9
-950	15.3	-9.7
-900	15.4	-9.6
-850	15.6	-9.4
-800	15.8	-9.2
-750	16.0	-9.0
-700	16.1	-8.9
-650	16.3	-8.7
-600	16.5	-8.5
-550	16.8	-8.2
-500	17.0	-8.0
-450	17.2	-7.8
-400	17.5	-7.5
-350	17.7	-7.3
-300	18.0	-7.0
-250	18.3	-6.7
-200	18.6	-6.4
-150	18.9	-6.1
-100	19.3	-5.7
-50	19.7	-5.3
0	20.1	-4.9
50	20.6	-4.4
100	21.2	-3.8
150	21.8	-3.2
200	22.6	-2.4
250	23.6	-1.4
300	25.0	0.0
350	26.7	1.7
400	27.8	2.8
450	28.2	3.2
500	28.3	3.3
550	28.0	3.0
600	28.0	3.0
650	27.8	2.8
700	27.9	2.9
750	28.2	3.2
800	28.3	3.3

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	40.6	15.6
-2450	40.7	15.7
-2400	40.7	15.7
-2350	40.8	15.8
-2300	40.9	15.9
-2250	41.0	16.0
-2200	41.1	16.1
-2150	41.2	16.2
-2100	41.3	16.3
-2050	41.4	16.4
-2000	41.5	16.5
-1950	41.6	16.6
-1900	41.7	16.7
-1850	41.8	16.8
-1800	41.9	16.9
-1750	42.0	17.0
-1700	42.1	17.1
-1650	42.2	17.2
-1600	42.3	17.3
-1550	42.4	17.4
-1500	42.6	17.6
-1450	42.7	17.7
-1400	42.8	17.8
-1350	42.9	17.9
-1300	43.1	18.1
-1250	43.2	18.2
-1200	43.4	18.4
-1150	43.5	18.5
-1100	43.6	18.6
-1050	43.8	18.8
-1000	44.0	19.0
-950	44.1	19.1
-900	44.3	19.3
-850	44.5	19.5
-800	44.7	19.7
-750	44.8	19.8
-700	45.0	20.0
-650	45.2	20.2
-600	45.5	20.5
-550	45.7	20.7
-500	45.9	20.9
-450	46.2	21.2
-400	46.4	21.4
-350	46.7	21.7
-300	47.0	22.0
-250	47.3	22.3
-200	47.6	22.6
-150	48.0	23.0
-100	48.4	23.4
-50	48.8	23.8
0	49.2	24.2
50	49.7	24.7
100	50.2	25.2
150	50.8	25.8
200	51.5	26.5
250	52.3	27.3
300	53.2	28.2
350	54.3	29.3
400	55.7	30.7
450	57.3	32.3
500	58.9	33.9
550	59.1	34.1
600	57.5	32.5
650	55.7	30.7
700	54.4	29.4
750	53.3	28.3
800	52.3	27.3

Tehachapi Renewable Transmission Project
Corona Modeling Location 5 - South of Vincent Substation

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	27.9	2.9
900	27.0	2.0
950	26.8	1.8
1000	25.4	0.4
1050	23.9	-1.1
1100	22.7	-2.3
1150	21.9	-3.1
1200	21.2	-3.8
1250	20.7	-4.3
1300	20.2	-4.8
1350	19.7	-5.3
1400	19.3	-5.7
1450	18.9	-6.1
1500	18.6	-6.4
1550	18.3	-6.7
1600	18.0	-7.0
1650	17.7	-7.3
1700	17.5	-7.5
1750	17.2	-7.8
1800	17.0	-8.0
1850	16.8	-8.2
1900	16.5	-8.5
1950	16.3	-8.7
2000	16.1	-8.9
2050	16.0	-9.0
2100	15.8	-9.2
2150	15.6	-9.4
2200	15.4	-9.6
2250	15.3	-9.7
2300	15.1	-9.9
2350	15.0	-10.0
2400	14.8	-10.2
2450	14.7	-10.3

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	51.5	26.5
900	50.9	25.9
950	50.3	25.3
1000	49.7	24.7
1050	49.2	24.2
1100	48.8	23.8
1150	48.4	23.4
1200	48.0	23.0
1250	47.6	22.6
1300	47.3	22.3
1350	47.0	22.0
1400	46.7	21.7
1450	46.4	21.4
1500	46.2	21.2
1550	45.9	20.9
1600	45.7	20.7
1650	45.5	20.5
1700	45.3	20.3
1750	45.1	20.1
1800	44.9	19.9
1850	44.7	19.7
1900	44.5	19.5
1950	44.3	19.3
2000	44.1	19.1
2050	44.0	19.0
2100	43.8	18.8
2150	43.7	18.7
2200	43.5	18.5
2250	43.4	18.4
2300	43.2	18.2
2350	43.1	18.1
2400	42.9	17.9
2450	42.8	17.8

Tehachapi Renewable Transmission Project

Corona Modeling Location 6 - Pathfinder Park

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	8.7	-16.3
-2450	8.8	-16.2
-2400	8.9	-16.1
-2350	9.0	-16.0
-2300	9.1	-15.9
-2250	9.2	-15.8
-2200	9.3	-15.7
-2150	9.5	-15.5
-2100	9.6	-15.4
-2050	9.7	-15.3
-2000	9.8	-15.2
-1950	9.9	-15.1
-1900	10.0	-15.0
-1850	10.2	-14.8
-1800	10.3	-14.7
-1750	10.4	-14.6
-1700	10.6	-14.4
-1650	10.7	-14.3
-1600	10.8	-14.2
-1550	11.0	-14.0
-1500	11.1	-13.9
-1450	11.3	-13.7
-1400	11.5	-13.5
-1350	11.6	-13.4
-1300	11.8	-13.2
-1250	12.0	-13.0
-1200	12.2	-12.8
-1150	12.4	-12.6
-1100	12.6	-12.4
-1050	12.8	-12.2
-1000	13.0	-12.0
-950	13.2	-11.8
-900	13.5	-11.5
-850	13.7	-11.3
-800	14.0	-11.0
-750	14.3	-10.7
-700	14.6	-10.4
-650	14.9	-10.1
-600	15.3	-9.7
-550	15.6	-9.4
-500	16.0	-9.0
-450	16.4	-8.6
-400	16.9	-8.1
-350	17.4	-7.6
-300	18.0	-7.0
-250	18.7	-6.3
-200	19.5	-5.5
-150	20.3	-4.7
-100	21.4	-3.6
-50	22.8	-2.2
0	24.5	-0.5
50	26.5	1.5
100	27.3	2.3
150	26.5	1.5
200	24.5	-0.5
250	22.6	-2.4
300	21.3	-3.7
350	20.2	-4.8
400	19.3	-5.7
450	18.6	-6.4
500	17.9	-7.1
550	17.4	-7.6
600	16.8	-8.2
650	16.4	-8.6
700	15.9	-9.1
750	15.6	-9.4
800	15.2	-9.8

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	36.7	11.7
-2450	36.8	11.8
-2400	36.9	11.9
-2350	37.0	12.0
-2300	37.1	12.1
-2250	37.2	12.2
-2200	37.3	12.3
-2150	37.4	12.4
-2100	37.5	12.5
-2050	37.6	12.6
-2000	37.8	12.8
-1950	37.9	12.9
-1900	38.0	13.0
-1850	38.1	13.1
-1800	38.2	13.2
-1750	38.4	13.4
-1700	38.5	13.5
-1650	38.6	13.6
-1600	38.8	13.8
-1550	38.9	13.9
-1500	39.1	14.1
-1450	39.2	14.2
-1400	39.4	14.4
-1350	39.5	14.5
-1300	39.7	14.7
-1250	39.9	14.9
-1200	40.1	15.1
-1150	40.3	15.3
-1100	40.5	15.5
-1050	40.7	15.7
-1000	40.9	15.9
-950	41.1	16.1
-900	41.3	16.3
-850	41.6	16.6
-800	41.8	16.8
-750	42.1	17.1
-700	42.4	17.4
-650	42.7	17.7
-600	43.0	18.0
-550	43.3	18.3
-500	43.7	18.7
-450	44.1	19.1
-400	44.5	19.5
-350	45.0	20.0
-300	45.5	20.5
-250	46.1	21.1
-200	46.7	21.7
-150	47.5	22.5
-100	48.3	23.3
-50	49.4	24.4
0	50.6	25.6
50	52.3	27.3
100	54.3	29.3
150	55.6	30.6
200	53.7	28.7
250	51.8	26.8
300	50.3	25.3
350	49.1	24.1
400	48.1	23.1
450	47.3	22.3
500	46.5	21.5
550	45.9	20.9
600	45.4	20.4
650	44.9	19.9
700	44.4	19.4
750	44.0	19.0
800	43.6	18.6

Tehachapi Renewable Transmission Project
Corona Modeling Location 6 - Pathfinder Park

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	14.9	-10.1
900	14.5	-10.5
950	14.2	-10.8
1000	14.0	-11.0
1050	13.7	-11.3
1100	13.4	-11.6
1150	13.2	-11.8
1200	13.0	-12.0
1250	12.7	-12.3
1300	12.5	-12.5
1350	12.3	-12.7
1400	12.1	-12.9
1450	12.0	-13.0
1500	11.8	-13.2
1550	11.6	-13.4
1600	11.4	-13.6
1650	11.3	-13.7
1700	11.1	-13.9
1750	11.0	-14.0
1800	10.8	-14.2
1850	10.7	-14.3
1900	10.5	-14.5
1950	10.4	-14.6
2000	10.3	-14.7
2050	10.1	-14.9
2100	10.0	-15.0
2150	9.9	-15.1
2200	9.8	-15.2
2250	9.7	-15.3
2300	9.5	-15.5
2350	9.4	-15.6
2400	9.3	-15.7
2450	9.2	-15.8

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	43.2	18.2
900	42.9	17.9
950	42.6	17.6
1000	42.3	17.3
1050	42.0	17.0
1100	41.7	16.7
1150	41.5	16.5
1200	41.3	16.3
1250	41.0	16.0
1300	40.8	15.8
1350	40.6	15.6
1400	40.4	15.4
1450	40.2	15.2
1500	40.0	15.0
1550	39.8	14.8
1600	39.7	14.7
1650	39.5	14.5
1700	39.3	14.3
1750	39.2	14.2
1800	39.0	14.0
1850	38.9	13.9
1900	38.7	13.7
1950	38.6	13.6
2000	38.5	13.5
2050	38.3	13.3
2100	38.2	13.2
2150	38.1	13.1
2200	38.0	13.0
2250	37.8	12.8
2300	37.7	12.7
2350	37.6	12.6
2400	37.5	12.5
2450	37.4	12.4

Tehachapi Renewable Transmission Project

Corona Modeling Location 7 - Segment 4 Section B

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	39.2	14.2
-2450	39.3	14.3
-2400	39.4	14.4
-2350	39.5	14.5
-2300	39.5	14.5
-2250	39.6	14.6
-2200	39.7	14.7
-2150	39.8	14.8
-2100	39.9	14.9
-2050	40.0	15.0
-2000	40.2	15.2
-1950	40.3	15.3
-1900	40.4	15.4
-1850	40.5	15.5
-1800	40.6	15.6
-1750	40.7	15.7
-1700	40.8	15.8
-1650	41.0	16.0
-1600	41.1	16.1
-1550	41.2	16.2
-1500	41.4	16.4
-1450	41.5	16.5
-1400	41.7	16.7
-1350	41.8	16.8
-1300	42.0	17.0
-1250	42.1	17.1
-1200	42.3	17.3
-1150	42.5	17.5
-1100	42.6	17.6
-1050	42.8	17.8
-1000	43.0	18.0
-950	43.2	18.2
-900	43.4	18.4
-850	43.6	18.6
-800	43.8	18.8
-750	44.1	19.1
-700	44.3	19.3
-650	44.6	19.6
-600	44.8	19.8
-550	45.1	20.1
-500	45.4	20.4
-450	45.7	20.7
-400	46.1	21.1
-350	46.5	21.5
-300	46.9	21.9
-250	47.3	22.3
-200	47.8	22.8
-150	48.3	23.3
-100	48.9	23.9
-50	49.6	24.6
0	50.3	25.3
50	51.2	26.2
100	52.3	27.3
150	53.7	28.7
200	55.5	30.5
250	57.5	32.5
300	58.2	33.2
350	56.7	31.7
400	54.7	29.7
450	53.1	28.1
500	51.9	26.9
550	50.8	25.8
600	50.0	25.0
650	49.3	24.3
700	48.6	23.6
750	48.1	23.1
800	47.6	22.6

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
-2500	42.4	17.4
-2450	42.5	17.5
-2400	42.6	17.6
-2350	42.6	17.6
-2300	42.7	17.7
-2250	42.8	17.8
-2200	42.9	17.9
-2150	43.1	18.1
-2100	43.2	18.2
-2050	43.3	18.3
-2000	43.4	18.4
-1950	43.5	18.5
-1900	43.6	18.6
-1850	43.7	18.7
-1800	43.9	18.9
-1750	44.0	19.0
-1700	44.1	19.1
-1650	44.2	19.2
-1600	44.4	19.4
-1550	44.5	19.5
-1500	44.7	19.7
-1450	44.8	19.8
-1400	45.0	20.0
-1350	45.1	20.1
-1300	45.3	20.3
-1250	45.5	20.5
-1200	45.6	20.6
-1150	45.8	20.8
-1100	46.0	21.0
-1050	46.2	21.2
-1000	46.4	21.4
-950	46.6	21.6
-900	46.9	21.9
-850	47.1	22.1
-800	47.3	22.3
-750	47.6	22.6
-700	47.9	22.9
-650	48.2	23.2
-600	48.5	23.5
-550	48.8	23.8
-500	49.2	24.2
-450	49.5	24.5
-400	50.0	25.0
-350	50.4	25.4
-300	50.9	25.9
-250	51.5	26.5
-200	52.1	27.1
-150	52.9	27.9
-100	53.8	28.8
-50	54.9	29.9
0	56.3	31.3
50	58.1	33.1
100	59.2	34.2
150	58.8	33.8
200	58.3	33.3
250	58.9	33.9
300	59.1	34.1
350	57.8	32.8
400	56.0	31.0
450	54.7	29.7
500	53.6	28.6
550	52.7	27.7
600	52.0	27.0
650	51.4	26.4
700	50.8	25.8
750	50.3	25.3
800	49.9	24.9

Tehachapi Renewable Transmission Project
Corona Modeling Location 7 - Segment 4 Section B

Existing Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	47.1	22.1
900	46.7	21.7
950	46.3	21.3
1000	45.9	20.9
1050	45.6	20.6
1100	45.3	20.3
1150	45.0	20.0
1200	44.7	19.7
1250	44.4	19.4
1300	44.2	19.2
1350	44.0	19.0
1400	43.7	18.7
1450	43.5	18.5
1500	43.3	18.3
1550	43.1	18.1
1600	42.9	17.9
1650	42.7	17.7
1700	42.6	17.6
1750	42.4	17.4
1800	42.2	17.2
1850	42.1	17.1
1900	41.9	16.9
1950	41.7	16.7
2000	41.6	16.6
2050	41.5	16.5
2100	41.3	16.3
2150	41.2	16.2
2200	41.0	16.0
2250	40.9	15.9
2300	40.8	15.8
2350	40.7	15.7
2400	40.6	15.6
2450	40.4	15.4

Proposed Scenario

Distance (ft)	Audible Noise (dBA)	
	Rain	Fair
850	49.5	24.5
900	49.1	24.1
950	48.7	23.7
1000	48.4	23.4
1050	48.1	23.1
1100	47.8	22.8
1150	47.5	22.5
1200	47.3	22.3
1250	47.0	22.0
1300	46.8	21.8
1350	46.6	21.6
1400	46.4	21.4
1450	46.2	21.2
1500	46.0	21.0
1550	45.8	20.8
1600	45.6	20.6
1650	45.4	20.4
1700	45.3	20.3
1750	45.1	20.1
1800	44.9	19.9
1850	44.8	19.8
1900	44.6	19.6
1950	44.5	19.5
2000	44.4	19.4
2050	44.2	19.2
2100	44.1	19.1
2150	44.0	19.0
2200	43.8	18.8
2250	43.7	18.7
2300	43.6	18.6
2350	43.5	18.5
2400	43.4	18.4
2450	43.2	18.2

Appendix L.
CPUC Station Fire Evaluation

STATION FIRE EVALUATION

ON SOUTHERN CALIFORNIA EDISON'S APPLICATION FOR THE

Tehachapi Renewable Transmission Project

Application No. A.07-06-031
SCH No. 2007081156

California Environmental Quality Act
Lead Agency:

California Public Utilities Commission

Prepared By:

Aspen Environmental Group

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1.0 Introduction

1.1 Purpose of Evaluation

In late August 2009, as the Final Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) for the Tehachapi Renewable Transmission Project (TRTP) was about to be published, a major wildfire broke out in the Angeles National Forest (ANF). This fire, named the Station Fire, was the largest wildfire in the recorded history of the ANF and burned most of the area traversed by proposed Segments 6 and 11 of the TRTP in the ANF. Therefore, the CPUC has undertaken this evaluation 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, in compliance with CEQA.[1]

1.2 Overview of Station Fire

The Station Fire started near the Angeles Crest Highway (SR-2) about one mile above Angeles Crest Fire Station on August 26, 2009, and burned approximately 160,577 acres (251 square miles) of National Forest System (NFS) lands in the ANF, as well as some adjacent non-NFS lands (InciWeb, 2009). The fire threatened 12,000 structures in the ANF and the nearby communities of La Cañada Flintridge, Glendale, Acton, La Crescenta, Pasadena, Littlerock, and Altadena, as well as the Sunland and Tujunga neighborhoods of the City of Los Angeles. The fire was determined to be 100 percent contained on October 16, 2009.

The SR-2 remains closed and is the primary access route for more than 18 camps/residences, numerous private residences, and the Mount Wilson Communication Facility and Observatory. Roads accessible to residents with identification only are Big Tujunga Canyon, Little Tujunga Canyon, Glendora Mountain Road, and Glendora Ridge Road.

The cause of the fire has been determined to be arson. The Station Fire is the largest fire in the recorded history of Los Angeles County and is the 10th largest fire in California since 1933 (InciWeb, 2009). Figure 1 shows the boundary of the Station Fire along with burn severity.

2.0 Impact Evaluation for the Station Fire

A site visit of the ANF, under the supervision of the Forest Service, was conducted by the CPUC on October 20, 2009 to review the change in environmental conditions resulting from the Station Fire. This site visit, along with the Burned Area Emergency Response (BAER) reports from the Forest Service, provides the basis for the evaluation presented below.

2.1 Agricultural Resources

2.1.1 Introduction

For the purposes of the agricultural resources analysis presented in the EIR/EIS for the proposed TRTP, the Study Area was divided into three regions: North Region, Central Region, and South Region. The Station Fire

[1] The USDA Forest Service is conducting a separate review of the impacts of the Station Fire in compliance with NEPA.

occurred within the Central Region of the Study Area and, therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on the Central Region.

2.1.2 Changed Conditions

The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. Most of the Central Region is characterized by undeveloped lands and open space which is managed by the Forest Service for the purposes of recreation and natural resources management, among various other uses.

The only agricultural activities within the ANF are tree plantations more than 0.5 mile away from the proposed Project routes. No agricultural resources within the ANF would be affected by the proposed Project. Consequently, the changed conditions resulting from the Station Fire and any fire-related damage and destruction of tree plantations do not affect the analysis of project-related impacts.

2.1.3 Impact Evaluation

The criteria used to evaluate and determine the significance of wilderness and recreation impacts in the EIR/EIS include the following:

- 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.

The following analysis evaluates whether the Station Fire affects the magnitude of any agricultural resource impacts previously identified under Significance Criteria AG1, AG2, or AG3, whether any new impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Convert Farmland to non-agricultural use (Criterion AG1)

Under Criterion AG1, impacts identified in the EIR/EIS included the Project's potential to temporarily preclude agricultural use of Farmland due to construction activities (Impact AG-1) or permanently convert Farmland to non-agricultural use (Impact AG-2). No Farmland was affected by the Station Fire. The Station Fire does not alter the nature or significance of Impacts AG-1 or AG-2, as described in the EIR/EIS. In addition, the Station Fire does not introduce new agricultural resource impacts under Criterion AG1, or require modifications to mitigation introduced in the EIR/EIS.

Interfere with agricultural operations (Criterion AG2)

Under Criterion AG2, impacts identified in the EIR/EIS included the potential for construction and operation of the proposed Project to interfere with agricultural operations (Impacts AG-3 and AG-4, respectively). As described above and in the EIR/EIS, Project activities (construction or operation and maintenance) would be more than 0.5 mile away from tree plantations within the ANF and would have no affect on these areas. The Station Fire does not alter the nature or significance of Impacts AG-3 or AG-4, as described in the EIR/EIS. In addition, the Station Fire does not introduce new agricultural resource impacts under Criterion AG2, or require modifications to mitigation introduced in the EIR/EIS.

Conflict with Williamson Act contract lands (Criterion AG3)

No Williamson Act contract lands are located within the ANF or were affected by the Station Fire. The Station Fire does not introduce new agricultural resource impacts under Criterion AG3, or require modifications to mitigation introduced in the EIR/EIS.

2.1.4 Cumulative Effects Analysis

As described above, the Station Fire did not affect any agricultural resources that would also be affected by the proposed Project. Consequently, the Station Fire does not change any cumulative analysis of agricultural resources described in the EIR/EIS.

2.2 Air Quality

2.2.1 Introduction

For the purposes of the air quality analysis presented in the EIR/EIS for the proposed TRTP, the affected portion of the proposed Project was divided into two jurisdictions: the Antelope Valley Air Quality Management District (AVAQMD) portion of the Mojave Desert Air Basin (MDAB) and the South Coast Air Quality Management District (SCAQMD)/South Coast Air Basin (SoCAB). The Station Fire occurred within both of these jurisdictions but predominantly within the SCAQMD/SoCAB portion of the ANF.

2.2.2 Changed Conditions

The Station Fire results in both emission increases and decreases to air quality conditions. The windblown particulate emissions within the Station Fire's perimeter could potentially increase due to the fine ash particulate and the reduction in cover. There will also be increased emissions from the activities conducted for rehabilitation. These increases within the ANF will be temporary and will abate over time as the natural ground cover is restored, and may also be partially offset due to use restrictions and reduced recreational activities in the burn area for a period of time. Additionally, there would be a reduction in natural biogenic VOC emissions due to the loss of vegetation that causes these emissions (most notably pine trees).

Regardless, of these direct and indirect temporary emission increases and reductions, the area's Federal and State Ambient Air Quality Attainment status remains unchanged from that evaluated in the Final EIR/EIS.

2.2.3 Impact Evaluation

The criteria used to evaluate and determine the significance of air quality impacts in the EIR/EIS include the following:

- 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 following analysis evaluates whether the Station Fire affects the magnitude of any project-related air quality impacts previously identified under Significance Criteria AIR1 through AIR 8, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS. This evaluation considers Alternative 2 (SCE's Proposed Project), Alternative 6, and the NEPA Lead Agency's preferred alternative, which are all within the area affected by the Station Fire.

Because the burn area is neither within the Kern County Air Pollution Control District (KCAPCD) jurisdiction nor in areas affected by Project Alternatives 3, 4, 5, or 7, the Station Fire does not change any conditions in KCAPCD portion of the Mojave Desert Air Basin (MDAB) or any significance conclusions for Project Alternatives 3, 4, 5 and 7.

Regional Emission Thresholds (Criterion AIR1)

Impact AQ-1: Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds.

Project-related construction activities and associated emissions may increase due to the fire. There is the potential for roads to be washed out and for the overall construction method assumptions to change due to current and likely future impacts due to the fire. Additionally, fugitive dust emissions from helicopter prop wash are expected to increase due to the fire and the resulting loss of vegetative cover both at the tower sites and at the helicopter staging areas. The actual magnitude of the construction emission increases in Segments 6 and 11 due to required changes in the construction requirements and the loss of vegetative cover are unknown, but the total emission increase is not expected to be substantial due to the following assumptions:

- As reported in the Station Fire Burn Area Emergency Response (BAER) Hydrology Specialist Report for the ANF (USDA Forest Service, 2009d), the highest amounts of sediment yields from the burned watersheds are expected during the first year after the fire, prior to any project-related construction (currently scheduled to begin in October 2010). Therefore, post-fire soil conditions are expected to be temporary, so the active construction or associated helicopter prop wash particulate emissions within the Station Fire's perimeter should not increase substantially due to fine ash particulate.

- Prop wash emissions at the helicopter staging areas can be adequately mitigated though the appropriate application of soil binders (Mitigation Measure AQ-1a), and at the construction sites where the helicopters do not land, the helicopters would remain at heights that will limit prop wash fugitive dust emissions potential.
- Road construction represents a very small percentage of the total construction emissions for Segments 6 and 11, so any marginal increases in road construction/repair that could be attributed to the fire would not be substantial in comparison to the construction emissions totals.

It is expected that the total activity resulting in air emission in any given day would not increase as a result of the Station Fire; rather the number of days of activity would increase if the fire does result in increased road construction requirements. Therefore, the worst-case daily emissions are not expected to increase. Additionally, the new major road and road rehabilitation construction work will begin and end prior to the major tower construction work, which is when the worst-case daily construction emissions occur.

The EIR/EIS determined that there would be significant and unmitigable project-related impacts during construction due to the emissions exceeding SCAQMD and AVAQMD thresholds. The magnitude of the worst-case daily construction emissions used for this determination are not expected to increase due to the fire, and as such the impact significance level for all criteria pollutants would be the same. The recommended mitigation measures (AQ-1b to AQ-1j) are the maximum feasible control methods available and include the use of soil stabilizers on unpaved roads and unpaved staging areas, and no additional mitigation is proposed. Therefore, the Station Fire does not alter the nature or significance of Impact AQ-1, as described in the EIR/EIS and the fire does not introduce new air quality impacts under Criterion AIR1, or require modifications to mitigation introduced in the EIR/EIS.

Impact AQ-2: Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds.

Project-related operation and maintenance emissions would occur later than construction and would not be expected to be significantly affected by the fire because these activities would occur on access roads that would be constructed or upgraded during Project construction or would be performed by small helicopters at heights that would not disturb the ground impacted by the fire. Any additional road washout events, requiring repair work, would be considered upset events that are not part of the normal Project operations. The Station Fire does not alter the nature or significance of Impact AQ-2, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR1, or require modifications to mitigation introduced in the EIR/EIS.

SCAQMD Localized Significance Thresholds (Criterion AIR2)

Impact AQ-3: Construction of the Project would expose sensitive receptors to substantial pollutant concentrations.

Project-related tower site emissions are not expected to be significantly affected by the Station Fire because the fire does not change the foundation construction or tower assembly requirements at the tower sites. Additionally, the area burned is generally very remote so emission increases from increased road construction work or helicopter prop wash would not occur near or impact sensitive receptors. Therefore, the Station Fire does not alter the nature or significance of Impact AQ-3, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR2, or require modifications to mitigation introduced in the EIR/EIS.

Impact AQ-4: Operation of the Project would expose sensitive receptors to substantial pollutant concentrations.

The Project's minimal operation and maintenance emissions would occur later than construction and would not be expected to be significantly affected by the fire because these activities would occur on access roads that would be constructed or upgraded during Project construction or would be performed by small helicopters at heights that would not disturb the ground impacted by the fire. Any additional road washout events, requiring repair work, would be considered upset events that are not part of the normal Project operations. The Station Fire does not alter the nature or significance of Impact AQ-4, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR2, or require modifications to mitigation introduced in the EIR/EIS.

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.

The Project's toxic air contaminant emissions, with consideration of the minor increases in emissions due to the Station Fire, would not exceed SCAQMD risk thresholds, due to the low amount of air toxics emitted and the general remoteness of the burn area which severely limits receptor impacts, so the Project impacts would remain less than significant. The Station Fire does not alter the nature or significance of Impact AQ-5, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR3, or require modifications to mitigation introduced in the EIR/EIS.

Federal General Conformity Rule (Criterion AIR4)

Impact AQ-6: The Project would not conform to Federal General Conformity Rules.

The annual emissions of SCE's proposed Project's (Alternative 2), considering potential minor increases due to the Station Fire are expected to remain below the General Conformity de minimis limits and are well below the 10 percent criteria of the non-attainment area annual emission inventories. The increase of emissions due to potential additional new access road construction and road rehabilitation construction is scheduled to occur prior to the main tower construction activities and therefore would not impact the maximum annual emission estimates and would not individually be high enough to exceed the 25 ton NOx emission threshold or 70 ton PM10 emission threshold. The large majority of the emissions that would contribute to these emission thresholds would be the result of helicopter usage in the construction of towers, and these emissions would not be influenced by the Station Fire. Also, as noted previously, by the time road construction starts it is presumed that the Station Fire's ash would not remain on the soil surface and therefore would not significantly impact the fugitive dust emissions potential; and the helicopter prop wash fugitive dust emissions, with appropriate application of recommended mitigation measures, would not increase substantially. Therefore, the proposed Project would continue to have less-than-significant impacts.

Alternative 6 and the NEPA Lead Agency's preferred alternative would both have emissions greater than the general conformity thresholds within the SoCAB and, therefore, would require mitigation (Mitigation Measure AQ-6). As noted, the construction emissions in the ANF may increase due to the fire, so the General

Conformity analysis will need to consider any and all changes to the Project construction activities and emission assumptions due to the fire, as appropriate under the General Conformity regulations. With the recommended emissions offset mitigation measure, Alternative 6 and the NEPA Lead Agency's preferred alternative would have less-than-significant impacts.

The Station Fire does not alter the nature or significance of Impact AQ-6, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR4, or require modifications to mitigation introduced in the EIR/EIS.

Odors (Criterion AIR5)

Impact AQ-7: The Project would create objectionable odors.

The odor impacts from the Project's construction and operation, with the consideration of minor emission increases due to the Station Fire, would remain less than significant. The potential increase or changes to construction activities do not include new types of activities with significant odor sources, and the areas of the potentially increased or revised construction activities are generally remote and away from potential receptors that could experience nuisance odors. Therefore, the Station Fire does not alter the nature or significance of Impact AQ-7, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR5, or require modifications to mitigation introduced in the EIR/EIS.

