4.1 INTRODUCTION

This section describes existing environmental conditions within the study area for the proposed Antelope Transmission Project – Segments 2 (Antelope to Vincent) and 3 (Antelope to Substations One and Two), including the following project components, which are described in detail in Section 3.0 (Description of the Proposed Project):

- T/L facilities (proposed and alternative)
- Substation facilities (existing SCE Antelope 220 kV and Vincent 500 kV substations, and proposed new Substations One and Two)

The primary purpose of this section is to describe the existing environmental conditions in a sufficient level of detail to meet CPUC CEQA Rules (Rule 17.1 Special Procedure for Implementation of the California Environmental Quality Act of 1970) and to support and form the basis for environmental impact assessments presented in Section 5.0 (Environmental Impacts and Mitigation) of this PEA.

The balance of this section is organized as follows:

- 4.2 Aesthetics
- 4.3 Agricultural Resources
- 4.4 Air Quality
- 4.5 Biological Resources
- 4.6 Cultural Resources
- 4.7 Geological Resources
- 4.8 Hazards and Hazardous Materials
- 4.9 Hydrology and Water Quality
- 4.10 Land Use and Planning
- 4.11 Mineral Resources
- 4.12 Noise
- 4.13 Population and Housing
- 4.14 Public Services/Utilities
- 4.15 Recreation
- 4.16 Traffic and Transportation

4.2 AESTHETICS

4.2.1 Introduction

Visual resources of a given area consist of the landforms, vegetation, water features, and cultural modifications (physical changes caused by human activities) that impart an overall visual impression of the area landscape. A number of factors are considered in the evaluation of a landscape's visual resources and of the potential for one or more visual impacts to occur with the introduction of a project. These factors include visual quality, viewer sensitivity, landscape visibility, and viewer exposure.

Impacts to visual resources may occur when a project alters the visual quality or landscape visibility (scenic views) of the area in which the project is located. The level of viewer sensitivity and existing view quality would affect the severity of the impact.

This section addresses the visual resources environmental baseline conditions and the potential for Segments 2 and 3 of the proposed Antelope Transmission Project to create impacts to visual resources in the project study area, as defined by CEQA and relevant local plans and ordinances.

4.2.1.1 Methodology

Baseline data collection was initiated with a review of the existing project information, including project area strip maps, project plans, and aerial photos, in order to gain familiarity with the project requirements. A field survey of the project area was conducted to evaluate the existing landscape setting and visual resource issues of concern including sensitive land uses adjacent to or crossed by the proposed and alternative T/Ls and substation facilities.

During field studies, the project landscapes were viewed to the extent feasible from public roads and vantage points in order to develop an overall assessment of landscape characteristics and the potential for project impacts based on visibility from public areas. Key Viewing Areas (KVAs) were identified at critical locations along the Segment 2 and 3 T/L routes. Locations of KVAs are indicated on Maps 5.2-1 through 5.2-3 in Section 5.2.

KVAs are generally selected for one or two reasons: 1) the location provides representative views of the landscape along a specific route segment or in a general region of interest; and/or 2) the viewpoint effectively captures the presence or absence of a potentially significant project impact in that location. KVAs are typically established in locations that provide high visibility to "relatively" large numbers of viewers and/or sensitive viewing locations such as residential areas, recreation areas, and vista points.

Baseline photos from KVAs Seg 2-1 through Seg 2-3 and Seg 3-1 through Seg 3-3 and computer-generated simulations of the proposed project from each KVA are presented on Figures 5.2-1 through 5.2-6 in Section 5.2. Each baseline photo is labeled as Photo A and project simulations are labeled Photo B.

Photos were taken with a Canon high-resolution digital camera. Camera settings were selected to produce an image that is identical to images produced by a Single Lens Reflex (SLR) 35-mm camera with a 50-mm lens. SLR images are considered representative of views as seen by the unaided human eye. A study of the project information and plans were then used to create perspective sketches and digital simulation renderings using Adobe Photoshop.

4.2.1.2 Grading of Views and Visual Quality

In the process of identifying the characteristics and quality of views it is helpful to provide working definitions of the terms used. These terms identify the basic values and gradiations applied to particular scenes prior to the application of the applicant proposed project. They are used in the balance of Section 4.2.

4.2.1.2.1 Visual Quality. (impression/appeal of existing landforms)

- **Low:** Landforms are indistinct and generally characterized by level or gently sloping terrain with minimal vertical elements. Vegetation is relatively dispersed and has low scenic character in it mass, color and variety. There are minimal accent elements such as significant water bodies, rocks, bluffs or distant mountain ranges. Example: High desert areas near Barstow or Yermo.
- **Medium:** Landforms are characterized as common in the region and typically involve rolling hills and some distinguished forms and vertical elements. Vegetation is more noticeable with trees, grass fields, dense chaparral areas, and greater color or variety which adds to scenic interest. There may be features such as noticeable permanent water bodies, rock outcrops and mountain backdrops.
- **High:** Landforms will be distinctive and "worth a trip" to visit; they are typically characterized by significant vertical elements, valleys, bluffs or perhaps other distinctive forms or colors such as the painted desert in the southwest. Vegetation will also be distinct with forest outcroppings or other major or landmark scenic elements. Example: Big Sur Coast of California.

4.2.1.2.2 Viewer Sensitivity. (viewer perceptions/expectations as they pass through an area)

- **Low:** Viewers have minimal expectations. They will use a route on a routine basis (commuting) or for purposes other than to enjoy the view. Typical is the use of major

highways or interstates where the emphasis is on arriving at the destination. Example: Interstate 405 through Los Angeles.

- **Medium:** Viewers have some expectations of scenic variety – for example, they will choose the route because it is interesting, has variety, or is new to the user.
- **High:** Viewers will select a park or transportation route because of its scenic character. Example: Yosemite.

4.2.1.2.3 Viewer Exposure. (includes number of viewers, time of exposure and whether the view is directly visible)

- **Low:** Typically the number of viewers for a transportation corridor is less than 500 to 1000 per day. The time of exposure is less than 30 seconds. The view of the affected area is not in the primary cone of vision for a driver or affecting the main view from a scenic vista.
- **Medium:** Typically the number of viewers along a transportation corridor is between 1,000 and 5,000 (a typical street). View duration may be up to a minute. The affected area will be more noticeable than in the low category.
- **High:** Typically, for a transportation corridor, the number of viewers is in excess of 5,000 (highways and freeways). View duration is more than a minute. The affected area is directly visible either in the primary cone of vision of a traveler or affects the main view from a scenic vista.

Note: The above guidance is general in nature and sometimes must be adapted to more specific criteria. This may be the case where there are atypical circumstances (e.g., a major reservoir may have more scenic value in the desert than near the California coast) or where a local agency may by fiat have set special criteria; e.g., the state of California may have designated a scenic highway.

4.2.2 Regional Setting

4.2.2.1 Segment 2

The Antelope Substation and the 20.0 miles of 500 kV T/L route and 0.5 mile of 220 kV T/L route as well as the Vincent Substation associated with Segment 2 of the Antelope Transmission Project are located in northern Los Angeles County. The proposed 500 kV T/L route parallels an existing T/L corridor for most of the route to the Vincent Substation. The only deviation from the existing corridor is the portion of the proposed route between MPs 8.1 and 14.8 to be constructed through open space areas on the planned Ritter Ranch and Anaverde developments. The 0.5 mile of proposed 220 kV T/L route is located north of the Vincent Substation. The project T/L route locations are indicated on Figure 3-1, General

Location Map, and Map 5.2-1, Segment 2. The proposed T/L route passes through undeveloped rural areas, agricultural areas, and areas proposed for suburban development near Palmdale.

The northern portion of Segment 2 is a landscape void of major visual features in the area adjacent to the Antelope Substation. About 4.5 miles south of the substation, the topography rises over the Portal Ridge, which has some modest vegetation and then drops into Leona Valley (the San Andreas Rift Zone) as shown on Photo No. 3. Southeast from the Leona Valley is the Anaverde Valley, which is flat and relatively devoid of significant vegetation, but has several large-scale developments proposed in the area as an extension of the City of Palmdale. The T/L corridor then traverses approximately 4.5 miles of the relatively inaccessible, rugged, and sparsely vegetated unincorporated Los Angeles County lands until exiting into the Soledad Canyon area. Soledad Canyon is a major transportation corridor and includes Highway 14, Soledad Canyon Road, and the railroad commute corridor between Palmdale and Los Angeles.

Overall, the visual quality of the area varies from moderate (see definitions provided in Section 4.2.1.2 above) in the eastern Leona Valley area to moderately low in the in the relatively open landscape of the Antelope Substation area, the Portal and Ritter Ridge areas, and the relatively inaccessible land north of Soledad Canyon. The visual quality is low in the Soledad Canyon to Vincent area given the presence of the highway, railroad, and the existing T/Ls.

Viewer exposure is relatively low, given the few residences and minimal traffic, in all areas except the Soledad Canyon area where it is high given the intense use of Highway 14.

4.2.2.2 Segment 3

The Antelope Substation and the southern 10.5 miles of the proposed and alternative T/L route associated with Segment 3 of the Antelope Transmission Project are located in northern Los Angeles County. The remainder of approximately 25 miles is in Kern County jurisdiction. The project location is indicated on Figure 3-1, General Location Map, and Map 5.2-1, Segment 3.

The proposed and alternative T/L routes pass through undeveloped rural areas and agricultural areas, and terminate in the industrial wind turbine fields near Tehachapi. The southern portion of Segment 3 is a flat, occasionally farmed landscape void of major visual features in the immediate foreground. Agriculture is a more predominant feature of the central portion of the corridor north to the Willow Springs Butte area. The countryside then transitions to one of rolling topography, occasional old mining sites, and open scrub land until the vicinity of Oak Creek Road. At this point, the industrial complex of the wind

turbines and Cal Cement dominate the man-generated land uses of the area. The last link of the transmission route then traverses the eastern extension of the Tehachapi Mountains crossing Cameron Canyon Road and the Pacific Crest Trail before dropping into the Highway 58 corridor area.

Overall, the visual quality of the area varies from moderately low in the flat open space and agricultural portions of the Antelope Valley to moderate in the Oak Creek Road area (Substation One) over the Tehachapi Mountains to the north. The quality then drops to moderately low in the area of Substation Two.

Overall viewer exposure to the project is relatively low, given the few residences and minimal traffic, in all areas except the Highway 58 corridor area where it is high given the relatively heavy use of this route.

4.2.2.3 Alternatives

In Segment 2, the regional setting is generally the same for the proposed project and Alternative AV1. Alternative AV2 provides an alternative route along the existing SCE T/L corridor in contrast to the loop of the proposed T/L through open space areas on the Ritter Ranch and Anaverde developments. In Segment 3 The regional setting for T/L route Alternatives A, B, and C and applicable substation alternatives is generally the same as described previously for the proposed project for the area between the Antelope Substation and Substation One. Between Substation One and Substation Two, Alternative C crosses a more scenic portion of Cameron Canyon Road than does the proposed route.

4.2.3 Planning and Future Development Context

4.2.3.1 Segment 2

Land uses in the area south of the Antelope Substation are low-density rural and no new projects are known for this area until the area known as Quartz Hill in west Lancaster is reached (approximately MP 3.5). At this point, there is active construction of new subdivisions at the base of Portal Ridge that are adjacent to the proposed T/L route and the existing T/L corridor in this area. Review with the city planners indicates two projects, one for 158 units on 75 acres and one for an unknown number that is in the pre-application process at this point.

The next area where there are known development proposals is the area of the Ritter Ranch (western Palmdale) where a specific plan has been filed. The general development areas include areas both northeast and southwest of the proposed T/L. In addition, the Anaverde Specific Plan (formerly the City Ranch Specific Plan) calls for development just east of the

Ritter Ranch. This development, now under construction, includes open space around the existing T/L corridor.

South of Anaverde, the land is under unincorporated Los Angeles County jurisdiction and no known future development is proposed with the exception of the proposed Palmdale 1000 development (refer to Figures 3-1 and 3-2). The proposed Segment 2 T/L route traverses the extreme southwest corner of this proposed development. At the southern end of Segment 2 is the Soledad Canyon area. Again, this area is fully occupied by the transportation corridor and the Vincent Substation. No known future development is proposed in this area.

4.2.3.2 Segment 3

Land uses in the area north of the Antelope Substation are low density rural. No major changes are projected for this component of Segment 3. At Avenue H, a large development known as the Del Sur Ranch is proposed in western Lancaster. The proposed T/L route passes immediately to the west of the land designated for development, though the details of this proposal are not known at this time. The only other known residential development near the proposed T/L route is the Copa De Oro/Kern Ross Estates project (west of MP 10.5), however, the closest portion of this project is located approximately 0.33 mile west of the proposed T/L route and would not be visually affected by the proposed project.

Both in the intervening area between these two projects and further north in the Antelope Valley, the general agricultural character of the land uses is projected to remain much as it is today.

At the northern end (Oak Creek Road and cresting the Tehachapi Mountains) there are no known residential proposals for the area, which is otherwise devoted to industrial and wind turbine uses.

4.2.3.3 Alternatives

In Segment 2, the planning and future development context is generally the same for the proposed project and Alternative AV1. Alternative AV2 provides an alternative route along the existing SCE T/L corridor in contrast to the loop of the proposed T/L through the Ritter Ranch and Anaverde developments.

In Segment 3, the planning and future development context for T/L route Alternatives A, B, and C and applicable substation alternatives is generally the same as described previously for the proposed project for the area between the Antelope Substation and Substation One. Between Substation One and Substation Two, Alternative C crosses a rural residential area (3 homes) in the vicinity of the Cameron Canyon Road crossing.

4.2.4 Summary of Adopted Plans and Policies

This section provides an overview of applicable visual resource policies along each of the project segments. The proposed and alternative T/L routes where the project would occur pass through different jurisdictions with different plans outlining goals and policies for protection of visual resources. Components of the project also cross Highways 58 and 138 in Kern County and Highway 14 in Los Angeles County. None of these highway segments are identified as Officially Designated Scenic Highways by Caltrans, however, Highway 58 in Kern County is identified as an eligible highway.

4.2.4.1 Segment 2

Segment 2 is within the jurisdictional boundaries of Los Angeles County and the cities of Lancaster and Palmdale. The applicable Los Angeles County General Plan policies are discussed below.

Under the Conservation, Open Space, and Recreation Element of the current LA County General Plan (1980a), areas of scenic value including ridgelines, as seen from public viewpoints, should be protected (Policy 19). A general overview of environmental resources (Section 3.g, page OS-5) in the Conservation Element indicates that certain roads passing through the Angeles National Forest are considered scenic routes. However, no proposed or alternate Segment 2 T/L routes are within the Angeles National Forest.

Section 15 of Appendix A of the Land Use Element (1980b) provides General Conditions and Standards for Development pertaining to Scenic Highways. The standards direct development within proposed and designated scenic corridors to enhance and complement scenic views (Section 15, Standard 2, page LU-A19), but are not more specific.

Policies in the Environmental Resources Element of the City of Palmdale General Plan (1993) protect visual resources from development which could result in negative impacts. Specifically, development which could alter the character of significant ridgelines including the Ritter, Portal, and Sierra Pelona ridges is discouraged (Policy ER 1.2.1). The Environmental Resources Element also identifies Elizabeth Lake Road, Bouquet Canyon Road, and Goode Hill Road as city scenic roadways. Policy ER 1.2.2 requires that development along scenic roadways follow special design standards, however, these design standards are not established (reference pages ER-4 and ER-19 of the element).

4.2.4.2 Segment 3

The southern portion of Segment 3 is located in Los Angeles County, with the majority of the segment within Kern County. The Los Angeles County General Plan policies discussed for Segment 2 above are also applicable to Segment 3.

The Circulation Element of the Kern County General Plan (2004c) identifies Highway 58 between Mojave and Boron as Scenic Route No. 2, but makes no mention of the area between Tehachapi and Mojave. Policies regarding the protection of designated scenic routes call for the creation of standards; however, no scenic corridor standards are included in the General Plan.

4.2.4.3 Alternatives

The applicability of adopted plans and policies to the proposed and alternative Segment 2 and Segment 3 project facilities is the same for the proposed and alternative components from a visual perspective.

4.2.5 Visual Context

The R-O-W visual context is linear and, therefore, evaluated in a series of sectors identified by route MPs given the character of the T/L route(s). The visual contexts identified below are utilized in identifying potential impacts in Section 5.2 (Aesthetics) of this PEA.