Angeles National Forest Strategy Conformance (Criterion AIR6)

Impact AQ-8: The Project would not conform to Angeles National Forest air quality strategies.

While there may be some emission increases due to the fire, 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 remain less than significant as the recommended Project mitigation will continue to minimize smoke and dust per the applicable ANF air quality strategy. Therefore, the Station Fire does not alter the nature or significance of Impact AQ-8, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR6, or require modifications to mitigation introduced in the EIR/EIS.

Conformance with Applicable Air Quality Management Plans (Criterion AIR7)

Impact AQ-9: The Project would not conform with applicable Air Quality Management Plans.

While there may be some emission increases due to the fire, after mitigation the Project would be consistent with the currently approved Air Quality Management Plans. The fire does not change the applicable plan mitigation measures, with which the Project has been determined to conform, so the Project would continue to have a less-than-significant impact. Therefore, the Station Fire does not alter the nature or significance of Impact AQ-9, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR7, or require modifications to mitigation introduced in the EIR/EIS.

Climate Change Impacts (Criterion AIR8)

Impact AQ-10: Emissions would contribute to climate change.

Minor increases in the Project's construction-related GHG emissions due to the Station Fire, as discussed under Impact AQ-1, above, would be more than offset by the Project's provision of greater renewable energy transmission and improved transmission effectiveness and efficiency. See the analysis of Impact AQ-10 in the Final EIR/EIS for additional information. Therefore, the Project would continue to provide a beneficial GHG emissions impact.

The Station Fire does not alter the nature or significance of Impact AQ-10, as described in the EIR/EIS. In addition, the Station Fire does not introduce new air quality impacts under Criterion AIR8, or require modifications to mitigation introduced in the EIR/EIS.

2.2.4 Cumulative Effects Analysis

The cumulative impact analysis in the EIR/EIS 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 of the EIR/EIS 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.

In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

Following is a discussion of the cumulative air quality impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1).** Construction activities associated with the proposed Project may increase somewhat due to the need for additional road construction or change to helicopter tower construction due to mud or landslides enabled by the fire that damage or render access roads impassable. However, most of the construction activity emission sources are not impacted by the fire; and the activities occurring when maximum daily emission were determined to occur, would not be impacted by the fire. Therefore, the combined effect of construction emissions from the proposed Project and construction of other projects would be no worse than previously evaluated and would remain cumulatively significant after mitigation during construction. The Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-2).** The Station Fire is not expected to significantly increase the Project's direct operating emissions; therefore, the Project's operation would continue to have a less-than-significant cumulative regional impact. Therefore, no significant cumulative impact is anticipated. The Station Fire

does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.

- **Construction of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3).** The Station Fire is not expected to change the emissions near sensitive receptors, therefore, the potential for cumulative impacts to sensitive receptors is the same as the Project impacts to sensitive receptors, i.e., the proposed Project's impacts would remain cumulatively significant to sensitive receptors after mitigation. The Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Operation of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-4).** The Station Fire is not expected to significantly increase the Project's direct operating emissions; therefore, the Project's operation would continue to have a less-than-significant cumulative localized impact to sensitive receptors. Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds (Impact AQ-5).** The fire would not significantly change the Project's air toxic emissions potential, and any emissions increase that will occur will generally occur in very remote areas of the ANF, so the Project cumulative health risk impacts would remain less than significant. Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **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). Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **The Project would create objectionable odors (Impact AQ-7).** The fire would not significantly change the Project's odor emissions potential, so the Project impacts would remain adverse but not be cumulatively significant. Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **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). Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **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). Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **Emissions would contribute to climate change (Impact AQ-10).** This impact is already evaluated in a globally cumulative context above.

In summary, the proposed Project would contribute to two air quality impacts that would be cumulatively significant and unavoidable (Class I) and four air quality impacts that would be less than significant with no mitigation required (Class III). The Station Fire would contribute to several of these cumulative impacts, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS, and do not require modification to any of the mitigation measures introduced in the EIR/EIS.

2.3 Biological Resources

2.3.1 Introduction

Most of the acreage burned by the Station Fire was on NFS lands, although some private inholdings and areas just outside of the boundaries of the ANF burned as well. For the purposes of the evaluation of impacts to biological resources presented in Section 3.4 of the EIR/EIS for the TRTP, the Project area was divided into three regions: the Northern Region, Central Region, and Southern Region. The Station Fire has affected nearly the entire Central Region of the Project area, and this evaluation of the effects of the fire on biological resources identified in the TRTP EIR/EIS focuses on this region.

2.3.2 Changed Conditions

The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. Most of the Central Region is characterized by undeveloped lands and open space that is managed by the Forest Service for the purposes of natural resources management and recreation, among various other uses. The 2005 Forest Plan indicates the mountains and foothills of southern California are home to approximately 9 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 listed species such as arroyo toad and Santa Ana sucker, and FS Sensitive species, including the Mt. Gleason Indian paintbrush, California spotted owl, Santa Ana speckled dace, pallid bat, and San Bernardino mountain kingsnake.

Following containment of the Station Fire, it is expected that biological resources will be temporarily affected as a result of fire-related damage and destruction of species and habitats in the Project area. It is expected that, over time, habitats will recover their pre-fire functional values, and affected populations may also recover. However, the fire and resulting sedimentation and erosion may cause the extirpation of populations of some species within the Central Region, including special-status species. In some cases, it may take years to determine the ultimate effect of the fire on a specific population.

In Section 3.4 of the EIR/EIS, Tables 3.4-6 (Special-Status Plants with the Potential to Occur in the Project Area) and 3.4-7 (Special-Status Wildlife with the Potential to Occur in the Project Area) list the species that are known to occur or have the potential to occur in the Central Region, and thus have the potential to be affected by the Station Fire. In addition, Table 3.4-4 (Vegetation Types Occurring in the Central Region) lists the vegetation communities and their associated acreages that were mapped in the Project area in the Central Region prior to the fire. It is expected that these vegetation communities will generally recover over time.

2.3.3 Impact Evaluation

The criteria used to evaluate and determine the significance of impacts to biological resources in the EIR/EIS include the following:

- 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.

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related impacts to biological resources previously identified under Significance Criteria BIO1 through BIO7, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Impacts to Riparian or Natural Communities (Criterion BIO1)

Under Criterion BIO1, impacts identified in the EIR/EIS include construction-related temporary and permanent losses of various natural vegetation communities (Impact B-1), including riparian and desert wash habitats (Impact B-2). Impacts related to the establishment and spread of nonnative and invasive weeds are identified (Impact B-3). Disturbance to wildlife (Impact B-4) and nesting birds (Impact B-5) due to construction activities could occur, and the Project would cause the loss of foraging habitat for wildlife (Impact B-6).

For the analysis of Project impacts under Impacts B-1 and B-2, any effects to remaining unburned habitat may have a more substantial effect on the environment, as unburned habitat is likely limited now in the alignment on the ANF. Large patches of remaining unburned habitat will likely be more heavily used by wildlife as the burned habitat recovers. In addition, type conversion is possible in burned areas. However, it will be difficult to quantify type conversion caused by the Project versus that caused by the fire. For the purposes of this analysis, it is assumed that vegetation communities mapped in the Project area prior to the fire will recover over time, and type conversion is expected to be minimal provided that invasive plants are not able to establish at the expense of the native plants across the burn areas, and provided that illegal OHV recreation on the ANF is prevented (USDA, 2009a). To manage these potential threats to the recovery of native vegetation, the USDA Forest Service has recommended intensive post-fire weed control efforts and measures to prevent unauthorized OHV activity as part of the post-fire management of the ANF (USDA, 2009a). With implementation of these measures, post-fire type conversion is expected to be minimal and restoration of areas disturbed during construction of the proposed Project should be conducted assuming the pre-fire vegetation communities mapped in those areas would be the same (Mitigation Measure B-1a).

The Station Fire could create more opportunities for weed establishment due to Project activities (Impact B-3) because recently burned areas are easily colonized by non-native and invasive species. However, the mitigation identified in the EIR/EIS for the Project is very robust and already requires SCE to undergo extensive weed removal and preventative measures on the ANF (Mitigation Measures B-3a through B-3c). Measures that target specific infestations (Mitigation Measures B-3b and B-3c) will also be particularly important to implement as these existing infestations could re-establish after the fire and provide sources for propagules to be spread into other areas on the ANF during Project construction and operation. As noted above, the USDA Forest Service has recommended monitoring and removal of populations of weeds existing prior to the fire as part of their own post-fire management actions, which would limit impacts related to the fire (USDA, 2009a). Implementation of mitigation measures identified in the EIR/EIS would reduce Project impacts related to the spread of non-native and invasive weeds such that impacts would remain less than significant.

The Station Fire will open up barriers to movement, such as dense chaparral. However, animals will still be expected to utilize access roads for movement throughout the Project area (Impact B-4). There will likely be a short-term decrease in wildlife density due to displacement; however, wildlife density should increase rapidly as vegetation recovers. Use of helicopters could result in increased air quality impacts to wildlife as rotor wash stirs up ash and debris. This would also occur, to a lesser extent, with the use of vehicles on burned roads. However, construction-related impacts to wildlife on the ANF are expected to remain less than significant with the implementation of mitigation discussed below.

Impacts to nesting birds (Impact B-5) in burned areas may be reduced if nesting habitat was burned; however, trees impacted by fire should begin regrowth by the next breeding season if they were not subject to mortality during the fire. In addition, raptors that typically nest in snags may not be affected much by the fire. In fact, burned areas may provide higher quality foraging habitat for some raptors. However, unburned habitat will likely support a higher density of breeding birds overall until habitat elsewhere recovers. Different avian species respond differently to fire, ranging from negative to positive responses. In addition, some species have exhibited “mixed” responses – increasing in abundance in burned areas in some studies and decreasing in others. Fire severity, time since last fire, and pre-fire vegetation structure all influence how a species will respond, and different species can respond differently to the same fire (Smucker et al., 2005). Therefore, predicting how avian species will respond to this fire is nearly impossible, and there will be a variety of responses across burned areas. However, the Project’s impacts to breeding birds on the ANF are expected to remain less than significant with the implementation of mitigation discussed below.

Any impacts to remaining unburned foraging habitat (Impact B-6) may have a more substantial effect on the environment, as unburned habitat is likely limited now in the alignment on the ANF. However, burned habitat may provide more value to some species, such as mule deer, as vegetation recovers and more browse is available, although this would not happen until after the winter rains occur. Burns generally increase biomass of forage and increase seed production following fire (USDA, 2000), so overall Project impacts to foraging habitat are expected to remain less than significant with the implementation of mitigation discussed below.

Mitigation measures introduced in the EIR/EIS would address the effects described under Criterion BIO1, and include the following:

- 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);
- AQ-1a (Implement Construction Fugitive Dust Control Plan); and
- H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits)

The preparation and implementation of a Habitat Restoration and Revegetation Plan (Mitigation Measure B-1a) will compensate for impacts to vegetation communities by restoring areas temporarily disturbed during construction. Where impacts are permanent, compensation for the loss of habitats will occur through the preservation, enhancement, or restoration of comparable off-site lands, or through funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts. The implementation of a Worker Environmental Awareness Program (Mitigation Measure B-1b) will ensure that all construction personnel are familiar with applicable regulations and laws regarding sensitive species that could be encountered in the project area, the consequences of non-compliance with these laws and regulations, identification and values of 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, and review of mitigation requirements. Treating all stumps of trees resulting from Project construction activities with Sporax (Mitigation Measure B-1c) will prevent the spread of annosus root disease. The implementation of an RCA Treatment Plan (Mitigation Measure B-2) will ensure that activities conducted within RCAs are approved by the USDA Forest Service prior to implementation and are conducted in such a way as to minimize disturbance to sensitive resources. The implementation of a Weed Control Plan (Mitigation Measure B-3a) will ensure that the spread and establishment of weeds due to Project activities is minimized. Controlling known populations of nonnative and invasive weeds along construction access routes and from within assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF (Mitigation Measures B-3b and B-3c) will minimize the potential for spread of these species into and through work areas, as outlined in the USDA Forest Service Land Management Plan (2005a). Pre-construction surveys and monitoring for breeding birds by a qualified biologist, and protective buffers established around active nests (Mitigation Measure B-5), will ensure that impacts to breeding birds are minimized. Implementation of a Construction Fugitive Dust Control Plan (Mitigation Measure AQ-1a) will minimize impacts to vegetation communities associated with fugitive dust generated during construction. Implementation of an Erosion Control Plan and compliance with water quality permits (Mitigation Measure H-1a) will minimize impacts associated with erosion and water quality.

In sum, the Station Fire does not introduce new impacts to biological resources under Criterion BIO1. With implementation of the mitigation measures listed above, impacts under Criterion BIO1 remain significant but mitigable (Class II), as described in the EIR/EIS.

Impacts to Endangered or Threatened Species, or Proposed or Designated Critical Habitat (Criterion BIO2)

Under Criterion BIO2, impacts identified in the EIR/EIS include direct and indirect effects to a number of listed species and their habitats. Species that would potentially be affected by Project construction and operation in the Central Region include the following:

- Listed special-status plants (Impact B-7)

- California red-legged frog and mountain yellow-legged frog (Impact B-8)
- Arroyo toad (Impact B-9)
- Special-status fish species and critical habitat for the Santa Ana sucker (Impacts B-12 and B-13)
- California condor (Impact B-14)
- Southwestern willow flycatcher, least Bell's vireo, and western yellow-billed cuckoo (Impact B-15)

The Station Fire will not affect the following species because they do not occur in the Central Region: desert tortoise (Impacts B-10 and B-11), coastal California gnatcatcher (Impacts B-16 and B-17), Swainson's hawk (Impacts B-18 and B-19), and Mohave ground squirrel (Impact B-22). In addition, the Station Fire will not affect the potential for avian electrocution or for avian collisions with transmission lines (Impacts B-20 and B-21).

Listed plant species (Impact B-7) were not observed in the ANF during any surveys conducted for the TRTP. However, fire could increase the potential for the occurrence of listed plants, especially Braunton's milk-vetch. This impact will remain Class II with implementation of the avoidance measures described in the EIR/EIS if a listed species is detected (Mitigation Measure B-7).

The mountain yellow-legged frog (Impact B-8) is considered to have a low potential to occur in the Project area. However, potential habitat existed prior to the fire. If present, Project activities could have a greater impact on any remaining populations as their habitat is likely limited. However, mitigation described in the EIR/EIS would ensure that impacts to this species, if present, remain less than significant.

A newly documented population of California red-legged frog (Impact B-8) exists approximately 0.8 mile downstream of Segment 11 in Aliso Canyon. This population was not directly impacted by the fire, but is considered at risk of extirpation due to post-fire modification of water quality and streamside habitat, debris flows, high water flows, etc. (USDA, 2009b). Mitigation Measure B-8a has been revised to minimize Project impacts to this population (see below).

Upper Big Tujunga Creek and Lynx Gulch, which are areas known to be occupied by the arroyo toad in the Project area (Impact B-9), have burned. It is believed that young of the year may have suffered a high rate of mortality as a result of the fire (USDA, 2009b). Breeding next year may be impacted if sedimentation is high in the water. Mitigation Measure B-9 has been revised to minimize Project impacts to this population (see below).

Fish populations in the Project area (Impact B-12) could severely decline or even disappear following the fire. If fish populations are extirpated, the Project impacts would not occur. If populations are greatly reduced, Project impacts could be more significant on remaining populations. However, sedimentation resulting from Project activities would be insignificant in comparison to sedimentation resulting directly from the fire. USGS initial investigations after the fire detected many dead fish, including chub, and the water was filled with ash. USGS is concerned about fish in ANF (R. Fisher, USGS, pers. comm.). Even fires that cover large areas are internally patchy, leaving areas of undisturbed habitat in watersheds where fish populations may persist and recolonize disturbed areas (Dunham et al., 2003). However, USGS is predicting that extreme amounts of erosion and sedimentation will occur this winter, and the amount of ash and debris that will be deposited into watercourses may potentially extirpate any remaining fish populations that survived the fire. The fire will affect the quality of critical habitat for the Santa Ana sucker (Impact B-13), but the designation of critical habitat will not change. The proposed Project's indirect effects to critical habitat would not be expected to change. Even if burned, the area will still be critical habitat. West Fork Cogswell Road is paved, so driving on the road would not be expected to increase sedimentation into adjacent habitat.

Condors (Impact B-14) roost on snags, large trees, cliffs, rocky outcrops, etc. Roosting habitat should still be present within the Project area. However, burned areas in the Project area may actually attract condors in the short-term. They could forage on animals killed in the fire, and open burned areas provide foraging habitat in areas where they would not forage pre-fire (chaparral, etc.). If condors are drawn to the area post-fire, Project activities would have a greater chance of disturbing them. If microtrash is not carefully controlled, condors may be at greater risk if they are drawn to the Project area, especially if microtrash is more visible in the burnt landscape. After vegetation begins establishing, and carrion from the fire is gone, the attractiveness of the Project area to condors should decrease. However, condors could establish new roosting spots in the Project area during the immediate post-fire period, and then continue to use them even as recovery occurs. However, mitigation identified in the EIR/EIS to minimize disturbance to condors would be sufficient to reduce Project impacts to less than significant even if condors begin using the Project area more after the fire.

Use of the ANF by the southwestern willow flycatcher, least Bell's vireo, and western yellow-billed cuckoo (Impact B-15) is somewhat limited, especially for vireo as much of the ANF is out of the elevational range typically associated with this species. The willow flycatcher has been observed on the ANF multiple times, including during surveys for this Project (Big Tujunga, Aliso Canyon) but none were nesting/breeding. The fire will limit potential habitat in the ANF, but use of this area by the willow flycatcher was considered low before the fire. However, if these species were utilizing other areas on the ANF, and those areas burned, these species may increase in abundance or move into previously unoccupied unburned (or lightly burned) habitat in the Project area. Nonetheless, the proposed Project is not expected to have a substantial effect on any of these species. However, surveys will still be completed and appropriate buffers established in accordance with the mitigation identified in the EIR/EIS.

Mitigation measures introduced in the EIR/EIS would address Project effects to listed species and critical habitat, and include the following:

- 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);
- 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-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures);
- B-8b (Conduct biological monitoring);
- B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas);
- B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms);
- B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily);
- B-15 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat);
- 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)

The preparation and implementation of a Habitat Restoration and Revegetation Plan (Mitigation Measure B-1a) will compensate for impacts to habitat by restoring areas temporarily disturbed during construction. Where impacts are permanent, compensation for the loss of habitats will occur through the preservation, enhancement, or restoration of comparable off-site lands, or through funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts. The implementation of a Worker Environmental Awareness Program (Mitigation Measure B-1b) will ensure that all construction personnel are familiar with applicable regulations and laws regarding sensitive species that could be encountered in the project area, the consequences of non-compliance with these laws and regulations, 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 implementation of an RCA Treatment Plan (Mitigation Measure B-2) will ensure that activities conducted within RCAs are approved by the USDA Forest Service prior to implementation and are conducted in such a way as to minimize disturbance to sensitive resources. The implementation of a Weed Control Plan (Mitigation Measure B-3a) will ensure that the spread and establishment of weeds due to Project activities is minimized. Pre-construction surveys and monitoring for breeding birds by a qualified biologist, and protective buffers established around active nests (Mitigation Measure B-5), will ensure that impacts to breeding birds are minimized. Preconstruction surveys and avoidance of any listed plant species (Mitigation Measure B-7) will ensure that effects to these species will be minimized. Protocol surveys for California red-legged frogs and arroyo toads in suitable habitats and the implementation of avoidance measures such as seasonal restrictions on Project activities within occupied habitat, exclusion fencing, restricting work to daytime hours, and relocation of individuals out of work areas will minimize effects to these species (Mitigation Measures B-8a and B-9). Monitoring conducted by a qualified biologist (Mitigation Measure B-8b) will minimize the potential for direct effects to listed wildlife. Avoidance and minimization measures such as the staging of Hazardous Material Spill Kit(s) along the West Fork Cogswell Road, daily inspection of the West Fork Cogswell Road by a qualified biological monitor, and block nets in select areas (Mitigation Measure B-12) will minimize effects to aquatic species. Monitoring by an authorized biologist and avoidance of helicopter use if condors are present, daily clean-up of microtrash, worker education, and reporting of all condor sightings to the appropriate resource agencies will minimize effects to California condors (Mitigation Measure B-14). Protocol and focused surveys conducted for listed riparian birds and the implementation of avoidance measures such as a disturbance-free buffer around active nests or territories will minimize impacts to southwestern willow flycatchers, least Bell's vireos, and western yellow-billed cuckoos (Mitigation Measure B-15). Implementation of a Construction Fugitive Dust Control Plan (Mitigation Measure AQ-1a) will minimize impacts to listed species associated with fugitive dust generated during construction. Implementation of an Erosion Control Plan and compliance with water quality permits (Mitigation Measure H-1a) will minimize impacts associated with erosion and water quality. Avoiding construction during rain events (Mitigation Measure H-1b) will minimize the potential for Project activities to occur during the period when listed amphibians are most likely to be active.

While no additional mitigation measures would be required in response to the Station Fire under Criterion BIO2, two existing mitigation measures should be revised to address the change in conditions. Mitigation Measure B-8a has been revised to require surveys for California red-legged frog at Aliso Canyon, as a newly discovered population exists less than one mile downstream of Segment 11 in this area. A full-time monitor will also be required at the access road crossing at this location. Mitigation Measure B-9 has also been revised to include a full-time monitor in all occupied arroyo toad habitat. Additions to the mitigation measures shown below, which result from this analysis of the Station Fire, are shown as underlined text; deletions are shown as strike-through text.

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 within work areas or adjacent to the project area:
    - 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 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, 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-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 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 arroyo toad buffer area to daylight hours only during the activity period for arroyo toads (generally March-November), unless otherwise approved by the 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 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 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, habitat assessments will be conducted every year 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.

In sum, the Station Fire does not introduce new impacts to biological resources under Criterion BIO2, but mitigation measures introduced in the EIR/EIS should be slightly modified, as described above, to ensure that impacts under Criterion BIO2 remain Class II, as described in the EIR/EIS.

Effects on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)

Under Criterion BIO3, impacts identified in the EIR/EIS include direct and indirect effects to a number of special-status species and their habitats. Species that would potentially be affected by Project construction and operation in the Central Region include the following:

- Special-status plants (Impact B-23)
- Southwestern pond turtle (Impact B-24)
- Two-striped and south coast garter snakes (Impact B-25)
- Coast Range newt (Impact B-26)
- Various terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species (Impact B-27)
- California spotted owl (Impacts B-30 and B-31)
- Various avian California Species of Special Concern (Impact B-32)
- Various special-status bat species (Impact B-33)
- Various special-status mammals (Impact B-35)
- San Diego desert woodrat (Impact B-36)
- Ringtail (Impact B-37)

The Station Fire will not affect the following species because they do not occur in the Central Region: mountain plover (Impact B-28), burrowing owl (Impact B-29), and American badger (Impact B-38). In addition, the Station Fire will not affect the potential for avian electrocution or for avian or bat collisions with transmission lines (Impacts B-20, B-21, and B-34).

Several special-status plant species (Impact B-23) were recorded in the Project area. Some of these occurrences may have been burned by the fire, but may recover if a sufficient seedbank exists and competition from non-natives does not preclude establishment. In addition, new populations may become established in newly burned areas. Some perennial species previously observed in the Project area, such as San Gabriel manzanita and San Gabriel scrub oak, may be difficult to detect if individuals were burned by the fire, even if they survived, because many of the diagnostic characteristics may not be present for some time after the fire.

For special-status aquatic herpetofauna such as southwestern pond turtles (Impact B-24), two-striped garter snakes and south coast garter snakes (Impact B-25), and Coast Range newts (Impact B-26), the fire likely killed an unknown number of individuals directly, and survival and reproduction will likely be lower in the next few years due to loss of habitat, sedimentation, potential loss of nest/breeding sites, etc. For example, in a study of two wildfires on a population of European pond turtles, it was found that a reduction in the population of 60 to 70 percent occurred during the fires, with a disproportionate level of mortality of very young individuals in the fires and in the following years, and a large rejuvenation of the population during the post-fire phase. During this study, large amounts of sedimentation and erosion were documented post-fire, as are expected to occur in the years following the Station Fire. Sediment obstructed the cavities under the banks which provide shelter to turtles, led to sub-surface runoff in periods of low water (reducing the area and volume of available water), and caused the disappearance of the deep pools which support many aquatic species during the summer (Cheylan and Poitevin, 1996). In addition, pond turtles can be washed out of their drainages during large flood events, as occurred during the 2005 El Niño season in southern California. Therefore, any impacts to these species from the TRTP will be more significant if the populations are depressed. However, the mitigation identified in the EIR/EIS includes focused surveys, monitoring, and avoidance/minimization measures. Accordingly, total impacts to special-status aquatic herpetofauna due to the

TRTP would be less than significant with implementation of this mitigation. The Station Fire does not alter this conclusion or require modifications to mitigation introduced in the EIR/EIS.

For special-status terrestrial herpetofauna (Impact B-27), many individuals likely survived the fire by retreating to burrows, rock crevices, etc. (Russell et al., 1999). However, some mortality likely occurred. For example, photographs of post-fire evaluations conducted by USGS in the Big Tujunga Creek watershed immediately after the fire burned through revealed one observed occurrence of a dead rattlesnake in the water. As described for the other herpetofauna, if populations are depressed following the fire, Project impacts would be more significant. However, the mitigation identified in the EIR/EIS requires monitoring, avoidance, and minimization measures during construction. This would ensure that Project impacts remain less than significant with implementation of mitigation. The Station Fire does not alter this conclusion

If substantial amounts of California spotted owl habitat (Impact B-30) were lost, impacts in remaining habitat will be more significant. However, the Project in total would not disturb large amounts of habitat. In addition, one study of 7 radiomarked owls (4 territories, 4 years post-fire) reported nesting in lower-intensity burn and unburned areas. For roosting during the breeding season, owls avoided moderate- and high-severity burn areas. Within 1 km of the center of their foraging areas, spotted owls selected all severities of burned forest and avoided unburned forest. Beyond 1.5 km, there were no discernable differences in use patterns among burn severities. Most owls foraged in high-severity burned forest more than all other burn categories. High-severity burned areas had a greater number of snags and higher shrub and herbaceous cover, factors thought to be associated with increased abundance or accessibility of prey (Bond et al., 2009). Therefore, impacts to California spotted owl habitat due to the proposed Project are not expected to be substantial.

It is assumed that a large amount of California spotted owl habitat was burned in the fire. Therefore, remaining unburned habitat may support higher densities of breeding owls (Impact B-31) in the next few years as burnt habitat recovers. For example, reproductive success increases with increasing canopy cover (Lee and Irwin, 2005; North et al., 2000). Therefore, there may be an increased potential for disturbance to owls during construction in and near unburned habitat, if canopy cover was affected by fire. However, existing mitigation is adequate to reduce impacts to the species. In addition, Bond et al. (2002) investigated breeding spotted owl response to fire in California, Arizona, and New Mexico by documenting minimum survival, site fidelity, mate fidelity, and reproductive success for 21 spotted owls after large (>540 ha) wildfires occurred within 11 owl territories. In each territory, fire burned through the nest and primary roost sites. It was found that owl survival rates one year after the fire did not differ significantly from reported annual adult survival probabilities for the species, meaning that the fires did not cause a significant increase in mortality. Seven pairs known from before the fires were observed again after the fires, and all were on their original territories the breeding season after the fires. Four of the pairs produced a total of 7 fledglings. No pair separations were observed after the fires. The investigators concluded that wildfires may have little short-term impact on survival, site fidelity, mate fidelity, and reproductive success of spotted owls (Bond et al., 2002). Because the magnitude of the Station Fire may be higher than those fires included in this study, and impacts may be higher, thorough surveys, limited operating periods (LOPs), and buffers will be especially important post-fire (Mitigation Measure B-30). Thus, with regard to impacts on spotted owl habitat, the Station Fire does not require modifications to mitigation introduced in the EIR/EIS, although it does highlight the importance of careful compliance with these mitigation measures. With the implementation of mitigation measures identified in the EIR/EIS, Project impacts related to the California spotted owl and its habitat would remain less than significant.

As described for Impact B-5 under Criterion BIO1, impacts to nesting avian California Species of Special Concern (Impact B-32) in the Project area may be reduced if nesting habitat was burned; however, trees that survived the fire should begin regrowth by the next breeding season. In addition, raptors that typically nest in snags are not expected to be substantially affected. In fact, burned areas may provide higher quality foraging habitat for some raptors. However, unburned habitat will likely support a higher density of breeding birds until habitat elsewhere recovers. Mitigation, including the revisions suggested above under Criterion BIO1 (Mitigation Measure B-5) would be sufficient to ensure Project impacts remain less than significant.

It is difficult to predict how fire may have impacted bats (Impact B-33), as there is little in the literature on this topic. Tree-roosting species may have been displaced or subjected to mortality, while mine/cave/rock crevice-roosting species may not have been impacted much, if at all. However, even these species could have been subjected to mortality through exposure to heat, smoke, low oxygen levels, etc. One known population in the Project area, those pallid bats roosting in the bat boxes under the highway bridge in Aliso Canyon, may have been displaced or killed in the fire. Post-fire foraging may be easier due to increased exposure of insects. The EIR/EIS concluded that Project-related effects to bats would be less than significant pre-fire, and this conclusion would not change post-fire, especially with the implementation of mitigation identified in the EIR/EIS including surveys, provision of substitute roosting habitat, and exclusion of bats prior to demolition of roosts (Mitigation Measures B-33a through B-33c).

Many special-status mammals (Impact B-35) could have survived the fire by retreating to burrows. Post-fire plant growth will produce a large food source. However, small mammal responses to fire are highly variable, as with other species. Studies indicate that although burrowing animals may escape death in a wildfire, few can survive intense burns. Post-fire succession, therefore, likely depends on migration from unburned areas. Differing migration rates among rodent species may lead to different post-fire communities at sites adjacent to and sites distant from unburned shrub cover (Schwilk and Keeley, 1998). Overall Project impacts would be expected to remain less than significant with existing mitigation. The Station Fire does not alter this conclusion.