4.2.5.1 Segment 2

4.2.5.1.1 Antelope Substation Area to Portal Ridge (MP 0.0 – 4.5). From the Antelope Substation to the base of the Portal Ridge, the land is flat with scattered ranches until the area of Avenue M and 75th Street W. is reached (see Context Photo No. 1, Figure 4.2-1). There are few residents or viewers of the proposed extension to the existing corridor (i.e., addition of new 500 kV T/L parallel to the existing T/L corridor). The only substantial street is Avenue K, which has relatively low usage. The immediate visual landscape is devoid of major features.

This condition is true until the end of this section at the base of Portal Ridge where there are several subdivisions under construction in the Avenue M area (see Context Photo No. 2). In this case there would be more viewers, but for the most part they would see the T/L within the context of the existing corridor and the views of the Portal Ridge. The most significant local feature would be more obscured by adjacent houses than by the T/L.

4.2.5.1.2 Leona Valley/Palmdale (MP 4.5 – 15.1). The proposed T/L crosses the Portal Ridge and drops into the eastern end of the Leona Valley as it crests into the Anaverde Creek area. The northern portion of this section is the most scenic component of Segment 2 (see Context Photos No. 3 and No. 4, Figure 4.2-2). Photo No. 3 shows the existing transmission corridor crossing the Portal Ridge/Ritter Ridge in the vicinity of Goode Hill Road and demonstrates the rolling hills and vegetative character of the area.

The southern portion of this sector is more barren where the T/L transitions southeast and skirts BLM lands near the Anaverde Creek area (see Context Photo No. 5, Figure 4.2-3).

The visual quality of the area is rated moderate for the Leona Valley portion and moderately low for the Anaverde Creek area.

At present there are few travelers in the area. The primary road is Elizabeth Lake Road (see Context Photo No. 4). Duration of views of the transmission corridor area is moderate.

The addition of houses with proposed construction in the Ritter Ranch and Anaverde Specific Plans would significantly change the landscape from open space/rural to residential.

4.2.5.1.3 Ritter Ridge to Soledad Canyon (MP 15.1 – 20.2). This sector of land is inaccessible to all but those using four-wheel drive vehicles. The landscape character is very rugged with minimal scrub vegetation. The overall character can be seen in the background of Context Photos No. 5 and No. 6 on Figure 4.2-3.

The proposed T/L would be added to the existing corridor and views of the new towers and lines would be seen in this context.

4.2.5.1.4 Vincent Substation (MP 20.2 – 21.5). This section of the proposed T/L route covers the upper reach of Soledad Canyon just before it exits into the Antelope Valley at Soledad Pass. In the space of a half a mile, there is the six-lane Highway 14, the two-lane Soledad Canyon Road, the Metro Commute/Union Pacific Railroad, and the Soledad wash, as well as four existing T/Ls. The area is already visually impacted and relatively devoid of any major visual features though it is enclosed on the north and south by low lying hills sparsely covered with scrub. The visual quality of the area is described as low (degraded) given the urban nature of the transportation corridor and lack of any distinguishing visual features. (See Photo 6, Figure 4.2-3).

The final connecting link to the Vincent Substation crosses the Soledad wash and connects to the substation from the west. While this link/substation area is visible from Highway 14 and seen against the backdrop of the Angeles National Forest, it is nearly 1 mile from the direct viewing point for northbound travelers and does not silhouette against the hills to the east. Angeles National Forest Road (N3) passes to the east of the substation and is the gateway to this component of the National Forest. There are numerous existing T/Ls terminating at Vincent Substation. This is represented by Context Photo No. 7, Figure 4.2-4.

The number of travelers viewing this sector from Highway 14 is very high though the duration of viewing the T/L corridor directly is relatively short and would be seen within the context of the existing corridor.

4.2.5.2 Segment 3

4.2.5.2.1 Antelope Substation Area (MP 0.0 – 2.0). From the Antelope Substation to the point where the proposed T/L diverges from the existing T/L corridor the land is flat and devoid of significant visual features. There are few residents or viewers of the extension of the existing corridor. The only substantial street is Avenue I which is also called the Lancaster Highway and connects Lancaster to Gorman on Interstate 5. This road has moderate usage but does pass through the Antelope Valley Poppy Reserve approximately 5 miles to the west. The immediate visual landscape is devoid of major features though Portal Ridge does provide a visual backdrop to the view to the southwest approximately 5 miles distant (see Photo No. 8, Figure 4.2-4). There are few residents in this area. The scenic quality is rated as moderate to moderate-low.

4.2.5.2.2 105th/107th Street Corridor Antelope Valley (MP 2.0 – 22.6). At MP 2.4, the proposed T/L corridor diverges from the existing corridor and starts its northern heading along 105th Street W. for about 2.5 miles before realigning with 100th Street W. about 18 miles to the north.

At the southern end of this sector, the land is completely flat and almost unpopulated (see Photo No. 9, Figure 4.2-5). In this photo, the Tehachapi Mountains are barely visible at the horizon and the wind farms can be seen on a clear day. Willow Springs Butte is the low hill visible at photo middle right. The right-hand portion of the grassland shown on Photo No. 9 is part of the proposed Del Sur Ranch development. The western portion of the development would abut the proposed T/L corridor for 1.5 miles.

Just beyond the small rise crossed by a dirt road where the vegetation changes to scrub, the land use changes to scattered farms and ranches. This land use is somewhat intensified at the northern portion of Los Angeles County in the areas from Avenue B to Rosamond Boulevard. The characteristics of this sector are represented by Photo No. 10, Figure 4.2-5, which is taken at the intersection of 105th Street W and Avenue C. The land remains flat, but some of the farms have planted trees as can be seen in the photo. At this point, there is a power line as evidenced by the wood poles on the east of 105th Street W.

The visual quality of this sector is rated as moderately low. There are very few travelers, almost all locals, and few residents immediately adjacent to the proposed corridor.

4.2.5.2.3 Oak Creek/Substation One (MP 22.6 – 25.6). At MP 22.6, after crossing Tehachapi Willow Springs Road, the Los Angeles Aqueduct, and a petroleum pipeline, the proposed T/L route angles northeast from the 105th Street W corridor and traverses the open scrub area of the Oak Creek Wash. The land in this area is more undulating and vegetation is characterized as low scrub. The area is almost completely devoid of roads or human

habitation. The only distinguishing visual characteristics are an occasional abandoned mining site and the Tehachapi Mountains to the north. The proposed T/L then reaches Oak Creek Road, proposed Substation One, and the nearly 5 miles of wind turbine farms fronting on Oak Creek Road.

The overall visual quality of this sector is moderate given the more varied landforms that are relatively undisturbed by human activity. The number of viewers is extremely low as access, until one reaches Oak Creek Road, has to be by four wheel drive vehicles.

4.2.5.2.4 Oak Creek Road Corridor (MP 25.6 – 31.0). This 5.4-mile-long section generally heads west following Oak Creek Road from Substation One to the point where the T/L route turns north at MP 31.0

This section is characterized by major wind turbine farms on the north (Midwind, Dutchwind, Morwind, etc.), the Sagebrush 220 kV T/L, as well as SCE's existing 66 kV lines, and relatively open country on the south. The view of Oak Creek Road at 80th Street is seen on Context Photo No. 11 showing the open area to the left and the Cal Cement operation photo center right (see open hill/excavation). The western portion of this section enters Oak Creek Canyon north and west of the Cal Cement facility. Thus, the views south of the corridor have a moderate visual quality. This is the area proposed for Substation One.

The area from north of Oak Creek Road viewing west, the context in which the T/L would be seen, is generally adjacent to the wind turbine farms and the visual quality is moderate/low given the visual clutter of the wind generators (see Context Photo No. 12 viewing along Oak Creek Road east toward Mojave; the windmills can be seen on the left).

The majority of travelers along this stretch of Oak Creek Road, based upon field observation, are employees or service support to the wind farms or Cal Cement and are relatively few in number. The duration of view would be long since the road parallels the proposed T/L route.

4.2.5.2.5 Oak Creek Road/Tehachapi Mountains (MP 31.0 – 35.2). The final 4.2 miles of the proposed T/L route reaching north from Oak Creek Road to proposed Substation Two parallels an existing 66 kV line and crosses open country over the Tehachapi Mountains. The line skirts several of the existing wind farms that are located in this area. While the area would be moderately scenic in its natural state, the addition of the many windfarms has degraded it to moderate/low in visual quality.

General public vehicular access occurs only where the line crosses Tehachapi Willow Springs Road (twice) at MPs 30.7 and 31.4; otherwise, the area is closed to public usage (see context Photo 13, Figure 4.2-7). The only exception is where the T/L route crosses the pedestrian Pacific Crest Trail near MP 31.1 adjacent to the Midwind facility. Use of this portion of the trail is very low but it is a designated recreation area located for its scenic

qualities. This portion of the trail north of the proposed T/L meanders past several windfarms. The southwestern component of the trail crosses Tehachapi Willow Springs Road and proceeds southwest up Oak Creek Canyon into the higher portion of the Tehachapi Mountains.

The number of travelers in the area is very low and their expectations, with the exception of users of the Pacific Crest Trail, would be moderate.

4.2.5.2.6 Substation Two Area/Monolith (MP 35.0). Proposed Substation Two is located at the intersection of Highline (a ranch road at this location) and Monolith (a short connecting road between the Highway 58 frontage road and the General Electric assembly and maintenance plant for the windfarms). This area is relatively rolling with a coverage of scrub. Context Photo No. 14, Figure 4.2-7 shows the view from the intersection of Highline and Monolith facing southwest with the Tehachapi Mountains in the background. Facing north it is approximately 0.5 mile to State Highway 58 and then an additional 3,000 feet to the Union Pacific Railroad and the large cement plant in Monolith. East and west is the Tehachapi valley floor with occasional farms but for the most part scrub. To the immediate south and southeast is a major windfarm area. The visual quality is moderate/low given the general flatness of the topography, the lack of significant vegetation, and the overall character of the windfarm and the railroad and cement plant.

Views to the site are relatively limited. It is not particularly visible from Highway 58 where the most obvious viewing position is more than a mile away. There are no local through roads. The Pacific Crest Trail is cut off from this location by a 600-foot-high ridge of the Tehachapi Mountain range capped with windmill farms. Visual sensitivity to travelers is classified as low.

4.2.5.3 Alternatives

The visual context for the proposed and alternative Segment 2 project facilities is generally as described in Section 4.2.2.3.

The visual context for Segment 3 T/L route Alternatives A, B, and C and applicable substation alternatives are generally the same as described previously for the corresponding portions of the proposed project. The only exception is that Alternative C between Substations One and Two would cross the Tehachapi Mountains approximately 2 miles east of the proposed route. This location takes the Alternative C T/L route through a more scenic and residential portion of Cameron Canyon when compared to the proposed route.

4.3 AGRICULTURAL RESOURCES

4.3.1 Introduction

This section describes agricultural resources in the project area for Segment 2 (Antelope to Vincent, including T/L route Alternatives AV1 and AV2) and Segment 3 (Antelope to Substations One and Two, including T/L route Alternatives A, B, and C, and Substations One and Two). The proposed 500 kV T/L routes associated with Segments 2 and 3 (refer to Figures 3-1, 3-2, and 3-3) begin in the City of Lancaster at the Antelope 220 kV Substation. Both Segments 2 and 3 also include 220 kV T/L components. This section discusses agricultural resources in both Los Angeles and Kern Counties, as the proposed Segment 2 is entirely within Los Angeles County, and the proposed Segment 3 extends north from Los Angeles County into southern Kern County.

Agricultural resources were evaluated by reviewing the Los Angeles County General Plan (Conservation and Open Space Element, January, 1980a, 1993), the Kern County General Plan (1994, 2004a), as well as the General Plans for the cities of Palmdale, Lancaster, and Tehachapi. Agricultural resources data were also obtained from the California Department of Conservation (Division of Land Resource Protection, and Farmland Mapping and Monitoring Program), as well as the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS).

4.3.2 County General Plan Policies

4.3.2.1 Los Angeles County

As stated in the Los Angeles County General Plan (1993), one of the County's goals is "*To preserve and protect prime agricultural lands, forests, fisheries, significant ecological areas and other biotic resources*." This general goal is soon to be revised and strengthened, as stated in the County's General Plan Update (2004b). The revised goal (Goal O-1 of the Conservation and Open Space Element) calls for preservation of productive farmland and land with agricultural opportunities to contribute to food production, open space and the local economy. The Goal O-1 is anticipated to enforce the following policies:

- Establish Agricultural Opportunity Areas, to identify prime agricultural soils and viable agricultural uses, where consistent with adjacent land uses and natural resources
- Support the establishment of voluntary agricultural preserves under the Williamson Act within Agricultural Opportunity Areas to preserve productive agricultural lands
- Support the Agricultural Commissioner's efforts to assist farmers and ranchers in their agricultural operations and discourage incompatible uses adjacent to farmlands

- Allow vacant land under utility lines to be used for agricultural activities, where such use is compatible with adjacent land uses

4.3.2.2 Kern County

Kern County considers the loss of valuable agricultural lands to urban development a prime concern. A basic question addressed in the County's General Plan (Land Use Element, 1994) is whether or not the unique resource of prime agricultural lands should be reserved for agriculture and urban growth directed to areas less suitable for agriculture.

Land division, even where actual development does not take place, can also adversely affect the County's agricultural resource base. This is particularly a problem in extensive agriculture areas, such as rangeland, where land values can be significantly increased beyond values based on agricultural productivity. Therefore, the following goals and policies relative to agricultural resources are stated in the 1994 General Plan:

- To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations that would not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities that exist in the County.
- Areas designated for agricultural use, which include Class I and II agricultural soils with surface delivery water systems, would be protected against residential and commercial subdivision and development activities.
- Areas identified by the Soil Conservation Service (now the NRCS) as having high rangesite value would be reserved for extensive agriculture uses, or as resource reserve if located within a County water district.
- Appropriate resource uses of all types would be encouraged as desirable and consistent in undeveloped portions of the County regardless of General Plan designation.

Kern County also addresses energy development in their General Plan (Energy Element, 1990). In the Plan, the County addresses the fact that full realization of the County's wind-generated electricity may be hampered due to the lack of adequate power transmission capacity. Therefore, one of the County's policies is to support the construction of additional transmission capacity for wind energy developments where land use and other constraints are minimal.

4.3.3 Farmland Conversion Trends

4.3.3.1 Los Angeles County

While Los Angeles is commonly viewed as an urbanized county, there is substantial crop production ongoing in the Antelope Valley area of the county. Despite the recent increase in agriculture in the Antelope Valley, Los Angeles County continues to report a net loss in agricultural acreage. Approximately 6,684 acres of agricultural lands (1,577 acres of "important farmland," and 5,107 acres of grazing land) were converted to another use between the years 2002-2004 (California Department of Conservation [CDOC], 2005). Refer to Table 4.3-1 for a summary of farmland conversion between 2000 and 2002 in Los Angeles County. This, however is a decrease in land use conversion, however, as approximately 14,188 acres of agricultural lands (8,045 acres of "important farmland," and 6,143 acres of grazing land) were converted to another use between the years 2000-2002 (CDOC, 2004).

The NRCS identifies soil suitability for agriculture as varying from "prime" to "poor." Prime Farmland (P), as defined by NRCS, is the farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. Other important farmland categories include Farmland of Statewide Importance (S), Unique Farmland (U), Farmland of Local Importance (L), and Grazing Land (G). S is similar to P but with minor shortcomings, such as greater slopes or less moisture. U is land of importance to the local agricultural economy as determined by each county's board of supervisors. G is land on which the existing vegetation is suited to the grazing of livestock.

Approximately 33,218 acres of Los Angeles County are identified as Prime Farmland (CDOC, 2005). The 1993 Los Angeles General Plan states that 450,000 acres of prime agricultural soil [then] remain undisturbed by urbanization. However, the majority of this farmland is located in the Antelope Valley where water costs and climatic conditions limit productivity. In the south county, urban growth has eliminated most agricultural acreage. As a result, the remaining agricultural activity has become very specialized, shifting to crops of high value, such as nursery products, cut flowers, vegetables, and fruits.