Woodrats experienced mortality, as evidenced by photos of dead woodrats taken by USGS biologists while assessing damage to the Big Tujunga Creek watershed in early September. However, the extent of mortality is unknown. Mitigation proposed in the EIR/EIS for Project effects to the San Diego desert woodrat (Impact B-36), including focused surveys and passive relocation (Mitigation Measure B-36) would ensure impacts remain less than significant. The Station Fire does not alter this conclusion.

Ringtails (Impact B-37) likely were impacted by the fire as described for other species. As such, Project effects would be more significant if populations are depressed. However, for the purposes of this Project, ringtails are only afforded protection on non-NFS lands due to their lack of federal status. Nonetheless, they could be impacted by Project activities in foothill canyons just south of the ANF boundary (such as Eaton Canyon, Santa Anita Canyon, San Gabriel Canyon, etc.). The mitigation identified in the EIR/EIS (Mitigation Measure B-37) requires focused surveys, monitoring, and avoidance/minimization measures (including passive relocation during the non-breeding season). This would reduce Project impacts to less than significant. The Station Fire does not alter this conclusion.

Mitigation measures introduced in the EIR/EIS would address Project effects to candidate, Forest Service Sensitive, and special-status species, and include the following:

- 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);
- 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-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms);
- B-23 (Preserve off-site habitat/management of existing populations of special-status plants);
- B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures);
- B-25 (Conduct focused surveys for two-striped garter snakes and south coast garter snakes and implement monitoring, avoidance, and minimization measures);
- B-26 (Conduct focused surveys for coast range newts and implement monitoring, avoidance, and minimization measures);
- B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna);
- B-30 (Conduct pre- and during construction nest surveys for spotted owls);
- 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-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate);
- B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season);
- 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)

The preparation and implementation of a Habitat Restoration and Revegetation Plan (Mitigation Measure B-1a) will compensate for impacts to habitat by restoring areas temporarily disturbed during construction. Where impacts are permanent, compensation for the loss of habitats will occur through the preservation, enhancement, or restoration of comparable off-site lands, or through funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts. The implementation of a Worker Environmental Awareness Program (Mitigation Measure B-1b) will ensure that all construction personnel are familiar with applicable regulations and laws regarding sensitive species that could be encountered in the project area, the consequences of non-compliance with these laws and regulations, 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 implementation of an RCA Treatment Plan (Mitigation Measure B-2) will ensure that activities conducted within RCAs are approved by the USDA Forest Service prior to implementation and are conducted in such a way as to minimize disturbance to sensitive resources. The implementation of a Weed Control Plan (Mitigation Measure B-3a) will ensure that the spread and establishment of weeds due to Project activities is minimized. Pre-construction surveys and monitoring for breeding birds by a qualified biologist, and protective buffers established around active nests (Mitigation Measure B-5), will ensure that impacts to breeding birds are minimized. Avoidance and minimization measures such as the staging of Hazardous Material Spill Kit(s) along the West Fork Cogswell Road, daily inspection of the West Fork Cogswell Road by a qualified biological monitor, and block nets in select areas (Mitigation Measure B-12) will minimize effects to aquatic species. Preconstruction surveys and avoidance of any listed plant species (Mitigation Measure B-7) will ensure that effects to these species will be minimized. Protocol surveys will be conducted to determine the location of all rare plants that could be impacted by construction of the Project (Mitigation Measure B-23). Rare plants will be avoided, or if avoidance is not feasible, will be compensated through reseeding or other approved methods. If Project activities will result in loss of more than 10 percent of the known individuals within an existing population of a rare 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). Focused pre-construction surveys and monitoring for southwestern pond turtles, two-striped garter snakes and south coast garter snakes, Coast Range newts, and special-status terrestrial herpetofauna, and avoidance and minimization measures such as relocation of individuals and exclusion fencing (Mitigation Measures B-24 through B-27) will minimize impacts to these species. Nest surveys, Limited Operating Periods (LOPs), no helicopter construction within 0.5 mile of breeding spotted owl territories, and a buffer between territories and helicopter overflights will minimize impacts to California spotted owls (Mitigation Measure B-30). Surveys for roosting bats and maternity colonies, provision of substitute roosting bat habitat, and exclusion of bats prior to demolition of roosts (Mitigation Measures B-33a through B-33c) will minimize impacts to special-status bat species. Focused surveys, a 10-foot disturbance-free buffer around active nests, and passive relocation if avoidance is not feasible will minimize impacts to San Diego desert woodrats (Mitigation Measure B-36). Focused surveys, a 200-foot disturbance-free buffer around occupied dens, and passive relocation in consultation with the CDFG if avoidance is not feasible, will minimize impacts to the ringtail (Mitigation Measure B-37). Implementation of a Construction Fugitive Dust Control Plan (Mitigation Measure AQ-1a) will minimize impacts to special-status species associated with fugitive dust generated during construction. Implementation of an Erosion Control Plan and compliance with water quality permits (Mitigation Measure H-1a) will minimize impacts associated with erosion and water quality. Avoiding construction during rain events (Mitigation Measure H-1b) will minimize the potential for Project activities to occur during the period when special-status amphibians are most likely to be active.

The Station Fire does not introduce new impacts to biological resources under Criterion BIO3. With implementation of the mitigation measures listed above, impacts under Criterion BIO3 would remain Class II, as described in the EIR/EIS.

Effects on federally protected wetlands (Criterion BIO4)

Under Criterion BIO4, impacts identified in the EIR/EIS include the loss of wetland habitats (Impact B-39). While wetland habitats on and adjacent to the ANF were impacted by the fire, this will not change the amount of habitat that would be impacted by Project construction. Therefore, there will be no effect from the Station Fire on Impact B-39.

Mitigation measures introduced in the EIR/EIS would address effects to wetland habitats, and include the following:

- 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 fish and aquatic organisms);
- AQ-1a (Implement Construction Fugitive Dust Control Plan); and
- H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits)

The preparation and implementation of a Habitat Restoration and Revegetation Plan (Mitigation Measure B-1a) will compensate for impacts to vegetation communities by restoring areas temporarily disturbed during construction. Where impacts are permanent, compensation for the loss of habitats will occur through the preservation, enhancement, or restoration of comparable off-site lands, or through funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts. The implementation of a Worker Environmental Awareness Program (Mitigation Measure B-1b) will ensure that all construction personnel are familiar with applicable regulations and laws regarding sensitive species that could be encountered in the project area, the consequences of non-compliance with these laws and regulations, identification and values of 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, and review of mitigation requirements. The implementation of an RCA Treatment Plan (Mitigation Measure B-2) will ensure that activities conducted within RCAs are approved by the USDA Forest Service prior to implementation and are conducted in such a way as to minimize disturbance to sensitive resources. The implementation of a Weed Control Plan (Mitigation Measure B-3a) will ensure that the spread and establishment of weeds due to Project activities is minimized. Avoidance and minimization measures such as the staging of Hazardous Material Spill Kit(s) along the West Fork Cogswell Road, daily inspection of the West Fork Cogswell Road by a qualified biological monitor, pre-construction fish surveys prior to any work where flowing or ponded water is present, and block nets in select areas (Mitigation Measure B-12) will minimize effects to aquatic resources. Implementation of a Construction Fugitive Dust Control Plan (Mitigation Measure AQ-1a) will minimize impacts to vegetation communities associated with fugitive dust generated during construction. Implementation of an Erosion Control Plan and compliance with water quality permits (Mitigation Measure H-1a) will minimize impacts associated with erosion and water quality.

The Station Fire does not alter the nature or significance of Impact B-39, as described in the EIR/EIS. In addition, the Station Fire does not introduce new impacts to biological resources under Criterion BIO4, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion BIO4 would remain Class II, as described in the EIR/EIS.

Interference with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)

Under Criterion BIO5, impacts identified in the EIR/EIS include interference with established bird and bat migratory corridors (Impact B-40), disturbance to wildlife caused by corona noise (Impact B-41), and effects to Management Indicator Species (MIS) (Impact B-42). There are no known bird or bat migratory corridors that would be directly impeded by the proposed Project, and large concentrations of migrants are not known to utilize any portion of the proposed Project. The Station Fire is not expected to change bird and migration corridors such that the Project would become an obstacle to movement. Therefore, there will be no effect from the Station Fire on Impact B-40. In addition, the Station Fire will have no effect on the generation of corona noise by the Project, and therefore will not affect analysis of the Project under Impact B-41. However, the Station Fire will have impacts on MIS in the Project area (Impact B-42).

MIS were all impacted by the fire to varying degrees (and will continue to be impacted by the aftermath of the fire, such as sedimentation, erosion, temporary lack of forage and habitat in general, etc.). As with all other species in the Central Region, the extent of impacts of the Station Fire to MIS will not be fully known for several years. However, the effects of the proposed Project would be mitigable with the implementation of mitigation proposed under Criteria BIO1 through BIO3.

Mitigation measures introduced in the EIR/EIS would address effects to MIS, and include the following:

- 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 owls);
- 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)

The preparation and implementation of a Habitat Restoration and Revegetation Plan (Mitigation Measure B-1a) will compensate for impacts to habitat by restoring areas temporarily disturbed during construction. Where impacts are permanent, compensation for the loss of habitats will occur through the preservation, enhancement, or restoration of comparable off-site lands, or through funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts. The implementation of a Worker Environmental Awareness Program (Mitigation Measure B-1b) will ensure that all construction personnel are familiar with applicable regulations and laws regarding sensitive species that could be encountered in the project area, the consequences of non-compliance with these laws and regulations, 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. Treating all stumps of trees resulting from Project construction activities with Sporax (Mitigation Measure B-1c) will prevent the spread of annosus root disease that could infect MIS or habitat for MIS. The implementation of an RCA Treatment Plan (Mitigation Measure B-2) will ensure that activities conducted within RCAs are approved by the USDA Forest Service prior to implementation and are conducted in such a way as to minimize disturbance to sensitive resources. The implementation of a Weed Control Plan (Mitigation Measure B-3a) will ensure that the spread and establishment of weeds due to Project activities is minimized. Controlling known populations of nonnative and invasive weeds along construction access routes and from within assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF (Mitigation Measures B-3b and B-3c) will minimize the potential for spread of these species into and through work areas, as outlined in the USDA Forest Service Land Management Plan (2005). Pre-construction surveys and monitoring for breeding birds by a qualified biologist, and protective buffers established around active nests (Mitigation Measure B-5), will ensure that impacts to breeding birds (including song sparrows and California spotted owls) are minimized. Monitoring conducted by a qualified biologist will minimize the potential for direct effects to listed wildlife, including arroyo toads (Mitigation Measure B-8b). Protocol surveys for arroyo toad in suitable habitat and the implementation of avoidance measures such as seasonal restrictions on Project activities within occupied habitat, restricting work to daytime hours, and relocation of individuals out of work areas will minimize effects to the species (Mitigation Measure B-9). Nest surveys, Limited Operating Periods (LOPs), no helicopter construction within 0.5 mile of breeding spotted owl territories, and a buffer between territories and helicopter overflights will minimize impacts to California spotted owls (Mitigation Measure B-30). Implementation of a Construction Fugitive Dust Control Plan (Mitigation Measure AQ-1a) will minimize impacts to MIS associated with fugitive dust generated during construction. Implementation of an Erosion Control Plan and compliance with water quality permits (Mitigation Measure H-1a) will minimize impacts associated with erosion and water quality. Avoiding construction during rain events (Mitigation Measure H-1b) will minimize the potential for Project activities to occur during the period when arroyo toads are most likely to be active.

The Station Fire does not alter the nature or significance of Impacts B-40 and B-41, as described in the EIR/EIS. In addition, the Station Fire does not introduce new impacts to biological resources under Criterion BIO5, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion BIO5 would remain Class III for Impacts B-40 and B-41, and would remain Class II for Impact B-42, as described in the EIR/EIS.

Conflicts with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances (Criterion BIO6)

Under Criterion BIO6, no Project impacts were identified in the EIR/EIS. Because of the extensive planning involved in Project design, including implementation of APMs BIO-1 through BIO-7, and the mitigation measures described above under 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. The occurrence of the Station Fire will have no effect on the Project’s consistency with local policies or ordinances protecting biological resources.

The Station Fire does not alter the nature or significance of Criterion BIO6, as described in the EIR/EIS. In addition, the Station Fire does not introduce new impacts to biological resources under Criterion BIO6, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, the Project will continue to have no effect under Criterion BIO6, as described in the EIR/EIS.

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)

Under Criterion BIO7, no Project impacts were identified in the EIR/EIS. There are no applicable HCPs, NCCPs, or other approved local, regional, or State HCPs in the Project area. Therefore, no impact would occur and the Station Fire will not affect impact analysis under Criterion BIO7.

The Station Fire does not alter the nature or significance of Criterion BIO7, as described in the EIR/EIS. In addition, the Station Fire does not introduce new impacts to biological resources under Criterion BIO7, or require modifications to mitigation introduced in the EIR/EIS. The Project will continue to have no effect under Criterion BIO7, as described in the EIR/EIS.

2.3.4 Cumulative Effects Analysis

Existing cumulative conditions in the Central Region are defined by efforts of the Forest Service to manage the ANF. Most of the proposed projects considered in the analysis of cumulative effects are focused on restoration, fuels management, habitat improvement, and maintenance of existing facilities. Although the extent of damage to biological resources associated with the Station Fire is not yet fully known, it is reasonable to assume that resources throughout the Central Region may have been damaged by the fire. In addition, many of the planned fuels management projects considered in the analysis in the EIR/EIS may no longer occur if the areas proposed for treatment burned. It is also assumed that post-fire restoration and rehabilitation will occur in various areas throughout the Project area.

In accordance with CEQA, when a Project’s contribution to a cumulative impact is not “cumulatively considerable” the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project’s incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project’s contribution to the cumulative impacts identified in the EIR/EIS.

Forty-two cumulative impacts were identified in the EIR/EIS for biological resources. Of those, 26 were determined to be significant (Class I) in the Central Region. For those resources for which the Project’s incremental contribution to cumulative impacts would be the same as described in the EIR/EIS, the cumulative impact analysis discussed in the EIR/EIS would remain the same. For some impacts the magnitude of the Project’s contribution to cumulative impacts may increase, as described below. However, with the implementation of the mitigation measures introduced in the EIR/EIS, with the enhancements recommended above, the Station Fire will not change the nature or the significance of the cumulative impacts of the Project on biological resources.

The potential for the spread of nonnative and invasive weeds due to Project activities (Impact B-3) will be greater post-fire. This impact will remain significant (Class I). However, the implementation of a Weed Control Plan (Mitigation Measure B-3a) will ensure that the spread and establishment of weeds due to Project activities is minimized. Controlling known populations of nonnative and invasive weeds along construction access routes and from within assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF (Mitigation Measures B-3b and B-3c) will minimize the potential for spread of these species into and through work areas, as outlined in the USDA Forest Service Land Management Plan (2005a).

The magnitude of the contribution of Project impacts to cumulative impacts for a given species may increase if that species was severely affected by the fire, but increases are not expected to be substantial. Species of concern include the arroyo toad (Impact B-9), special-status fish (Impact B-12), and California spotted owl (Impacts B-30 and B-31). For each of these species, the Project’s contribution to cumulative impacts was determined in the EIR/EIS to be cumulatively considerable. The Station Fire does not change this conclusion. As discussed above, it is recommended that Mitigation Measure B-9 be revised to require full-time monitoring of construction activities in occupied habitat. With the implementation of this enhanced mitigation measure, Project impacts are not expected to increase substantially over what was discussed in the EIR/EIS.

Before the fire occurred, the Forest Service, as federal lead agency, determined that the Final EIR/EIS should reflect that impacts to nesting California spotted owls (Impact B-31) would not be significant (Class III). As noted above, in order to minimize impacts to nesting spotted owls, thorough surveys, limited operating periods (LOPs), and buffers will be especially important post-fire (Mitigation Measure B-30). So long as the relevant APMs and mitigation measures applicable to nesting spotted owl habitat that are set forth in the EIR/EIS are fully and carefully complied with, cumulative impacts on spotted owl habitat would remain Class III.

Impacts to Santa Ana sucker critical habitat (Impact B-13) would remain less than cumulatively considerable (Class III). The proposed Project would not result in the loss of critical habitat for this species, and indirect effects associated with the use of an existing paved access road adjacent to the critical habitat would remain minor. Impacts related to electrocution of avian species (Impact B-20), transmission line strikes by special-status bats (Impact B-34), interference with migratory corridors (Impact B-40), and corona noise (Impact B-41) would not be affected by the Station Fire, and would remain less than cumulatively considerable (Class III).

In summary, the proposed Project would contribute to 26 biological resources impacts that would be cumulatively significant and unavoidable (Class I) and five biological resources impacts that would be less than significant with no mitigation required (Class III). The remaining 11 impacts identified in the EIR/EIS do not apply in the Central Region where the Station Fire occurred. The Station Fire would contribute to several of these cumulative impacts, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.4 Cultural Resources

2.4.1 Introduction

Baseline conditions for the cultural resources analysis in the Project's EIR/EIS were established through background research, records searches, and a pedestrian survey of the transmission line corridor and ancillary areas needed for construction. On the ANF, the survey corridor along the transmission line ROW was 500 feet wide. The survey corridor also included 13 helicopter staging areas proposed by SCE for Alternative 2 (SCE's Proposed Project) and 13 helicopter staging areas proposed by the ANF for Alternative 6 (Maximum Helicopter Construction in the ANF).

As described in Section 3.5.2 and Tables 3.5-2 and 3.5-5 of the EIR/EIS, the cultural resources analysis identified 73 archaeological and historical sites along Segments 6 and 11, including both the transmission line ROW and ancillary areas. Constraints on the effectiveness of the inventory included steep slopes in some portions of the study area, restricted access, and obscured surface visibility. Dense chaparral vegetation in the lower elevations made passage through some areas difficult and limited ground surface visibility. In the higher elevations, forest duff also obscured the ground surface.

2.4.2 Changed Conditions

Generally speaking, fires neither destroy existing archaeological sites nor create new sites. However, the Station Fire consumed substantial amounts of brush, surface vegetation, and forest duff, all of which tend to obscure the visibility of archaeological sites. Since post-fire conditions likely include substantially improved ground visibility and access, the inventory of archaeological and historical sites in the APE would very likely grow with a post-fire survey.

Most archaeological and historical sites in the study area have not been evaluated for significance, and their integrity and eligibility for the National Register of Historic Places or California Register of Historical Resources have not been assessed. Thus, changes in site significance or eligibility resulting from the Station Fire are unknown and unknowable.

2.4.3 Impact Evaluation

The criteria used in the EIR/EIS to evaluate and determine the significance of impacts to cultural resources include the following:

- Criterion CR1: The Project would cause an adverse effect on a historic property or Traditional Cultural Property as defined by federal guidelines (the ANF, USACE, and CPUC agreed that the federal guidelines would apply to all aspects of the Project and would 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.

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. Indirect impacts may occur if activities occur near, but not directly on, known cultural resources.

The Station Fire did not introduce any new impacts that were not discussed in the EIR/EIS. Construction of the proposed Project would still result in the same types of impacts as outlined in EIR/EIS Section 3.5.6 (Alternative 2: SCE's Proposed Project [cultural resource impacts]), and the severity of the impacts would not change as a result of the fire. However, the magnitude of impacts could increase as a result of changed conditions, as discussed above; that is, if the inventory of resources expands because there are more sites than are currently known, then more sites potentially could be affected by construction of the project.

Despite the potential for the inventory of resources to expand, the change in the magnitude of impacts would not be substantial with implementation of the recommended mitigation measures and would not change the CEQA significance conclusions for cultural resources identified in the EIR/EIS. Direct impacts still could be avoided through minor design modifications that would reduce Project effects to a less-than-significant level (Class II) by the avoidance and protection measures listed in Mitigation Measures C-1a through C-1h. Mitigation Measure C-1i would also serve to minimize indirect Project impacts. Implementation of these measures would reduce impacts to less-than-significant levels. Thus, it is not necessary to change existing mitigation measures and no additional mitigation measures would be required.

2.4.4 Cumulative Effects Analysis

Existing cumulative conditions in the area affected by the Station Fire are defined by a suite of natural and cultural agents which can diminish the integrity of any resource or group of resources. From a cultural resources perspective, human activities most likely to contribute to cumulative impacts include increasing recreational uses of the ANF; ranching, agriculture, and silviculture; and development of roads, trails, transmission lines, and other infrastructure. Natural factors affecting the integrity of the resources are erosion, sedimentation, and soil deflation.

The extent of damage associated with the Station Fire to recreational facilities, economic support facilities, and other infrastructure is not yet known. In the aftermath of the fire, however, it is reasonable to assume that any such damaged facilities would be repaired or rebuilt. While not associated directly with the Project, reconstruction of recreational resources, roads, trails, and other infrastructure damaged or destroyed by the fire has the potential to affect cultural resources adversely. Similarly, it is likely that erosion and sedimentation will increase as a result of the fire. The greater potential for erosion of archaeological sites or sedimentation over them increases the potential for cumulative effects to cultural resources.

If the Project is ultimately designed so that most cultural resource 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 will not be cumulatively considerable. In that case, it is unlikely that changes caused by the Station Fire would change the magnitude or severity of impacts sufficiently to increase the Project's contribution to cumulative impacts. Thus, the significance conclusions regarding cumulative impacts would not change and no new mitigation measures or modification of existing measures would be required.

If the Project cannot be designed 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. In that case, the changed conditions in the burn area and the Project and non-Project related responses (i.e., reconstruction of infrastructure, increased erosion/sedimentation) would contribute to the cumulative effect. As described in the EIR/EIS, 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. The nature and magnitude of the Project's contribution to cumulative impacts is the same as described in the EIR/EIS. The Station Fire does not change this conclusion.

In summary, the proposed Project would not result in any individual cultural resources impacts that would be significant and unavoidable. As a result of the Station Fire, the inventory of cultural resources in the Project APE could expand due to improved visibility of cultural resources, thus changing the baseline conditions. However, all individual impacts would remain mitigable to a level of less than significant (Class II). Conversely, the Station Fire could contribute to cumulative impacts on cultural resources, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS. As such, the Station Fire will not alter the nature or significance of the proposed Project's cultural resource impacts as addressed in the EIR/EIS.

2.5 Environmental Contamination and Hazards

2.5.1 Introduction

The environmental contamination analysis presented in the EIR/EIS for the proposed TRTP focused on the areas within about one mile of the Segment 6 and 11 alignments and several helicopter staging sites. The Station Fire occurred throughout the mountain region traversed by Segments 6 and 11 and, therefore, this evaluation of how the fire may affect the EIR/EIS analysis addresses the mountain region.

2.5.2 Changed Conditions

The majority of the mountain region for Segments 6 and 11 falls within the jurisdictional boundaries of the ANF and experienced moderate to severe burn throughout as a result of the Station Fire. Most of the mountain region is characterized by undeveloped lands and open space with only scattered improvements that may result in the presence of contaminated soil or debris following the fire. Based on the site visit conducted on October 20, 2009, many of the improvements within the ANF were burned as a result of the Station Fire including, Mill Creek Summit Station, Monte Cristo Campground (burned around the campground, but not in the center where most of the facilities are located), Shortcut Station (burned around the station, but the structures appear to have only sustained minor damage), and Barley Flats (not seen on the site visit, but confirmed by the Forest Service), among others. In general, there are no improvements at the transmission structure sites as the new structures would be located within an existing ROW. Helicopter Site #7, located at Barley Flats, includes several building structures from the former Nike missile facility. Fire damage to these structures may result in the presence of asbestos containing construction materials or lead from lead-based paint in ash materials at the site. All other proposed helicopter sites are vacant land with no building structures.

2.5.3 Impact Evaluation

The criteria used to evaluate and determine the significance of environmental contamination impacts in the EIR/EIS include the following:

- Criterion ECH1: Result in soil contamination, including flammable or toxic gases, at levels exceeding federal, State, or local hazardous waste limits established by 40 CFR Part 261 and Title 22 CCR 66261.21, 66261.22, 66261.23, and 66261.24.
- Criterion ECH2: Result in mobilization of contaminants currently existing in the soil, creating potential pathways of exposure to humans or other sensitive receptors. Contaminants may include leaking munitions and explosives of concern (MEC) and the ordnance itself.
- Criterion ECH3: Cause contamination 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 at levels in excess of those permitted by California Occupational Safety and Health Administration (Cal-OSHA) in CCR Title 8 and the Federal Occupational Safety and Health Administration (OSHA) in Title 29 CFR Part 1910.

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related environmental contamination impacts previously identified under Significance Criteria ECH1, ECH2 or ECH3, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Result in soil contamination, including flammable or toxic gases, during construction (Criterion ECH1)

Under Criterion ECH1, impacts identified in the EIR/EIS included the Project's potential to result in soil contamination during construction caused by spills and leaks of fuels, lubricants, solvents, and paints. It is unlikely that construction-related leaks and spills would increase (or decrease) as a result of the Station Fire. Therefore, the Station Fire does not alter the nature or significance of impacts under Criterion ECH1, as described in the EIR/EIS. In addition, the Station Fire does not introduce new environmental contamination and hazards impacts under Criterion ECH1, or require modifications to mitigation introduced in the EIR/EIS.

Result in mobilization of contaminants currently existing in the soil, creating potential pathways of exposure to humans or other sensitive receptors (Criterion ECH2)

In general the mountain region and ANF lands are free of existing soil contamination. ANF has indicated that the asbestos containing construction materials of damaged buildings and asbestos in ash at the Barley Flats helicopter site will require cleanup prior to reuse of the facility as a helicopter landing site. Consequently, the Project will not result in mobilization of contaminants existing in the soil along access roads, helicopter sites, or transmission structure sites. The Station Fire does not have any effect on this impact, and would not alter the nature or significance of the impact as described in the EIR/EIS.

Cause contamination 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 accidental spill or release of hazardous materials at the substations during facility operation or along the transmission line during maintenance operations. This could potentially result in exposure of workers and the public to hazardous materials. Nevertheless, the Station Fire is not anticipated to change the incidence of accidental spills or releases of hazardous materials during maintenance of the transmission line in the mountain region. The Station Fire does not alter the nature or significance of impacts under Criterion ECH3, as described in the EIR/EIS. In addition, the Station Fire does not introduce new environmental contamination and hazards impacts under Criterion ECH3, or require modifications to mitigation introduced in the EIR/EIS.

2.5.4 Cumulative Effects Analysis

The geographic extent for the analysis of cumulative impacts related to environmental contamination is limited to the Project site and the immediate vicinity surrounding Project substations, laydown areas, and the transmission line ROWs occupied by the proposed alignment. These geographic limits are appropriate to consider the potential cumulative impacts as the current and past land uses on the Project site and directly adjacent to the Project site are the most significant factors to evaluate the potential for environmental contamination at a project site. Impacts would have the potential to occur during construction and operation and would be limited to the areas where concurrent construction or maintenance is occurring. The effects of the Station Fire do not change the potential for new or existing environmental contamination to occur with the project limits along Segments 6 and 11 and would not change the potential to encounter contamination during construction or change the potential for accidental spills or releases during operation.

With regard to cumulative environmental contamination impacts, the proposed Project's contribution to a cumulative impact would only be considered significant if it combined with other projects to result in substantial volumes of contaminated soil that require off-site treatment and that, as a combined volume, exceeded the capacity of available treatment facilities or resulted in substantial exposure of hazardous materials to the public. For the reasons discussed below, the proposed Project's contribution to cumulative impacts would not be cumulatively considerable. The following discussion focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

- **Soil or groundwater contamination results due to improper handling and/or storage of hazardous materials during construction activities could occur through accidental releases of hazardous materials used during construction (Impact E-1).** The Station Fire will not change the potential or magnitude of accidental releases of hazardous materials during construction. As was disclosed in the EIR/EIS, any Project related accidental spills would be minimized and cleaned up immediately, and would not be cumulatively considerable and a less than significant cumulative effect would occur. The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Excavation or grading could result in mobilization of existing soil or groundwater contamination from known sites (Impact E-2).** The Station Fire would not change the occurrence of preexisting soil and groundwater contamination and would not change the potential to encounter preexisting contamination during proposed Project construction, which would not change the potential exposure of construction workers to potential health hazards. No preexisting soil contamination or hazardous waste sites was identified in the EIR/EIS for ANF lands along Segments 6 and 11 and no new additional soil contamination

resulted from the Station Fire. Although the proposed Project includes APM HAZ-1 and Mitigation Measures E-2a and E-2b, which would require investigation of potentially contaminated sites along the proposed transmission line route as well as clean up of any contamination identified, application of these measures is not anticipated in the Station Fire burn area. Therefore, as disclosed in the EIR/EIS because any contamination encountered would be removed and/or remediated prior to construction, Impact E-2 would not have the potential to combine with impacts of other projects and would not be cumulatively considerable. The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

- **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).** Although Impact E-3 could occur along portions of the Project alignment that are in close proximity to landfills and active, inactive, and abandoned oil wells, these conditions do not occur in the ANF lands or in the Station Fire burn area. Application of Mitigation Measures E-3a (Determine if landfill gases are present), E-3b (Implement personnel safety and monitoring measures), and E-3c (Verify location and status of abandoned oil and natural gas wells) are not anticipated for the Station Fire burn area. Therefore, as disclosed in the EIR/EIS, Impact E-3 would not have the potential to combine with impacts of other projects and would not be cumulatively considerable. The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Unanticipated preexisting soil and/or groundwater contamination could be encountered during excavation or grading (Impact E-4).** Impact E-4 could occur if preexisting soil and groundwater contamination is encountered during proposed Project construction, which would result in exposure of construction workers to potential health hazards. However, the potential for unanticipated preexisting soil contamination within ANF lands is considered unlikely due to the current and historic land use as open space recreation and no significant commercial or industrial activities. The potential for unanticipated preexisting soil contamination does not change as a result of the Station 4. Therefore, as disclosed in the EIR/EIS, the proposed Project includes APM HAZ-3 and Mitigation Measures E-4a (Appoint individuals with correct training for sampling, data review, and regulatory coordination) and E-4b (Document compliance with APM HAZ-3) which require identification and disposal of potentially impacted soil. Therefore, because any contamination encountered would be removed and/or remediated prior to construction, Impact E-4 would not have the potential to combine with impacts of other projects and would not be cumulatively considerable. The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Soil or groundwater contamination could result from an accidental spill during operation (Impact E-5).** Soil or groundwater contamination could result at the substations during facility operation or along the transmission line during maintenance operations and the frequency or magnitude of such spills are not changed as a result of the Station Fire. Therefore, as discussed in the EIR/EIS, APM HAZ-5 would require measures to minimize and/or avoid unforeseen spills of hazardous materials during operations as well as to clean up potentially harmful materials in the unlikely event of a release. These measures would greatly reduce the likelihood of a release as well as the potentially harmful effect of a release. Since measures would be in place to greatly reduce the likelihood of a release as a result of proposed Project activities, Impact E-5 would not be cumulatively considerable. The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

In summary, the Station Fire would have no change on the Project's contribution to five impacts with no cumulative adverse effect (Impacts E-1 through E-5). The Station Fire would not change the magnitude of the Project's contribution to several cumulative impacts, as described above, and the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.6 Geology, Soils, and Paleontology

2.6.1 Introduction

For purposes of analysis the discussion of the geology, soils, and paleontology issue areas, the components of the proposed TRTP, as presented in the EIR/EIS, were divided geographically into three areas of similar geologic and geomorphic expression defined by beginning and ending substations, with the proposed Project substations discussed in a separate subsection. The Station Fire occurred in the Vincent Substation to Mesa Substation (Segments 6, 7, and 11) section, throughout the mountain region traversed by Segments 6 and 11 and across several helicopter staging sites in the San Gabriel Mountains. Therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on San Gabriel Mountains region of the Vincent Substation to Mesa Substation (Segments 6, 7, and 11) section.