Under the California Land Conservation Act of 1968 (known as the Williamson Act), the owner of an agricultural parcel may enter into a contract with a county in which the owner agrees to maintain agricultural operations on the parcel for a 10-year period. In exchange, the county assesses the property for tax purposes based solely on the agricultural value of the parcel, lowering the property tax obligation of the property owner.

4.3.3.2 Kern County

Kern County has expressed concern for the potential conversion of prime and important farmland to urban uses and the resultant loss for agricultural use. The County recognizes that

TABLE 4.3-1
FARMLAND CONVERSION IN LA COUNTY FROM 2002 TO 2004
(IN ACRES) [1]

Land Use Category		Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Grazing Land	Total Agricultural Land	Urban and Built-up Land	Other Land	Total Converted
Prime Farmland	to:	--	0	4	22	401	427	40	900	1,367
Farmland of Statewide Importance	to:	0	--	0	0	0	0	0	44	44
Unique Farmland	to:	0	0	--	0	54	54	25	12	91
Farmland of Local Importance	to:	0	0	17	--	57	74	1	0	75
Important Farmland Subtotal		**0**	**0**	**21**	**22**	**512**	**555**	**66**	**956**	**1,577**
Grazing Land [2, 3]	to:	1,194	78	20	566	--	1,858	1,241	2,008	5,107
Agricultural Land Subtotal		**1,194**	**78**	**41**	**588**	**512**	**2,413**	**1,307**	**2,964**	**6,684**
Urban and Built-up Land[4]	to:	71	0	0	0	8	79	--	405	484
Other Land [3]	to:	1,133	56	14	1	14	1,218	1,934	--	3,152
Water Area	to:	0	0	0	0	0	0	0	0	0
Total Acreage Converted		**2,398**	**134**	**55**	**589**	**534**	**3,710**	**3,241**	**3,369**	**10,320**

[1] Due to the incorporation of digital soil survey data (SSURGO) during this 2005 update, acreages for farmland, grazing and other land use categories may differ from those published in the 2000-2002 California Farmland Conversion report.

[2] Conversion to Other Land primarily the result of the use of improved digital imagery to delineate oil field boundaries on the Val Verde and Newhall quads.

[3] Conversion to Prime Farmland primarily due to newly irrigated agricultural land in the Antelope Valley.

[4] Conversion from Urban and Built-up Land primarily the result of the use of improved digital imagery to delineate more distinct urban boundaries.

implementation of the updated General Plan could potentially result in the ultimate loss through actual development, not merely a change in the General Plan designations, of 71,841 acres of prime and important farmland. An additional estimated 8,000 to 9,000 acres of prime and important farmland could be converted to urban uses if certain areas are developed and approved for proposed Specific Plans. Also, approximately 55,000 of resource land used for grazing could be converted to urban uses if all of the proposed areas are developed and approved for Specific Plans (Kern County General Plan, 2004e).

There would be an eventual loss of additional agriculture production as certain lands with General Plan designations for residential, commercial and industrial uses are eventually developed. The Kern County zoning ordinance allows the A (Intensive Agriculture) and A-1 (Limited Agriculture) designation as an interim use and is considered consistent with the General Plan. Kern County considers these lands, although used for agriculture, to be permanently committed in the future to an urban use through the approval by the Board of Supervisors of non-agricultural General Plan designations.

Kern County continues to report a net loss in agricultural acreage. Approximately 12,097 acres of agricultural lands (8,647 acres of "important farmland," and 3,450 acres of grazing land) were converted to another use between the years 2000-2002 (CDOC, 2004; 2002-2004 conversion data for Kern County is currently unavailable). Refer to Table 4.3-2 for a summary of farmland conversion between 2000 and 2002 in Kern County.

Approximately 530,079 acres of Kern County are identified as Prime Farmland (CDOC, 2004). This is 497,697 acres more Prime Farmland than exists in the County of Los Angeles. At the southern end of the San Joaquin Valley, Kern County is the most diverse and productive farming area in the world, producing over 250 different crops. Kern County alone outranks the agricultural production of 20 states.

4.3.4 Important Farmland

4.3.4.1 Segment 2

The existing SCE Antelope 220 kV Substation is located on historical grazing land. The proposed 500 kV T/L for Segment 2 traverses a small patch of potential Prime Farmland approximately 2 miles south of the Antelope Substation. This farmland area is less than 1-mile long in extent. From there, the proposed T/L for Segment 2 does not traverse any other significant farmland throughout the rest of the 21.5-mile-long segment. However, grazing land is traversed at the northern end of Segment 2.

TABLE 4.3-2
FARMLAND CONVERSION IN KERN COUNTY FROM 2000 TO 2002
(IN ACRES)

Land Use Category		Prime Farmland	Farmland of Statewide Importance	Unique Farmland	Farmland of Local Importance	Grazing Land	Total Agricultural Land	Urban and Built-up Land	Other Land	Total Converted to Another Use
Prime Farmland [1, 2]	to:	--	28	64	0	2,410	2,502	1,279	1,603	5,384
Farmland of Statewide Importance [1, 2]	to:	56	--	21	0	77	154	31	1,472	1,657
Unique Farmland [2]	to:	1	12	--	0	290	303	0	1,303	1,606
Farmland of Local Importance	to:	0	0	0	--	0	0	0	0	0
Important Farmland Subtotal		**57**	**40**	**85**	**0**	**2,777**	**2,959**	**1,310**	**4,378**	**8,647**
Grazing Land [3, 4]	to:	1,352	394	242	0	--	1,988	351	1,111	3,450
Agricultural Land Subtotal		**1,409**	**434**	**327**	**0**	**2,777**	**4,947**	**1,661**	**5,489**	**12,097**
Urban and Built-up Land [5]	to:	187	4	16	0	55	262	--	358	620
Other Land [6, 7]	to:	2,664	759	1,401	0	2,595	7,419	3,522	--	10,941
Water Area	to:	0	0	0	0	0	0	0	0	0
Total Acreage Converted	**to:**	**4,260**	**1,197**	**1,744**	**0**	**5,427**	**12,628**	**5,183**	**5,847**	**23,658**

1 Conversions between Important Farmland categories primarily due to corrections made to soil unit identification.

2 Conversion to Grazing and Other Land primarily due to land left idle for three update cycles in the northeastern portion of the county.

3 Conversion to Prime Farmland primarily due to newly irrigated agricultural land.

4 Conversion to Other Land primarily due to identification of vacant land adjacent to the airport, ranchettes and aggregate mines.

5 Conversion from Urban and Built-up Land primarily the result of the use of digital imagery to delineate more distinct urban boundaries.

6 Conversion to Prime and Unique Farmland due to newly irrigated agricultural land including citrus groves, turf farms and alfalfa.

7 Conversion to Grazing Land due to newly identified grazing on specified areas of the Kern National Wildlife Refuge.

4.3.4.2 Segment 3

The proposed 500 kV T/L route for Segment 3 (i.e., Antelope to Substation One) traverses potential Prime Farmland and grazing land at the south end of the route, just north of the Antelope Substation. Grazing lands are traversed until the proposed route approaches the community of Rosamond. At Rosamond, the route traverses an area of potential Prime Farmland (approximately 2 miles in length along the route). Unique farmland and Farmland of Statewide Importance also exist directly north of the Prime Farmland. Grazing land exists at the north end of the proposed 500 kV T/L route, and along the proposed 220 kV route between Substation One and Two, including the proposed substation locations.

4.3.5 Alternative T/L Routes

4.3.5.1 Segment 2

Alternative AV1 is a short 2.1-mile-long segment, located parallel to and east of the proposed Segment 2 route, beginning at MP 5.7 and ending at MP 7.7. Alternative AV2 is 3.1 miles long, departing from the proposed T/L route at MP 8.1 and traversing the Ritter Ranch and Anaverde specific plan areas to a juncture with the proposed T/L route at approximately MP 14.8.

Alternative AV1 does not traverse any designated farmland or grazing land. However, Alternative AV2 does traverse Farmland of Local Importance near MP 1.5. The alternative route traverses less than 1 mile of this farmland.

4.3.5.2 Segment 3

Alternative A traverses a small area (less than one mile) of Prime Farmland approximately 3 miles north of the Antelope Substation. Alternatives A and B (refer to Figures 3-1 and 3-3) do not traverse any other potential Prime Farmland at the south end of Segment 3; only grazing lands are traversed. Both alternatives do, however, traverse potential Prime Farmland, Unique Farmland, and Farmland of Statewide Importance near Rosamond. Alternative B traverses a small portion of potential Prime Farmland that exists directly north of the proposed "Copa De Oro/Kern Ross Estate," (at MP 12.5) and Alternative A also traverses a small portion of Farmland of Statewide Importance (at MP 16.5).

Similar to the proposed 500 kV T/L route, Alternatives A, B, and C (220 kV) only traverse grazing lands at the northern ends of the routes. A large area of potential Prime Farmland exists near the north end of the route, south of Tehachapi, however, none of the proposed or alternative T/L routes traverse it.

The alternative 500 kV and 220 kV substation locations in the Tehachapi Wind Farm Area (Substation One and Substation Two) are located on grazing lands.

4.3.6 Modifications to Substations

The Antelope Substation, as well as Substations One and Two (and their associated alternatives) are located in areas with soils that are capable of supporting grazing uses. The SCE Antelope Substation was converted to electric transmission-related use years ago and any farmland potential at the site was negated at the time of construction. The proposed modifications to the Antelope and Vincent substations would not occur on land that is currently grazed. No important farmlands are located at or adjacent to the existing substations, or within the areas proposed for the new substations (Substations One and Two) to be constructed.

4.4 AIR QUALITY

4.4.1 Introduction

This chapter describes the existing air quality within the project area and evaluates the potential incremental air-quality impacts associated with the construction and operation of the project. Although some temporary impacts result during construction activities, the project is not expected to cause any objectionable odors, expose sensitive receptors to increased pollutant concentrations, or otherwise significantly affect air quality.

The baseline conditions and regulatory framework discussions presented herein apply equally to the proposed Segment 2 and 3 components and their corresponding alternatives.

4.4.2 Applicable Laws and Regulations

Ambient air quality standards in California are the responsibility of both the United States EPA and the California Air Resources Board (CARB). These standards are set at concentrations that provide margins of safety for the protection of public health and welfare. Federal and state air quality standards are presented in Table 4.4-1. The federal, state, and local air quality regulations are identified below in further detail.

4.4.2.1 Federal Regulations

The EPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for oxidants (ozone), carbon monoxide (CO), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), particulate matter (PM_{10}), and lead (Pb). The EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf).

4.4.2.2 California Regulations

CARB is responsible for ensuring implementation of the California Clean Air Act and federal Clean Air Act, and for regulating emissions from consumer products and motor vehicles. CARB established California Ambient Air Quality Standards (CAAQS) for all pollutants for which the federal government has NAAQS and also has standards for sulfates, visibility, hydrogen sulfide, and vinyl chloride. California standards are generally more stringent than the NAAQS. CARB established emission standards for vehicles sold in California and for various types of equipment. CARB also sets fuel specifications to reduce vehicular emissions, although it has no direct regulatory approval authority over the proposed project. Federal and state air quality standards are presented in Table 4.4-1.

TABLE 4.4-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	National Standards	State Standards
Ozone		
8-hour	0.08 ppm(1)	None
1-hour (federal)	0.12 ppm	0.09 ppm
Carbon Monoxide		
1-hour	35 ppm	20 ppm
8-hour	9 ppm	9 ppm
Nitrogen Dioxide		
1-hour	None	0.25 ppm
Annual	0.053 ppm	None
Suspended Particulates		
PM_{10}: 24-hour	150 µg/m³(2)	50 µg/m³
Annual	50 µg/m³	20 µg/m³, AAM(3)
$PM_{2.5}$: 24-hour	65 µg/m³	None
Annual	15 µg/m³	12 µg/m³, AAM(3)
Sulfur Dioxide		
1-hour	None	0.25 ppm
24-hour	0.14 ppm	0.04 ppm
Annual	0.03 ppm	None
Lead		
30-Day Average	None	1.5 µg/m³
Quarterly Average	1.5 µg/m³	None
Sulfate		
24-hour	None	25 µg/m³
Visibility		10 miles for hours with
8-hour (10am to 6pm)	None	humidity less than 70%
Hydrogen Sulfide		
1-hour	None	0.03 ppm
Vinyl Chloride		
24-hour	None	0.01 ppm

[1] ppm = parts per million.

[2] µg/m3 = micrograms per cubic meter.

[3] AAM = Annual Arithmetic Mean.

The California Clean Air Act (Assembly Bill [AB] 2595) mandates achievement of the maximum degree of emission reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date.

California also established a state air toxics program (AB1807, Tanner) subsequently revised by the new Tanner Bill (AB2728). This program sets forth provisions to implement the national program for control of hazardous air pollutants. The Air Toxic "Hot Spots" Information and Assessment Act (AB2588), as amended by Senate Bill (SB) 1731, requires

operators of certain stationary sources to inventory air toxic emissions from their operations and, if directed to do so by the local air district, prepare a health risk assessment to determine the potential health impacts of such emissions. If the health impacts are determined to be "significant" (greater than 10 per million exposures or non-cancer hazard index greater than 1.0), each facility must, upon approval of the health risk assessment, provide public notification to affected individuals.

The California Health and Safety Code (§39655) defines a toxic air contaminant (TAC) as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health. Under California's TAC program (Assembly Bill 1807, Health and Safety Code §39650 et seq.), CARB, with the participation of the local air pollution control districts, evaluates and develops any needed control measures for air toxics. The general goal of regulatory agencies is to limit exposure to TACs to the maximum extent feasible.

4.4.2.3 Local Regulations

The project area falls within the jurisdictional authorities of the Antelope Valley Air Quality Management District (AVAQMD) and Kern County Air Pollution Control District (KCAPCD). Segment 3 components are within AVAQMD and KCAPCD jurisdictions. The boundary between the AVAQMD and the KCAPCD is the Los Angeles/Kern County Line at approximately MP 9.6 of the proposed Segment 3 500 kV T/L route between the Antelope Substation and Substation One (refer to Figures 3-1 and 3-3). All of Segment 2 is within the AVAQMD (i.e., Los Angeles County). Both the AVAQMD and KCAPCD are responsible for air quality planning in the basin and development of the Air Quality Management Plans (AQMP). The AQMPs establish the strategies that would be used to achieve compliance with NAAQS and CAAQS in all areas within the jurisdictions. The AVAQMD and KCAPCD generally regulate stationary sources of air pollutants. Potential regulations that may apply to the proposed project include Permits, Fees, and Prohibitions.

Review of the project description (refer to Section 3.0 of the PEA) indicates most equipment would be mobile or portable. Portable equipment would comply with the CARB Portable Equipment Registration Program (PERP). Emissions that would be generated from this project consist of criteria combustion pollutants and fugitive dust emissions.

4.4.3 Existing Conditions

4.4.3.1 Meteorology and Climate

Segments 2 and 3 of the proposed Antelope Transmission Project are located within the western portion of the Mohave Desert Air Basin (MDAB) that includes portions of Kern County and Los Angeles County.

The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in southern California by differential heating are channeled through the MDAB. The MDAB is separated from the southern California coastal and central California Valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevada in the north by Tehachapi Pass (3,800 feet elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet).

During the summer a Pacific Subtropical High cell that sits off the coast generally influences the MDAB, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, to indicate at least three months have maximum average temperatures over 100.4°F.

4.4.3.2 Regional Air Quality

The AVAQMD and KCAPCD monitor levels of various criteria pollutants at various monitoring stations. During the 2003 ozone season (May to October), only four exceedances of the federal 0.12 parts per million (ppm) one-hour ozone standard were logged at the AVAQMD's Lancaster air monitoring station. The ozone levels in 2003 were lower than in 2002, when five days of unhealthful air were recorded in the Antelope Valley.

Windblown smog originating in the South Coast Air Basin (SCAB) that includes the Los Angeles Basin, Orange County, and the valley portion of San Bernardino County is a primary source of air pollution measured within the AVAQMD and KCAPCD boundaries. Transported pollutants from the San Joaquin and the Santa Clarita Valleys also impact local air quality concentrations. Tables 4.4-2 through 4.4-6 provide air quality data for the Mojave and Lancaster air monitoring stations for calendar years 2002 through 2004.

TABLE 4.4-2
AMBIENT OZONE LEVELS: 2002-2004 (PPM)[1,4]

	Mojave – 923 Poole Street			Lancaster – 43301 Division Street		
	2002	2003	2004	2002	2003	2004
Maximum 1-Hour Average	0.115	0.119	0.121	0.157	0.156	0.121
Number of Days Exceeding California 1-Hour Standard[2]	16	31	8	46	50	37
Number of Days Exceeding Federal 1-Hour Standard[3]	0	0	0	5	4	0
Maximum 8-Hour Average	0.102	0.103	0.090	0.107	0.120	0.010
Number of Days Exceeding Federal 8-Hour Standard	26	27	3	38	33	24

1 Data source: CARB – ADAM (http://www.arb.ca.gov/adam/welcome.html).

2 The California 1-hour O_3 ambient air quality standard is 0.09 ppm.

3 The Federal 1-hour O_3 ambient air quality standard is 0.12 ppm.

4 ppm = parts per million.

TABLE 4.4-3
AMBIENT NITROGEN DIOXIDE LEVELS: 2002-2004 (PPM)[1,2,3]

	Mojave – 923 Poole Street			Lancaster – 43301 Division Street		
	2002	2003	2004	2002	2003	2004
Maximum 1-Hour Average	0.071	0.073	0.064	0.101	0.067	0.103
Annual Average	0.009	0.009	0.008	0.016	0.015	0.015
Number of Days Exceeding California 1-Hour Standard[2]	0	0	0	0	0	0

1 Data source: CARB – ADAM (http://www.arb.ca.gov/adam/welcome.html).

2 All hourly and annual average concentrations are below the state and federal NO_2 ambient air quality standards.

3 ppm = parts per million.

TABLE 4.4-4
AMBIENT CARBON MONOXIDE LEVELS: 2002-2004 (PPM)[1,2,3,4]

	Mojave – 923 Poole Street			Lancaster – 43301 Division Street		
	2002	2003	2004	2002	2003	2004
Maximum 1-Hour Average	ND	ND	ND	ND	ND	ND
Maximum 8-Hour Average(2)	ND	ND	ND	2.24	1.88	1.72

1 Data source: CARB – ADAM (http://www.arb.ca.gov/adam/welcome.html).

2 All 8-hour concentrations are below the California and federal CO ambient air quality standards of 9.0 ppm.

3 ppm = parts per million.

4 ND = No data for this pollutant at these monitoring stations.

TABLE 4.4-5
AMBIENT SULFUR DIOXIDE LEVELS: 2002-2004 (PPM)[1,2,3,4]

	Mojave – 923 Poole Street			Lancaster – 43301 Division Street		
	2002	2003	2004	2002	2003	2004
Maximum 1-Hour Average	ND	ND	ND	ND	ND	ND
Maximum 24-Hour Average	ND	ND	ND	ND	ND	ND
Annual Average	ND	ND	ND	ND	ND	ND

1 Data source: CARB – ADAM (http://www.arb.ca.gov/adam/welcome.html).

2 ppm = parts per million.

3 Project area is in attainment for sulfur dioxide.

4 ND = No data for this pollutant at these monitoring stations.

TABLE 4.4-6
AMBIENT PARTICULATE LEVELS: 2002-2004 ($\mu g/m^3$)[1,2,3]

	Mojave – 923 Poole Street			Lancaster – 43301 Division Street		
	2002	2003	2004	2002	2003	2004
Maximum 24-Hour Average	20861	97	41	73	57	56
Estimated Number of Days per Year[1] Exceeding California Standard (30 $\mu g/m^3$, 24-hour average)	6.6	12.1	0	ND	1	0
Estimated Number of Days per Year[1] Exceeding Federal Standard (50 $\mu g/m^3$, 24-hour average)	6.6	0	0	0	0	0
State Annual Average	21.4	19.3	18.3	ND	23.2	ND
National Annual Average	23.1	20.9	ND	29.7	24.6	22.6

1 Data source: CARB – ADAM (http://www.arb.ca.gov/adam/welcome.html).

2 $\mu g/m^3$ = micrograms per cubic meter.

3 ND = No data for this pollutant at these monitoring stations.

4.5 BIOLOGICAL RESOURCES

As part of the Antelope Transmission Project, SCE plans to construct the following:

- Segment 2 – Antelope to Vincent T/L (20.0 miles of 500kV T/L and 0.5 mile of 220 kV T/L)
- Segment 3 – Antelope to Substation One (500 kV T/L; including transition bus work at Substation One for 500 kV towers and T/Ls to 220 kV) and Substation One to Substation Two (220 kV T/L, including new 220 kV Substation Two)

The USGS 7.5 min. topographic quads for these segments are: Tehachapi North, Tehachapi South, Monolith, Willow Springs, Little Buttes, Del Sur, Sleepy Valley, Lancaster West, Palmdale, Ritter Ridge, and Pacifico Mountain (refer to Figures 3-1, 3-2, and 3-3).

As part of the project's permitting and environmental assessment process, SCE conducted an evaluation of the likelihood of occurrence by any special-status plant or wildlife species in the project area and in association with any of the proposed project facilities.

The purpose of this assessment is to present the results of field surveys conducted over several years, and literature/database reviews, to document the likelihood of certain special-status plants and wildlife potentially being affected by the proposed project.

The project R-O-W study area for biological resources includes the centerline along the proposed and alternative T/L routes plus a buffer zone (i.e., 0.5 mile on either side of the R-O-W centerline). Within this linear route study area, biologists determined the potential or actual occurrence of selected special-status plant and wildlife species, or sensitive habitats.

4.5.1 Study Approach and Methods

The approach to the project involved completing two phases. In the first phase, background information was gathered and compiled in preparation for going into the field. The description of this phase appears in Section 4.5.1.1, below. Following this pre-field orientation, the second phase involved having qualified field biologists conduct field studies along the routes and other project facilities. Section 4.5.1.2, below, describes the methods used for the field survey phase of the project. A map atlas was prepared and it summarizes many of the findings presented in this report, including dominant vegetation types and California Natural Diversity Data Base (CNDDB) (CDFG, 2002) occurrences in the vicinity of Segments 2 (refer to Figure 4.5-1A) and 3 (refer to Figure 4.5-1B).

4.5.1.1 Pre-field Methods

Biologists contracted by SCE (BioResource Consultants: C. Thelander [Project Manager], D. Taylor, Ph.D., Scott Werner, Peter Bloom, Scott Thomas, William Vanherweg, James Castle, Charlene Burge, Christopher Bysshe, and Edward Johnson) compiled a list of candidate sensitive species (plants and wildlife), and areas of special concern, that are known or expected to occur in the project area. Standard database searches were performed (e.g., CNDDB: RareFind3, various botanical herbaria, etc.). All of the information compiled formed the basis for a project-specific database and resource mapping effort for the project area.

Special-status species are plants and animals that are either listed as endangered or threatened under the federal or state Endangered Species Acts (Section 670.2, Title 14, California Code of Regulations; Section 1900, Fish and Game Code: ESA Section 17.11, Title 50, Code of Federal Regulations), listed as rare under the California Native Plant Protection Act, or considered to be rare (but not formally listed, Section 15380 CEQA Guidelines) by resource agencies, professional organizations (e.g., Audubon Society, California Native Plant Society [CNPS], The Wildlife Society), and the scientific community.

Specific criteria were used to select species for inclusion in the project as a rare, sensitive, or listed species (see Appendix D-1). Collectively these are termed "special-status" species. Based on these criteria, a target list of special-status plants and wildlife with potential to occur in the project area was prepared. Sources of information used included the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2001b), Angeles National Forest, Land and Resources Management Plan (1987), West Mojave Plan (BLM, 2005), and the CNDDB (RareFind3) maintained by the California Department of Fish and Game (CDFG, 2002).

To aid the fieldwork and data collection, a map atlas was compiled that depicted the proposed project facilities using USGS 7.5 minute topographic base maps. These maps were numbered sequentially and compiled in a three-ring binder format. A set of maps was provided to each of the field biologists for reference and to assist with data collection and navigation in the field. The maps included the pre-survey (known) locations of any sensitive species or their habitat, areas likely to require specific surveys in the project area, and any access roads.

4.5.1.2 Field Survey Methods

The proposed project has been under consideration for several years. As a result, field surveys have been conducted over this period along various portions of the routes. Most of the work was completed during the spring and summer months of 2001, 2002, and 2003.

The first fieldwork along the T/L routes was conducted in April 2001. The most recent surveys were completed in August 2005. During 2005 the entire Segment 2 and 3 T/L routes were surveyed using reconnaissance-level sampling methods aimed at possibly documenting "presence" but not detailed enough to confirm "absence". As deemed appropriate by the field biologists using their professional judgment, specific walking searches were conducted where deemed appropriate in attempts to document presence for species suspected of being in the area or where suitable habitat was thought to occur. In many instances, areas found prior to 2005 were resurveyed to obtain additional information on presence/absence. This was especially true for nesting raptors such as Swainson's hawks and burrowing owls and for plants given the extraordinary rainfall that preceded the 2005 flowering season.

Typically a two-person team of biologists traveled together conducting the field surveys and recording data. Additionally, individual specialists conducted their own focused surveys on an as-needed basis.

The field surveys were scheduled to coincide with the season of year when observations of sensitive plants or certain wildlife species were most likely to occur. For plants, several visits to the project area were required to address differing flowering seasons for each sensitive plant species. All vascular plant species observed during surveys of the routes were documented (Appendix D.2). Directed surveys for special status plant species potentially occurring in the project area were based on the California Native Plant Society's *Botanical Survey Guidelines* (CNPS, 2001a).

Surveys were conducted by inspection of the proposed and alternative routes, and substations, but the specific locations of towers and other project areas where impacts might occur were not identified prior to going into the field. Many unpaved access routes were inspected for special-status plant species and wildlife habitat. The survey area was modified at some locations where steep topography would preclude the ability to use the area for construction activities, such as canyons where the transmission line would span but not impact habitat.

At each survey site, dominant habitat characteristics and factors affecting local habitats, general soil characteristics, slope, aspect, and drainage were recorded onto field maps. Directed surveys were then focused on observed suitable habitats for special-status species potentially occurring in the project area (Tables 4.5-1A and 4.5-1B). Plant surveys were floristic in nature and were conducted during the blooming period for each special-status species having potential to occur in the project area.

Data collection was standardized for each site visited to the fullest extent possible. A field form designed specifically for the project was developed to record the results of field surveys. Digital photos were taken periodically for reference purposes. The field biologists

TABLE 4.5-1A
SUMMARY OF SENSITIVE PLANT SPECIES THAT MAY POTENTIALLY OCCUR IN THE PROJECT REGION [1]

Scientific Name	Common Name	CA Status	Federal Status	Segment (CNDDB)	CNPS List	CNPS Code	Feb	March	April	May	June	July	Aug	Sept
Calochortus clavatus var. *gracilis*	Slender mariposa lily	None	None		1B	323		■	■	■				
Calochortus palmeri var. *palmeri*	Palmer's mariposa lily	None	None		1B	223				■	■	■		
Calochortus plummerae	Plummer's mariposa lily	None	None		1B	223				■	■	■		
Calochortus striatus	Alkali mariposa lily	None	None	2	1B	222			■	■	■			
Dodecahema leptoceras	Slender-horned spineflower	Endangered	Endangered		1B	333			■	■	■			
Galium grande	San Gabriel bedstraw	None	None		1B	313	■	■	■	■	■	■		
Opuntia basilaris var. *brachyclada*	Short-joint beavertail cactus	None	None	2	1B	323			■	■	■			

[1] Shading denotes months in which flowering occurs and/or when species is most likely to be observed.

Note: The column 'Segment (CNDDB)' refers to route segments where CNDDB Occurrence Records appear for the species (2 = Antelope – Vincent; and, 3 = Antelope – Substations One and Two).

TABLE 4.5-1B
OTHER RARE PLANTS GENERALLY NOT MANDATED FOR CEQA MITIGATION REVIEW THAT MAY OCCUR IN THE PROJECT REGION[1]

Scientific Name	Common Name	CA Status	Federal Status	CNPS List	CNPS Code	Feb	March	April	May	June	July	Aug	Sep
Calystegia peirsonii	Pierson's morning-glory	None	None	4	123				■	■			
Canbya candida	White pygmy poppy	None	None	4	123		■	■	■	■			
Chamaesyce vallis-mortae	Death Valley spurge	None	None	4	123				■	■			
Chorizanthe spinosa	Mojave spineflower	None	None	4	122			■	■	■	■	■	
Goodmania luteola	Golden goodmania	None	None	4	111			■	■	■	■	■	
Juncus cooperi	Cooper's rush	None	None	4	221	■	■	■	■	■	■		
Loeflingia squarrosa var. *artemisiarum*	Sagebrush loeflingia	None	None	2						■	■	■	■
Mucronea californica	California spineflower	None	None	4	122		■	■	■	■	■	■	
Muilla coronata	Crowned muilla	None	None	4	113		■	■	■				
Phacelia mohavensis	Mojave phacelia	None	None	4	122		■	■	■	■	■	■	
Sclerocactus polyancistrus	Mojave fish-hook	None	None	4	113			■	■	■			
Syntrichopappus lemmonii	Lemmon's sunflower	None	None	4	221					■	■	■	■
Viola aurea	Golden violet	None	None	2	221			■	■	■			

[1] Shading denotes months in which flowering occurs and/or when species is most likely to be observed.

were equipped with handheld GPS units. Specific locations of sensitive resources found in the field were digitized for later mapping and reporting purposes. CNDDB Reporting Forms were submitted for all special-status species.

4.5.2 Environmental Setting

The mountains and foothills of southern California are inhabited by 18 amphibian, 61 reptile, 299 bird, 104 mammal, and about 2,900 vascular plant species (CDFG, 1996). Throughout the proposed project area, habitat is present for many of these species because of the diversity of topography and climate it traverses.

Major portions of the project area overlap with the planning area that was recently the subject of an intensive planning effort known as the West Mojave Plan (BLM, 2005). The Plan consists of two components: a Federal component that will amend the existing 1980 California Desert Conservation Area Plan, and a Habitat Conservation Plan that will cover development on private lands. It presents a comprehensive strategy to conserve and protect species such as the desert tortoise, the Mohave ground squirrel and some 100 additional special-status wildlife and plant species. It encompasses an area including some 3.2 million acres of public lands plus an additional 3.0 million areas under private ownership. The proposed project is located on the western edge of this planning area.

Although finalized, the West Mojave Plan has not yet been implemented. However, SCE has included sensitive species information from the Plan in this document, and is following the intent of the Plan when it comes to mitigation measures to protect these sensitive species.

The project area for Segments 2 and 3 includes the southern Antelope Valley. Segment 3 runs north across the mainly disturbed grasslands and scrublands of the Antelope Valley where it enters the Tehachapi Range, where biological influences associated with the southern Sierra Nevada are encountered.

Several dominant vegetation types typify the environmental setting for the overall project area. These include ruderal/disturbed areas undergoing development as residential or commercial facilities, several chaparral community types (predominately chamise), valley-foothill riparian and woodland, montane upland hardwoods, lower montane conifer/ hardwood, Joshua tree woodland, pinyon/juniper woodland, interior/desert scrub including creosote bush scrub, grasslands/wildflower fields, and several types of agriculture, including cattle grazing and dry or irrigated farming. Biologists recorded the distribution of these dominant vegetation types along the T/L routes based on field surveys and interpretations from aerial photographs taken in 2000.

Over much of the project area the habitat quality of native vegetation communities has been degraded because of various human activities and land conversions. Large areas of ruderal

vegetation occur that are dominated by weedy species that often establish themselves either because of previous agricultural activities, grazing, or because of weed-abatement plowing. These can eventually produce fields of non-native grasses or undesirable weeds such as star-thistle (*Centaurea melitensis*). Ruderal/degraded scrub and ruderal chaparral mosaic often results from agricultural/weed abatement activities or frequent fires that encourage the spread of non-native grasses. Fires usually spread more easily through non-native grasslands than through native, fire-adapted vegetation types. As a result, native shrub communities often gradually disappear. This process has been underway over much of the project area.

At various locations in the project region there are remnants of sensitive or declining habitat types. Many of these locations are recorded in the CNDDB RareFind3 system. They can include: Southern Coast Live Oak Riparian Forest, Southern Cottonwood Willow Riparian Forest, Southern Riparian Scrub, Southern Sycamore Alder Riparian Woodland, Southern Willow Scrub, Joshua Tree Woodland, Valley Needlegrass Grassland, and Wildflower Field.