2.6.2 Changed Conditions

The majority of the San Gabriel Mountains region for Segments 6 and 11 falls within the jurisdictional boundaries of the ANF and experienced moderate to severe burn throughout. It is assumed that the moderate to severe burn that occurred along Segments 6 and 11 resulted in loss of nearly all of the vegetation that typically reduces erosion during rain events and stabilizes soils on steep slopes resulting in a distinct change in conditions related to erosion of soil and stabilization of soils on steep slopes. Most of the mountain region is characterized by undeveloped lands and open space with moderate to steep slopes throughout that may result in temporary, localized increase in soil erosion, soil creep, and debris flows during the rainy season or spring snow melt period, until protective vegetative cover and root structure are restored following the fire. Although the change in conditions would not increase the potential that erosion would result from transmission line construction, the project may experience additional erosion along access roads and work areas as sheet flow and concentrated flow would not be impeded by vegetation. In addition, project areas may experience additional sediment loading as areas outside of the actual project construction areas may yield more than normal sediment during rain events.

The change in conditions on the steep slopes where soils had been previously stabilized by vegetation could result in a slight increase in potential that grading of access roads and work pads in areas near and along steep slopes may trigger or accelerate soil creep or slumps. As reported in the Station Fire Burn Area Emergency Response (BAER) Soils Resource Assessment for the ANF (USDA Forest Service, 2009c), the majority of erosion sources in the burn area are untreatable due to steepness and ravel hillslope process. Eroded soil provides the materials for damaging debris flows and stream bulking; however, due to slope characteristics and hillslope processes in the burn area, land treatment(s) for geology and soils cannot be recommended. Other geology issues such as landslides, seismic-related hazards, and unsuitable soil conditions would not change. The Station Fire would not affect conditions for paleontologic resources, as there are no paleontologic resources in the San Gabriel Mountains.

2.6.3 Impact Evaluation

The criteria used to evaluate and determine the significance of geology, soils and paleontologic resource impacts in the EIR/EIS include the following:

- Criterion GEO1: Results in disturbance or otherwise adverse effects on unique geologic features or geologic features of unusual scientific value for study or interpretation.
- Criterion GEO2: Results in known mineral and/or energy resources being rendered inaccessible.
- Criterion GEO3: Results in triggering or acceleration of geologic processes, such as landslides, substantial soil erosion, or loss of topsoil during construction.
- Criterion GEO4: Expose people or structures to potential risk of loss or injury where there is high potential for earthquake-related ground rupture in the vicinity of major fault crossings.
- Criterion GEO5: Expose people or structures to potential risk of loss or injury where there is high potential for seismically induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and/or surface cracking.
- Criterion GEO6: Expose people or structures to potential risk of loss or injury where corrosive soils or other unsuitable soils are present.
- Criterion GEO7: Results in damage to Project structures where there is potential for future slope failures on existing unstable slopes.
- Criterion GEO8: Results in the destruction of scientifically important paleontological resources.

The following impact analysis evaluates whether the Station Fire will affect the magnitude of any project-related geology, soils, and paleontology impacts previously identified under Significance Criteria GEO1 through GEO8, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Unique geologic features (Criterion GEO1)

As discussed in the EIR/EIS, no unique geologic features or geologic features of unusual scientific value for study or interpretation would be disturbed or otherwise adversely affected by the proposed Project and thus no impact would occur. The occurrence of the Station Fire does not have any effect as there were no unique geologic features in the area. Therefore, the Station Fire does not alter the nature or significance of impacts under Criterion GEO1, as described in the EIR/EIS. In addition, the Station Fire does not introduce new geology, soils, and paleontology impacts under Criterion GEO1, or require modifications to mitigation introduced in the EIR/EIS.

Known mineral and/or energy resources (Criterion GEO2)

Under Criterion GEO2, Impact G-1 (Project activities could interfere with access to known energy resources) was identified in the EIR/EIS along portions of the Project, however this impact does not apply to the portions of Segments 6 and 11 were they cross the San Gabriel Mountains as there are no known active mines, quarries, or oil fields in this area. Therefore the Station Fire would not alter or change the significance of Impact G-1, as described in the EIR/EIS.

Triggering or acceleration of geologic processes, such as landslides, soil erosion, or loss of topsoil, during construction (Criterion GEO3)

Under Criterion GEO3, impacts identified in the EIR/EIS included the Project's potential that construction activities such as excavation and grading could result in the triggering or acceleration of erosion (Impact G-2) and could cause slope instability or trigger landslides (Impact G-3). As mentioned above it is likely that, as a temporary effect of the loss of vegetation on the nearby moderate to steep slopes, increased natural erosion and soil creep and slumping may occur; however, it is unlikely that impacts from erosion due to construction-related ground disturbance would be increased as a result of the Station Fire. Project construction activities may cause additional soil creep, soil slumps, and debris flows on moderate to steep slopes where the temporary loss of stabilizing vegetation has occurred due to the Station Fire. This could result in damage to downhill facilities, roads, or structures. This would result in a temporary increase in the potential for Impact G-3 to occur along the San Gabriel Mountain portions of Segments 6 and 11.

APMs and mitigation measures introduced in the EIR/EIS would address and minimize these impacts, and would include: SCE's APM GEO-3 and APM HYD-1, and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) to address any erosion issues under Impact G-2; and APM GEO-2 and Mitigation Measure G-3 (Conduct geological surveys for landslides and protect against slope instability) to address construction related slope stability issues for Impact G-3. Thus there would be no change in the nature or significance of Impacts G-2 and G-3, as described in the EIR/EIS, due to the Station Fire. In addition, the Station Fire does not introduce new geology or soils impacts under Criterion GEO3, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion GEO3 would remain Class II, as described in the EIR/EIS.

Exposure to potential risk of loss or injury due to earthquake-related ground rupture (Criterion GEO4)

Although Criterion GEO4, Impact G-4 (Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards) is identified in the EIR/EIS in the San Gabriel Mountains region where Segments 6 and 11 cross active faults, the occurrence of the Station Fire in this area does not have any effect on the presence of active faults nor the likelihood of fault rupture and would not change the potential for this impact to occur. Therefore, the Station Fire would not alter or change the significance of Impact G-4, as described in the EIR/EIS.

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)

Although Criterion GEO5, Impact G-5 (Project structures could be damaged by seismically induced groundshaking and/or ground failure exposing people or structures to hazards) is identified in the EIR/EIS in the San Gabriel Mountains region of the Project Area due to the close proximity to active regional faults, the occurrence of the Station fire in this area does not have any effect on the presence of active faults in the area nor the likelihood of earthquakes to occur and thus would not change the potential for this impact to occur. Therefore, the Station Fire would not alter or change the significance of Impact G-5, as described in the EIR/EIS.

Exposure to potential risk of loss or injury where corrosive soils or other unsuitable soils are present (Criterion GEO6)

As discussed in the EIR/EIS, project structures could be damaged by problematic soils exposing people or structures to hazards (Impact G-6). Unsuitable soils include corrosive soils which have a potential to corrode steel and concrete and expansive soils which exhibit shrink-swell behavior that can cause differential and cyclical foundation movements. The potential for these unsuitable soil characteristics to occur along the San

Gabriel Mountains region of the Project is unchanged by the Station Fire, and thus there would be no change in the nature or significance of Impact G-6 due to the Station Fire.

Damage to Project structures due to slope failure (Criterion GEO7)

As discussed in the EIR/EIS, portions of the Project located in the San Gabriel Mountain areas with steep slopes could potentially be subject to slope failures under Criterion GEO 7, resulting in the occurrence of Impact G-7 (Transmission line structures could be damaged by landslides, earth flows, or debris slides, during operation). The temporary loss of stabilizing vegetation due to the Station Fire may cause additional soil creep, soil slumps, and debris flows on moderate to steep slopes where soils may become saturated and flow onto project access roads, helicopter sites, or transmission structure sites. This would result in a temporary increase in the potential for Impact G-7 to occur along the San Gabriel Mountain portions of Segments 6 and 11.

APMs and Mitigation Measures introduced in the EIR/EIS would address and minimize these impacts, and would include: APM GEO-2 and Mitigation Measure G-3 (Conduct geological surveys for landslides and protect against slope instability) to address slope stability issues for Impact G-7. Thus there would be no change in the nature or significance of Impact G-7, as described in the EIR/EIS, due to the Station Fire. In addition, the Station Fire does not introduce new geology or soils impacts under Criterion GEO7, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion GEO7 would remain Class II, as described in the EIR/EIS.

Destruction of unique paleontological resources (Criterion GEO8)

No paleontological resources are present in the San Gabriel Mountains region, and thus Criterion GEO8 and Impact G-8 (Grading and excavation could destroy paleontological resources) do not apply to this portion of the Project. Therefore the Station Fire would not alter or change the significance of Impact G-8, as described in the EIR/EIS.

2.6.4 Cumulative Effects Analysis

Existing cumulative conditions in the San Gabriel Mountains region are defined by past and ongoing development throughout the area that has resulted in substantial alterations to the natural landscape. Past, existing, and future projects could contribute to the cumulative effects of geology, soils, and paleontological resources creating any of the following conditions: triggering or acceleration of erosion or slope failures; loss of mineral resources, and damage or loss to paleontological resources. These conditions would be limited to the areas within and adjacent to the boundaries of individual projects. In order to be cumulatively considerable, such conditions would have to occur at the same time and in the same location as the same or similar conditions of the proposed Project. Seismic impacts (groundshaking, earthquake-induced ground failure, and fault rupture) from the numerous local and regional faults comprise an impact of the geologic environment on individual projects and would not introduce cumulatively considerable impacts. It is assumed that the moderate to severe burn that occurred along Segments 6 and 11 in the San Gabriel Mountains region resulted in loss of nearly all of the vegetation that typically reduces erosion during rain events and stabilizes soils on steep slopes resulting in a distinct change in the baseline conditions related to erosion of soil and stabilization of soils on steep slopes. It is expected that the vegetation will regrow and that the Station Fire will not affect soil erosion and slope stability in the long term.

In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the

CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

In the EIR/EIS it has been determined that three impacts associated with the proposed Project would not be cumulatively considerable and therefore would not contribute to cumulative impacts, these impacts include: Impact G-1 (Project activities could interfere with access to known energy resources), Impact G-2 (Erosion could be triggered or accelerated due to construction activities), and Impact G-3 (Excavation and grading during construction activities could cause slope instability or trigger landslides). The Station Fire does not change the potential for these impacts to cumulatively combine with past and future projects.

Following is a discussion of the geology, soils, and paleontology impacts identified in the EIR/EIS and the potential for the Projects incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution could be determined to be cumulatively considerable.

- **Project structures could be damaged by surface fault rupture at crossings of active faults (Impact G-4).** The occurrence of the Station Fire does not effect on the presence of active faults or the likelihood of fault rupture and would not change the potential for this impact to occur. As described in the EIR/EIS, damage to and/or failure of proposed Project structures in the event of surface fault rupture at crossings of active faults could combine with past and future projects to result in a significant impact where such structures are in close proximity to other structures or people. However, the Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Project structures could be damaged by seismically induced groundshaking and/or ground failure (Impact G-5).** The occurrence of the Station fire in this area does not have any effect on the presence of active faults in the area nor the likelihood of earthquakes to occur and thus would not change the potential for this impact to occur. As described in the EIR/EIS, large earthquakes on regional faults could result in strong to very strong seismically induced groundshaking, liquefaction, and earthquake induced slope failures, potentially resulting in the failure of Project structures and adjacent structures which would combine to result in a significant cumulative impact where such structures are in close proximity to other structures or people. However, the Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Project structures could be damaged by problematic soils exposing people or structures to hazards (Impact G-6).** Effects of the Station Fire would not affect or change the expansive and corrosive characteristics of the soil in the Project area. As described in the EIR/EIS, unsuitable soils could damage Project structures and structures of past and future projects facilities, comprising their structural integrity. 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. However, the Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Project structures could be damaged by landslides, earthflows, debris flows and/or rock fall (Impact G-7).** As described in the EIR/EIS, the proposed Project could contribute to the potential for damage to and/or failure of proposed Project structures and adjacent structures which would combine to result in a significant impact where such structures are in close proximity to other structures or people. The mountain region where the Station Fire occurred is characterized by undeveloped lands and open space with moderate to steep slopes throughout, and the removal of stabilizing vegetation by the fire may result in temporary, localized increases soil creep, soil slumps, and debris flows during the rainy season or spring snow melt period, until protective vegetative cover and root structure are restored following the fire. Therefore, in the

short-term, effects of the Station Fire could contribute to this cumulative effect. However, the Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

- **Grading and excavation could destroy paleontological resources (Impact G-8).** As described in the EIR/EIS, portion of the Project Area are underlain by geologic units with potential for significant paleontological resources and construction of the project in areas of overlapping development with other projects would be likely that important fossils or paleontological resources would be uncovered in at least several of these sites. However, the Station Fire occurred in an area of The San Gabriel Mountains with no paleontological resources and thus would not affect the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

In summary, the proposed Project would contribute to five geology, soils and paleontology impacts that would be less than significant with no additional mitigation required (Class III). The Station Fire would contribute to one of these cumulative impacts, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.7 Hydrology and Water Quality

2.7.1 Introduction

For the purposes of the hydrology and water quality analysis presented in the EIR/EIS for the proposed TRTP, the Study Area was divided into three regions: North Region, Central Region, and South Region. The Station Fire occurred within the Central Region of the Study Area and, therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on the Central Region.

2.7.2 Changed Conditions

The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. As described in Section 3.8 (Hydrology and Water Quality) of the EIR/EIS, the State of California uses a hierarchical naming and numbering convention to define watershed areas, with boundaries defined according to size and topography, and with multiple sub-watersheds within larger watersheds. Table 3.8-2 (State of California Watershed Hierarchy Classifications) of the EIR/EIS shows the primary watershed classification levels used by the State of California, listed in order of largest to smallest as follows: Hydrologic Region (HR), Hydrologic Unit (HU), Hydrologic Area (HA), and Hydrologic Sub-Area (HSA). The area affected by the Station Fire is located entirely within the South Coast Hydrologic Region (HR). Within this HR, the Station Fire burned lands within the Los Angeles River Hydrologic Unit (HU), as well as a portion of the Santa Clara-Calleguas HU (to the north) and the San Gabriel River HU (to the southeast). This area drains to the South Coast HR and eventually to the Pacific Ocean. Water quality regulation for this area is governed by the Los Angeles RWQCB (LARWQCB).

Topography in the Central Region is generally rugged with deep, V-shaped canyons separated by sharp dividing ridges. Steep walled canyons with side slopes of 70 percent or more are common. The gradient of principal canyons ranges from 150 to 850 feet per mile. The principal vegetative cover of upper mountain areas consists of various species of brush and shrubs known as chaparral. Most trees found on mountain slopes are oak, with alder, willow, and sycamore found along streambeds at lower elevations. Pine, cedar, and juniper are found in ravines at higher elevations and along high mountain summits. Stream channels are typically unimproved and defined by the natural drainage of the landscape. (LADPW, 2005b)

Following containment of the Station Fire, it is expected hydrology and water quality conditions will be temporarily affected as a result of fire-related damage to vegetation and soil characteristics. The burning of vegetation results in soil exposure and susceptibility to disturbance by wind and precipitation, which subsequently causes higher rates of erosion, particularly in steep or variable topography such as within the Station Fire burn area. In addition, during a fire, the heating of soils can create a hydrophobic (water-repellant) layer near the surface of the soils, which results in increased rates of runoff. The severity of the water repellency in the surface soil layer typically decreases over time as it is exposed to moisture and in many cases, it does not substantially affect infiltration beyond the first year (USDA Forest Service, 2005). As reported in the Station Fire Burn Area Emergency Response (BAER) Hydrology Specialist Report for the ANF (USDA Forest Service, 2009d), the highest amounts of sediment yields from the burned watersheds are expected during the first year after the fire, prior to any project-related construction (currently scheduled to begin in October 2010). Therefore, post-fire soil conditions are expected to be temporary, as related to the environmental setting for hydrology and water quality, and will eventually return to pre-fire conditions. Also, as reported in the BAER Hydrology Specialist Report, threats to human life, property, and infrastructure as a result of the Station Fire include the following: roads with low-water crossings may be flooded and covered with debris; large peak flows and sediment/debris flows could flood downstream areas and infrastructure; and trails, campgrounds, and Forest Service roads in the mountainous areas may be subject to excessive erosion and degradation during large runoff producing storm events. The recommended treatment for these conditions is natural recovery.

2.7.3 Impact Evaluation

The criteria used to evaluate and determine the significance of hydrology and water quality impacts in the EIR/EIS include the following:

- Criterion HYD1: Violate any water quality standards or waste discharge requirements, create any substantial new sources of polluted runoff, or otherwise degrade water quality.
- Criterion HYD2: Substantially deplete groundwater supplies or interfere with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Criterion HYD3: Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion, siltation, or other flood-related damage on- or offsite.
- Criterion HYD4: Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite, or otherwise create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems.
- Criterion HYD5: Result in or be subject to damage from inundation by mudflow.

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related hydrology and water quality impacts previously identified under Significance Criteria HYD1 through HYD4, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Violate any water quality standards or waste discharge requirements, create any substantial new sources of polluted runoff, or otherwise degrade water quality. (Criterion HYD1)

Under Criterion HYD1, impacts identified in the EIR/EIS included the Project's potential for construction activities to degrade surface water quality through erosion and accelerated sedimentation (Impact H-1). As described above (Changed Conditions), soils in the Station Fire burn area are expected to have hydrophobic characteristics for at least the first year after the fire. Hydrophobic soils are more easily disturbed than non-hydrophobic soils, and would likely result in increased erosion, particularly on slopes, if construction activities occur before the soils recover. As described in the EIR/EIS, APMs included as part of the Project would reduce the likelihood of construction-related water quality degradation through erosion and sedimentation. In particular, APM HYD-1 (Construction SWPPP) requires implementation of a Construction Stormwater Pollution Protection Plan (SWPPP), which would include BMPs to reduce erosion and sedimentation, such as straw wattles, water bars, covered stockpiles, silt fences, silting basins, and mulching or seeding to protect exposed areas as well as monitoring to ensure that the BMPs are implemented. Additionally, APM HYD-2 (Environmental Training Program) requires establishment of an environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, and SWPPP measures, to all field personnel.

In order to further reduce the potential for localized, short-term degradation of surface water quality through erosion and sedimentation, especially within the ANF and areas affected by the Station Fire, implementation of Mitigation Measures H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) and H-1b (Dry weather construction), in addition to Mitigation Measure B-2 (Implement RCA Treatment Plan) as described in Section 3.4 (Biological Resources) of the EIR/EIS, would be required.

- H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits);
- H-1b (Dry weather construction); and
- B-2 (Implement RCA Treatment Plan).

Mitigation Measure H-1a would require that an Erosion Control Plan be submitted to the CPUC and the USDA Forest Service prior to commencement of any soil-disturbing activities, while Mitigation Measure H-1b (Dry weather construction) would minimize soil-disturbing activities during wet weather in the ANF, and would prohibit soil-disturbing activities on those lands during major storm events, unless otherwise authorized by the Forest Service. On steeply sloped topography subject to intense precipitation, limiting construction to dry weather substantially lowers the potential to cause erosion and water quality degradation. Mitigation Measure B-2 (Implement RCA Treatment Plan) would require the applicant to receive ANF approval before constructing or modifying any structure, culvert, or bridge or modifying any habitat on NFS lands in Riparian Conservation Areas. Although soils in the Station Fire burn area are more susceptible to disturbance and subsequent water quality impacts until the soil is recovered (including re-vegetation in the burn area), the APMs and mitigation measures described above would minimize the potential for water quality impacts to occur. The Station Fire does not alter the nature or significance of Impact H-1, as described in the EIR/EIS. With implementation of the mitigation measures listed above, this impact under Criterion REC1 would remain Class II, as described in the EIR/EIS.

Other impacts that were identified under Criterion HYD1 in the EIR/EIS included the Project's potential to degrade water quality through the accidental release of potentially harmful or hazardous materials during construction activities (Impact H-2), or during operation and maintenance activities (Impact H-3). Potentially harmful or hazardous materials that may be used during Project construction and/or operation and maintenance include: lead-based paint flakes, diesel fuel, gasoline, lubricant oils, hydraulic fluid, antifreeze, transmission fluid, lubricant grease, cement slurry, and other fluids required for the operation of vehicles and equipment during construction and/or operation and maintenance activities. Motorized equipment could leak hazardous materials such as motor oil, transmission fluid, or antifreeze due to inadequate or improper maintenance, unnoticed or unrepaired damage, improper refueling, or operator error.

The following APMs, which are included as part of the Project, would reduce the likelihood that an accidental spill or release of hazardous materials would directly or indirectly impact water quality: HYD-1 (Construction SWPPP), HYD-2 (Environmental Training Program), HYD-3 (Accidental Spill Control), HYD-4 (Non-storm Water and Waste Management Pollution Controls), and HAZ-2 (Hazardous Materials and Waste Handling Management). APM HYD-1 requires implementation of a Construction SWPPP, which would define the following: where hazardous materials would be stored; where trash would be placed; where motorized equipment would be parked, fueled, and serviced; and where construction materials would be stored. APM HYD-2 requires establishment of an environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention and response measures, and SWPPP measures, to all field personnel. APM HYD-3 requires that the Construction SWPPP include an emergency response program to ensure quick and safe cleanup of accidental spills. APM HYD-4 requires that excess concrete and concrete slurry that is produced during tower and substation construction would be retained on-site within a bermed area and then transported to an approved landfill for disposal. APM HAZ-2 requires development of a Project-specific hazardous materials management and hazardous waste management program, which would outline proper hazardous materials use, storage and disposal requirements as well as hazardous waste management procedures. All Project personnel would be provided with Project-specific training.

Although the APMs APM HYD-1 through APM HYD-4 and APM HAZ-2 would reduce the potential for water quality degradation through the accidental release of potentially harmful or hazardous materials, these adverse effects could still occur. In order to further reduce the potential for degradation of water quality through accidental release of potentially harmful or hazardous materials, implementation of Mitigation Measure H-1b (Dry weather construction) would be required. The Station Fire does not have any effect on Impacts H-2 or H-3, and would not alter the nature or significance of these impacts as described in the EIR/EIS. Impact H-2 would be less than significant with the implementation of mitigation measures (Class II), and Impact H-3 would be less than significant with no mitigation required (Class III). The Station Fire does not introduce new hydrology and water quality impacts under Criterion REC1, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion REC1 would remain as described in the EIR/EIS.

Substantially deplete groundwater supplies or interfere with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted). (Criterion HYD2)

As described in the EIR/EIS, construction, operation, and maintenance of the Project would not cause or contribute to the depletion of groundwater supplies or interference with groundwater recharge in the Project area, and would therefore result in No Impact under Significance Criterion HYD-1. The Station Fire does not have any effect under Criterion HYD2, and does not introduce new hydrology and water quality impacts under Criterion REC2, or require modifications to mitigation introduced in the EIR/EIS.

Place within a watercourse or flood hazard area structures which would impede or redirect flood flows, or otherwise substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion, siltation, or other flood-related damage on- or offsite. (Criterion HYD3)

Under Criterion HYD3, impacts identified in the EIR/EIS included the potential for Project structures to cause erosion, sedimentation, or other flood-related damage as a result of impeding flood flows (Impact H-4). Encroachment of a Project structure into a stream channel or floodplain could result in flooding of or erosion damage to the encroaching structure, diversion of flows and increased flood risk for adjacent property, or increased erosion on adjacent property. As described in the EIR/EIS, the Project would traverse one Flood Hazard Area in the Central Region. The identified Flood Hazard Area is associated with Kentucky Springs Canyon, and although additional flood hazards may be associated with streams within the ANF, FEMA does not map Flood Hazard Areas within the Forest. Implementation of Mitigation Measure H-1a would substantially reduce the potential for damage due to flooding or erosion of the encroaching structure, diversion of flood flows and increased flood risk for adjacent property, or increased erosion on adjacent property through implementation of an erosion control plan and demonstrated compliance with applicable permits, such as local floodplain management ordinances. The Station Fire does not introduce new hydrology and water quality impacts under Criterion REC3, or require modifications to mitigation introduced in the EIR/EIS. With implementation of Mitigation Measures H-1a, this impact under Criterion REC3 would remain Class II, as described in the EIR/EIS.

Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite, or otherwise create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems. (Criterion HYD4)

The rate and amount of surface runoff is determined by multiple factors, including the following: amount and intensity of precipitation; amount of other imported water that enters a watershed; and amount of precipitation and imported water that infiltrates to the groundwater. Infiltration is determined by several factors, including soil type, antecedent soil moisture, rainfall intensity, the amount of impervious surfaces within a watershed, and topography. As described under Criterion HYD1, as a result of the Station Fire, soils in the burn area are temporarily hydrophobic and will likely result in increased surface runoff and decreased infiltration, until soils are fully recovered (including re-vegetation of the burn area). However, with implementation of APMs and mitigation measures described above, that are included as part of the Project, effects of the Station Fire would not substantially increase the rate or amount of surface runoff to the degree that flooding would occur on- or offsite, or that existing or planned stormwater drainage systems would be overwhelmed. The Station Fire does not introduce new hydrology and water quality impacts under Criterion REC4, or require modifications to mitigation introduced in the EIR/EIS.

Result in or be subject to damage from inundation by mudflow. (Criterion HYD5)

Under Criterion HYD5, impacts identified in the EIR/EIS included the potential for Project structures to be inundated by mudflow (Impact H-5). Mudflows are a type of mass wasting or landslide, where earth and surface materials are rapidly transported downhill under the force of gravity. Mudflow may be triggered by heavy rainfall that the soil is not able to sufficiently drain or absorb. As a result of this super-saturation, soil and rock materials become unstable and eventually slide away from their existing location. The area affected by the Station Fire receives heavy seasonal precipitation and contains areas of steep slopes that would increase the probability of mudflow events; however, the soils in this area are not prone to mudslides. With implementation of APMs and mitigation measures described above, that are included as part of the Project, effects of the Station Fire would not contribute to the Project's potential to be inundated by mudflow. The Station Fire does not introduce new hydrology and water quality impacts under Criterion REC5, or require modifications to mitigation introduced in the EIR/EIS.

2.7.4 Cumulative Effects Analysis

Existing cumulative conditions in the Central Region are defined by efforts of the Forest Service to manage the ANF. The Forest Service has prepared a BAER Hydrology Specialist Report for the Station Fire burn area, which recommends that natural recovery is the best treatment for post-fire hydrologic conditions, which are expect to improve within one year following the fire.

Following is a discussion of the cumulative hydrology and water quality impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Construction activities would degrade surface water quality through erosion and accelerated sedimentation (Impact H-1).** The extent of damage to soils as a result of the Station Fire is not yet known, although it is reasonable to assume that the Station Fire will cause hydrophobic characteristics in soils throughout the burn area. However, this affect is temporary and soils are expected to recover within approximately one year. As described in the EIR/EIS, construction of the Project would include soil-disturbing activities that could result in erosion and sedimentation that could affect surface water quality. APMs and mitigation measures included as part of the Project would minimize the potential effects of erosion and sedimentation associated with soil disturbance. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact H-2).** The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials (Impact H-3).** The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows (Impact H-4).** The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Project structures would be inundated by mudflow (Impact H-5).** The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

In summary, the proposed Project would contribute to two hydrology and water quality impacts that would be cumulatively significant and unavoidable (Class I), one hydrology and water quality impact that would be less than significant with mitigation (Class II), and two hydrology and water quality impacts that would be considered less than significant (Class III). The Station Fire would contribute to Cumulative Impact H-1, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.8 Land Use

2.8.1 Introduction

As addressed in Section 1 (Introduction), the Station Fire started near the Angeles Crest Highway and it has burned approximately 160,577 acres of NFS lands in the ANF, as well as private in-holdings and some adjacent non-NFS lands.

For the purposes of the EIR/EIS land use analysis, the Study Area was divided into three regions, including the North Region, Central Region, and South Region. As illustrated in Figure 1, the footprint of the Station Fire primarily occurs within the Central Region, which is located between the Vincent Substation and the southern boundary of the ANF (Milepost [MP] 24.5 of Segment 11, and MP 26.9 of Segment 6. The existing Vincent and Gould Substations are located outside of the ANF's jurisdictional boundaries; however, for the purposes of the land use analysis, these substations are considered part of the Central Region. Due to the location and geographic extent of the fire, the following evaluation is focused on the Central Region.