4.5.2.1 Segment 2: Antelope – Vincent

The Segment 2 T/L route extends 21.5 miles from the Antelope Substation west of Lancaster to the southeast and terminates at the Vincent Substation east of Acton. From Antelope Substation to MP 4.5, vegetation is primarily disturbed annual grassland and scrub. At approximately MP 4.5 the T/L route enters the foothills of the Castaic Ranges west of Quartz Hill. On Portal Ridge (MPs 4.5 to 7.8), vegetation is a mix of grassland and juniper woodland, with patches of Joshua tree-juniper woodland. Alternative AV1 deviates slightly from the proposed T/L route along the southern half of Portal Ridge, but Alternative AV1 is close enough to the proposed T/L route that the vegetation and landscape features are similar. In the lower Leona Valley, the proposed T/L route crosses Amargosa Creek, whose main branch and tributaries support sensitive riparian habitat such as Southern Cottonwood Willow Riparian Forest and recent records of sensitive species such as California red-legged frogs, southwestern pond turtles, and two-striped garter snakes.

From MPs 8.1 to 14.8, the proposed T/L route extends to the west through open space areas on Ritter Ranch and Anaverde developments, while Alternative AV2 continues southeast along the existing T/L corridor. South of Ritter Ranch, the proposed T/L route extends through the Sierra Pelona hills into Soledad Canyon to terminate at the Vincent Substation. Much of the northern portion of Ritter Ranch burned in the Leona fire of 2002, and portions of southern Ritter Ranch are still recovering from the Shannon fire of 1999. Ritter Ranch and the Sierra Pelona are predominately a mix of chamise chaparral, juniper woodland, montane hardwood chaparral, annual grassland, and ruderal/disturbed areas. These communities have substantial, recently burned, early successional zones in addition to mature, intact zones. Occasional minor stream crossings exist in the area that support riparian scrub habitat. On this southern portion of the T/L route, known occurrences or suitable habitat exists for short-

joint beavertail cactus, and suitable habitat exists for sensitive species such as coast horned lizards, burrowing owls, horned larks, Bell's sage sparrows, and southern California rufous-crowned sparrows. A rare plant, Peirson's morning-glory (*Calystegia peirsonii*) was documented along the Segment 2 T/L route; however, this species is on CNPS List 4 and is not considered to merit CEQA consideration (CNPS 2001).

4.5.2.2 Segment 3: Antelope – Substations One and Two

The Segment 3 T/L route extends from the Antelope Substation north for approximately 25.6 miles to a proposed substation (Substation One) near the Cal Cement plant west of Mojave, and then another 9.6 miles from Substation One to Substation Two. From the Antelope Substation north to near Willow Springs, the proposed T/L route and two alternatives T/L route (A, B) run nearly due north through what once was a mix of native annual grasses, interior/desert scrub comprised mainly of creosote bush scrub, saltbush, Joshua tree woodland, wildflower fields, pinyon/juniper woodland, and some sagebrush areas.

Today most of the lower elevational areas are comprised of ruderal, highly disturbed, non-native annual grasses mixed with mustard, star thistle, and Russian thistle. Several areas are under cultivation for a variety of dry farming and irrigated crops, including alfalfa. Swainson's hawks are known to nest in the area, as well as burrowing owls.

North of the Willow Springs area where the slope and elevation increases along the T/L route, creosote bush scrub and Joshua tree woodlands predominate. Le Conte's thrashers have recently been observed in this area, and other sensitive species as desert tortoises and Mohave ground squirrels may occur here as well. As the elevation increases going north, pinyon/juniper woodland appears in transition with creosote bush scrub, Joshua tree woodland, and sagebrush communities.

The terminus of the T/L route in the Tehachapi Wind Resource Area is a complex transition zone between southern Sierra Nevada, Mojave Desert, and coastal scrub provinces. Here several major vegetation communities merge and commingle. The general region is host to numerous special-status plants and wildlife species, including the Tehachapi pocket mouse, nesting and wintering golden eagles, prairie falcons, and other raptors. In general, the western Antelope Valley is widely recognized as an area that supports relatively large numbers of raptors during the fall and winter.

4.5.3 Special-status Species Occurrence

4.5.3.1 Sensitive Plants

Tables 4.5-1A and 4.5-1B summarize the 21 special-status plant species that may occur in or near the proposed project facilities, and could therefore possibly be affected by the project.

Based on field surveys during 2001-2005, an assessment of probable occurrence in the project area was formulated, and is presented in Table 4.5-2. For each plant, the probability of occurrence was derived from field experience at reference populations or from literature as compared to the habitat conditions encountered along the T/L routes. For plants judged as having moderate to high potential for occurrence along the T/L route, more specific discussions are provided below Table 4.5-2. For plants judged as having low potential, no further assessment is provided, because potential impacts to such plants are considered unlikely and hence not significant.

4.5.3.1.1 Slender Mariposa Lily *(Calochortus clavatus* var. *gracilis).* *Calochortus clavatus* var. *gracilis* is an uncommon bulb-forming herb limited to the Transverse Ranges of California, occurring only within Los Angeles County. *Calochortus clavatus* var. *gracilis* is on the California Native Plant Society List 1B and is considered by CNPS as endangered throughout its range. It is not formally listed by either the state or federal governments. Ownbey (1940), Fiedler and Ness (1993), and Fiedler and Zebell (2002) list it as occurring only in the San Gabriel Mountains, but the specimens cited by Ownbey were in the Castaic Range west of Segment 2. The habitat selected by *Calochortus clavatus* var. *gracilis* is described generally as coastal sage scrub or a mixed scrub. Field surveys near the wind energy facilities (Segment 3) failed to locate *Calochortus clavatus* var. *gracilis*. However, the closely-related *Calochortus clavatus* var. *pallidus* was located scattered along segments of the Segments 2 and 3 T/L routes.

Because mariposa lilies can remain dormant and not flower for years, *Calochortus clavatus* var. *gracilis* is judged to have moderate potential for occurrence along the Segment 2 T/L proposed and alternative routes.

4.5.3.1.2 Palmer's Mariposa Lily *(Calochortus palmeri* var. *palmeri).* *Calochortus palmeri* var. *palmeri* is an uncommon bulb-forming herb limited to the southerly mountains of west-central and south-central California. *Calochortus palmeri* var. *palmeri* is on the CNPS List 1B and is considered by CNPS as endangered throughout its range. It is not formally listed by either the state or federal governments.

CNPS (2001b) considers *Calochortus palmeri* var. *palmeri* to be "declining rapidly: occurs in wet meadows where seriously threatened by grazing". The habitat selected by *Calochortus palmeri* var. *palmeri*, described as the moist but not saturated portions of montane meadows, occurs in some areas of Segment 2 and the northern reaches of Segment 3. *Calochortus palmeri* var. *palmeri* was not documented during field surveys, but because mariposa lilies can go without flowering in years with unfavorable climate and growing conditions, *Calochortus palmeri* var. *palmeri* is judged to have moderate potential for occurrence along the project alignments.

TABLE 4.5-2
SUMMARY PROJECT ASSESSMENT FOR RARE, THREATENED, OR ENDANGERED PLANTS WITH SUITABLE HABITAT IN THE PROJECT REGION[1]

Scientific Name	Common Name	Habitat Requirements, Suitable Habitat Along Alignment, Observations	Probability of Occurrence, Segment 2	Probability of Occurrence, Segment 3	Preconstruction Surveys Recommended
Calochortus clavatus var. *gracilis*	Slender Mariposa Lily	Heavy soils in shrublands (chaparral or coastal sage scrub); not located in field surveys	Moderate	Moderate	Yes
Calochortus palmeri var. *palmeri*	Palmer's Mariposa Lily	Moist to vernally saturated, grassy or herb dominated openings in forest, glades; not located in field surveys	Moderate	Moderate	Yes
Calochortus plummerae	Plummer's Mariposa Lily	Rocky or stony shrublands (chaparral or coastal sage scrub); not located in field surveys	Moderate	None	Yes
Calochortus striatus	Alkali Mariposa Lily	Suitable subalkaline meadow habitat absent from Segments 2 and 3; meadows near Tehachapi judged non-habitat	Moderate	Moderate	Yes
Dodecahema leptoceras	Slender-horned Spineflower	Sandy washes, sandy openings in chaparral or coastal scrub, often after fires; not located in field surveys	Moderate	None	Yes
Galium grande	San Gabriel Bedstraw	Rocky, northerly facing ridges in chaparral, Big Cone fir or pine forests; not located in field surveys	Low	None	No
Opuntia basilaris var. *brachyclada*	Short-joint Beavertail	Chaparral or coastal scrub. Verified occurrence near Vincent Substation.	Observed	None	Yes

[1] Note: plants with moderate or high probability of project occurrence are discussed in text.

The areas with the highest probability of occurrence are on the northern-most portions of Segment 3 between proposed Substations One and Two, and on Segment 2.

4.5.3.1.3 Plummer's Mariposa Lily *(Calochortus plummerae)*. *Calochortus plummerae* is an uncommon bulb-forming herb limited to the Transverse Ranges of southern California. *Calochortus plummerae* is on CNPS List 1B and is considered endangered throughout its range. It is not formally listed by either the state or federal governments.

CNPS (2001b) considers *Calochortus plummerae* to be "Significantly reduced by development, and continues to decline". The habitat selected by *Calochortus plummerae* is described generally as rocky shallow soils, often on decomposed granitic deposits, within chaparral, woodland, or open forest communities. *Calochortus plummerae* was not documented in the project area during field surveys conducted in 2001-2005. Because mariposa lilies can go without flowering in years with unfavorable climate and growing conditions, *Calochortus plummerae* is judged to have moderate potential for occurrence along the project alignments even though it was not documented during field surveys.

This species has a moderate probability of occurrence in the area of Segment 2 where suitable habitat conditions exist.

4.5.3.1.4 Alkali Mariposa Lily *(Calochortus striatus)*. *Calochortus striatus* is an uncommon bulb-forming herb limited to the southern San Joaquin Valley, far western Mojave Desert, and inland parts of southern California; it is also found in Nevada (Ash Meadows, and formerly Las Vegas). *Calochortus striatus* is on the CNPS List 1B and is considered endangered throughout its range.

Calochortus striatus is limited to salty or alkaline soils about springs in desert lowlands, often where salt grass (*Distichlis spicata*) meadows are characteristic. Known records from the vicinity of Lancaster (e.g., Amargosa Creek floodplain area) and Rosamond on the Los Angeles-Kern County line occur east of the project alignments. *Calochortus striatus* was not documented at this location during field surveys conducted in 2001-2005. Because mariposa lily populations can go without flowering in years with unfavorable climate and growing conditions, *Calochortus striatus* is judged to have moderate potential for occurrence along the project alignments even though it was not documented during field surveys.

Although much of the formerly suitable habitat for *Calochortus striatus* on the floor of the Antelope Valley is developed for either agriculture or rural residential uses, its occurrence in this region cannot be entirely ruled out. Several sites near the existing Monolith Substation in Segment 3 have seasonally moist heavy-clay soils in sites dominated by rabbitbrush (*Chrysothamnus nauseosus*), sites that are similar to described habitat for *Calochortus striatus,* further supporting its potential occurrence.

This species has a moderate probability of occurrence in the area of Segments 2 and 3 where suitable habitat conditions, as described above, exist. Pre-construction clearance surveys within suitable habitat are recommended.

4.5.3.1.5 Slender-horned Spineflower *(Dodecahema leptoceras)*. *Dodecahema leptoceras* is a small annual herb restricted to southern California. It is listed as endangered by the state and federal governments. *Dodecahema leptoceras* is on the CNPS List 1B and is considered by that organization to be endangered throughout its range. It is found only in Los Angeles, Riverside, and San Bernardino counties.

Dodecahema leptoceras occurs in sandy washes and other sandy soil sites. CNPS (2001b) states that many historical occurrences have been lost to urbanization and stream channelization, and that *Dodecahema leptoceras* is currently threatened by development, sand and gravel mining, flood control, proposed reservoir construction, and other elements of urbanized development.

Dodecahema leptoceras is judged to have moderate potential for occurrence along the Project alignments even though it was not documented during field surveys: most of the suitable habitat for this species is in sites under existing transmission line spans across washes but not adjacent to existing towers or access roads.

This species has a moderate probability of occurrence in the area of Segment 2 within suitable habitat. Pre-construction clearance surveys in suitable habitat are recommended.

4.5.3.1.6 San Gabriel Bedstraw *(Galium grande)*. *Galium grande* is a tufted perennial herb restricted to the Transverse Ranges of southern California, documented only from Los Angeles County. *Galium grande* is on the CNPS List 1B and is considered by CNPS as endangered throughout its range. It is not formally listed by either the State of Federal governments.

Galium grande typically occurs in open chaparral, oak woodland, or similar woodland communities including stands of Big Cone Fir (*Pseudotsuga macrocarpa*), generally at high elevations (ca. 3,000 to 6,000 feet). CNPS (2001b) lists urbanization and associated impacts as primary threats, but also invokes mining, horticultural collecting, grazing, and off-road vehicles as secondary concerns. A sizable proportion of the approximately 30 known occurrences are on Angeles National Forest lands, where Species Management Guidelines (Soza et al., 2002) are in use. No occurrences of *Galium grande* were documented during field surveys in this region. Surveys conducted prior to the fires of 2002 may have not located all of the occurrences in this vicinity, since plants of *Galium grande* in dense chaparral would be more difficult to spot, and would be expected to grow vigorously after fire.

This species has a low probability of occurrence in the area of Segment 2. No pre-construction clearance surveys are recommended.

4.5.3.1.7 Short-joint Beavertail *(Opuntia basilaris* var. *brachyclada)*. *Opuntia basilaris* var. *brachyclada* is a cactus restricted to the Transverse Ranges of southern California, documented only from Los Angeles and San Bernardino Counties. *Opuntia basilaris* var. *brachyclada* is on the CNPS List 1B and is considered endangered throughout its range. It is not formally listed by either the state or federal governments. *Opuntia basilaris* var. *brachyclada* typically occurs in open chaparral, juniper woodland, or similar woodland communities, but not at high elevations. CNPS (2001b) lists urbanization and associated impacts as primary threats, but also invokes mining, horticultural collecting, grazing, and off-road vehicles as secondary concerns. A sizable proportion of the approximately 60 known occurrences are on Angeles National Forest lands, where Species Management Guidelines are being applied.

This species is known to occur at three locations along the alignment of Segment 2, and suitable habitat exists along the entire length of Segment 2. Field surveys in this region conducted prior to the fires of 2002 may have not located all of the occurrences in this vicinity, since plants of *Opuntia basilaris* var. *brachyclada* in dense chaparral would be more difficult to spot.

At one location, plants were located only where a previous fire (circa 2000) made them both more visible but also resulted in their abundant regrowth, making then more easily detected. For this reason, *Opuntia basilaris* var. *brachyclada* may occur along other project alignments in the region. Pre-construction clearance surveys in suitable habitat are recommended.

4.5.3.2 Sensitive Wildlife

Table 4.5-3 summarizes the sensitive wildlife species (n = 27) that occur regionally and that may be affected by the project. Additional information is provided below for selected sensitive wildlife species whose known distributions, plus habitat conditions observed in the project area, indicate that they may occur there, or potentially be impacted in some way by the project.