2.8.2 Changed Conditions

The majority of the ANF is made-up of undeveloped lands used for recreation and natural resource management; there are also some parcels of privately held land that do not fall under the jurisdiction of the Forest Service. As detailed in EIR/EIS Section 3.9.2.1 (Regional Setting [for land use]), suitable land uses within the ANF on NFS lands have been established through eight land use zones, a suite of special designation overlays, as well as designated Inventoried Roadless Areas (IRAs). The ANF additionally includes 11 geographical units called "Places." Each Place has a theme, setting, desired condition and management program emphasis.

The footprint of the Station Fire lies within nine Places, including the Soledad Front Country, Mojave Front Country, Angeles High Country, Angeles Uplands (West), Angeles Uplands (East), Angeles High County, San Gabriel Canyon, Big Tujunga Canyon and Front Country. The footprint additionally falls within lands zoned Back Country, Back Country Non-Motorized, Critical Biological, Developed Area Interface, Existing Wilderness, and Back Country Motorized Use Restricted. The area of the fire's footprint also includes two Special Interest Areas (Aliso-Arrastre Middle and a small portion of Aliso-Arrastre North), one Research Natural Area, four Wild and Scenic Rivers (eligible), and several Prescription 1B IRAs. Some of the ANF's private in-holdings appear to have been affected by the fire (please refer to Figure 1), although it also appears that some of these properties did not burn. Within one-half mile of proposed Segments 6 and 11, it also appears that, outside of the ANF, only the City of La Cañada-Flintridge was affected by the fire (although other jurisdictions more than one-half mile away from the proposed Project were also affected).

Within one-half mile of Segments 6 and 11, the fire affected all portions of Segment 11 between approximately MP 1.5 and MP 22, and all of Segment 6 between approximately MP 2.2 and MP 19.5. However, some lands within one-half mile of the Segment 6 right-of-way (ROW) did not burn between approximately MP 12 and MP 15, and along the eastern side of its ROW between approximately MP 17.3 and MP 19 (a portion of the San Gabriel Wilderness Area).

Segments 6 and 11 both fall within designated utility corridors. Predominant land uses within one-half mile of Segment 6 include recreation, open space, resource management, and designated electrical utility corridors. As with Segment 6, predominant land uses within one-half mile of Segment 11 include recreation, open space, resource management, and designated electrical utility corridors. EIR/EIS Section 3.9.2.2 (Alternative 2: SCE's Proposed Project [environmental setting description for land use]) and its supporting figures in the EIR/EIS's Map and Series Volume detail the existing land uses within one-half mile of these portions of Segments 6 and 11, and also identify applicable Forest Service land use zones, ownership, special designations, Places and IRAs. With the exception of the areas noted in the above paragraph that did not burn, and those types of structures that are capable of withstanding a wildfire, it is assumed that virtually all land use features within one-half mile of Segment 11 from MP 1.5 to MP 22, and Segment 6 between MP 2.2 and MP 19.5, have been either completely destroyed or otherwise substantially damaged.

Within the City of La Cañada-Flintridge, existing land uses within on-half mile of Segment 11 that appear to have been affected by the fire (e.g., destroyed or substantially damaged) include residential, open space/undeveloped, open space/recreation, electrical power facilities, and transportation, communication, and other utilities. Within this area, General Plan land use designations affected by the fire include Residential, Parks/Recreation, and Open Not Developable.

2.8.3 Impact Evaluation

The criteria used to evaluate and determine the significance of land use-related impacts in the EIR/EIS include the following:

- Criterion LU1: Preclude a permitted land use, or create a disturbance that would diminish the function of a particular land use.
- Criterion LU2: Conflict with any applicable federal, State or local land use plans, goals, or policies.

The following analysis evaluates whether the Station Fire affects the magnitude of any impacts previously identified under Significance Criteria LU1 or LU2, whether any new impacts would be introduced as a result of the fire, and whether the effects of the fire necessitate any type of modification to the mitigation measures presented in EIR/EIS Section 3.9 (Land Use).

Preclude a permitted land use, or create a disturbance that would diminish the function of a particular land use (Criterion LU1)

Under Criterion LU1, potential impacts associated with the proposed Project and its alternatives include construction-related disruptions, displacements, or preclusions of existing or planned residential and non-residential land uses, and operational and maintenance disruptions, displacements, or preclusions of existing or planned residential and non-residential land uses. There are both residential and non-residential uses within the ANF and in the City of La Cañada-Flintridge that have been either destroyed or damaged by the fire. However, it is also reasonably assumed that the vast majority of these land uses will be re-established. Regardless of the timing of these re-building efforts, construction of the proposed Project would still result in the same types of impacts as outlined in EIR/EIS Section 3.9.6 (Alternative 2: SCE's Proposed Project [land use impacts]).

Under Criterion LU1, identified mitigation measures presented in the EIR/EIS to reduce possible residential and non-residential land use effects include as related to the proposed Project and its alternatives include:

- L-1a (Construction liaison - Property owners);

- L-1b (Advance notification of construction - Property owners);
- L-1c (Quarterly construction updates - Property owners);
- L-2a (Construction plan provisions - Non-residential property owners);
- L-2b (Aircraft flight path and safety provisions and consultations); and
- L-4 (Consult with federal, State, and local agencies).

Mitigation Measures L-1a though L-2b would reduce potentially significant impacts to existing residential and non-residential land uses within Segments 6 and 11 to less than significant prior to, during and immediately following construction (Impacts L-1 through L-3). Mitigation Measure L-4 would additionally provide affected local jurisdictions and other affected agencies with information related to both construction and operation and maintenance of the Project that would assist them with the planning of their operations, as well as their evaluation of future development and re-development, thereby reducing potential long-term impacts to non-residential land uses to less than significant (Impact L-4).

It is not anticipated that the Station Fire would alter the nature or significance of Impacts L-1 through L-4 (Impact Criterion LU1) for the proposed Project or its alternatives. Although the Station Fire has destroyed several types of land uses (such as residential dwellings and Forest Service facilities and structures), it is reasonable to assume that eventually all these types of uses and their associated structures/development needs will be re-constructed. As such, the Station Fire would not be expected to introduce new, permanent impacts under Criterion LU1, or require any type of modification to the mitigation measures summarized above. With full implementation of these mitigation measures, the proposed Project's impacts under Criterion LU1 would remain adverse but mitigable to a less-than-significant level (Class II), regardless of the Station Fire.

Conflict with any applicable federal, State, or local land use plans, goals, or policies (Criterion LU2)

As outlined in the EIR/EIS, the proposed Project and its alternatives traverse numerous jurisdictions, all of which have adopted plans related to land use planning and management. Nearly forty land use planning documents were reviewed for the proposed Project and its alternatives, and seventeen policies, goals, objectives and standards were found to be directly applicable to Project implementation. Of these seventeen policies, none related to the City of La Cañada-Flintridge were identified for detailed evaluation. Nine goals and management objectives related to the "Land Management Plan: Angeles National Forest" (Land Management Plan) were identified for detailed evaluation. In the EIR/EIS's land use analysis (Section 3.9) it was determined that with two Project-specific amendments to the ANF's Land Management Plan for (1) Standards S9 and S10, and (2) a designated Riparian Conservation Area (RCA), and issuance of construction-related Special Use Permits, no conflicts with USDA Forest Service's adopted plans and policies would occur. It was additionally determined that with implementation of Mitigation Measures L-2b and L-4, as listed above, no conflicts with non-Forest Service adopted land use plans would occur in the Central Region. The occurrence of the Station Fire will require on-going reconstruction/replacement of destroyed and damaged facilities and structures, as well as the implementation of measures to minimize the potential impacts of the fire's environmental consequences (such as erosion control measures for the rainy season, possible hydro-mulching and other revegetation efforts, etc.). However, these emergency actions would not be anticipated to conflict with adopted plans, policies, goals, objectives, or standards because such efforts are typically permissible within the context of an emergency permit or approval, with corrective measures eventually undertaken for full compliance with adopted land use regulations.

The USDA Forest Service's National Strategic Goal 1 and several ANF Land Management Plan objectives address wildfire prevention, suppression, and community and firefighter safety and protection. Although it is possible that the Forest Service may eventually re-evaluate and modify these goals and objectives from "lessons learned" on the Station Fire, this process would not be anticipated to occur in the near future, and predicting the outcome of such an evaluation would be highly speculative. However, in the short-term, it is reasonable to assume that the Applicant would adhere to any specific fire safety and prevention measures stipulated by the Forest Service as part of its discretionary review and approval process, including those that may evolve from the Forest Service's experience with the Station Fire. Therefore, no conflicts with any applicable federal, State, or local land use plans, goals, or policies would be anticipated to occur as a result of the Station Fire. The Station Fire does not have any effect on this impact, and would not alter the nature or significance of the impact as described in the EIR/EIS.

2.8.4 Cumulative Effects Analysis

EIR/EIS Table 2.9-6 (Cumulative Projects on NFS Lands) lists planned and proposed projects on NFS lands, which include the Los Angeles River District, San Gabriel River Ranger District, and the Santa Clara/Mojave Rivers District of the ANF. However, no specific projects in the Central Region have been identified that would contribute to a cumulative impact on residential or non-residential land uses. As mentioned above, it is reasonable to assume that, in the aftermath of the Station Fire, on-going reconstruction/replacement of destroyed and damaged facilities and structures associated with specific types of land use will occur, both on and off NFS lands. The following discussion addresses the cumulative land use impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to these impacts as related to changed conditions resulting from the Station Fire.

- **Preclude a permitted land use, or create a disturbance that would diminish the function of a particular land use (Criterion LU1).** The Station Fire will require the reconstruction/replacement of both private and public facilities for specific types of land uses within the ANF and in the City of La Cañada-Flintridge. Some of these activities may occur in the very near future (e.g., undertaken as emergency measures), while other activities may not be implemented for several months or years; additionally, some of these activities could likely involve repairs to the existing transmission lines associated with the proposed Project. Although the timing or magnitude of these activities cannot be predicted with any certainty at this time, it is possible that if some of these actions are implemented at the same time as Project construction, they could temporarily disrupt, displace, or preclude existing residential or non-residential land uses (Impacts L-1 and L-2). However, these impacts would be temporary in nature and with application of Mitigation Measures L-1 through L-2b, the proposed Project's incremental contribution to cumulative land use impacts during construction would not change.

  As referenced above, reconstruction/replacement activities caused by the Station Fire could continue for several years. As such, some of these activities could continue into the operation and maintenance phase of the Project. However, within the Central Region, the proposed Project would be operated and maintained within existing utility corridors; its operation and maintenance would not be expected to change substantially from existing conditions and would not permanently disrupt, displace or preclude any surrounding residential or non-residential land uses (Impacts L-3 and L-4), regardless of whether they require reconstruction/replacement.
- **Conflict with any applicable federal, State, or local land use plans, goals, or policies (Criterion LU2).** As noted above, with implementation of Mitigation Measures L-2b and L-4, construction, operation and maintenance of the proposed Project would not conflict with applicable federal, State or local adopted land use plans (Impact L-5) in the Central Region. Although some post-fire measures may require activities that do not fully comply with adopted land use policies, goals, objective or standards, such efforts are typically allowable within the context of an emergency permit or approval, with corrective measures eventually

undertaken for full compliance with adopted land use ordinances and regulations. Therefore, the physical and/or procedural/administrative actions necessary to recover from the Station Fire would not be anticipated to conflict with any applicable federal, State, or local land use plans, goals, or policies. Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.

In summary, within the Central Region, the proposed Project would not result in any land use impacts, individually or cumulatively, that would be significant and unavoidable. All impacts would be either less than significant (Class III) or mitigable to a less-than-significant level (Class II). Although the Station Fire has either partially disrupted or entirely destroyed residential and non-residential land uses and their related facilities and structures, the reconstruction/replacement of these previously existing uses would not be anticipated to result in any significant and unavoidable impacts, individually or cumulatively; such efforts would, overall, simply replace (and potentially improve) existing conditions. As such, the Station Fire will not alter the nature or significance of the proposed Project's land use impacts as addressed in the EIR/EIS.

2.9 Noise

2.9.1 Introduction

As related to the noise analysis presented in the EIR/EIS for the proposed TRTP, the Station Fire occurred within TRTP Segment 6 and Segment 11. Therefore, this evaluation of how the fire may affect the EIR/EIS noise analysis is focused on construction, operation, and cumulative noise impacts within these two segments. These segments and the proposed alignments are part of all alternatives (Alternatives 2 through 7).

2.9.2 Changed Conditions

Prior to the Station Fire, NFS lands within Segments 6 and 11 were characterized as undeveloped and open space land managed by the Forest Service for the purposes of recreation and natural resources management. Other than these recreational resources and opportunities in the ANF and several scattered residential units within the ANF on private land inholdings, few other noise sensitive receptors were identified in the EIR/EIS within the affected portions of TRTP Segments 6 and 11. ANF land used for recreational purposes is currently unavailable as a result of the fire, but will eventually be reopened to the public.

Section 3.10 (Noise) of the EIR/EIS, Table 3.10-2 (Ambient Noise Levels along Proposed Project Route), presented the results of ambient noise measurements taken along the proposed TRTP route. Within the ROW of both Segments 6 and 11, existing 220-kilovolt (kV) transmission lines were active at the time ambient noise measurements were conducted. Due to the open space nature of the NFS lands within TRTP Segments 6 and 11, corona discharge noise from these existing transmission lines was considered in the EIR/EIS as a major component of ambient noise sources within this ROW. Table 3.10-3 (Existing Audible Corona Noise along Proposed Project Route) of the EIR/EIS presents the calculated corona noise from existing transmission lines within Segments 6 and 11 of the proposed Project. Although these existing 220-kV transmission lines may be subject to temporary disruption(s) as a result of the Station Fire, any damage to these existing lines will likely be repaired expeditiously due to existing power load requirements. The ambient corona noise levels associated with existing transmission lines will be the same as described in the EIR/EIS.

2.9.3 Impact Evaluation

The criteria used to evaluate and determine the significance of noise impacts in the EIR/EIS include the following:

- Criterion NOI1: A substantial temporary or periodic increase in ambient noise levels during construction in the vicinity of sensitive receptors above levels existing without the Project.
- Criterion NOI2: A permanent and substantially higher level of ambient noise source in the vicinity of sensitive receptors.

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related noise impacts previously identified under Significance Criteria NOI1 or NOI2, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Substantial temporary or periodic increase in ambient noise levels during construction in the vicinity of sensitive receptors above existing levels (Criterion NOI1)

Under Criterion NOI1, impacts identified in the EIR/EIS included the Project's potential to impact sensitive receptors as a result of significant temporary increases in ambient noise levels (Impact N-1) and/or to exceed jurisdictional noise ordinances pertaining to temporary noise levels (Impact N-2) during TRTP construction. The Station Fire will not substantially alter the construction schedule or types of construction equipment evaluated in the EIR/EIS noise analysis. As discussed above, sensitive receptors within the ANF portions of Segments 6 and 11 include recreational resources and several scattered residential units. The Station Fire has temporarily closed these ANF recreational resources but they will eventually be reopened to the public. While residential units within the ANF were damaged or destroyed as a result of the Station Fire, none of these units are located in close proximity to Segments 6 and 11.

As discussed above, the Station Fire will not have a long-term effect on ambient corona noise levels associated with existing 220-kV transmission lines. In addition, the Station Fire will have no effect on the Project's maximum construction noise levels analyzed in the EIR/EIS and presented in EIR/EIS Table 3.10-4 (Estimated Construction Equipment Noise Levels Versus Distance). As the EIR/EIS noise analysis for Criterion NOI1 assumed that all sensitive receptors located within the ANF would be present during Project construction, mitigation measures introduced in the EIR/EIS would address temporary construction impacts to ANF receptors, including:

- APM NOI-1 (Limit Hours and Days for Construction), APM NOI-3 (Advance Notification), APM NOI-4 (Establish Toll Free Number);[2]
- N-1a (Implement Best Management Practices for construction noise); and
- N-1b (Avoid sensitive receptors during mobile construction equipment use).

The 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) would reduce construction noise and impact significance. However, the level of construction noise would still be substantially higher than ambient noise and would disturb sensitive receptors to a significant level. The EIR/EIS noise analysis assumes that recreational facilities are in use during Project construction, and that recreational users are sensitive noise receptors. Although the full extent of damage to recreational resources from the Station Fire is not yet known, as described below in Section 2.14 (Wilderness and Recreation), it is expected that fire-related impacts to recreational resources within the ANF will be temporary. As such, construction noise impacts would be identical to those described in the EIR/EIS. In accordance with CEQA, impact significance determinations within the EIR/EIS were provided for the Project

[2] Applicant Proposed Measures (APMs) are a commitment by the Applicant (SCE) and are considered part of the proposed Project.

as a whole, and therefore, regardless of whether the Station Fire has an effect on the presence of sensitive noise receptors at the time of Project construction, the mitigation measures and significance of the construction noise impacts (Impact N-1) of the proposed Project would not change from that presented in EIR/EIS. Construction noise associated with the proposed Project would continue to result in significant impacts (Class I).

The Station Fire does not change the applicable 2005 Forest Land Management Plan (Forest Plan) serving as the primary policy document regulating the ANF portions of Segments 6 and 11, as analyzed in the EIR/EIS. As discussed above, the Station Fire will not significantly affect existing ambient corona noise or construction noise associated with the Project. Therefore, the Station Fire would have no effect on the construction noise policy consistency analysis (Impact N-2) presented in the EIR/EIS. While construction noise associated with the proposed Project was found to be consistent with the Forest Plan in the EIR/EIS, it would be inconsistent with a number of other jurisdictional policies and ordinances pertaining to construction noise levels, thereby resulting in a significant impact (Class I). The Station Fire would have no affect on this significance determination.

In summary, the Station Fire does not alter the nature or significance of Impacts N-1 or N-2 associated with Criterion NOI1, as described in the EIR/EIS. In addition, the Station Fire does not introduce new noise impacts under Criterion NOI1, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion NOI1 would remain significant (Class I) for the proposed Project as a whole, as described in the EIR/EIS.

A permanent and substantially higher level of ambient noise source in the vicinity of sensitive receptors (Criterion NOI2)

Under Criterion NOI2, impacts identified in the EIR/EIS included the Project's potential to affect sensitive receptors as a result of significant permanent increases in ambient noise levels (Impact N-3) and/or to exceed jurisdictional noise ordinances pertaining to ambient noise levels (Impact N-4) during Project operation and maintenance. Corona noise from existing 220-kV transmission lines along TRTP Segments 6 and 11 within the ANF was considered in the EIR/EIS as a component of both ambient noise sources, Table 3.10-3 (Existing Audible Corona Noise along Proposed Project Route), and as a component of calculated future noise sources in conjunction with the proposed Project, Table 3.10-5 (Modeled Future Audible Corona Noise along Proposed Project Route). As described above, these existing 220-kV transmission lines may be subject to temporary disruption(s) as a result of the Station Fire, but any damage is expected to be repaired expeditiously due to existing power load. The ambient corona noise levels associated with existing transmission lines will be the same as described in the EIR/EIS. Existing ambient conditions and modeled future noise levels within the Station Fire burn area are the same as described in the EIR/EIS, and would not affect the significance of the modeled future noise increase identified in the EIR/EIS.

As discussed above, sensitive receptors located in the ANF include recreational resources, and scattered residential structures on private land inholdings. Recreational resources throughout the burn area are presently unavailable as a result of the fire, but will eventually be reopened and/or restored to pre-fire conditions for public use. Residential units within the ANF were damaged or destroyed as a result of the Station Fire, but none of these units are located in close proximity to Segments 6 and 11. In addition, it should be noted that a portion of Segment 11 is located outside of NFS lands and includes sensitive receptors. The presence of sensitive receptors throughout the Station Fire burn area would be the same during operation and maintenance of the Project as described in the EIR/EIS. Furthermore, the Station Fire would not alter the noise analysis of inspections and maintenance activities within the ANF portions of TRTP Segments 6 and 11.Therefore, operational noise impacts (Impact N-3) would remain unchanged from that presented in the EIR/EIS; this impact would remain significant and unavoidable (Class I).Based on the assumption that the Station Fire has no effect on the 2005 Forest Plan, no change to the noise policy consistency analysis presented in the EIR/EIS would occur as a result of the Station Fire. While operational noise of the proposed Project would be consistent with the 2005 Forest Plan, it would not be in compliance with a number of other jurisdictional noise regulations along the remaining portions of the proposed Project ROW. Therefore, operational noise of the proposed Project as a whole would be inconsistent with applicable noise policies and ordinances (Impact N-4), and this impact would remain significant and unavoidable (Class I).

In summary, the Station Fire does not alter the nature or significance of Impacts N-3 or N-4 associated with Criterion NOI2, as described in the EIR/EIS for the proposed Project as a whole. In addition, the Station Fire does not introduce new noise impacts under Criterion NOI2. Impacts under Criterion NOI2 would remain Class I for the proposed Project as a whole, as described in the EIR/EIS.

2.9.4 Cumulative Effects Analysis

Future projects on NFS lands in the ANF considered in the EIR/EIS cumulative noise analysis focused on repairs, re-establishment, and rehabilitation of existing facilities. The extent of damage to ANF lands and resources from the Station Fire is not yet known. However, it is reasonable to assume that infrastructure and sensitive receptors throughout the ANF portions of the proposed Project have been damaged by the fire and will be repaired or replaced by the Forest Service, to the extent practicable. In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative noise impacts identified in the EIR/EIS. Following is a discussion of the cumulative noise impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Construction noise would substantially disturb sensitive receptors (Impact N-1).** As discussed above, the Station Fire would not alter ambient noise conditions in the ANF, as presented in the EIR/EIS, and would have no potential to affect construction noise associated with the proposed Project. Therefore, the Station Fire does not alter the Project's contribution to this cumulative effect; the nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS.
- **Construction noise levels would violate local standards (Impact N-2).** As discussed above, the Station Fire does not alter the applicable 2005 Forest Land Management Plan, and has no effect on the construction noise policy consistency analysis presented in the EIR/EIS for the ANF portions of Segments 6 and 11. Therefore, the Station Fire does not alter the Project's contribution to this cumulative effect; the nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS.
- **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 (Impact N-3).** As discussed above, the Station Fire would not alter ambient noise conditions in the ANF, as presented in the EIR/EIS, and would have no potential to affect operations and maintenance noise associated with the proposed Project. Therefore, the Station Fire does not alter the Project's contribution to this cumulative effect; the nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS.
- **Operational noise levels would violate local standards (Impact N-4).** As discussed above, the Station Fire does not alter the applicable 2005 Forest Land Management Plan, and has no effect on the operations and

maintenance noise policy consistency analysis presented in the EIR/EIS for the ANF portions of Segments 6 and 11. Therefore, the Station Fire does not alter the Project's contribution to this cumulative effect; the nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS.

In summary, the Station Fire does not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.10 Public Services and Utilities

2.10.1 Introduction

The Station Fire occurred within the Central Region of the Study Area and, therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on the Central Region.

2.10.2 Changed Conditions

The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of Segment 6 and approximately 70 percent of Segment 11. These segments and the proposed alignments are part of all alternatives (Alternatives 2 through 7). Most of the Central Region is characterized by undeveloped lands and open space managed by the USDA Forest Service, which has primary wildland fire suppression responsibility on NFS lands. The Southern California Geographic Coordination Center (GACC) also has responsibility for the mobilization of federal resources within the sphere of influence of the ANF. In addition, the Forest Service has a Mutual Aid agreement with the Los Angeles County Fire Department (LACFD) to provide fire services, and the California Department of Forestry has contracts with the LACFD to protect privately owned forestlands, watersheds, and rangelands referred to as State Responsibility Areas (SRAs). Section 3.11 (Public Services and Utilities) of the EIR/EIS lists the fire stations potentially affected by construction and operation of the TRTP. However, none of the fire stations noted in Section 3.11 are located within the Station Fire boundary.

Law enforcement is provided by the Forest Service, California Department of Fish and Game (CDFG), and the California Highway Patrol (CHP). However, none of the Forest Service ranger district offices noted in Section 3.11 are located within the Station Fire boundary, nor are there CDFG or CHP stations located near the ANF. Likewise, none of the schools or hospitals noted in Section 3.11 are within the Station Fire boundary. However, the Los Angeles County Department of Public Work's Road Maintenance Yard 557A is located within the Station Fire boundary.

There may be utility infrastructure that is within the boundaries of the Station Fire. However, no major utility station, including natural gas, electricity, wastewater, and water systems, is located within the Station Fire boundaries. In addition, the solid waste management and disposal facilities listed in Section 3.11 are not located within the Station Fire boundary.

2.10.3 Impact Evaluation

The criteria used to evaluate and determine the significance of impacts related to public services and utilities in the EIR/EIS include the following:

- Criterion PSU1: Increase demand for public services that cannot be readily met by existing public service providers and facilities
- Criterion PSU2: Impede or interfere with existing public services emergency access

- Criterion PSU3: Result in a major reduction or interruption of existing utility systems or cause a collocation accident
- Criterion PSU4: Substantially change the ability of water treatment, wastewater treatment, or solid waste facilities to adequately supply water and accommodate solid waste and wastewater
- Criterion PSU5: Require new or expanded water entitlements and resources
- Criterion PSU6: Conflict with or be unable to adhere to federal, State, and/or local laws, regulations, or standards relating to solid waste

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related public service and utility impacts previously identified under Significance Criteria PSU1 through PSU6, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Increase demand for public services that cannot be readily met by existing public service providers and facilities (Criterion PSU1)

Under Criterion PSU1, impacts identified in the EIR/EIS included the Project's potential increase in the need for emergency services if an accident or other emergency incident were to occur at a construction site (Impact PSU-1). A potential hazard could be the accidental ignition of a fire within the dry vegetation along the construction zone, particularly in the ANF where chaparral vegetation is prevalent and there is a considerable history of wildfires. However, the fire risks associated with proposed Project construction activities would also be reduced with the implementation of SCE's Fire Management Plan, which is intended to prevent, control, and extinguish fire during the construction period. In addition, the mitigation measures introduced in the EIR/EIS would also address these effects, and include the following:

- 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)

The Station Fire does not increase the potential need for emergency services. It is more likely that the Station Fire reduces fire potential in the vicinity of Segments 6 and 11 in the near term as much of the vegetative fuel has now been burned. With implementation of the mitigation measures listed above, Impact PSU-1 would remain Class II, as described in the EIR/EIS.

Impede or interfere with existing public services emergency access (Criterion PSU2)

Under Criterion PSU2, impacts identified in the EIR/EIS included the Project's potential to temporarily result in lane closures during the construction period and interfere with emergency response vehicles (Impact PSU-2).Temporary lane closures during proposed Project construction could potentially interfere with emergency response vehicles, such as police, fire, and medical vehicles. This would be of particular concern in rural areas, such as the ANF, where roads are limited to two lanes and substantially longer distances must be traveled to utilize alternative routes. However, Mitigation Measure T-1a (Prepare Traffic Control Plans) requires SCE to inform emergency service agencies of road closures, detours, and delays. This measure also includes provisions to accommodate emergency vehicles, such as immediately stopping work for emergency vehicle passage, short detours, and alternate routes developed in conjunction with local agencies. The implementation of Mitigation Measure T-1a would mitigate this impact to a less-than-significant level (Class II).

Within the boundaries of the Station Fire, if there is damage to existing roads, potential impacts to emergency access would be reduced or avoided by implementation of Mitigation Measure T-1a, and impacts to emergency services would remain at a less-than-significant level (Class II).

Also under Criterion PSU2, impacts identified in the EIR/EIS included the Project's potential to impede emergency aircraft response services (Impact PSU-3). Helicopters and airplanes are often the fastest resources to respond to an emergency situation, and the use of helicopters during construction in the ANF could interfere with emergency response aircrafts if an emergency were to occur in the vicinity of proposed helicopter construction sites. However, should construction or maintenance activities require the use of helicopters, 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. The Station Fire would not alter the use of helicopters for construction and maintenance and, therefore, would not introduce any new impacts or alter the significance conclusion stated in the EIR/EIS. As a result, these impacts would not be significant (Class III).

Result in a major reduction or interruption of existing utility systems or cause a collocation accident (Criterion PSU3)

Under Criterion PSU3, an impact identified in the EIR/EIS included the Project's potential to disrupt utility systems during the construction period (Impact PSU-4). Disruptions in the flow of water and/or gas utility services are likely during the construction period. However, Mitigation Measure PSU-4 requires SCE to notify members of the public, the jurisdiction, and the service providers that would be affected by the planned outage. The Station Fire would not increase the potential for disruption of utility systems and, therefore, would not introduce any new impacts or alter the significance conclusion stated in the EIR/EIS. As a result, with implementation of Mitigation Measure PSU-4 this impact would remain at a less-than-significant level (Class II).

Also under Criterion PSU3, an impact identified in the EIR/EIS included the Project's potential to disrupt public works maintenance yards during construction. In particular, construction of the proposed Project could temporarily interrupt access to the Los Angeles County's Department of Public Work (DPW) road maintenance yard (RD557A) located in the ANF near Segment 11. Access to the maintenance yard may be interrupted by damage to roads from the Station Fire. However, as stated in the EIR/EIS, implementation of Mitigation Measure PSU-5 (Notification of public service interruption) requires coordination with the DPW in order to avoid multiple or extended disruptions. If damage by the Station Fire has presented potential disruptions, this mitigation would include coordination regarding potential disruptions that may be a result of the Station Fire. If this is the case, impacts to maintenance yards would be temporary and mitigation would require coordination between SCE and DPW; therefore, this impact would remain at a less-than-significant level (Class II).

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)

Under Criterion PSU4, impacts identified in the EIR/EIS included the Project's potential to temporarily increase water use during construction and contribute to increased long-term water consumption during the operation period. Water would be required for dust suppression, human consumption, and sanitary purposes during the entire Project construction period. This would temporarily create increased demand for water from local water purveyors along the proposed route. This increase would not be large enough to affect the existing supply, especially considering that water usage for the proposed Project would be spread over a 59-month period and across multiple locations, thereby not creating a significant increase in demand at one particular time or place. The water requirements of the Project would not change the ability of the water suppliers identified in Section 3.11 to serve existing customers. As a result, the impact would not be significant (Class III).

Also under Criterion PSU4, impacts identified in the EIR/EIS included the Project's potential to generate additional wastewater and solid waste during construction and operation (Impacts 7 and 8). Wastewater generation associated with 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. As a result, the impacts on wastewater capabilities would not be significant (Class III).

The Station Fire does not alter the amount of water needed for construction and operation, nor does it alter the amount of wastewater and solid waste that would be generated during construction and operation. As such, the Station does not introduce new impacts under Criterion PSU4 and would not change the significance determination stated in the EIR/EIS.

Require new or expanded water entitlements and resources (Criterion PSU5)

Under Criterion PSU5, during Project construction water would be required for dust suppression, domestic drinking, and sanitary purposes. The amount of water required would be largely dependent on site-specific conditions, and would be used over the 59-month construction period for the proposed Project. Therefore, water used during construction would not increase the demands of the water suppliers identified in Section 3.11, and would not require new or expanded water facilities, sources, or entitlements. In addition, during the operation and maintenance period the insulators would not require annual cleaning. Consequently, the proposed Project would require negligible amounts of water for maintenance activities. Water demands of the proposed Project would not pose an impact (No Impact). The Station Fire would not alter the amount of water required for construction and operation of the proposed Project and, therefore, would not introduce new impacts or alter the significance conclusion stated in the EIR/EIS.

Conflict with or be unable to adhere to federal, State, and/or local laws, regulations, or standards relating to solid waste (Criterion PSU6)

Under Criterion PSU6, impacts identified in the EIR/EIS included the potential for the amount of waste material recycled during construction activities to not adhere to State standards (Impact PSU-9). The Integrated Waste Management Act of 1989, which is described in Section 3.11.3 (Applicable Laws, Regulations, and Standards), requires all local and county governments to adopt a Source Reduction and Recycling Element to identify means of reducing the amount of solid waste sent to landfills. During construction of the proposed Project, removed conductor wiring and metal from replaced tower structures would be dismantled and recycled. Soil from drilling or excavation would be screened and separated for use as backfill to the maximum extent possible. Other waste such as packing crates, spare bolts, and other construction debris would be hauled off site for recycling when possible. Mitigation Measure PSU-9 requires SCE to recycle a minimum of 50 percent of the waste generated during construction activities along the entire Project route.

The Station Fire does not alter the amount of waste that would be generated during construction activities, as described in the EIR/EIS. In addition, the Station Fire does not introduce new impacts under Criterion PSU6, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measure listed above, Impacts PSU-9 would occur in the same way as described in the EIR/EIS, and would remain less-than-significant (Class II).

2.10.4 Cumulative Effects Analysis

In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

Following is a discussion of the cumulative public services and utility impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Emergency services would be needed if an accident or other emergency incident occurs at a construction site (Impact PSU-1).** Construction of the proposed Project along with activities for other projects could result in potentially hazardous conditions that would require emergency services. However, due to mitigation measures required for the proposed Project, the likelihood of the need for emergency response teams as a result of multiple construction accidents would be low. These mitigation measures include: PSU-1a (Revise SCE's Fire Management Plan), PSU-1b (Review of construction methods by county fire departments), PSU-1c (Practice safe welding procedures), and PSU-1d (Fire preventive construction equipment requirements). The Station Fire does not alter the nature or magnitude of the Project's contribution to this cumulative effect.
- **Temporary lane closures during the construction period would interfere with emergency response vehicles (Impact PSU-2).** Construction of the proposed Project would interfere with the regular flow of traffic due to temporary lane closures, and would require the implementation of Mitigation Measure T-1a (Traffic Control Plan) in order to reduce the Project's impacts to a less than-significant-level. From a cumulative impacts perspective, emergency vehicles would be adversely affected if construction of other projects listed in the Cumulative Scenario were to occur in the proximity of the proposed Project. In addition, damage from the Station Fire could also interfere with emergency response vehicles. However, with implementation of the Traffic Control Plan required by Mitigation Measure T-1a it is not likely that emergency access would be impeded by multiple construction sites in the same vicinity and timeframe. The Station Fire does not alter the nature or magnitude of the Project's contribution to this cumulative effect.
- **Construction and operation would impede emergency aircraft response services (Impact PSU-3).** Construction and operation of the proposed Project could interfere with emergency aircraft services. Likewise, construction of other projects in the vicinity of the proposed Project could cause interruptions for emergency response operations, and activities related to the Station Fire may also cause interruptions for emergency response operations. However, it is unlikely that interferences would occur at the same time, as all flight operations would be restricted by FAA rules on temporary flight restrictions from flying in designated areas. The Station Fire does not alter affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **Utility systems would be temporarily disrupted during the construction period (Impact PSU-4).** Disruptions in the flow of utility services for co-located utilities are likely to occur during construction of the proposed Project, and would require the implementation of Mitigation Measure PSU-4 (Notification of utility service interruption) in order to reduce the Project's impacts to a less-than-significant level. In addition, construction of other projects in the vicinity of the proposed Project may also cause temporary utility

disruptions. Effects of the Station Fire may also result in temporary disruptions to utility disruptions; however, any disruptions caused by the Station Fire would likely be repaired by the start of construction of the proposed Project. Therefore, the Station Fire does not alter the nature or magnitude of the Project's contribution to this cumulative effect.

- **Public Works maintenance yards would be disrupted during the construction period (Impact PSU-5).** Damage from the Station Fire may contribute to disruptions or access to the DPW road maintenance yard located within the Station Fire boundaries. Similarly, construction of the proposed Project would likely result in disruptions at Public Works maintenance yard, and implementation of Mitigation Measure PSU-5 (Notification of public service interruption) is required to minimize such disruptions. However, projects within the ANF listed in the Cumulative Scenario include fuels management and maintenance of existing facilities, and therefore, are not expected to cause disruptions to the road maintenance yard. As such, if a disruption is known to be unavoidable, SCE shall coordinate with the appropriate Public Works Department/s in order to avoid multiple or extended disruptions. The Station Fire does not alter the nature or magnitude of the Project's contribution to this cumulative effect.
- **Project construction would temporarily increase water use and Project operation would contribute to increased long-term water consumption (Impact PSU-6).** Effects of the Station Fire are not expected to contribute to increased long-term water consumption. As described in the EIR/EIS water would be required for dust suppression during the entire construction period of the proposed project, and the majority of planned and proposed projects included in the Cumulative Scenario are residential developments, which require substantially more water and water infrastructure during construction than the proposed transmission line project. However, the existing water supply for each region listed in Section 3.11, shows that multiple water allocations are available along the entire length of the proposed route. Therefore, while the proposed Project and the present and reasonably foreseeable future projects would require a portion of the available water supply for construction activities, the Station Fire would not contribute to long-term water consumption and this impact would not be significant. The Station Fire does not alter the nature or magnitude of the Project's contribution to this cumulative effect.
- **Additional wastewater would be generated during Project construction and operation (Impact PSU-7).** Effects of the Station Fire would not result in wastewater generation that would exceed the capabilities of wastewater facilities. In addition, projects within the ANF listed in the Cumulative Scenario, include fuels management and maintenance of existing facilities, and therefore, are not expected to generate an amount of wastewater that would exceed the capabilities of wastewater facilities. As a result, while the Project and the present and reasonably foreseeable future projects would incrementally increase cumulative impacts, this would not significantly impact the capabilities of waste management. The Station Fire does not alter the nature or magnitude of the Project's contribution to this cumulative effect.
- **Additional solid waste would be generated during Project construction and operation (Impact PSU-8).** Effects of the Station Fire may contribute to the amount of waste material generated; however, as listed in Section 3.11, waste management services are abundant and there are numerous disposal facilities with available space. Therefore, clean-up efforts for the Station Fire, the proposed Project, and the present and reasonably foreseeable future projects would require waste capabilities, such waste is not expected to exceed the capabilities of existing waste disposal facilities and recycling facilities. Therefore, the Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **The amount of waste material recycled during construction activities would not adhere to State standards (Impact PSU-9).** Effects of the Station Fire may contribute to the amount of waste material that is required to be recycled. However, Mitigation Measure PSU-9 (Recycle construction waste) would ensure the proposed Project's compliance with State standards, and projects included in the Cumulative Scenario are also subject to the Integrated Waste Management Act of 1989. Therefore, maximum recycling efforts during construction activities would be implemented and Impact PSU-9 would not be significant. The Station Fire does not alter the nature or magnitude of the Project's contribution to this cumulative effect.

In summary, the Station Fire would contribute to several of these cumulative impacts, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.11 Socioeconomics

2.11.1 Introduction

For the purposes of the socioeconomics analysis presented in the EIR/EIS for the proposed TRTP, the Study Area was divided into three regions: North Region, Central Region, and South Region. The Station Fire occurred within the Central Region of the Study Area and, therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on the Central Region.

2.11.2 Changed Conditions

The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. The extent of damage from the Station Fire is not yet known, although it is known that some recreational cabins on NFS lands in the ANF been destroyed in the fire. Effects of the Station Fire do not substantially alter the demographics, housing, or labor characteristics that were used to identify socioeconomic impacts in the EIR/EIS.

2.11.3 Impact Evaluation

For the purposes of the socioeconomics analysis prepared for the EIR/EIS, five categories of potential socioeconomic impacts were evaluated, including the following: Population and Housing, Quality of Life, Employment, Private Property Value, Local Business Revenue, and Public Revenue. The following analysis evaluates whether the Station Fire affects the magnitude of any socioeconomic impacts previously identified in the EIR/EIS, or whether any new impacts would be introduced as a result of the fire.

Population and Housing

As described in the EIR/EIS, an impact would occur to population and housing if the Project would: directly or indirectly induce population growth in an area, displace existing residents or housing units and necessitate the construction of replacement housing elsewhere, and/or obstruct proposed or approved residential development. The full extent of damage associated with the Station Fire has not yet been determined, although it is known that some rural cabins were destroyed in the fire. However, as described in the EIR/EIS, there is ample housing available in the Project area, to the north and south of the Station Fire burn area. Effects of the Station Fire will not displace residents to the degree that the construction of replacement housing would be required elsewhere. Additionally, the Station Fire burn area affected lands almost exclusively within the Angeles National Forest, where neither population growth nor residential developments are expected to occur. The Station Fire does not introduce new socioeconomics impacts under population and housing. Impacts to population and housing will remain as described in the EIR/EIS.

Quality of Life

"Quality of life" refers to the level of satisfaction or degree of well-being experienced by an individual partly as a result of physical surroundings, although a variety of factors contribute to an individual's overall experience of quality of life. A variety of temporary impacts associated with the Station Fire could have a temporary adverse effect on factors which some individuals may perceive contribute to their quality of life, such as visual changes and access restrictions throughout the burn area. However, the Station Fire does not introduce new socioeconomics impacts under quality of life. Impacts to quality of life would remain as described in the EIR/EIS.

Employment

The Station Fire will have no effect on the construction workforce required for the Project. The Station Fire does not introduce new socioeconomics impacts to employment; impacts will remain as described in the EIR/EIS.

Private Property Value

Under the private property value issue of concern, impacts identified in the EIR/EIS included the potential for operation and maintenance activities to affect property values along the Project alignment (Impact S-1). The vast majority of the Station Fire burn area is within National Forest System lands of the Angeles National Forest, where this impact does not have the potential to occur. Furthermore, as described in the EIR/EIS, factors that have the potential to affect property value are numerous and varied; as a result, it is not possible to identify exactly how the Project would potentially affect private property values. It is reasonable to assume that some aspect of the Project would potentially affect private property values in the North and South Regions, although the effects of transmission lines on property value are generally smaller in comparison to other relevant factors. Finally, effects of the Station Fire are expected to be long-term yet temporary in nature. The Station Fire does not introduce new socioeconomics impacts under the private property value issue of concern. This impact would occur as described in the EIR/EIS.

Local Business Revenue

Under the local business revenue issue of concern, impacts identified in the EIR/EIS included the potential for construction activities to cause a temporary decrease in revenues for agricultural landowners (Impact S-2). As described in the EIR/EIS, the Project alignment would have the potential to affect agricultural business revenues along Segments 10 and 4; neither of these segments would be affected by the Station Fire. Therefore, the Station Fire does not introduce new socioeconomics impacts under local business revenue. Impacts to local business revenue would remain as described in the EIR/EIS.

Public Revenue

Under the local business revenue issue of concern, impacts identified in the EIR/EIS included the potential for Project activities to affect public agency revenue (Impact S-3). As described in the EIR/EIS, in the short-term, Project construction activities would have the potential to negatively affect Forest Service revenue through decreased sales of National Forest Adventure Passes as a result of temporary closures of Forest recreational areas during the construction period. In order to accommodate Project construction activities, it would be necessary to temporarily restrict public access to some portions of High Impact Recreation Areas (HIRAs). Mitigation Measure R-1e (SCE shall compensate ANF for lost income from Adventure Pass sales due to recreation area closures associated with the Project), as described in Section 3.15 (Wilderness and Recreation) of the EIR/EIS, would help to compensate for this temporary revenue loss by requiring that SCE coordinate with the Forest Service to agree upon an acceptable level of compensation relevant to loss of Adventure Pass revenue. The Station Fire does not introduce new socioeconomics impacts under the public revenue issue of concern, and impacts to public revenue would remain as described in the EIR/EIS.

2.11.4 Cumulative Effects Analysis

Existing cumulative conditions in the Central Region are defined by efforts of the Forest Service to manage the ANF. Following is a discussion of the cumulative socioeconomic impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Operation and maintenance activities would affect property values along the Project alignment (Impact S-1).** The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Construction activities would cause a temporary decrease in revenues for agricultural landowners (Impact S-2).** The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Project activities would affect public agency revenue (Impact S-3).** The Station Fire is not expected to have any effect on the Project's contribution to this cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

In summary, the Station Fire would not contribute to cumulative socioeconomic impacts, and the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.12 Traffic and Transportation

2.12.1 Introduction

For the purposes of the traffic and transportation analysis presented in the EIR/EIS for the proposed TRTP, the Study Area was divided into three regions: North Region, Central Region, and South Region. The Station Fire occurred within the Central Region of the Study Area and, therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on the Central Region.

2.12.2 Changed Conditions

The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. These segments are also part of Alternatives 3 through 7; however, as discussed in the EIR/EIS, impacts of these alternatives within the ANF would be identical or substantially similar to those of the proposed Project. Major roadways in this region of the proposed Project that would be used by construction traffic or crossed by overhead transmission lines include the following two highways:

State Route 2 (SR-2) is a two-lane undivided freeway that traverses the ANF in an east-west direction. This highway, also known as the Angeles Crest Highway, is under the jurisdiction of Caltrans and has an ADT within the ANF of approximately 3,700 vehicles (Caltrans, 2007).

Angeles Forest Highway is a two-lane undivided highway that traverses the ANF in a north-south direction. This highway connects the Antelope Valley region with the Los Angeles metropolitan area. This roadway is under the jurisdiction of Los Angeles County and experiences an ADT of approximately 3,500 trips (Los Angeles County, 2008).

As a result of the Station Fire, SR-2 and Angeles Forest Highway are currently closed to public access. As noted during the October 20, 2009 site visit to the ANF, guard rails lining these roadways have been substantially damaged, roadway striping is not visible, roadway shoulders are lined with piles of various types of debris, and many portions of these roadways are lined with severely burned, dead trees. The roads are currently under repair and will remain closed to the public until all guard rails are replaced and any dead roadside trees that pose potential safety hazards to drivers are removed. It is expected that these repairs will be completed prior to commencement of construction activities in the ANF. In addition to SR-2 and Angeles Forest Highway, Project construction will require use of approximately 14 NFS roads, as well as multiple small maintenance trails and spur roads which provide access between larger NFS roads and proposed transmission tower sites. Some spur roads that will be used during construction are well maintained and continually used, while others are overgrown with brush and show very little evidence of existence.

The conditions of all NFS roads and spur roads as a result of the Station Fire are currently unknown; however, as observed on October 20, 2009 during a site visit to the ANF, the entire burn area is generally devoid of vegetation, therefore it is reasonable to assume that brush that had previously obscured overgrown roads was burned in the fire and such overgrowth no longer exists. Some roads are expected to be damaged by erosion and landslides during winter rain events because erosion and sedimentation in the ANF is expected to increase substantially as a result of the loss of vegetative cover caused by the Station Fire. As mentioned, it is expected that the Forest Service will repair any damaged roads to pre-fire conditions prior to commencement of Project construction activities in the ANF.

2.12.3 Impact Evaluation

The criteria used to evaluate and determine the significance of traffic and transportation impacts in the EIR/EIS include the following:

- Criterion TRA1: A major roadway (arterial or collector classification) would be closed to through traffic as a result of construction activities and there would be no suitable alternative route available; or the installation of the transmission line within, adjacent to, or across a roadway would reduce the number of, or the available width of, one or more travel lanes during the peak traffic periods, resulting in a temporary substantial disruption to traffic flow and/or substantial increased traffic congestion.
- Criterion TRA2: An increase in vehicle trips associated with construction workers or equipment would result in an unacceptable reduction in level of service on the roadways in the Project vicinity.
- Criterion TRA3: Construction activities would temporarily restrict access to or from adjacent land uses and there would be no suitable alternative access.
- Criterion TRA4: Construction activities or operations would restrict the movements of emergency vehicles (police cars, fire trucks, ambulances, paramedic units) and there would be no reasonable alternative access routes available.
- Criterion TRA5: Construction activities would disrupt bus transit service and there would be no suitable alternative routes or stops.
- Criterion TRA6: Construction activities within, adjacent to, or across a railroad right-of-way would result in a temporary disruption of rail traffic.
- Criterion TRA7: Construction activities would impede pedestrian movements or bike trails in the construction area and there would be no suitable alternative pedestrian/bicycle access routes.

- Criterion TRA8: Construction activities or staging activities would increase the demand for and/or reduce the supply of parking spaces and there would be no provisions for accommodating the resulting parking deficiencies.
- Criterion TRA9: Construction should not be inconsistent with regional and local transportation plans.
- Criterion TRA10: An increase in roadway wear in the vicinity of the construction zone would occur as a result of heavy truck or construction equipment movements, resulting in noticeable deterioration of a roadway surface or other features in the road ROW.
- Criterion TRA11: A Project structure, crane, or wires were to be positioned such that it could adversely affect aviation activities.

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related traffic and transportation impacts previously identified under Significance Criteria TRA1 through TRA11, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Closure of roads or reduction of travel lanes (Criterion TRA1)

Under Criterion TRA1, impacts identified in the EIR/EIS included the Project's potential to result in the closure of roads to through traffic or reduction of travel lanes to result in substantial congestion (Impact T-1). Construction of the proposed Project could result in roadway closures at locations where the construction activities, especially transmission line stringing, would be located within ROWs of public streets and highways. Although temporary closures of this nature would likely occur for only a few minutes at a time, even temporary road closures on roads with ADT greater than 10,000 vehicles per lane could substantially disrupt traffic flow and substantially increase traffic congestion, particularly if road closures occurred during a.m. or p.m. peak hours of travel. In addition, delivery of large equipment and materials via truck may require temporary road closures.

The current condition of the two major roadways located within the ANF, SR-2 and Angeles Forest Highway, is unknown. Damage to roads located in the ANF as a result of the Station Fire may result in lane closures or restricted roadway access. However, fire-related road damage is expected to be temporary, and will be repaired prior to Project construction. Mitigation measures introduced in the EIR/EIS would address potential traffic and transportation effects under Criterion TRA1, and include the following:

- T-1a (Prepare Traffic Control Plans); and
- T-1b(Restrict lane closures).

It should be noted that some roads required for Project construction may still be closed and/or under repair at the onset of construction activities. Should this situation occur, Mitigation Measures T-1a and T-1b would be sufficient to ensure that potential impacts under Criterion TRA1 remain less than significant. The Station Fire does not introduce new traffic and transportation impacts under Criterion TRA1, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measures T-1a and T-1b, impacts under Criterion TRA1 would remain Class II, as described in the EIR/EIS.

Unacceptable level of service reduction to vicinity roads (Criterion TRA2)

Under Criterion TRA2, impacts identified in the EIR/EIS included the Project's potential for construction traffic to result in congestion on area roadways (Impact T-2). Construction of the proposed Project would generate additional traffic on regional and local roadways. Construction worker commute trips, Project equipment deliveries, and hauling materials such as support towers, concrete, conductor, and excavation spoils would increase existing traffic volumes in the Project area. It is expected that fire-related damage to roads within the Station Fire burn area will be repaired prior to construction. Therefore, the Station Fire does not introduce new traffic and transportation impacts under Criterion TRA1, or require modifications to mitigation introduced in the EIR/EIS.

Restricted access to properties (Criterion TRA3)

Construction of the proposed Project would not restrict access to driveways or otherwise affect access for the adjacent residences, institutions, businesses, and other uses. The proposed Project would not include any trenching or other excavation in road ROWs that would impede access to adjacent uses. Therefore, there would be no impact associated with restricted access to properties. The Station Fire does not introduce new traffic and transportation impacts under Criterion TRA3.

Restrict the movements of emergency vehicles (Criterion TRA4)

Under Criterion TRA4, impacts identified in the EIR/EIS included the Project's potential for construction activities to temporarily interfere with emergency response (Impact T-3). Overhead construction activities could interfere with emergency response by ambulance, fire, paramedic, and police vehicles. The two major roadways located within the ANF, SR2 and Angeles Forest Highway, are currently closed for repair. It is expected that repairs will be completed prior to commencement of Project construction activities in the ANF. Therefore, the Station Fire does not introduce new traffic and transportation impacts under Criterion TRA4, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measures T-1a and T-1b, impacts under Criterion TRA4 would remain Class II, as described in the EIR/EIS.

Disruption to transit service (Criterion TRA5)

Under Criterion TRA5, impacts identified in the EIR/EIS included the Project's potential for construction activities to temporarily disrupt transit routes (Impact T-4). Overhead stringing activities that would require short-term road closures associated with construction of the proposed transmission line would disrupt transit routes. No transit services use roads located within ANF. Therefore the Station Fire does not alter the nature or significance of Impact T-4, as described in the EIR/EIS. In addition, the Station Fire does not introduce new traffic and transportation impacts under Criterion TRA5, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measure T-4, impacts under Criterion TRA5 would remain Class II, as described in the EIR/EIS.

Disruption to rail traffic (Criterion TRA6)

Under Criterion TRA6, impacts identified in the EIR/EIS included the Project's potential for construction activities to cause a temporary disruption to rail traffic or operations (Impact T-5). Overhead construction activities could interfere with rail traffic because construction of overhead transmission lines could require temporary use or closure of a railroad ROW. No rail lines are located within ANF. Therefore the Station Fire does not alter the nature or significance of Impact T-5, as described in the EIR/EIS. In addition, the Station Fire does not introduce new traffic and transportation impacts under Criterion TRA6, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measure T-5, impacts under Criterion TRA6 would remain Class II, as described in the EIR/EIS.

Impediment of pedestrian movements or bike paths (Criterion TRA7)

Under Criterion TRA7, impacts identified in the EIR/EIS included the Project's potential for construction activities to temporarily interfere with the use of pedestrian/bicycle paths (Impact T-6). Pedestrian and bicycle circulation could be affected by transmission line construction activities if pedestrians and bicyclists were unable to pass through the construction zone or if established pedestrian and bike routes were blocked. There are no designated bicycle paths or pedestrian paths located along the roadways within the ANF that may be affected by construction activities. The Station Fire does not alter the nature or significance of Impact T-6, as described in the EIR/EIS. In addition, the Station Fire does not introduce new traffic and transportation impacts under Criterion TRA7, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measure T-6, impacts under Criterion TRA7 would remain Class II, as described in the EIR/EIS.

Reduction in the supply of parking spaces (Criterion TRA8)

Under Criterion TRA8, impacts identified in the EIR/EIS included the Project's potential for construction to result in localized shortages of public parking along the Project ROW (Impact T-7).The portions of the proposed Project route that are located within the ANF would not cross any areas of urban or residential development or areas with designated parking spaces. Although construction workers would park along roadsides along this segment, such activities would not be expected to result in a reduction of the local parking space supply. The Station Fire does not alter the nature or significance of Impact T-7, as described in the EIR/EIS. In addition, the Station Fire does not introduce new traffic and transportation impacts under Criterion TRA8, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measure T-2, impacts under Criterion TRA8 would remain Class II, as described in the EIR/EIS.

Construction would be inconsistent with transportation plans (Criterion TRA9)

Under Criterion TRA9, impacts identified in the EIR/EIS included the Project's potential for construction to conflict with planned transportation projects (Impact T-8). The proposed Project could conflict with future transportation projects if it would place structures within transportation ROWs that would be developed with new transportation infrastructure. However, no planned transportation projects with which the proposed Project could conflict have been identified in the Central Region of the Project area. Therefore, the Station Fire does not introduce new traffic and transportation impacts under Criterion TRA9, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measure T-8, impacts under Criterion TRA9 would remain Class II, as described in the EIR/EIS.

Noticeable deterioration of road surfaces (Criterion TRA10)

Under Criterion TRA10, impacts identified in the EIR/EIS included the potential for increases in roadway wear in the vicinity of the construction zone due to heavy truck or construction equipment movements, thereby resulting in noticeable deterioration of a roadway surface or other features in the road (Impact T-9). The potential exists for unexpected damage to occur on features in road ROWs due to the operation of construction vehicles and equipment. However, APM TRA-5 (Repair Damaged Streets) would require any damage to local streets to be repaired, and streets be restored to their pre-Project condition. The Station Fire does not introduce new traffic and transportation impacts under Criterion TRA10, or require modifications to mitigation introduced in the EIR/EIS. With implementation of APM TRA-5, impacts under Criterion TRA10 would remain Class III, as described in the EIR/EIS.

Adverse effects to aviation activities (Criterion TRA11)

Potential impacts to navigable airspace could occur during both construction and operation of a transmission line project due to the presence of physical impediments attributable to the proposed Project. No elements of the proposed Project route that are located within the ANF are near general aviation or larger airports. However, because the proposed Project would result in construction of structures greater than 200 feet in height, pursuant to FAA guidelines, SCE would be required to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the Manager of the FAA Air Traffic Division for review and approval of the Project. Final design of the proposed transmission route would have to comply with FAA guidelines. No portions of the proposed Project within the Central Region would be located in an area that would require review by the US Armed Forces (CMLUCA, 2008).

The Station Fire does not introduce new traffic and transportation impacts under Criterion TRA11, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the Mitigation Measure T-10, impacts under Criterion TRA11 would remain Class II, as described in the EIR/EIS.

2.12.4 Cumulative Effects Analysis

Existing cumulative conditions in the Central Region are defined by existing traffic on SR-2 (ADT of approximately 3,700 vehicles) and Angeles Forest Highway (ADT of approximately 3,400 vehicles) and construction projects within the ANF that would add vehicle trips to these roadways. Cumulative traffic and transportation impacts identified in the EIR/EIS were determined to be Class III (less than significant). The Station Fire is not expected to result in substantial increases in traffic on SR-2 or Angeles Forest Highway.

As a result of the Station Fire, SR-2 and Angeles Forest Highway are currently closed to public access. All guard rails lining these roadways have been substantially damaged, roadway striping is not visible, roadway shoulders are lined with piles of various types of debris, and many portions of roadway are lined with severely burned, dead trees. The roads are currently under repair and will remain closed to the public until all guard rails are replaced and any dead roadside trees that pose potential safety hazards to drivers are removed. It is expected that these repairs will be completed prior to commencement of project-related construction activities in the ANF. Based on the site visit in the ANF on October 20, 2009, it was observed that several existing electrical subtransmission lines within the ANF have been substantially damaged and will need to be replaced. These lines are lower voltage lines supported by wooden poles which burned in the Station Fire. Because the schedule for completion of repairing electrical subtransmission lines within the ANF is unknown, it is conservatively assumed for this analysis of cumulative impacts for the proposed Project that these repair activities would occur concurrently with construction activities associated with the proposed Project.