4.5.3.2.1 California Red-legged Frog (*Rana aurora draytonii*).

Status, Distribution, and Habitat Requirements

The California red-legged frog is a federally threatened species. It is the largest native frog in the western United States and inhabits ponds, marshes, streams, and reservoirs with year-round water greater at least 2-3 feet deep. Optimal habitat consists of sheltered pools with cattails and bordered by willows, but red-legged frogs have also been found in and near

TABLE 4.5-3
SUMMARY OF SENSITIVE WILDLIFE SPECIES THAT MAY POTENTIALLY OCCUR IN THE PROJECT REGION

Common Name	Scientific Name	Status	Probability of Project Occurrence[1]: Segment 2	Probability of Project Occurrence[1]: Segment 3	Preconstruction Survey Recommended
Amphibians					
California Red-legged Frog	*Rana aurora draytonii*	FT	Low	Low	No
Reptiles					
Silvery Legless Lizard	*Anniella pulchra pulchra*	CSC	Low	Low	No
Two-striped Garter Snake	*Thamnophis hammondii*	CSC	Low	Low	No
Coast Horned Lizard	*Phrynosoma coronatum blainvillii* *Phyrnosoma coronatum frontale*	CSC	High High	High High	Yes
Southwestern Pond Turtle	*Emys (=Clemmys) marmorata pallida*	CSC	Low	Low	No
Desert Tortoise	*Gopherus agassizii*	FT, CT	Low	Low	Yes
Birds					
Bald Eagle	*Haliaeetus leucocephalus*	CE, FT, FP	Moderate	Moderate	No
White-tailed Kite	*Elanus leucurus*	FP	Moderate	Moderate	Yes (nesting)
Sharp-shinned Hawk	*Accipiter striatus*	CSC	Moderate	Moderate	No
Cooper's Hawk	*Accipiter cooperi*	CSC	Moderate	Moderate	Yes (nesting}
Golden Eagle	*Aquila chrysaetos*	CSC, FP	Moderate	High	Yes (nesting)
Ferruginous Hawk	*Buteo regalis*	CSC, BLM	Moderate (wintering)	Moderate (wintering)	No
Swainson's Hawk	*Buteo swainsoni*	CT	Low	High	Yes (nesting)
Northern Harrier	*Circus cyaneus*	CSC	Moderate	Moderate	Yes (nesting)
Merlin	*Falco columbarius*	CSC	Moderate (wintering)	Moderate (wintering)	No

TABLE 4.5-3 (CONTINUED)
SUMMARY OF SENSITIVE WILDLIFE SPECIES THAT MAY POTENTIALLY OCCUR IN THE PROJECT REGION

Common Name	Scientific Name	Status	Probability of Project Occurrence[1]: Segment 2	Probability of Project Occurrence[1]: Segment 3	Preconstruction Survey Recommended
Peregrine Falcon	*Falco peregrinus anatum*	CE, FP	Moderate (wintering)	Moderate (wintering)	No
Prairie Falcon	*Falco mexicanus*	CSC	High	High	No
Mountain Plover	*Charadrius montanus*	CSC	Moderate (wintering)	Moderate (wintering)	No
Burrowing Owl	*Athene cunicularia*	CSC	High	High	Yes
Loggerhead Shrike	*Lanius ludovicianus*	CSC	High	High	Yes (nesting)
California Horned Lark	*Eremophila alpestris actia*	CSC	High	None[2]	Yes (nesting)
Le Conte's Thrasher	*Toxostoma lecontei*	CSC	Low	High	Yes (nesting)
Southern California Rufous-crowned Sparrow	*Aimophila ruficeps canescens*	CSC	High	None[3]	Yes (nesting)
Bell's Sage Sparrow	*Amphispiza belli belli*	CSC	High	None[4]	Yes (nesting)
Tricolored Blackbird	*Agelaius tricolor*	CSC	Low	Low	No
Mammals					
Tehachapi Pocket Mouse	*Perognathus alticola inexpectatus*	CSC	None	High	Yes
Mohave Ground Squirrel	*Spermophilus mohavensis*	CT	Low	Moderate	Yes

Status Codes:
FT – Federally Threatened
CE – California Endangered
CT – California Threatened
CSC – California Species of Concern
BLM – BLM-Sensitive
FP – Fully Protected

TABLE 4.5-3 (CONTINUED)
SUMMARY OF SENSITIVE WILDLIFE SPECIES THAT MAY POTENTIALLY OCCUR IN THE PROJECT REGION

Probability of Presence:
High – Project includes suitable habitat with confirmed presence of species.
Moderate – Project includes suitable habitat, but no confirmed presence, or outside known current distribution.
Low – Project includes marginal habitat, little potential presence of species, or outside known current distribution.
None – No suitable or potential habitat, or far from known distribution.

[1] Values in ( ) refer to route segment within which a CNDDB Occurrence Record, or field surveys for this project, verifies presence (2 = Antelope-Vincent; 3 = Antelope-Substations One and Two).

[2] A different, non-sensitive subspecies, *Eremophila alpestris ammophilus*, has a high probability of occurence along Segment 3.

[3] A different, non-sensitive subspecies, *Aimophila ruficeps ruficeps*, has a moderate probability of occurrence along Segment 3.

[4] A different, non-sensitive subspecies, *Amphispiza belli canescens*, has a high probability of occurrence along Segment 3.

intermittent streams and stock ponds with little adjacent vegetation. Breeding occurs from November through March, when they typically lay eggs during or shortly after winter and spring rainfall events.

Habitat Assessment and Occurrence in the Project Area

There are few if any deep, permanent sources of water in the project area. However, there is a CNDDB record from 1995 of four California red-legged frogs inhabiting a spring-fed pond on Ritter Ranch. This location is more than 1 mile from the proposed Segment 2 T/L route and will not be affected by the project. Along Segment 3, the only significant stream (Oak Creek) appears to contain the deep, ponded water preferred by California red-legged frogs. There are no CNDDB records for this species in Kern County.

Potential Project-Related Impacts

If this species still occurs in the project area, it is unlikely to be impacted by the proposed project since aquatic habitats will be avoided. The proposed T/L routes will span drainages and no new towers will be constructed within drainages. There is an existing access road that currently crosses Amargosa Creek. Some grading of this existing road may be required, however no new ground-disturbing impacts will take place at this location.

4.5.3.2.2 Silvery Legless Lizard *(Anniella pulchra pulchra)*.

Status, Distribution, and Habitat Requirements

Silvery legless lizards are a state species of special concern. Although found primarily at low elevations, they can range up to 5,700 feet in the Sierra Nevada foothills. Legless lizards are usually associated with sandy or loose loamy soils for burrowing, and in areas that are sparsely vegetated. It occurs in desert scrub areas in the Mojave Desert similar to areas found along portions of Segments 2 and 3.

Habitat Assessment and Occurrence in the Project Area

Little is known about the specific habitat requirements of this species. Suitable habitat likely occurs in the project area. A 1995 CNDDB record exists along Segment 2 in the Leona Valley, within 0.5 miles of the proposed Segment 2 T/L route. Two 1988 CNDDB occurrence records represent the first records for the desert floor of the Antelope Valley. These were recorded approximately 4 miles northeast of the proposed Segment 2 route in two separate localities. The observer noted that high moisture content of the soil was essential for this species. In addition, two silvery legless lizards were seen during June 2005 near Avenue K and 40th St. West in Lancaster, about 4 miles northeast of Segment 2 (Occurrence no. 34).

However, soils at this site were described as sandy and almost dune like, which raises questions about the moisture requirements of this species.

Potential Project-Related Impacts

Suitable habitat may occur for this species in portions of Segment 2 near the Antelope Substation, and in low-lying areas south of Ritter Ridge. Moister soils along Segment 3 north of Cal Cement presumably offer suitable habitat as well. However, it is difficult to assess whether the project would impact such a secretive and little-known species. Systematic pre-construction clearance surveys are not feasible because so little is known about specific habitat requirements; however, where suitable habitat conditions may be disturbed by construction, biological monitors and workers would be trained to identify this species. If any individuals are observed during construction they would be relocated to a safe site nearby.

4.5.3.2.3 Two-striped Garter Snake (*Thamnophis hammondii*).

Status, Distribution, and Habitat Requirements

The two-striped garter snake is a state species of special concern. They inhabit streams from the coast to about 7,000 feet in elevation throughout much of central and southern California, mainly from near Salinas to Baja California. They inhabit a broad range of stream types, from rocky intermittent and perennial streams bordered by willow thickets to large sandy rivers bordered by riparian vegetation. Stock pond and artificial water sources are also used. The life history of the two-striped garter snake is poorly known, despite the fact that the snake was once fairly common throughout its range.

Habitat Assessment and Occurrence in the Project Area

The large streams bisected by Segments 2 and 3 support few, if any, aquatic habitats that would be impacted by the proposed project. Amargosa Creek in the Leona Valley (Segment 2) provides potential habitat for two-striped garter snakes, and there are two CNDDB records within the project area. A 1999 observation was made in the creek near the Elizabeth Lake Pine Canyon Road bridge , and in 1995 a two-striped garter snake was seen less than 1 mile downstream in an area of Cotton-Willow Riparian Forest. Habitat similar to Amargosa Creek occurs on Ritter Ranch at Anaverde Creek at MP 12.3 of the proposed Segment 2 T/L route in an intermittent flow area dominated by arroyo willow (*Salix lasiolepis*). No snakes were observed here during 2005 surveys.

On Segment 3, suitable habitat for two-striped garter snakes occurs along Oak Creek, in a Cotton-Willow Riparian Forest west of Tehachapi-Willow Springs Road. East, or downstream of Tehachapi-Willow Springs Road, the creek has a perennial flow but

streamside vegetation was sparse during 2005 surveys after a fire burned through the area in 2004.

Potential Project-Related Impacts

It is unlikely that this species would be impacted by the proposed project since aquatic habitats would be avoided, however, pre-construction surveys for sensitive wildlife that may be impacted during construction should address potential impacts to this species or its habitat.

4.5.3.2.4 Coast Horned Lizards *(Phrynosoma coronatum blainvillii* and *P. c. frontale)*.

Status, Distribution, and Habitat Requirements

There are two forms of coast horned lizards that occur in the project area and both are state species of special concern. They are the coast (San Diego) horned lizard (*P. c. blainvillii*) and the coast (California) horned lizard (*P. c. frontale*). The ranges of these two subspecies overlap in the region. They are widely distributed throughout the project area, and throughout southern California. This ground-dwelling reptile has a distinctive flattened body that can reach up to four inches in length. Pointed scales line each side of their body, across their backs, and along the backside of their head where two larger, rigid, pointed scales stick out as well. Their cryptic coloration pattern begins with two dark patches behind their head, followed by three dark bands down their back with numerous patches along the tail. Their overall color consists of various shades of brown with light-brown accents.

Both races are typically found in areas of open vegetation such as coastal sage scrub, chaparral, and grassland habitats and typically associated with sandy substrates and nearby native anthills. They are insectivorous. The majority of their diet consists of native ants but they do consume other invertebrates such as beetles, grasshoppers, and caterpillars. Breeding season occurs from spring to early summer.

Habitat Assessment and Occurrence in the Project Area

Coast horned lizard habitat is expected to occur along much of Segments 2 and 3, especially in the southern portions south of Highway 138. It is likely that they will be encountered during construction.

Potential Project-Related Impacts

Construction may result in impacts to coast horned lizards. Construction vehicles may crush individuals or their local food resources. Pre-construction clearance surveys are

recommended where feasible; worker training programs will be conducted to minimize impacts to this species.

4.5.3.2.5 Southwestern Pond Turtle *(Emys marmorata pallida)*.

Status, Distribution, and Habitat Requirements

Southwestern pond turtles are a state species of special concern. The species ranges from San Luis Obispo County southward into San Diego County. South of the Santa Clara River, pond turtle populations have declined significantly. They inhabit a wide range of low-elevation aquatic habitats. They rarely occur above 4,000 feet in elevation. They are found in aquatic habitats such as rivers and streams that have persistent, deep pools. They are active year-round in most areas. Southwestern pond turtles have similar but narrower habitat requirements than two-striped garter snakes (see above). These turtles require a more permanent source of water, emergent rocks and/or logs for basking, intact upland areas with clay or silty soils for nesting, and areas of shallow water with dense vegetation to serve as shelter and foraging habitat for hatchlings.

Habitat Assessment and Occurrence in the Project Area

There are two CNDDB occurrences of southwestern pond turtles along Segment 2, in Amargosa Creek. These records were generated during the same surveys, at the same sites, as the two-striped garter snake records described above in the two-striped garter snake section. These sites are within 0.5 miles of the proposed Segment 2 T/L route. Anaverde Creek on Ritter Ranch may not provide a sufficient year-round supply of water, but Oak Creek west of Tehachapi Willow Springs Road (Segment 3) may provide suitable habitat for southwestern pond turtles.

Potential Project-Related Impacts

Though suitable habitat may occur in the project area, it is unlikely that this species would be affected by construction. Aquatic habitats, especially rivers and streams, are generally spanned by powerlines and no impacts to these habitats are anticipated. Pre-construction clearance surveys will be conducted if it is anticipated that construction will impact wetland areas with flowing water and habitat suitable for this species. These surveys will be conducted within 100 feet of any perennial water source.

4.5.3.2.6 Desert Tortoise *(Gopherus agassizii)*.

Status, Distribution, and Habitat Requirements

The desert tortoise is state and federally listed as threatened. It occurs throughout California's desert regions, with the highest densities reported in creosote bush scrub. They also occur occasionally in Joshua tree woodland habitats in the western Mojave Desert.

Habitat Assessment and Occurrence in the Project Area

Although there are no occurrence records in the CNDDB for desert tortoise in the project area it is highly likely that the species occurred there historically and it may still be present. A review of occurrence records suggest that no recent surveys for desert tortoises have been conducted in the area. Suitable habitat exists in the northern portions of Segment 3. Potential habitat was found during surveys of the routes, which is considered the western-most portion of the species' range. The approximate boundaries of habitat considered suitable for the species in the project area are depicted in Figure 4.5-1B. The West Mojave Plan includes four Desert Wildlife Management Area (DWMAs); none overlap with the proposed project area in either Segment 2 or Segment 3. Portions of the project area, mainly in Segment 3, occur within the 'Survey Areas' designated in the West Mojave Plan (BLM, 2005).

Potential Project-Related Impacts

Desert tortoises may be impacted by the project during construction. Worker training programs and biological monitoring can be used to effectively reduce the likelihood of impacts occurring. Pre-construction clearance surveys will be conducted consistent with the final West Mojave Plan or wherever suitable habitat exists in the project area.

4.5.3.2.7 Bald Eagle *(Haliaeetus leucocephalus)*.

Status, Distribution, and Habitat Requirements

Bald eagles are a federally threatened, state endangered, and state fully protected species. After many years of poor reproduction and loss of habitat, the species is recovering over much of its former range. This is largely attributable to the elimination of using DDE and other organochlorines as agricultural pesticides. Also, the creation of artificial reservoirs throughout the state has provided suitable habitat over much of their range. While on migration, bald eagles can be seen just about anywhere in the state. However, they are generally associated with large waterbodies such as lakes and reservoirs, or wildlife refuges where waterfowl congregate. Bald eagles typically eat fish, mammal, carrion, and waterbirds/waterfowl.

Habitat Assessment and Occurrence in the Project Area

No nesting by this species is known for the region. The nearest known nesting locations are associated with large reservoirs and lakes in the southern Sierra Nevada foothills and in the Owens Valley many miles from the project area. Occasional winter migrants are reported in the western Mojave Desert region but there are no known winter concentration areas in the region that reliably support bald eagles for extended periods of time or in large numbers.

Potential Project-Related Impacts

Bald eagles may encounter the proposed transmission lines during migration. There have been records of bald eagles striking transmission lines, especially when visibility is low. Conversely, transmission towers provide safe and suitable perching sites from which to hunt or loaf. No pre-construction clearance surveys are recommended.

4.5.3.2.8 White-tailed Kite *(Elanus leucurus)*.

Status, Distribution, and Habitat Requirements

White-tailed kites, a state fully protected species, typically are found in association with low rolling foothills or valley margins with scattered trees and river bottom areas, or marshes adjacent to deciduous woodlands. They hunt usually over open grasslands, meadows, or marshes. Dense tree stands are often preferred for nesting sites. Loss of habitat is the primary threat to the species.

Habitat Assessment and Occurrence in the Project Area

It is likely that white-tailed kites occur in isolated areas where suitable habitat exists. No nesting sites are known along the routes, but wintering and foraging habitat occurs in small, isolated areas. The species migrates throughout California between late Fall and Spring, so they may be seen in a variety of settings outside of the nesting season.

Potential Project-Related Impacts

No impacts to nesting habitat are expected to occur because of the proposed project. While some suitable foraging habitat may be temporarily disturbed, these impacts would be insignificant. Pre-construction clearance surveys for nesting sites within 500 feet of work locations are recommended.

4.5.3.2.9 Northern Harrier *(Circus cyaneus)*.

Status, Distribution, and Habitat Requirements

Northern harriers are a state species of special concern. They occur throughout the state and elsewhere wherever suitable habitat exists. They are mostly associated with meadows, marshes, and wetland areas where they nest and forage for small mammals and birds.

Habitat Assessment and Occurrence in the Project Area

Little suitable habitat for northern harriers exists along the route in Segment 2. Marginal habitat for wintering harriers occurs in portions of Segment 3 where there are agricultural fields (mainly alfalfa). It is not uncommon during fall and winter to encounter northern harriers in valleys with grasslands and meadows.