In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

Following is a discussion of the cumulative traffic and transportation impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Closure of roads to through traffic or reduction of travel lanes would result in substantial congestion (Impact T-1).** Construction of the proposed Project could result in roadway closures at locations where the construction activities, especially transmission line stringing, would be located within ROWs of public streets and highways. Construction traffic related to the repair of electrical subtransmission lines within the ANF would likely use the same major roadways within the ANF that may experience Project-related lane closures. Additionally, repair of subtransmission lines may also require lane closures related to wire stringing activities. When combined with the effects of proposed Project-related lane closures, such traffic and lane closures could result in substantial congestion on SR-2, Angeles Forest Highway, or smaller NFS roads. However, existing traffic volumes on these roadways are low and lane closures are regulated by the applicable jurisdictional agency through encroachment permits which require specific measures to minimize disruption to local traffic flow. Therefore, substantial congestion is not expected to occur and this impact would not be cumulatively significant. Furthermore, the Station Fire does not alter the Project's contribution to this cumulative effect.
- **Construction traffic would result in congestion on area roadways (Impact T-2).** Construction of the proposed Project would temporarily increase traffic (through Project trip generation) on the regional and local roadways. In the event that substantial construction projects within the ANF, such as repairing the electrical subtransmission lines that burned in the Station Fire, it is possible proposed Project-related traffic, when combined with existing traffic and traffic from such projects, could result in substantial congestion on SR-2, Angeles Forest Highway, or smaller NFS roads to result in a significant cumulative impact. However, existing traffic volumes on these roadways are low, and as discussed above, even with lane closures related to the proposed Project or other projects, substantial congestion is not expected to occur on roadways within the ANF. Additionally, Mitigation Measure T-2 (Prepare Construction Transportation Plan) would minimize the proposed Project's contribution to this impact. Therefore, the proposed Project's contribution to a significant cumulative impact to congestion on regional and local roadways would not be cumulatively considerable. The Station Fire does not alter the Project's contribution to this cumulative effect.
- **Construction activities could temporarily interfere with emergency response (Impact T-3).** Lane closures associated with construction of the proposed Project could disrupt the routes traveled by emergency providers. In the event that substantial construction projects within the ANF are required as a result of the Station Fire, such as repairing electrical subtransmission lines that burned down in the fire, it is possible proposed Project-related traffic, when combined with existing traffic and traffic from such projects, could result in substantial congestion on SR-2, Angeles Forest Highway, or smaller NFS roads that could also result in a significant cumulative impact with regard to interference with emergency services. However, existing traffic volumes on these roadways are low, and as discussed above, even with lane closures related to the proposed Project or other projects, substantial congestion is not expected to occur on roadways within the ANF. Additionally, Mitigation Measure T-1a (Prepare Traffic Control Plans) requires construction activity to be coordinated in advance with emergency service providers to avoid restricting movements of emergency vehicles, and lane closures associated with the proposed Project would be of very short duration. Therefore, the proposed Project's contribution to a potential significant impact would not be cumulatively considerable. The Station Fire does not alter the Project's contribution to this cumulative effect.
- **Construction activities could temporarily disrupt transit routes (Impact T-4).** Because there are no transit routes located within the ANF, the Station Fire would not affect the cumulative scenario for this impact. Therefore, as discussed in the EIR/EIS, the proposed Project's contribution to a potential significant impact for Impact T-4 would not be cumulatively considerable. The Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Construction activities would cause a temporary disruption to rail traffic or operations (Impact T-5).** Because there are no rail lines located within the ANF, the Station Fire would not affect the cumulative scenario for this impact. Therefore, as discussed in the EIR/EIS, the proposed Project would not have the potential to combine with impacts of other reasonably foreseeable projects to result in a cumulative impact. The Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude

of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

- **Construction activities could temporarily interfere with the use of pedestrian/bicycle paths (Impact T-6).** There are no designated bicycle or pedestrian paths located along the roadways within the ANF that may be affected by construction activities, which would not necessarily preclude use of these roads by bicyclists and pedestrians. The Station Fire does not alter the nature or significance of Impact T-6, as described in the EIR/EIS. Therefore, as discussed in the EIR/EIS, implementation of Mitigation Measure T-6 (Ensure pedestrian and bicycle circulation and safety) would render impacts of the proposed Project to less than cumulatively considerable 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.
- **Construction would result in localized shortages of public parking along the Project ROW (Impact T-7).** The portions of the proposed Project route that are located within the ANF would not cross any areas of urban or residential development or areas with designated parking spaces. Although construction workers would park along roadsides along this segment, such activities would not be expected to result in a reduction of the local parking space supply. The Station Fire does not alter the nature or significance of Impact T-7, as described in the EIR/EIS. Therefore, as discussed in the EIR/EIS, implementation of Mitigation Measure T-2 requires that construction vehicles be parked within the transmission ROW. Therefore impacts of the proposed Project are not expected to combine with the impacts of other projects to result in a cumulative impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Construction would conflict with planned transportation projects (Impact T-8).** No planned transportation projects with which the proposed Project could conflict have been identified in the Central Region of the Project area, therefore the Station Fire does not alter the nature or significance of Impact T-8, as described in the EIR/EIS. With implementation of the mitigation measure T-8, impacts under Criterion TRA9 would remain Class II, as described in the EIR/EIS. If substantial repairs to SR-2 or Angeles Forest Highway are required as a result of damage from the Station Fire, it is possible that these roadways may be temporarily inaccessible to proposed Project construction vehicles, however, it is expected that any substantial repairs to these roadways would be completed prior to commencement of proposed Project construction activities within the ANF. Therefore, impacts of the proposed Project would not have the potential to combine with similar impacts of other past, present and future projects to result in a significant impact. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Construction vehicles and equipment could damage road ROWs (Impact T-9).** There is potential for unexpected damage to roads by vehicles and equipment to occur from construction vehicles. The Station Fire does not introduce new traffic and transportation impacts under Criterion TRA10, or require modifications to mitigation introduced in the EIR/EIS. If left unmitigated, road damage caused by the proposed Project, when combined with unrepaired road damage from past, present, and reasonably foreseeable projects would combine to be significant. However, APM TRA-5 (Repair Damaged Streets), which would be implemented as part of the proposed Project, would require any damage to local streets be repaired, and streets be restored to their pre-Project condition. Therefore, impacts of the proposed Project would not have the potential to combine with similar impacts of other past, present and future projects to result in a significant impact. The Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Project transmission structures could present an aviation hazard (Impact T-10).** The proposed Project would result in construction of structures greater than 200 feet in height, and would place structures beneath potential military flight test pathways, which could result in an aviation hazard or obstruction hazard to nearby airports or military training activities. Other projects, such as transmission lines, radio towers, and buildings that exceed 200 feet in height or are located within military flight test pathways could combine with the proposed Project to be significant. However, the proposed Project, as well as any other project that would result in construction of features over 200 feet in height would be required to coordinate with the

FAA and 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. The Station Fire does not introduce new traffic and transportation impacts under Criterion TRA11, or require modifications to mitigation introduced in the EIR/EIS. Compliance with these procedures would ensure that potential impacts from multiple projects would not combine to result in a significant impact to civilian or military aviation activities. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

In summary, the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.13 Visual Resources

2.13.1 Introduction

To facilitate the visual resource analysis presented in the EIR/EIS for the proposed TRTP, and to be compatible with the recreation and wilderness analysis, the Visual Resources Study Area was divided into three sub-areas: North Area, Center Area, and South Area. The Station Fire occurred within the Center Area of the TRTP Study Area and, therefore, this evaluation of how the fire may have affected the EIR/EIS analysis is focused on the Center Area and its viewsheds.

For all segments of the proposed Project and its alternatives, baseline data were collected using an approach that incorporated a combination of information review, agency consultation, analysis of aerial photographs and satellite imagery, review of maps, field reconnaissance, site analysis, and on-site photography. Existing information was used to the extent possible and appropriate, including the Proponent's Environmental Assessment that was prepared by SCE and the Visual Resource Report prepared by CH2M-Hill for SCE (SCE, 2007a).

2.13.2 Changed Conditions

The Center Area is located between the Vincent Substation (MP 0.0 of the proposed Project's Segments 6 and 11) and the southern boundary of the ANF (MP 24.5 of the proposed Project's Segment 11 and MP 26.9 of the proposed Project's Segment 6). The majority of the Center Area falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. The Gould Substation, part of Segment 9, is located just outside of the ANF's jurisdictional boundaries, but was included as part of the Center Area because of its visual context to the ANF and the fact that Segment 11 continues past Gould Substation inside the ANF boundary.

For planning purposes, the ANF has been divided by the Forest Service into a series of geographic units, each of which is called a "Place." The ANF Forest Plan assigned Place designations to 11 areas throughout the ANF. Of the 11 Places, five would be crossed by the proposed Project (see Map & Figure Series Volume, Figure 3.14-2 - Angeles National Forest Landscape Places and Scenic Integrity Objectives Segment 6 and 11 [in the EIR/EIS]). They are, from north to south:

- Soledad Front Country
- Angeles High Country
- Angeles Uplands West
- Big Tujunga Canyon (only a tiny corner)

- The Front Country

The Forest Plan established standards for each Place, including a theme, setting, desired condition and program emphasis section. These four descriptions provide visual resource management direction of the ANF.

- **Theme -** refers to images of the landscape that can be defined with a brief set of physical, visual or cultural attributes that encapsulate the sense of place.
- **Setting -** provides a description of the landscape character of the Place. The Forest Service describes landscape character as "an overall visual and cultural impression of landscape attributes; the physical appearance and cultural context of a landscape that gives it an identity and 'sense of place'" (USDA Forest Service, 1995).
- **Desired Condition -** paints a picture of what the Place could be as the national forest implements activities to move toward the overall forest-wide desired conditions.
- **Program Emphasis -** identifies priority activities the national forest will emphasize in the next three to five years.

The Forest Service Scenery Management System (SMS) uses Theme, Setting, Desired Condition, Program Emphasis, and Scenic Integrity Objectives to evaluate, manage, and monitor visual resources, landscape aesthetics, and scenery on NFS lands. Desired Condition expresses the highest quality goal for a given landscape. A Scenic Integrity Objective (SIO) defines the minimum level of visual quality to which any National Forest landscape should be subjected, in other words, the minimum acceptable standard for visual quality for an area. Segments 6 and 11 of TRTP crosses landscapes designated for "Natural Appearing" Desired Condition and High SIO with small, isolated areas of Moderate SIO (see Map & Figure Series Volume, Figure 3.14-2 [in the EIR/EIS]).

As mentioned above, the ANF includes 11 geographical units called "Places." The footprint of the Station Fire occupies all or part of nine Places, including the Soledad Front Country, Mojave Front Country, Angeles High Country, Angeles Uplands (West), Angeles Uplands (East), Angeles High County, San Gabriel Canyon, Big Tujunga Canyon and Front Country. The Station Fire footprint occupies lands designated for "Naturally Evolving" Desired Condition and Very High SIO in the San Gabriel Wilderness and "Natural Appearing" Desired Condition and High SIO with small areas of Moderate SIO outside the wilderness.

Following containment and control of the Station Fire and implementation of measures recommended in the BAER report, the ANF will be re-opened to public use. It is expected that visual resources conditions have been affected to varying degrees, from minor to severe, based on previously existing visual quality, previously existing landscape character, previously existing vegetation characteristics, previously existing vegetation screening, burn severity, and fire severity (NWCG, 2009). Additionally, fire control operations such as control lines, handlines, and dozer lines have created wide swaths in the landscape with new ground disturbances and complete vegetation removal. There was fire retardant use that created temporary red colors in the previously green and now blackened landscape. New vegetative openings with bare soils were created for safety zones. There may have been "danger tree" felling for firefighter safety, which would leave charred trees and logs lying on the ground. Once the ANF is re-opened, all of these fire control operations will be visible in foreground, middleground, and background distances from sensitive receptor locations.

The "Forest floor" will be visible because previously existing vegetation has been burned off. Existing roads and trails that may have been visually screened by previously existing vegetation will now be very visually evident. The color of the landscape will have changed from dark green, medium green, and tan to blackened shrubs and tree skeletons, white ash, red retardant, and small patches of green unburned vegetation. Many of the grassy openings will green-up after the first fall/winter rains and blackened shrub and tree skeletons will weather and fade to a silver, gray color in the next few years.

The new scenic condition after the Station Fire is one of a changed landscape, with views and scenic attributes different from those of the past, prior to the fire. This landscape will visibly appear to be in transition over the next ten to fifteen years, or longer, with some changes occurring within the next few growing seasons, such as green-up following fall/winter rains. Heavy winter rains may also create mud flows and landslides in the denuded landscape, and these would further alter and degrade the scenic conditions and landscape character. However, over the next few years, new grasses and shrubs will re-establish and begin to soften the effects of the fire. The landscape aesthetics will improve as these changes occur and the effects of the fire will slowly fade with time.

According to Figure 1 (Station Fire Burn Severity), all of Segment 11 and most of Segment 6 received high or moderate burn severity and this will dramatically alter previously existing visual conditions. Additionally, Segment 6 MP 0 to 3.7, S6 MP 13.2 to 13.8, and S6 MP 19.4 to 26.9 was unburned; however, with the surrounding landscapes burned at high to moderate severity, the entire viewshed of Segment 6 was likely negatively affected.

There was high burn severity across Segment 11 north of Mount Gleason Road and across Segment 6 north of Mill Creek Summit. Both of these landscape areas are locations where the Pacific Crest Trail crosses under the proposed Project's new transmission lines. With high burn severity, it is reasonable to assume that the existing visual conditions as seen from the PCT have been drastically altered by the wildfire. Previously existing vegetative screening is likely now completely missing and the previously dark green landscape dominated by evergreen trees on north-facing slopes is likely now blackened and almost devoid of vegetation.

Another area of high burn severity is on the north-facing slopes near SR- 2, the Angeles Crest Scenic Byway, and Segment 6 crosses through these areas of high burn severity. The Upper Big Tujunga Canyon Road and Angeles Forest Highway also traverse these same north-facing landscapes that had high burn severity. There would be similar visual effects as those described above near the PCT, with the previously dark green landscape dominated by evergreen trees now probably blackened and almost devoid of vegetation.

In areas of moderate burn severity, the landscape that was previously green and covered by chemise and chaparral is most likely now dominated by a landscape of scorched earth and blackened shrub skeletons, where few of the previously dominant valued attributes of the landscape character are still intact. The green color and natural forms of the landscape's vegetative patterns were likely most affected. In areas of moderate burn severity, if there were trees present, the vertical forms of tree trunks and landforms resemble the form of the area that existed prior the fire, but with the loss of foliage, only the blackened, skeleton tree trunks would remain.

2.13.3 Impact Evaluation

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 Visual 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:

- Criterion VIS1: Have a substantial adverse effect on the existing landscape character and visual quality of the site and its surroundings.
- Criterion VIS2: Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.
- Criterion VIS3: Substantially damage 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 VIS4 Conflict with applicable adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection and management of visual quality in the landscape.

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related visual resource impacts previously identified under Significance Criteria VIS1, VIS2, VIS3, or VIS4, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Have a substantial adverse effect on the existing landscape character and visual quality of the site and its surroundings. (Criterion VIS1)

Under Criterion VIS1, visual impacts identified in the EIR/EIS included the following: 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); 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); for a landscape with an existing transmission line, increased structure size and new materials would result in adverse visual effects (Impact V-3); and vegetative clearing and/or earthwork associated with road improvements and pulling/splicing locations would adversely affect landscape character and visual quality (Impact V-4).

As mentioned above, it is expected that the Forest Service will temporarily close portions of the ANF as a result of the Station Fire, which would affect the availability of viewing opportunities for the traveling and recreating public. However, after the ANF is re-opened for public use, sensitive receptors will again be able to view landscapes in the ANF and recreation opportunities will again be available to the public. Mitigation measures introduced in the EIR/EIS would address these visual effects of Criterion VIS1, and include the following:

- 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);
- 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-3a (Match spans of existing transmission structures);
- V-3b (On NFS lands, provide restoration/compensation for impacts to landscape character and visual quality);
- V-4a (Construct, operate, and maintain the Project using 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); and
- V-4d (Dispose of excavated materials as prescribed).

The Station Fire does not alter the nature or significance of Impacts V-1, V-2, or V-3, as described in the EIR/EIS. Implementation of Mitigation Measures V-1 through V-4d would decrease the amount of visual disturbance and would improve the visual environment, as compared to the proposed Project or its alternatives without mitigation. The combination of all these measures would lessen the adverse visual impacts of the Project and would improve the visual attributes of the affected area, although, overall, these visual impacts of the Project would remain significant and adverse (Class I).

The Station Fire has adversely affected existing landscape character and visual quality, in connection with Impact V-4, because previously existing vegetation that partially or totally screened roads has been destroyed by the wildfire. This loss of vegetative screening has made these access/spur roads more visible in the short term and medium term, although the effective implementation of Mitigation Measure V-3b will, over time as new plantings grow, decrease these impacts to the same level of visual disturbance as would exist had the Station Fire not occurred. As noted in the EIR/EIS, the visual impacts associated with access and spur roads and splicing and pulling locations throughout proposed Segments 6, 10, and 11 would remain significant and adverse (Class I). The Station Fire does not change this conclusion.

Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area (Criterion VIS2)

As discussed in the EIR/EIS, the proposed Project could have visual impacts associated with light or glare. Impact V-5 (New metal surfaces associated with transmission infrastructure would potentially reflect sunlight and produce glint or glare in certain lighting conditions) was analyzed in the EIR/EIS.

Aesthetic APMs 1, 3, 4, 15, 18, 19, and 22 address the visual effects of new metal surfaces and materials associated with new transmission infrastructure that could potentially reflect sunlight and produce glare or glint in certain lighting conditions. Aesthetic APMs 16 and 21 address the visual effects of new lighting sources that could produce light spill or glare. These Aesthetic APMs were considered in the analysis of the proposed Project. As discussed in the EIR/EIS, new metals for Alternative 2's LSTs, TSPs, light weight steel poles, and conductors would reflect more sunlight than old, rusted metals. However, with implementation of APM AES-1 (Transmission Lines - Reduce Light Reflection off Towers/Poles) and Mitigation Measure V-2b (Treat surfaces with appropriate colors, textures, and finishes), it is not anticipated that there would be any substantial daytime glare or glint produced by the new structures.

In the TRTP *Visual Resource Specialist Report*, specific colored galvanizing treatments have been suggested for the Center Area (ANF) to blend new transmission line structures with the (previously) existing landscape colors. Light, medium, and dark galvanizing treatments were suggested for the Center Area (ANF) in Table 6-7 (Locations Where Colored Galvanizing Treatments Are Recommended to Improve the Visual Environment). As a consequence of the Station Fire, existing vegetative colors and patterns have been altered and existing landscape conditions have been affected; however, it is assumed that the color recommendations would remain the same. This assumption is based on the knowledge that landform backdrops and skyline ridge locations have remained the same, and colored galvanizing treatments are likely to remain the same as well. In addition, as re-growth of vegetation occurs, the pre-fire vegetation colors will be re-established. The Station Fire does not alter the nature or significance of impacts under Criterion VIS2, as described in the EIR/EIS. In addition, the Station Fire does not introduce new visual resources impacts under Criterion VIS2, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion VIS2 would remain Class II, as described in the EIR/EIS.

Substantially damage 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)

As discussed in the EIR/EIS, the Project would contribute to the long-term loss or degradation of a scenic highway viewshed or a scenic trail viewshed (Impact V-6). There are no Applicant-Proposed Measures for Aesthetics (APM-AES) that addresses the long-term loss or degradation of a scenic highway viewshed or a scenic trail viewshed. Discussions in the EIR/EIS address potential long-term loss or degradation of a scenic highway viewshed or a scenic trail viewshed, and were subdivided into North, Center, and South Areas.

In the Center Area, the proposed Project would cross directly over the PCT at two locations: Segment 6 MP 7.3; and Segment 11 MP 7.6. The PCT trailhead at Mill Creek Summit is also located at S6 MP 7.3, and its visual environment would be affected by Alternative 2. The exact location of the lattice steel structure proposed for Segment 6 at the Mill Creek Summit would have to be carefully designed so that it does not encroach directly upon the PCT feeder trail from the trailhead parking area or on the paved road at the trailhead. Field verification by SCE engineers indicates that the increased size of the footprint of the new LST would not require relocation of the feeder trail trailbed or the PCT trailbed. Because there is no other feasible or practicable location for the transmission line structure at Mill Creek Summit, the project would not conflict with Forest-specific Design Criteria Standard ANF S1. Therefore, the proposed Project would not require a Project-specific Forest Plan amendment.

The proposed Project's Segment 6 and Segment 11 would cross over the Angeles Crest Highway at four different locations (at approximately S11 MP 16.0, MP 17.7, and MP 18.4 for Segment 11 and at S6 MP 16.8 for Segment 6). Additionally, Segment 6 would result in a direct crossing of the Silver Moccasin National Recreation Trail (Trail 11W06) at S6 MP 17.2.

Figure 1 (Station Fire Burn Severity) indicates that there was high burn severity at both PCT crossings of Segment 6 at Mill Creek Summit at of Segment 11 near Camp 16 on the Mount Gleason Road. Loss of existing pine and Douglas fir trees and other existing vegetation has created a greater visual contrast for the proposed Project. Loss of vegetative screening and destruction of landscape characteristics will affect the overall visual impacts of TRTP in the short and medium term.

As noted in the EIR/EIS, the introduction of new 500-kV transmission lines crossing over scenic highways and trails, and visible within viewsheds of scenic highways and trails, as proposed under Alternative 2, would create a significant impact. However, the implementation of Mitigation Measure V-3b (On NFS lands, provide restoration/ compensation for impacts to landscape character and visual quality) would help to minimize and compensate for the adverse visual effects of these new transmission lines and structures, resulting in adverse but less-than-significant visual impacts (Class II), as described in the EIR/EIS. Although the Station Fire will temporarily alter the nature of impacts under Criterion VIS3, as described in the EIR/EIS, the implementation of Mitigation Measure V-3b will, over time, mitigate those impacts to a level of insignificance, such that the impacts under Criterion VIS3 would remain Class II, as described in the EIR/EIS.

Conflict with applicable adopted city, county, State, or federal plans, policies, regulations, or standards applicable to the protection and management of visual quality in the landscape (Criterion VIS4)

Any Project-related construction or operational activity that would occur within the jurisdictional boundaries of an established Resource Management Plan or Conservation Plan, and that would not be in compliance with such plans, would cause an impact under Criterion VIS-4. Of particular note is the Forest Service's Land

Management Plan (Forest Plan) for the ANF which, for the purposes of this analysis, is confined to the Center Area. As described in Section 3.14.3 of the EIR/EIS and Appendix C of the *Visual Resources Specialist Report*, there are local laws, regulations, and standards for the protection and enhancement of visual resources. The majority of these laws, regulations, and standards are managed by city or county governments, and a few are managed by the California Department of Parks and Recreation, which operates in accordance with a General Plan, or the California Department of Transportation for scenic highways. Because the Station Fire was located in the Center Area, only the ANF Forest Plan standards were affected by the wildfire. No additional mitigation measures would be required for Criterion VIS4 because of the Station Fire.

In summary, the Station Fire does not introduce any new visual impacts under the four criteria listed above. Moreover, the Station Fire will not alter the nature or significance of any of the impacts as described in the EIR/EIS. Impacts under Criteria VIS-1 and VIS-4 will remain significant (Class I), as described in the EIR/EIS, whereas impacts under Criteria VIS-2 and VIS-3 will be mitigated to a less-than-significant level (Class II), as described in the EIR/EIS. Although the Station Fire will, in the short and medium term, exacerbate some of the visual impacts of the Project due to the destruction of existing vegetation and other landscape elements, the natural vegetation in the ANF will eventually grow back, independent of whether the proposed Project is built or not. Moreover, the effective implementation of Mitigation Measure V-3b will hasten the eventual recovery of those areas of the ANF that will be directly impacted by the proposed Project, and will allow for the mitigation of the impacts of the Station Fire more effectively and expeditiously than would otherwise be the case if the proposed Project does not proceed forward.

2.13.4 Cumulative Effects Analysis

As identified in Section 3.14.6.1 of the EIR/EIS, it has been determined that visual resources impacts associated with the proposed Project would contribute to certain cumulative impacts. These impacts include Impacts V-1 through V-7. The potential for visual resources impacts of the proposed Project to combine with similar impacts of other projects within the geographic scope of the cumulative analysis were described in the EIR/EIS.

As described in the EIR/EIS, in the Center Area, there are many past projects and activities that have modified the landscape and changed the naturally evolving landscape character, although most of the Center Area remained natural-appearing in the ANF before the Station Fire. As described in the EIR/EIS and considering visual conditions before the Station Fire, some of these past activities in the Center Area have adversely affected naturally evolving and/or natural-appearing landscape character and visual quality, including the construction of dams, reservoirs, highways, and roads. The Big Tujunga and Cogswell Dams have altered landscape character through the introduction of large water-bodies and large concrete structures into landscapes that generally have no natural lakes. New paved highways have created large cut-and-fill slopes with barren soils, creating adverse color and texture contrasts. Previous timber harvests have altered natural vegetative communities, but generally these past timber harvest activities are natural-appearing and have not created adverse visual impacts. Fire breaks, fuel breaks, and fire suppression activities have created visual scars in the landscape, and large-scale wildfires have changed vegetative communities and resulted in loss of mature forest landscape character and degradation of visual quality. Also within the Center Area, there are several existing high-voltage transmission lines including the Gould-Vincent, La Honda-Vincent, and Antelope-Pardee corridors operated by SCE. In addition, the City of Los Angeles Department of Water and Power's transmission line corridors are also located in the Center Area. These existing high-voltage transmission lines in the Center Area have introduced industrial landscape character features into the naturally evolving and natural-appearing landscapes of the Center Area, and have degraded landscape character and visual quality.

Off-highway vehicle (OHV) use in designated areas has created unnatural appearing lines, soil erosion, and visual scars in the landscape.

Following the Station Fire and wildfire suppression efforts, there are obvious landscape changes that have adversely affected naturally evolving and/or natural-appearing landscape character and visual quality. It is reasonable to assume that previously existing landscape character and visual quality, as well as existing infrastructure (highways, roads, transmission lines, etc) throughout the Center Area have been altered and/or damaged by the fire. As described in the EIR/EIS, it was expected that future scenic conditions would have continued into the future, but that is no longer the case because of the widespread destruction of landscape features caused by the Station Fire.

In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

Following is a discussion of the cumulative visual impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **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).** Construction activities associated with the proposed Project would be visible and would attract attention temporarily, as described in Section 3.14.6.1 of the EIR/EIS. Additionally, there will be temporary construction activities and equipment involved with burned area restoration and rehabilitation. These wildland restoration activities would combine with construction activities of TRTP and would be cumulatively considerable. All of these construction activities would be readily visible throughout the Project area, and would be cumulatively adverse and significant. The nature and magnitude of the Project's contribution to this cumulative impact is increased relative to what was described in the EIR/EIS as a result of the Station Fire. However, there is no change to the significance conclusion of this cumulative effect.
- **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).** The Station Fire did not affect any landscapes that currently have no transmission lines, and therefore, there are no cumulative visual effects of TRTP and the Station Fire for Impact V-2. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **For a landscape with an existing transmission line, increased structure size and new materials would result in adverse visual effects (Impact V-3).** Construction and operation of new transmission lines with increased structure size and new materials would detract from the pre-fire and post-fire existing landscape character and visual quality, as described in Section 3.14.6.1 of the EIR/EIS, and combined with existing transmission lines in the same vicinity, and future transmission lines that may be proposed in the same viewsheds, would lead to cumulatively adverse and significant visual impacts. The nature and magnitude of the Project's contribution to this cumulative impact is increased relative to what was described in the EIR/EIS as a result of the Station Fire. However, there is no change to the significance conclusion of this cumulative effect. Moreover, once the natural vegetation in the ANF grows back, the Project's contribution to this cumulative impact will decrease to the level it would have been had the Station Fire not taken place.
- **Vegetative clearing and/or earthwork associated with road improvements and pulling/splicing locations would adversely affect landscape character and visual quality (Impact V-4).** Construction, operation,

and maintenance of existing and proposed Project transmission lines in the proposed Project corridors would create permanent visual scars that would be visible and would attract attention, as described in Section 3.14.6.1 of the EIR/EIS. Because of the loss of vegetative screening caused by the Station Fire, existing access/spur roads are more visible and new earthwork to re-open and/or widen existing access/spur roads will become more visually evident. Wildland restoration and rehabilitation activities, combined with the proposed Project's transmission lines in the same viewsheds would lead to cumulatively adverse and significant visual impacts. The nature and magnitude of the Project's contribution to this cumulative impact is increased relative to what was described in the EIR/EIS as a result of the Station Fire. However, there is no change to the significance conclusion of this cumulative effect. Moreover, once the natural vegetation in the ANF grows back, the Project's contribution to this cumulative impact will decrease to the level it would have been had the Station Fire not taken place.

- **New metal surfaces associated with transmission infrastructure would potentially reflect sunlight and produce glare in certain lighting conditions (Impact V-5).** New materials that would be used in construction of the proposed Project would consist of colored galvanizing steel that would blend with the previous landscape characteristics, prior to the wildfire. It is not known if existing transmission line structures parallel to Segments 6 and 11 were damaged by the Station Fire. If other existing transmission line LSTs were damaged and would need to be repaired or replaced, then the use of new non-colored galvanized steel could potentially reflect sunlight and produce glare in certain lighting conditions. This could cause a visual effect that would be cumulatively adverse and significant. The nature and magnitude of the Project's contribution to this cumulative impact is increased relative to what was described in the EIR/EIS as a result of the Station Fire. However, there is no change to the significance conclusion of this cumulative effect. Moreover, once the natural vegetation in the ANF grows back, the Project's contribution to this cumulative impact will decrease to the level it would have been had the Station Fire not taken place.
- **The Project would contribute to the long-term loss or degradation of a scenic highway viewshed or scenic trail viewshed (Impact V-6).** Prior to the Station Fire, there were no projects in the ANF that would threaten the viewsheds of the Angeles Crest Scenic Highway, PCT, Silver Moccasin National Recreation Trail, or West Fork National Scenic Bikeway, except for the proposed Project and/or any of the TRTP alternatives. Now with the advent of the Station Fire and efforts for fire recovery, landscape rehabilitation, and landscape restoration, in addition to the proposed Project, Impact V-6 could be cumulatively adverse and significant. The nature and magnitude of the Project's contribution to this cumulative impact is increased relative to what was described in the EIR/EIS as a result of the Station Fire. However, there is no change to the significance conclusion of this cumulative effect. Moreover, once the natural vegetation in the ANF grows back, the Project's contribution to this cumulative impact will decrease to the level it would have been had the Station Fire not taken place.
- **The Project would conflict with established visual resource management plans or landscape conservation plans (Impact V-7).** Appendix C of the *Visual Resources Specialist Report* provides lists of applicable federal, State, and local laws, regulations, and standards for visual resources in the North, Center, and South Areas. In the North Area, there are no established Visual Resource Management Plans or Visual Resource Conservation Plans; therefore, existing and future projects would not add cumulative visual effects. In the Center Area, the majority of Segments 6 and 11 are situated within areas of natural-appearing landscapes designated with High Scenic Integrity Objective (SIO), as dictated by the Forest Plan. Existing access and spur roads currently do not meet the Natural-Appearing Desired Condition or High SIO, and re-opening or reconstructing them to higher road maintenance standards would adversely impact visual resources, would further degrade existing conditions, and would not meet the Desired Condition or established High Scenic Integrity Objectives. Therefore, Project-specific amendments to the 2005 Forest Plan, as described in EIR/EIS Sections 3.14.2 and 3.14.6.1 would be required. Future projects that would upgrade the size of transmission lines or maintain/improve access and spur roads would add to cumulative visual effects. In the South Area, the proposed Project and future projects would cross lands administered by the Puente Hills Landfill Habitat Preservation Authority (PHLHPA). Impact V-7 would be cumulatively adverse and significant. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

In summary, the proposed Project would contribute to seven visual resource impacts that would be cumulatively significant and unavoidable (Class I). The Station Fire and fire recovery efforts would contribute to several of these cumulative impacts, as described above. The Station Fire has altered to a great extent, and fire recovery efforts additionally will alter, the nature of previously existing landscape character and visual quality. The proposed Project's visual effects would contribute to cumulative visual effects, which will be greater in the Center Area as a result of the Station Fire. However, the nature and significance of the proposed Project's contribution to these cumulative impacts, is not increased by the Station Fire and remains as described in the EIR/EIS. These impacts will remain Class I, as described in the EIR/EIS. Moreover, once the natural vegetation in the ANF grows back, the Project's contribution to these cumulative impacts will decrease to the level they would have been had the Station Fire not taken place.

2.14 Wilderness and Recreation

2.14.1 Introduction

For the purposes of the wilderness and recreation analysis presented in the EIR/EIS for the proposed TRTP, the Study Area was divided into three regions: North Region, Central Region, and South Region. The Station Fire occurred within the Central Region of the Study Area and, therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on the Central Region.

2.14.2 Changed Conditions

The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. Most of the Central Region is characterized by undeveloped lands and open space which is managed by the Forest Service for the purposes of recreation and natural resources management, among various other uses. A wide variety of recreational resources are available within the ANF, including hiking, mountain biking, horseback riding, OHV use, camping, picnicking, fishing, water sports, and general outdoor relaxation and appreciation.

Within the ANF, "Developed Recreation" includes resources that are regularly maintained by the Forest Service such as OHV routes, trails (for hiking, biking, and equestrian use), campgrounds, picnic areas, information centers, and other, similar facilities, while "Dispersed Recreation" includes undeveloped areas such as open space and natural scenic vistas which are used for recreational purposes but are not regularly maintained by the Forest Service. Following containment of the Station Fire, it is expected that wilderness and recreation conditions will be temporarily affected as a result of temporary closures of ANF lands, as well as fire-related damage and destruction of Developed Recreation resources in the Project Area. However, it is expected that over time, all existing Developed and Dispersed Recreation will be restored. In Section 3.15 of the EIR/EIS, Tables 3.15-14a (Developed Recreation Resources within One-Half Mile of Alternative 2 in the Central Region) and 3.15-14b (Dispersed Recreation Opportunities within One-Half Mile of Alternative 2 in the Central Region) list the recreational resources and opportunities that are expected to be affected by the Station Fire. Although the Station Fire has affected the availability of these resources and opportunities, it is expected that they will be restored over time, in accordance with existing Forest Management.

2.14.3 Impact Evaluation

The criteria used to evaluate and determine the significance of wilderness and recreation impacts in the EIR/EIS include the following:

- Criterion REC1: Directly or indirectly disrupt or preclude activities in established federal, State, or local recreation areas or wilderness areas.
- Criterion REC2: 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.

The following analysis evaluates whether the Station Fire affects the magnitude of any wilderness and recreation impacts previously identified under Significance Criteria REC1 or REC2, whether any new impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Directly or indirectly disrupt or preclude activities in established federal, State, or local recreation areas or wilderness areas. (Criterion REC1)

Under Criterion REC1, impacts identified in the EIR/EIS included the Project's potential to restrict access to or disrupt activities within established recreational areas as a result of construction (Impact R-1) or operation and maintenance (Impact R-2). As mentioned above, it is expected that the Forest Service will temporarily close portions of the ANF as a result of the Station Fire, which would affect the availability of Dispersed and Developed recreation opportunities to the public. It is expected that some recreational resources and opportunities in the ANF that would be made unavailable as a result of the fire would also be affected by Project construction. Mitigation measures introduced in the EIR/EIS would address these effects, and include the following:

- 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 (PCT)); and
- R-1e (SCE shall compensate ANF for lost income from Adventure Pass sales due to recreation area closures associated with the Project).

Mitigation Measure R-1a would help to minimize Impact R-1 for both Developed and Dispersed Recreation by requiring coordination among all relevant agencies. Similarly, Mitigation Measures R-1b through R-1e would help to minimize impacts through public awareness and outreach. Mitigation Measure R-1c is similar to Applicant-Proposed Measures (APMs) REC-1 (Temporary Closures) and REC-2 (Closure Notices) and would reinforce these APMs by requiring specific procedures such as maintaining public notices and submitting coordination documentation to the CPUC and the Forest Service.

The Station Fire does not alter the nature or significance of Impacts R-1 or R-2, as described in the EIR/EIS. In addition, the Station Fire does not introduce new wilderness and recreation impacts under Criterion REC1, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion REC1 would remain Class II, as described in the EIR/EIS.

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)

As discussed in the EIR/EIS, Project activities (construction or operation and maintenance) would have the potential to 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). Specifically, the Project may cause or contribute to the degradation of the San Gabriel Wilderness Area's characteristics of solitude and unconfined recreation due to the close proximity of Project construction, operation, and maintenance activities to this Wilderness Area. The Station Fire does not have any effect on this impact, and would not alter the nature or significance of the impact as described in the EIR/EIS. Impact R-3 would remain less than significant (Class III).

Also under Criterion REC2, the EIR/EIS determined that the Project would have the potential to cause or contribute to degradation of the Pacific Crest National Scenic Trail (PCT) (Impact R-4), to 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), and to facilitate unmanaged recreational uses that would contribute to the long-term loss or degradation of recreational opportunities (Impact R-6). As previously discussed, it is expected that portions of the ANF will be temporarily closed to public access and recreational use as a result of the Station Fire. Portions of the PCT and OHV trails may be affected by fire-related closures; however, such closures would not cause or contribute to degradation of trails. The closure of ANF lands may result in a loss of recreational opportunity for OHV users (Impact R-5), but such effect would be temporary in nature, and would not affect the impact significance discussion presented in the EIR/EIS. Temporary fire-related closures may also reduce the potential for unmanaged recreation to occur in the Project Area, as unmanaged recreation is largely associated with access to Forest roads. As described in the EIR/EIS, implementation of the following mitigation measures would ensure that Impacts R-4, R-5, and R-6 remain less than significant (Class II):

- R-1a (Coordinate construction schedule and maintenance activities with managing officer(s) for affected recreation areas);
- R-1d (Notification of temporary closure and reroute of the Pacific Crest National Scenic Trail (PCT));
- R-1e (SCE shall compensate ANF for lost income from Adventure Pass sales due to recreation area closures associated with the Project); and
- R-5 (Avoid permanent upgrades to Forest System roads).

The Station Fire does not alter the nature or significance of Impacts R-3, R-4, R-5, or R-6, as described in the EIR/EIS. In addition, the Station Fire does not introduce new wilderness and recreation impacts under Criterion REC2, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion REC2 would occur in the same way as described in the EIR/EIS.

2.14.4 Cumulative Effects Analysis

Existing cumulative conditions in the Central Region are defined by efforts of the Forest Service to manage the ANF. From a wilderness and recreation perspective, past and present projects within the ANF are characterized by Forest Service activities to improve and maintain Developed Recreation resources such as campgrounds and picnic areas, manage trails and OHV networks, and prevent construction within or degradation of designated Wilderness Areas. The extent of damage to Developed Recreation resources associated with the Station Fire is not yet known. However, it is reasonable to assume that infrastructure throughout the Central Region may have been damaged by the fire. As described in the EIR/EIS, it is expected that future recreation projects in the Central Region will be focused on repairs, re-establishment, or rehabilitation of existing facilities. It is expected that damage to Developed Recreation resources associated with the Station Fire will eventually be repaired, and that the Station Fire will not affect Developed Recreation in the long term.

In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

Following is a discussion of the cumulative wilderness and recreation impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Construction activities would restrict access to or disrupt activities within established recreational areas (Impact R-1).** The extent of damage to recreational resources and opportunities as a result of the Station Fire is not yet known, although it is reasonable to assume that the Station Fire will cause or contribute to the temporary restriction of access to recreational resources and the disruption of activities within recreational areas in the Central Region. As described in the EIR/EIS, construction of the proposed Project would also temporarily restrict access to certain recreational resources. However, the Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.
- **Operation and maintenance activities would restrict access to or disrupt activities within established recreational areas (Impact R-2).** The Station Fire may reduce access to recreational resources in the ANF in the short term, but is not expected to have a long-term effect on recreational access. Neither the Station Fire nor any anticipated future projects or activities, including operation and maintenance activities associated with the proposed Project, are expected to combine in a way that would significantly affect access to recreational resources. Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **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).** Effects of the Station Fire are not expected to cause or contribute to the degradation of one or more of the four primary Wilderness Area characteristics. As described in the EIR/EIS, the proposed Project would have the potential to contribute to the degradation of the "solitude and unconfined recreation" characteristic of the San Gabriel Wilderness Area. However, neither the Station Fire nor any anticipated future projects or activities, including operation and maintenance of the proposed Project, are expected to combine in a way that would significantly affect characteristic(s) of the San Gabriel Wilderness Area, or another Wilderness Area. Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **The Project would cause or contribute to degradation of the Pacific Crest National Scenic Trail (PCT) (Impact R-4).** The proposed Project would traverse the PCT in two locations within the Central Region, and it is possible that closures of portions of the ANF that are required as a result of the Station Fire may affect the same portions of the PCT that would be affected by the Project. Therefore, in the short-term, effects of

the Station Fire could contribute to this cumulative effect. However, the Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

- **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).** Closures of portions of the ANF that are required as a result of the Station Fire may result in a temporary loss of recreational opportunity for OHV users in the Forest, but would not have a long-term effect on OHV recreation. As described in the EIR/EIS, construction of the proposed Project may contribute to a temporary loss of recreational opportunity for OHV users due to construction-related road closures, but also would not have a long-term effect on OHV recreation. Neither the Station Fire nor any anticipated future projects or activities, including operation and maintenance of the proposed Project, are expected to combine in a way that would significantly affect OHV recreation. Therefore, no significant cumulative impact is anticipated. The Station Fire does not alter this conclusion or affect the nature or magnitude of the Project's contribution to this cumulative effect.
- **The Project would facilitate unmanaged recreational uses that would contribute to the long-term loss or degradation of recreational opportunities (Impact R-6).** Closures of portions of the ANF that are required as a result of the Station Fire would restrict public access through the Forest, and would likely discourage unmanaged recreational uses. As described in the EIR/EIS, construction of the proposed Project would require road improvements that may facilitate unmanaged recreation. The Station Fire is not expected to facilitate unmanaged recreation, and does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire.

In summary, the proposed Project would contribute to four wilderness and recreation impacts that would be cumulatively significant and unavoidable (Class I) and two wilderness and recreation impacts that would be less than significant with no mitigation required (Class III). The Station Fire would contribute to several of these cumulative impacts, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

2.15 Wildfire Prevention and Suppression

2.15.1 Introduction

Whereas most large fires in Southern California are influenced by Santa Ana wind conditions, the Station Fire, which ranks as the tenth largest fire in California's history, was primarily driven by strong westerly winds, high temperatures, and extremely dry fuels (Cal Fire, 2009). For the purposes of the wildfire prevention and suppression analysis presented in the EIR/EIS for the proposed TRTP, the Study Area was divided into two regions: the low risk Project area and the Tehachapi Fireshed. The Station Fire occurred almost entirely within the Tehachapi Fireshed of the Study Area. A total of 10 percent or 148,000 acres of the Tehachapi Fireshed were burned by the Station Fire, and only 12,000 acres burned outside the Fireshed to the northeast. None of the low-risk project area was burned by the Station Fire. Therefore, this evaluation of how the fire may affect the EIR/EIS analysis is focused on the Tehachapi Fireshed.

2.15.2 Changed Conditions

The portion of the Tehachapi Fireshed that was burned by the Station Fire falls within the jurisdictional boundaries of the ANF and includes approximately 70 percent of the proposed Project's Segments 6 and 11. No part of any alternative transmission route burned in the Station Fire.

The fuel types that covered the newly burned portion of the Tehachapi Fireshed were dominated by tall chaparral with patches of brush and dormant brush and interspersed hardwoods (Cal Fire, 2005; Refer to Section 3.16.2.1 for a detailed description of these fuel types). The majority of the Station Fire area burned at a moderate intensity with interspersed areas of high intensity and patches of unburned fuels.

The Station Fire has substantially reduced the fuel load in a portion of the Tehachapi Fireshed along Segments 6 and 11 relative to what was described in the Draft EIR/EIS. However, the fuel load along the unburned portions of Segments 6 and 11 within the Tehachapi Fireshed boundary and the portions of Segments 5, 7, and 8A within the Tehachapi Fireshed boundary remain unchanged. The area burned by the Station Fire, and the entire landscape of the Tehachapi Fireshed, is a dynamic landscape. Over the short term, the burned area is likely to be dominated by early successional plant species, including native and non-native grasses and herbs, which tend to dominate a burned site for the first several years after a fire. Chaparral is highly tolerant to the disturbance fire provides, and will generally dominate a burned site several decades after a fire through resprouting from moderately burned shrubs and germination of seeds in the soil. In the long term, therefore, chaparral is likely to recolonize the Station Fire scar.

In addition to fuel load, drought, disease, heat, and wind contribute to wildfire susceptibility. Notably, increased fire frequency on the same site tends to favor vegetative type conversion to early successional species such as native and non-native grasses and herbs (Johnson et al., 2006). Therefore, if the Station Fire scar were to reburn within the next 10 years, the reburned area would be susceptible to type conversion.

Segment 6 would be constructed over a period of 28 months, finishing in January of 2013. Segment 11 would be constructed over a period of 49 months, finishing in October of 2014. Segment 5 would be constructed over a period of 27 months, finishing in February of 2012. Segment 7 would be constructed over a period of 40 months, finishing in May of 2013. Segment 8 would be constructed over a period of 47 months, finishing in December of 2013.

2.15.3 Impact Evaluation

The criteria used to evaluate and determine the significance of fire prevention and suppression impacts in the EIR/EIS include the following:

- Criterion FIRE1: Activities associated with the Project adversely affect fire prevention and suppression activities.
- Criterion FIRE2: Project-related activities or the presence of the Project expose communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire.
- Criterion FIRE3: Activities associated with Project construction or maintenance result in a fuel vegetation matrix with an increased ignition potential and rate of fire spread.

The following analysis evaluates whether the Station Fire affects the magnitude of any project-related wildfire prevention and suppression impacts previously identified under Significance Criteria FIRE1, FIRE2, or FIRE3, whether any new project-related impacts would be introduced as a result of the fire, and whether effects of the fire necessitate the modification of mitigation measures introduced in the EIR/EIS.

Activities associated with the Project adversely affect fire prevention and suppression activities. (Criterion FIRE1)

Under Criterion FIRE1, impacts identified in the EIR/EIS included the potential for construction or maintenance of the Project to reduce the effectiveness of firefighting (Impact F-1), and the potential for the presence of the Project to reduce the effectiveness of firefighting (Impact F-2). Because fuel loads along portions of Segments 6 and 11 have been substantially reduced, thereby reducing the risk of wildfire to occur in the short term within the burned area of the Station Fire, the risk of wildfire along the burned portions of Segments 6 and 11 is reduced relative to what was disclosed in the Draft EIR/EIS. Therefore, the potential for the burned portions of Segments 6 and 11 to adversely affect fire prevention and suppression in the short term, or during construction, would also be reduced (Impact F-1). In the long term, over the lifetime of the proposed Project, the Station Fire scar would be expected to again be dominated by tall chaparral. Therefore, in the long term, the potential for the presence and maintenance of the proposed Project to adversely affect fire prevention and suppression would be the same as was disclosed in the Draft EIR/EIS (Impacts F-1 and F-2). Because fuel load along the unburned portions of Segments 6 and 11 within the Tehachapi Fireshed boundary and the portions of Segments 5, 7, and 8A within the Tehachapi Fireshed boundary remain unchanged, the potential for those portions of the Project to adversely affect fire prevention and suppression would be the same as was disclosed in the Draft EIR/EIS in both the short and long term. A mitigation measure introduced in the EIR/EIS would address the effects of Impact F-1:

- F-1 (Prepare wildland traffic control plans).

Although Impact F-1 would be reduced along portions of Segments 6 and 11 in the short term, Mitigation Measure F-1 would still be required to mitigate the potentially significant effects of Impact F-1 for the unburned portions of the proposed Project within the Tehachapi Fireshed and for the burned portions of Segments 6 and 11 in the long term.

The Station Fire does not alter the significance of Impacts F-1 or F-2, as described in the EIR/EIS. In addition, the Station Fire does not introduce new wildfire prevention and suppression impacts under Criterion FIRE1, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measure listed above, Impact F-1 would remain Class II, and Impact F-2 would remain Class III as described in the EIR/EIS.

Project-related activities or the presence of the Project expose communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire. (Criterion FIRE2)

As discussed in the EIR/EIS, Project-related activities or the presence of the Project would potentially expose communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire. Construction and maintenance activities, including the use of heavy equipment and the presence of personnel doing high risk activities during high risk conditions, would create a significant risk of a fire with potentially damaging impacts to communities, firefighter health and safety, natural resources, and personnel health and safety in the highly volatile Tehachapi Fireshed. As discussed above for Criterion FIRE1, fuel loads along portions of Segments 6 and 11 have been substantially reduced, thereby reducing the risk of wildfire to occur in the short term within the scar of the Station Fire. Therefore, the potential for construction to cause a wildfire along the burned portions of Segments 6 and 11 would also be reduced in the short term (Impacts F-3 and F-4). However, construction of the burned portions of Segments 6 and 11 would last until January of 2013 and October of 2014, respectively, and this would be of a duration sufficient for vegetation to regenerate enough to result in a fire during extreme weather conditions. Although a fire ignited in the scar of the Station Fire would be unlikely to result in a large wildfire during the construction window, a small fire could pose hazards to the health and safety of personnel and firefighters. Additionally, in the long term, over the lifetime of the proposed Project, the Station Fire scar would be expected to again be dominated by tall chaparral. Therefore, in the long term, the potential for the presence and maintenance of the proposed Project to result in an increased risk of wildfire would be the same as was disclosed in the Draft EIR/EIS. Finally, because fuel load along the unburned portions of Segments 6 and 11 within the Tehachapi Fireshed boundary and the portions of Segments 5, 7, and 8A within the Tehachapi Fireshed boundary remain unchanged, the potential for those portions of the Project to expose communities, firefighters, personnel and/or natural resources to an increased risk of wildfire would be the same as was disclosed in the Draft EIR/EIS in both the short and long term.

As described in the EIR/EIS, implementation of the following mitigation measures would ensure that Impacts F-3 and F-4 remain less than significant (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);
- F-4 (Prepare and implement Emergency Evacuation Plan);

Finally under Criterion FIRE2, the EIR/EIS determined that the presence of the overhead transmission line in areas where a transmission line does not currently exist would increase the risk of wildfire and compromise firefighter safety (Impact F-5). This impact would be less than significant for the proposed Project because the Project would only replace existing transmission lines through the high-risk Tehachapi Fireshed, and no transmission lines are proposed in areas where transmission lines do not currently exist within the Tehachapi Fireshed boundary. Only Alternative 4 proposes to construct transmission lines in areas where they do not currently exist, and because the Station Fire did not burn any portion of the Alternative 4 transmission corridors it would not affect the significance conclusion of Impact F-5 for that alternative (Class I for Impact F-5).

The Station Fire does not alter the significance of Impacts F-3, F-4, or F-5, as described in the EIR/EIS. In addition, the Station Fire does not introduce new wildfire prevention and suppression impacts under Criterion FIRE2, or require modifications to mitigation introduced in the EIR/EIS. With implementation of the mitigation measures listed above, impacts under Criterion FIRE2 would occur in the same way as described in the EIR/EIS.

Activities associated with Project construction or maintenance result in a fuel vegetation matrix with an increased ignition potential and rate of fire spread. (Criterion FIRE3)

As discussed in the EIR/EIS, Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread (Impact F-6). Construction and maintenance of the proposed Project would contribute to the introduction and proliferation of non-native, invasive plants. These fine fuels increase the likelihood that the background sources of ignition in the environment would result in a wildfire ignition, resulting in wildfire ignitions earlier in the year and an increased level of fire recurrence. While the introduction of non-native plants would not increase the background rate of ignition sources, it would increase the ignition potential, or the likelihood that an ignition source would result in an actual wildfire ignition. In addition, non-native grasslands have a "spotting" effect during a wildfire, where embers from these grasslands are blown ahead of the fire line, contributing to an increased rate of fire spread. Invasive annual grasses also influence fire spread by creating a fine fuel continuum between patchy, perennial shrubs allowing wildfires to expand further into otherwise sparsely vegetated wildlands (Wiedinmyer and Neff, 2007). Disturbed areas are more susceptible to colonization by weedy plant species, especially when multiple disturbances occur. Further, if the Station Fire scar were to reburn within the next 10 years, the reburned area would be highly susceptible to type conversion. Construction and maintenance of the proposed Project in the Station Fire burn scar would increase the likelihood of weed invasions, and therefore these activities would increase the ignition potential and rate of fire spread along the burned portions of Segments 6 and 11. As described in the EIR/EIS, implementation of the following mitigation measure would ensure that Impact F-6 would remain less than significant (Class II):

- B-3a (Prepare and implement a Weed Control Plan).

This mitigation measure would ensure that Impact F-6 would remain less than significant in a post-Station Fire landscape.

2.15.4 Cumulative Effects Analysis

Existing cumulative conditions in the Tehachapi Fireshed are defined by an existing landscape with other high voltage transmission lines and wildland-urban interface communities. From a wildfire prevention and suppression perspective, past and present projects are defined as fuel modification projects in the ANF, existing transmission lines in the ANF, and residential development projects at the edges of the ANF. The effects of Station Fire include reducing the fuel load along a portion of Segments 6 and 11, and substantially reducing the risk of wildfire in the short term within the scar of the fire.

In accordance with CEQA, when a Project's contribution to a cumulative impact is not "cumulatively considerable" the effect is not considered significant and does not need to be discussed in detail. Therefore, the CEQA determination that needs to be made relative to cumulative impacts is whether the proposed Project's incremental contribution to a cumulative impact is considerable. This evaluation focuses on whether the Station Fire changes the nature or magnitude of the Project's contribution to the cumulative impacts identified in the EIR/EIS.

Following is a discussion of the cumulative wildfire prevention and suppression impacts identified in the EIR/EIS and the potential for the Project's incremental contribution to those impacts to change as a result of the Station Fire such that the Project's contribution is cumulatively considerable.

- **Construction and/or maintenance activities would reduce the effectiveness of firefighting (Impact F-1).** The Station Fire will reduce the risk of fire and therefore reduce the project's contribution to firefighting impacts along the burned portions of Segments 6 and 11 in the short term (construction). In the long term, and along all other Project segments within the Tehachapi Fireshed in both the short and long term, the Project's contribution to cumulative effects on firefighting effectiveness would be unchanged. As was disclosed in the EIR/EIS, the Project's effects on firefighting effectiveness would not be cumulatively considerable and a less than significant cumulative effect would occur. The Station Fire slightly reduces the Project's contribution to this cumulative effect. The nature of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and only the magnitude of the effect is altered in the short term in scar of the Station Fire. There is no change to the significance conclusion of this cumulative effect.
- **The presence of new or higher overhead transmission line would reduce the effectiveness of firefighting (Impact F-2).** As stated in the EIR/EIS, the cumulative effect would be less than significant. The Station Fire would not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire. There is no change to the significance conclusion of this cumulative effect.
- **Construction and/or maintenance activities would increase the risk of wildfire (Impact F-3).** As stated in the EIR/EIS, construction of the proposed Project would increase wildfire ignitions in fuel-laden

wildlands. The Station Fire substantially reduces the Project's contribution to this cumulative effect along the burned portions of Segments 6 and 11 in the short term (during construction). The Station Fire does not alter the Project's contribution to this effect in the long term and along all other segments of the Project within the Tehachapi Fireshed in the short and long term. As stated in the EIR/EIS the mitigation measures listed for Impact F-3 above 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 Station Fire reduces the Project's contribution to this cumulative effect. The nature of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and only the magnitude of the effect is decreased by the Station Fire in the short term in the scar of the Station Fire. There is no change to the significance conclusion of this cumulative effect.

- **Construction and/or maintenance activities would increase the risk of personnel injury or death in the event of fire (Impact F-4).** As stated in the EIR/EIS, 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 Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire. There is no change to the significance conclusion of this cumulative effect.
- **Presence of the overhead transmission line would increase the risk of wildfire and compromise firefighter safety (Impact F-5).** As stated in the EIR/EIS, because the risk of wildfire ignition would not increase as a result of the proposed Project, this effect would not combine with other past, present, and reasonably foreseeable projects to result in a cumulative impact. Therefore this impact would not be cumulatively significant. The Station Fire does not alter the Project's contribution to this cumulative effect. The nature and magnitude of the Project's contribution to this cumulative impact is the same as described in the EIR/EIS and is not altered by the Station Fire. There is no change to the significance conclusion of this cumulative effect.
- **Project activities would introduce non-native plants, which would contribute to an increased ignition potential and rate of fire spread (Impact F-6).** As stated in the EIR/EIS, 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, 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. The Station Fire would alter the Project's contribution to this cumulative effect for construction activities within the burn scar because disturbed areas are more susceptible to biological invasions. The nature and magnitude of the Project's contribution to this cumulative impact is increased relative to what was described in the EIR/EIS as a result of the Station Fire, but only along the burned portions of Segments 6 and 11. There is no change to the significance conclusion of this cumulative effect.

In summary, the Station Fire would reduce the Project's contribution to one Class III and one Class II impact in the short term (Impacts F-1 and F-3), increase the Project's contribution to one Class I impact (Impact F-6), and have no change on the Project's contribution to three impacts with no cumulative adverse effect (Impacts F-2, F-4, and F-5). The Station Fire would affect the magnitude of the Project's contribution to several cumulative impacts, as described above, but the effects of the Station Fire do not alter the nature or significance of the proposed Project's contribution to cumulative effects described in the EIR/EIS.

3.0 Other Required NEPA and CEQA Considerations

3.1 Long-Term Implications

3.1.1 Irreversible and Irretrievable Commitment of Resources

Implementation of the proposed Project would result in the consumption of energy as it relates to the fuel needed for construction-related activities and would require the manufacture of new materials, some of which would not be recyclable at the end of the Project's lifetime, and the energy required for the production of these materials, which would also result in an irretrievable commitment of natural resources. Maintenance and inspection of the proposed Project would not change appreciably from SCE's existing activities in the Project area, and thus would not cause a substantial increase in the consumption or use of nonrenewable resources.

Effects of the Station Fire would not change the proposed Project's irreversible and irretrievable commitment of resources described in the Final EIR/EIS. Please see Section 5.1.2 of the Final EIR/EIS for a complete discussion of irreversible and irretrievable commitment of resources for the proposed Project.

3.1.2 Growth-inducing Effects

Effects of the Station Fire would not change the proposed Project's growth-inducing effects described in the Final EIR/EIS. Please see Section 5.1.4 of the Final EIR/EIS for a complete discussion of growth-inducing effects for the proposed Project.

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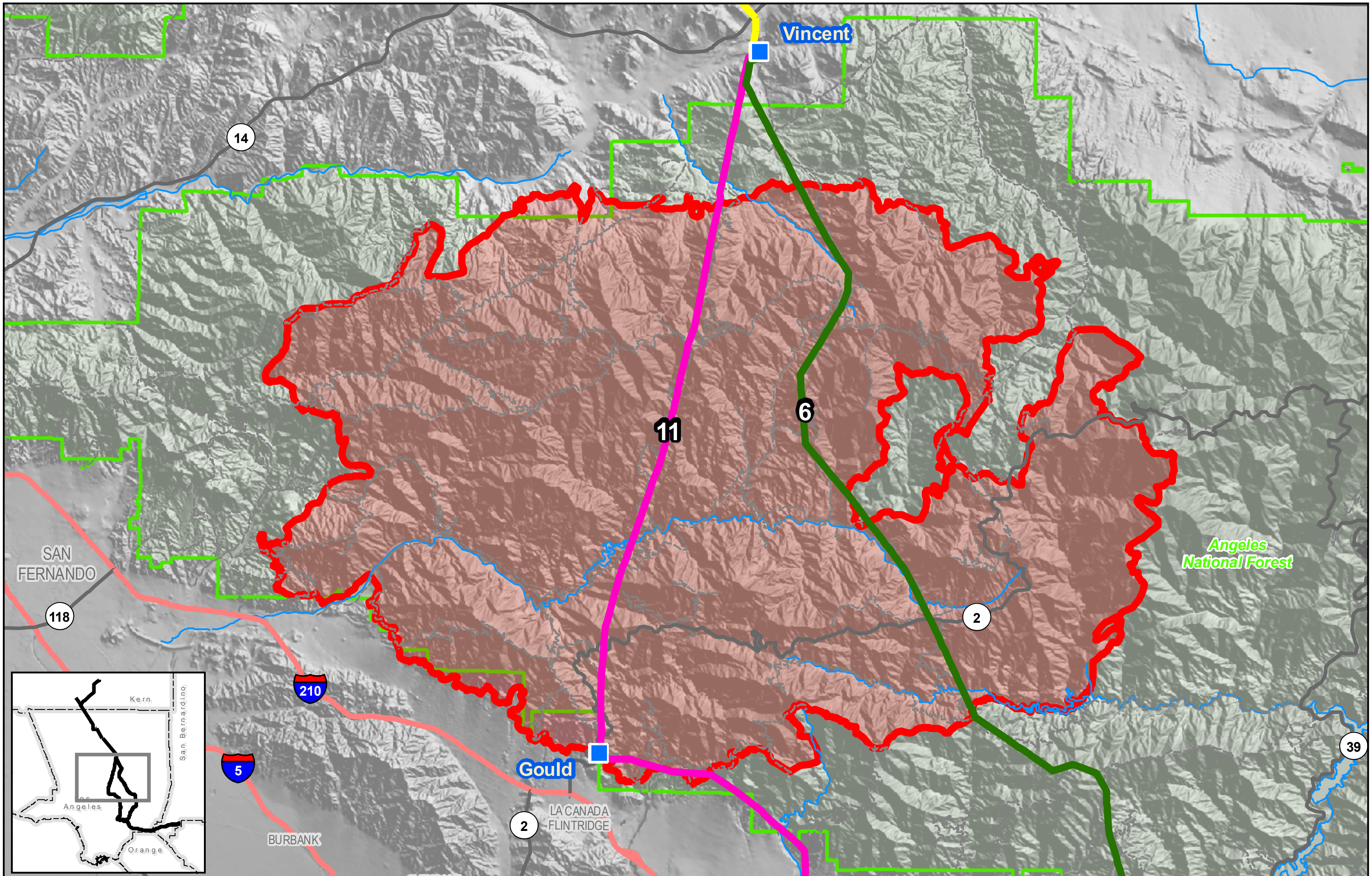

Aspen Environmental Group

1" = 3.5 miles

1:221,760

0 3.5 7 Miles

Substations

National Forest Boundary

Station Fire Boundary

Figure 1

Station Fire Burn Area