Potential Project-Related Impacts

No direct impacts to this species are expected because of the proposed project. In a regional context, a minimal amount of foraging habitat may be temporarily disturbed or modified. Specific habitat for nesting is not expected to be impacted by the project; however, pre-construction clearance surveys are recommended as part of any general raptor nesting surveys.

4.5.3.2.10 Sharp-shinned Hawk *(Accipiter striatus)*.

Status, Distribution, and Habitat Requirements

Sharp-shinned hawks are a state species of special concern. No nesting sites are known (or expected) for the project area. Numerous migrants can, however, be seen throughout southern California during the non-breeding season.

Habitat Assessment and Occurrence in the Project Area

Suitable habitat is present throughout the project area for migrating sharp-shinned hawks. There are no CNDDB occurrence records for this species nesting in the project region. It is likely that sharp-shinned hawks would be seen during construction in woodland areas. Typically these would be brief encounters with migrants.

Potential Project-Related Impacts

No impacts are expected to occur to the species because of the project. Since this species is not known to nest in this portion of California, no pre-construction clearance surveys are warranted.

4.5.3.2.11 Cooper's Hawk *(Accipiter cooperi)*.

Status, Distribution, and Habitat Requirements

Cooper's hawks are a state species of special concern. They breed throughout much of the mountainous areas in the project area and are typically associated with riparian communities, though not exclusively. In addition to the breeding population, large numbers of Cooper's hawks migrate through California during the winter.

Habitat Assessment and Occurrence in the Project Area

Breeding habitat in the project area occurs where riparian woodland habitat occurs, though some nesting may occur in more arid conditions. There are no CNDDB occurrence records for the species nesting in the project area, though it is likely that they nest in the region.

Potential Project-Related Impacts

Cooper's hawks are unlikely to be directly impacted by the proposed project. The greatest concern would be for the loss of a nesting site during the breeding season. The species is relatively susceptible to disturbance and human activity near their nests. They would abandon nesting territories early in the breeding cycle under some circumstances. Preconstruction surveys in suitable nesting habitat can locate any active nesting territories and impacts can be avoided by seasonal work restrictions in certain areas.

4.5.3.2.12 Swainson's Hawk *(Buteo swainsoni)*.

Status, Distribution, and Habitat Requirements

Swainson's hawks are a state threatened species. They have no federal listing designation. They nest mainly in northern and central California, but they are occasionally seen in southern California, including in the project area, during migration. Their selection of nesting sites varies greatly, but often nests are placed in trees that are situated in grasslands and agricultural areas, or in Great Basin sage and pinyon-juniper habitats.

Habitat Assessment and Occurrence in the Project Area

Two pairs of nesting Swainson's hawks were observed during 2005 along Segment 3 near the Los Angeles and Kern County line in the area around MP 9.0 of the proposed route. The closest nest is located approximately 0.7 miles from the proposed Segment 3 T/L route. One or both of these particular nesting territories have been occupied for several years and are adjacent to a series of alfalfa fields (CNDDB Occurrence numbers 802 and 803). Other

suitable habitat is present throughout Segment 2 within a 5-mile radius around the Antelope Substation.

Potential Project-Related Impacts

No impacts to Swainson's hawks or their habitat are expected because of the proposed project. Because nearby construction activities during the nesting season could cause abandonment of a nest, preconstruction surveys will be conducted to identify whether any active nesting territories are present. Seasonal work restrictions would be applied to avoid impacting any nests found near the R-O-W or other project facilities during construction.

4.5.3.2.13 Ferruginuous Hawk (*Buteo regalis*).

Status, Distribution, and Habitat Requirements

Ferruginous hawks are a state species of special concern. They breed north of California, but numerous individuals winter throughout the arid and agricultural areas of the state. They eat small rodents and are most commonly associated with flat, open terrain including agricultural areas such as alfalfa fields, fallow fields, and pastures.

Habitat Assessment and Occurrence in the Project Area

Suitable habitat for wintering ferruginous hawks is prevalent throughout the project area, mainly in Segment 2 and 3 north of Angeles National Forest and extending into the Antelope Valley to Rosamond. There are no CNDDB Occurrence Records for this species in the region, but they are observed frequently by birdwatchers.

Potential Project-Related Impacts

No impacts are expected to occur to this species because of the proposed project. Since this species does not breed in the region, no pre-construction clearance surveys are warranted.

4.5.3.2.14 Golden Eagle *(Aquila chrysaetos)*.

Status, Distribution, and Habitat Requirements

Golden eagles are a state species of special concern, state fully protected species, and they receive federal protection under the Bald and Golden Eagle Protection Act. Golden eagles hunt for rabbits and other small mammals in open habitats such as grasslands, oak savannahs, and scrub communities. They nest throughout California, but less so in southern California where habitat loss and urbanization has greatly reduced the amount of suitable nesting and foraging habitat. The species requires relatively large home ranges. Nesting territories probably overlap with the project area, but there are no known nesting sites within it. Nesting

habitat includes cliffs, and various tree species that provide suitable height and security. Non-breeding individuals may be seen foraging or loafing in the project area at any time of the year. They often use high perches such as transmission towers for foraging.

Habitat Assessment and Occurrence in the Project Area

CNDDB Occurrence Record No. 57 reports a nesting site in the area of Oil Canyon Creek, approximately 16 miles north of Mojave. A more recent 2004 CNDDB record (Occurrence number 87) reported a golden eagle nest in the Tehachapi Mountains 2 miles west of Quail Lake, which is about 26 miles west of the project area. Other nesting sites are present throughout the project area, but not all are active every year. Much of the project area provides suitable foraging habitat for golden eagles, especially those areas where agriculture, grassland, and scrub habitats dominate the landscape. Historical nesting locations are known for the Monolith area. Other nesting territories are known throughout the western Mojave Desert. It is likely that individuals from these and other nearby nesting territories, and winter migrants, frequently forage along the entire length of the proposed routes.

Potential Project-Related Impacts

No impacts to golden eagles are expected because of the project. Transmission towers provide excellent perch sites from which eagles often forage. In some instances, towers are used for nesting sites, although no nests were observed in transmission towers during surveys. All transmission and subtransmission lines would be built per Avian Power Line Interaction Committee guidelines to be raptor-safe. Since no significant amount of habitat loss is expected, use by golden eagles and other large raptors in the area should remain largely the same as it was prior to the project.

Suitable habitat for golden eagles occurs mainly in the Antelope Valley and Tehachapi Mountain areas of the routes in Segments 2 and 3, although individuals may be seen anywhere in the project area. Pre-construction clearance surveys are recommended for nesting sites on existing towers and in areas of suitable habitat within one mile of construction.

4.5.3.2.15 Merlin *(Falco columbarius)*.

Status, Distribution, and Habitat Requirements

Merlins are a state species of special concern. They are only known to occur in California as migrants, though there are persistent rumors in the bird-watching and falconry community of historical nesting sites near the Oregon border. It is common to see merlins nearly anywhere in the project area during the non-breeding months. Relatively large numbers of merlins pass through the region during migration each year. They are aerial predators, rarely landing on

the ground and rarely dependent upon specific habitat conditions. They are attracted to areas, natural or artificial, that attract flocks of small birds. They are seen foraging on flocks of meadowlarks in grasslands, on European starlings around feedlots, and in urban settings hunting sparrows and other passerines.

Habitat Assessment and Occurrence in the Project Area

The project area provides suitable habitat for merlins during their migration through California from northern latitudes to Central and South America. No specific habitat features predict their occurrence, other than the likely presence of small birds.

Potential Project-Related Impacts

No direct impacts to merlins are expected from this project because they are wide-ranging aerial predators whose occurrence is rarely associated with any particular habitat conditions or vegetation type. Since this species does not nest in the region, no pre-construction surveys are warranted.

4.5.3.2.16 Peregrine Falcon *(Falco peregrinus)*.

Status, Distribution, and Habitat Requirements

Peregrine falcons are state listed as a threatened species and are state fully protected. They were recently delisted in 1999 from federal endangered status following a nationwide population recovery. Peregrines nest throughout mountainous and coastal California, and in urban areas. They use coastline and interior cliffs and artificial structures such as bridges and buildings for nesting. No known nesting sites occur in the project area, or within 10 lateral miles at any point along the routes.

Habitat Assessment and Occurrence in the Project Area

No suitable nesting habitat for peregrines occurs along or near the routes. It is likely that peregrines may occasionally use the R-O-W as foraging habitat. No peregrines were observed during field surveys along the routes.

Potential Project-Related Impacts

No nesting habitat or critical foraging habitat would be disturbed or removed because of the project. There are no wetland habitats, or other habitat features present along the routes that might concentrate peregrine prey species, and thus attract peregrines.

Transmission towers often provide perching sites for loafing and foraging. Some peregrines are killed occasionally by striking transmission lines (Walton, 2003). As aerial predators,

they can hit line spans while flying or pursuing their favorite prey, small to mid-sized birds. These impacts are unavoidable and incidental. The R-O-W already supports transmission lines and there have been no reported instances of peregrines striking transmission lines in this area. No suitable nesting habitat for peregrines would be impacted; therefore, no pre-construction surveys are warranted.

4.5.3.2.17 Prairie Falcon *(Falco mexicanus)*.

Status, Distribution, and Habitat Requirements

Prairie falcons are a state species of concern. They occur throughout California, but rarely in close association with human activity or urbanization. They nest on cliffs in foothill and mountainous regions. Desert scrub, arid open areas, and grasslands are their preferred habitat (Garrett and Dunn, 1981). They are especially adaptable and have been recorded nesting in the Sierra Nevada from above 10,000 feet elevation to desert canyons near Death Valley.

Habitat Assessment and Occurrence in the Project Area

Historical nesting sites are known for the southern Sierra Nevada near Monolith and in some of the desert butte areas of the Antelope Valley and western Mojave Desert. Because prairie falcons nest exclusively on cliffs, no nesting sites are known or expected to occur in the project area. Individuals may be seen foraging in the R-O-W throughout its length. They often perch on transmission towers.

Potential Project-Related Impacts

No impacts to prairie falcons or their habitat are expected because of the proposed project. They most likely would be encountered in the Antelope Valley portions of the routes in Segments 2 and 3. Pre-construction surveys are not warranted, because no suitable nesting cliffs occur within one mile of the proposed project area.

4.5.3.2.18 Mountain Plover *(Charadrius montanus)*.

Status, Distribution, and Habitat Requirements

Mountain plovers are state species of special concern. They were proposed in 1999 for federal listing as a threatened species but the petition was denied by the U.S. Fish and Wildlife Service. They winter in sparsely vegetated fields and grasslands, including recently tilled fields. They are less common on the coastal side of mountain ranges than inland. They appear, at least in some areas, to prefer alkali flats and cultivated/plowed fields.

Habitat Assessment and Occurrence in the Project Area

Much of the Antelope Valley north of Angeles National Forest provides suitable wintering habitat for mountain plovers. This winter migrant moves from field to field and is unlikely to be disturbed by construction activities. No primary wintering areas are known in the region, meaning sites where the species resides for extended periods. CNDDB Occurrence Record No. 9 is an observation of 24 individuals seen on 12 March 1999 at 120th Street W. about 1 mile north of Avenue D; 3 miles and northwest of Antelope Acres in Segment 3. This type of sighting is consistent with the expected use of the area by groups migrating through the area.

Potential Project-Related Impacts

No impacts to mountain plovers are expected from the proposed project because ground disturbances will be small relative to the total amount of potential mountain plover foraging habitat throughout the Antelope Valley. Although mountain plovers could potentially forage on the freshly graded tower and substation sites, this species does not nest in the region. No pre-construction surveys are needed to protect this species.

4.5.3.2.19 Burrowing Owl *(Athene cunicularia)*.

Status, Distribution, and Habitat Requirements

Burrowing owls are a state species of special concern. Once a widespread species throughout California, their distribution is now fragmented and much reduced. Loss of habitat is considered the major cause of their decline. Burrowing owls typically frequent low foothill valleys including the Antelope Valley and the western Mojave Desert. They seem to prefer dry sparse grasslands, desert scrub, and agricultural areas. Burrows initiated by California ground squirrels are often used for nesting and roosting.

Habitat Assessment and Occurrence in the Project Area

Suitable habitat for burrowing owls occurs over most of the project area; however, the northern portions of Segment 3 provide the highest quality habitat. Observers searched throughout the project area, including during the appropriate nesting season for the species in the region, and focusing on CNDDB locations. Only one family group of owls was found, in 2005, east of the Cal Cement Plant at MP 24.4 of the proposed Segment 3 T/L route. No burrows were located.

There is only one record in the CNDDB database for Segment 2. CNDDB Occurence No. 353 was a nesting observation made in 1999 in the Anaverde Valley 0.6 miles east of MP 15.0 of the proposed Segment 2 T/L route. No burrowing owls were observed on Ritter Ranch during recent surveys (Chlup 2005).

There are three CNDDB records along Segment 3. CNDDB Occurence No. 586 was a nesting observation in 2003 along West Avenue I, about 1.6 miles west of MP 1.7 of the proposed Segment 3 T/L route. CNDDB Occurence No. 358 was a nesting observation made in 1999 along 110th St. West, between Avenues A and B, at MP 9.3 of the Alternative B route of Segment 3. CNDDB Occurence No. 349 was a juvenile bird seen in 1999 at Avenue B at 95th St. West, 0.5 miles east of MP 9.3 of the Alternative A route of Segment 3. There are at least six other CNDDB burrowing owl records from the Antelope Valley within 15 miles of the project area. These additional records, in combination with the relatively recent occurrences along the project route indicate that a remnant population of burrowing owls persists in the Antelope Valley.

Potential Project-Related Impacts

Based on preliminary survey results, no impacts to burrowing owls are expected to occur due to construction of the proposed project. Preconstruction surveys are recommended in suitable habitat to locate active nesting sites. If any are located within the area potentially affected by the project, then seasonal work restrictions would be applied so that the work is done in the non-breeding season (July – February). If construction cannot be delayed, SCE would arrange for any young owls present at any particular burrow to be relocated by a qualified raptor specialist possessing the appropriate permits.

4.5.3.2.20 Loggerhead Shrike *(Lanius ludovicianus)*.

Status, Distribution, and Habitat Requirements

The loggerhead shrike is a state species of special concern. It is widely distributed where habitat remains in California. Typically it is associated with low elevations (<5,000 feet) in dry, open areas with sparse shrubs or trees. Loggerhead shrikes are sit-and-wait predators and are often seen perched on trees, fences, telephone lines, and transmission towers. The species has declined in recent decades due largely to loss of habitat and conversion of native vegetation to agriculture. The conditions that predict suitable habitat are quite variable throughout the state making identification of specific, required habitat features difficult to determine.

Habitat Assessment and Occurrence in the Project Area

Habitat for loggerhead shrikes exists mainly in Segments 2 and 3 in low arid areas of the Antelope Valley. Shrikes were observed foraging throughout the project area in the Antelope Valley, although no nests were located. Densities were notably higher in the northern Antelope Valley where Joshua tree stands are common.

Potential Project-Related Impacts

Direct impacts to this species can be avoided by ensuring that no active nesting sites are disturbed. Some temporary habitat loss would likely occur as a result of the project. Pre-construction surveys for possible nesting sites should be conducted where suitable nesting habitat (i.e., trees or dense shrubs greater than 3 feet in height) exists.

4.5.3.2.21 California Horned Lark (*Eremophila alpestris actia*).

Status, Distribution, and Habitat Requirements

California horned lark is a state species of special concern. Two subspecies of horned larks occur in the project area. The California horned lark (*E. a. actia*), and the Mohave horned lark (*E. a. ammophilus*) (Grinnell and Miller, 1944). The California horned lark is found along the coastal ranges (including the Castaic Range, at the southern end of the project) from Humboldt County south to Baja California. They are year-round resident birds, with some local movements occurring in late summer and winter. The Mohave horned lark ranges from the southern San Joaquin Valley into the Antelope Valley and throughout the Mojave Desert into southern Nevada. Horned larks are an open prairie bird, typically found in grasslands, mountain meadows, and coastal plains with sparse trees or shrubs. Other subspecies are common throughout the western United States in grasslands, desert scrub, shrubsteppe, and short-grass prairie habitats.

Habitat Assessment and Occurrence in the Project Area

The distribution of California horned larks is limited to Segment 2. Horned larks were observed at Ritter Ranch and are likely prevalent throughout the grasslands and recently burned chamise chaparral of the Sierra Pelona south to the Vincent substation, which roughly corresponds to the area between MPs 5 and 21.5 of the proposed route.

Potential Project-Related Impacts

California horned larks are likely to be nesting along open, grassy areas of Segment 2, and impacts to horned larks may occur if construction is done during the nesting season. Pre-construction surveys, monitoring, and the proper timing of construction activities can significantly reduce the likelihood of impacts. Pre-construction clearance surveys for possible nesting sites will be conducted.

4.5.3.2.22 Le Conte's Thrasher (*Toxostoma lecontei*).

Status, Distribution, and Habitat Requirements

Le Conte's thrasher is a state species of special concern. They typically occur in Joshua tree woodlands and arid desert scrub in the Mojave Desert, and other arid valleys such as the Carrizo Plains. They are usually found in association with desert washes. Like most thrashers of the Southwest, they are a non-migratory, permanent resident.

Habitat Assessment and Occurrence in the Project Area

During 2005, individuals or pairs of Le Conte's Thrashers were observed at six separate locations along Segment 3. These observations were all in Joshua Tree/Creosote Woodland, between MPs 13.0 and 24.0 of the proposed Segment 3 T/L route. Suitable habitat exists throughout this stretch of the project route, roughly from Rosamond Boulevard north to Oak Creek Road, and it appears that there is a substantial extant population of Le Conte's thrashers along this R-O-W.

South of Rosamond Boulevard, most historic Joshua tree woodland and desert scrub has been severely degraded and converted into grassland, agriculture, and non-native herbaceous fields. Many former washes that historically contained habitat for Le Conte's thrashers are now devoid of woody vegetation and can no longer support this species.

Noteworthy nearby historical Le Conte's thrasher CNDDB records include: Occurrence Record No. 57 (a nest observed in 1980 about 4 miles west of MP 14.0 of the proposed Segment 3 route); Occurrence Record No. 1 (a 1920 museum specimen from what is now downtown Palmdale, about 3.5 miles northeast of MP 16.0 of the proposed Segment 2 route); and Occurrence Record No. 2 (a 1926 museum specimen from a location 2 miles northeast of MP 20.0 of the proposed Segment 2 route).

Potential Project-Related Impacts

Le Conte's thrashers are highly likely to be found nesting along the proposed Segment 3 T/L route in the Antelope Valley. Impacts to thrashers may occur if construction is done during the nesting season in the immediate area of their nests. The species is especially susceptible to impacts from vehicular traffic (BLM, 2005). Pre-construction surveys, monitoring, and the proper timing of construction activities can significantly reduce the likelihood of impacts. Seasonal work restrictions near active nesting sites, if any are found, would avoid impacts or disturbance to the species. A marginal amount of suitable nesting habitat for thrashers is expected to be lost because of the proposed project. Pre-construction clearance surveys for possible nesting sites within suitable habitat are recommended.

4.5.3.2.23 Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*).

Status, Distribution, and Habitat Requirements

The southern California rufous-crowned sparrow is a state species of concern. It is resident bird of the coast ranges, from Santa Barbara County south to Baja California. These birds typically inhabits arid, rocky hills and canyons with shrubby or grassy vegetation. Their population numbers have likely been significantly reduced in southern California because of habitat loss due to urban development, although few population trend data are available.

Habitat Assessment and Occurrence in the Project Area

Singing southern California rufous-crowned sparrows were found in two locations at Ritter Ranch, at MPs 9.7 and 13.8 of the proposed Segment 2 T/L route. Suitable habitat occurs throughout the Segment 2 T/L route south of Antelope Valley. Habitat is likely optimal for this species in the area from MPs 13.0 to 18.0 of the proposed Segment 2 T/L route.

Potential Project-Related Impacts

Southern California rufous-crowned sparrows are likely to be nesting along the proposed Segment 2 T/L route. Some temporary and permanent impacts in the form of habitat loss are likely to occur due to the placement of towers and potential roads along the route. Direct impacts to rufous-crowned sparrows could occur if construction takes place during the nesting season (March to August), but such impacts can be avoided if pre-construction nesting surveys are conducted, or if construction is done outside the nesting season. Pre-construction clearance surveys for possible nesting sites within suitable habitat are recommended.

4.5.3.2.24 Bell's Sage Sparrow (*Amphispiza belli belli*).

Status, Distribution, and Habitat Requirements

The Bell's sage sparrow is a state species of concern. It is a year-round resident in chaparral and coastal sage scrub habitats of coastal California, from the inner coast ranges of Shasta County south to Baja California. A different subspecies, *A. b. canescens*, inhabits desert and alkali scrub of the southern San Joaquin valley, higher elevations of the Antelope Valley, and areas northward to Mono County. Range limits of the Bell's sage sparrow in the project area are not clearly defined, but birds inhabiting chaparral communities of the Castaic Range (Segment 2) are considered to be *belli* (Grinnell and Miller, 1944, Chase and Carlson, 2002). Bell's sage sparrow populations in southern California have been reduced by urban

expansion and the conversion of shrublands to grasslands by increased fire frequency and invasion of exotic vegetation (Chase and Carlson, 2002).

Habitat Assessment and Occurrence in the Project Area

Bell's sage sparrows were observed at Ritter Ranch near MP 9.5 of the proposed Segment 2 T/L route. Although some of it burned in 2002, suitable habitat exists in this area from MPs 9.0 to 12.0.

Potential Project-Related Impacts

Bell's sage sparrows are likely to be nesting along the Proposed Segment 2 T/L route. Some temporary and permanent impacts in the form of habitat loss are likely to occur due to the placement of towers and potential roads along the route. Direct impacts to Bell's sage sparrows could occur if construction takes place during the nesting season (March to August) near nesting sites, but such impacts can be avoided if pre-construction nesting surveys are conducted and disturbance-free buffer zones around nesting sites are created, or if construction is done outside the nesting season. Pre-construction clearance surveys for possible nesting sites within suitable habitat are recommended.

4.5.3.2.25 Tricolored Blackbird (*Agelaius tricolor*).

Status, Distribution, and Habitat Requirements

The tricolored blackbird is state species of concern. It is a colonial resident breeder primarily limited to central and southern California. Tricolored blackbirds inhabit freshwater emergent wetlands, usually containing large amounts of cattails or bulrush. They need dense stands of cattails, bulrush, willows, or other mesic vegetation for colonial nesting. Foraging habitat consists of flooded areas or grasslands (Grinnell and Miller 1944).

Habitat Assessment and Occurrence in the Project Area

There are several CNDDB records of recent tricolored blackbird nesting colonies in the Antelope Valley, the closest being Occurrence number 401 at Lake Palmdale in 1994, which is about 2 miles northeast of MP 18.0 of the proposed Segment 2 route. However, there are no significant marshes along the project route. Amargosa Creek and Oak Creek, mentioned in several species accounts above, do not support suitable habitat for tricolored blackbirds.

Potential Project-Related Impacts

No impacts to tricolored blackbirds or their habitat are expected because of the proposed project. Pre-construction surveys are not warranted, because no suitable habitat exists within the proposed project area.

4.5.3.2.26 Tehachapi Pocket Mouse *(Perognathus alticolus inexpectatus)*.

Status, Distribution, and Habitat Requirements

The Tehachapi pocket mouse is a state species of special concern. This subspecies of pocket mouse is endemic to the Tehachapi Mountains (Segment 3) and the western Transverse Ranges (Best, 1994). The habitat requirements for pocket mice are not well defined. They can be found in arid grasslands, desert scrub habitats, pinyon/juniper woodlands, and in open desert conditions. Live-trapping specific sites is the only way to suitably determine presence/ absence.

Habitat Assessment and Occurrence in the Project Area

Since the habitat requirements for Tehachapi pocket mice are so varied and poorly defined or recognizable, we conclude that it is likely the species would be encountered during the project. This can only be verified by live-trapping efforts at areas where specific impacts are expected in suitable habitat for the species.

Potential Project-Related Impacts

Some temporary and permanent impacts in the form of habitat loss are likely to occur because of the proposed project. Permanent impacts may occur where facilities are constructed and where the species' occurrence is documented. A pre-construction clearance survey where suitable habitat is present would be conducted by a qualified expert on the species. Recommendations would identify where trapping should be conducted to help identify presence/absence. If trapping or other indications suggest the species' presence, a biological monitor would be present during ground-disturbing activities to minimize potential impacts to this species.

4.5.3.2.27 Mohave Ground Squirrel *(Spermophilus mohavensis)*.

Status, Distribution, and Habitat Requirements

Mohave ground squirrels are a state threatened species. They prefer open desert scrub, alkali scrub, and Joshua tree woodland habitats. They are sometimes found in grasslands, as well.

They are restricted to the Mojave Desert. The eastern limits of their known range border on the proposed project area east of Mojave, CA.

Habitat Assessment and Occurrence in the Project Area

The closest Mohave ground squirrel CNDDB Occurrence Records to the project area, since 1970, are six records approximately 8 to 10 miles east of the proposed Segment 3 T/L route. Number 26 is a 1920 collection site near Lancaster where 1984 trapping efforts reconfirmed the species' presence. Number 134 is a site near Palmdale where squirrels were trapped during 1973 to 1977. Number 271 is a site east of Air Force Plant 42 where squirrels were detected in 1973. Number 281 is a 1973 detection in Rosamond. Number 284 is a 1987 observation near the California aqueduct and Highway 58. No. 300 is a 1998 observation 2 miles north of Mojave Airport. Most sightings for this species are east of Highway 14. The West Mojave Plan includes a range map for the species within that planning area. That map indicates that it is unlikely that the species occurs in the proposed project area.

Potential Project-Related Impacts

The area south of Antelope Substation can be considered outside of the known current range of this species. Pre-construction clearance surveys are recommended where suitable habitat for the species remains in the Antelope Valley and where recent survey data suggests surveys are warranted.

4.5.3.2.28 Bat Species. Several bat species that are listed by state and federal agencies as rare, threatened, or endangered are known to occur in the region, and probably in the project area. These include: Yuma myotis bat (*Myotis yumanensis*) (BLM sensitive), spotted bat (*Euderma maculatum*) (BLM sensitive, California Special Concern), Townsend's big-eared bat (*Corynorhinus townsendii*) (BLM sensitive, California Special Concern, Forest Service Sensitive), pallid bat (*Antrozous pallidus*) (BLM sensitive, California Special Concern, Forest Service Sensitive), and western mastiff bat (*Eumops perotis*) (BLM sensitive, California Special Concern).

All are wide-ranging, migratory species that may be within the project area at some period in their life cycle. Some species may use cracks or niches on transmission towers for resting sites. All are aerial predators that fly over many diverse habitats and environmental conditions in search of insect prey.

No impacts to bats are expected because of the proposed project in terms of habitat loss or loss of maternity sites for bats. No trees are expected to be removed because of the proposed project. Therefore, no field surveys specifically intended to locate bats were conducted as part of this effort. No pre-construction clearance surveys are warranted to determine bat presence/absence.

4.6 CULTURAL RESOURCES

For the purpose of this discussion, the term "cultural resources" is employed as a general heading that encompasses those resources labeled ethnographic (Native American), archaeological (prehistoric), historical (post-European contact), and paleontological (although such resources are not cultural). Each of these topics is discussed below with regard to the Antelope Transmission Project. Figures 4.6-1, 4.6-2, and 4.6-3 illustrate the overall Study Area, the sample points along the proposed and alternative T/L routes and substations sites, and the Archaeological Sensitivity Index (ASI) model, respectively, developed by the Center for Archaeological Research (CAR) at California State University, Bakersfield (CSUB) (see Section 4.6.1.6 below; also see Appendix E). These figures demonstrate the most archaeologically sensitive areas of the project as determined by the ASI model.

The known cultural resources in the project area have the potential to be significantly impaired by disturbance. Therefore, access to archaeological site location data is restricted. Designating an archaeologically sensitive area keeps archaeological site content and location information confidential by prohibiting (i) archaeological information to unauthorized individuals and (ii) inclusion in publicly distributed documents (California Government Code Section 6354.10).

The following information is summarized from the report entitled *Phase I Archaeological and Paleontological Assessment of the Tehachapi Wind Power Transmission System Project for Southern California Edison, Kern and Los Angeles Counties, California*, submitted to SCE by the CAR in September 2004. The project has since been renamed the Antelope Transmission Project, which is the name used below. Further details related to Sections 4.0 and 5.0 herein are available in that report (see Appendix E). The cultural resource environmental setting section of this PEA addresses proposed Segment 2, including Alternatives AV1 and AV2, Segment 3, including Alternatives A, B and C, and Substations One and Two (proposed and alternative sites).

4.6.1 Segment 2

4.6.1.1 Ethnographic Resources

Prior to European contact, the Kitanemuk inhabited the southern Tehachapi Mountains and claimed a major portion of the Antelope Valley (Blackburn and Bean, 1978:564). Sutton (1980:220) suggested that the "late prehistoric period population of Antelope Valley was ancestral to the ethnographic Kitanemuk," although Blackburn (as cited in Sutton, 1980:220) believed that they "were more likely proto-Tataviam." Summaries of the ethnographic data on the Kitanemuk are available in Kroeber (1925) and Blackburn and Bean (1978).

Sutton (1979) suggested that the Antelope Valley was virtually abandoned about 300 years ago, precipitating substantial changes in territory, settlement patterns, economics, and social organization of the valley inhabitants at that time. Subsequently, the population of the valley was represented by the "ethnographically documented Kitanemuk" (Sutton, 1980:214). Kroeber (1925) assigned almost the entire Antelope Valley to the Kitanemuk, while Blackburn and Bean (1978) restricted them to the northern part of the valley. There are no historical period estimates of population for the Kitanemuk, but "comparisons with similar groups suggest that 500-1,000 people would be a reasonable estimate in view of the size of the territory that they occupied" (Blackburn and Bean, 1978:564).

The Kitanemuk employed a hunting and gathering economy. Since there are so few ethnographic or archaeological data available on the Kitanemuk, it is difficult to assess Kitanemuk subsistence. However, Blackburn and Bean (1978:564) maintained that the "general ecological adaptation and subsistence technology of the Kitanemuk differed little from that of their neighbors to the north or west." This adaptation emphasized resource exploitation of fish, waterfowl, and a variety of roots and seeds, with little emphasis on large mammals (Wallace, 1978:449-450).

The settlement patterns of the precontact Kitanemuk are also poorly understood (Sutton 1980:215), although most villages appear to have been located in the Tehachapi Mountains. Sutton (1980:216) suggested that the ethnographic Kitanemuk settlement pattern "would have consisted of a number of semi-permanent villages located in the Tehachapi Mountains with small seasonal sites located so as to exploit specific resources." Kitanemuk social, political, and religious systems apparently were well developed. Each village had a chief, ceremonial manager, messengers, shamans, and diviners (Blackburn and Bean 1978:567). Their social system was probably patrilineal and lacked the totemic moiety systems found in other areas of southern California (Blackburn and Bean, 1978:567).

While the extent of Kitanemuk contact with other groups is poorly known, it has been suggested that they may have been heavily involved in the California trade system, and perhaps "served as middlemen in that network" (Sutton, 1980:221). According to Blackburn and Bean (1978:564), there was considerable interaction not only among Kitanemuk villages, but between the Kitanemuk and outside groups such as the Chumash and the Tübatulabal. Their relationship with the Yokuts and Tataviam was usually one of hostility, while an amiable relationship seems to have occurred with the Chumash and Tübatulabal.

Kroeber (1925:612) reported that Kitanemuk structures consisted of "a series of individual family rooms surrounding a court that had entrances on two sides only." These communal dwellings were constructed with wooden poles covered with mats made of rush. Within these rooms, each family had its own door and fireplace (Kroeber, 1925:612; Harrington, 1942:2).

4.6.1.2 Archaeological Resources

A significant number of formal archaeological investigations have been conducted in the western Mojave Desert. General summaries of the prehistory of this region have been presented in Warren (1984), Warren and Crabtree (1986), and Sutton (1988, 1996). The following general time periods are presented to provide a temporal framework for this part of the Project Area.

The generally accepted time periods for this region are the Paleoindian Period (ca. 12,000 to 10,000 B.P.), the Lake Mojave Period (ca. 10,000 to 7,000 B.P.), the Pinto Period (ca. 7,000 to 4,000 B.P.), the Gypsum Period (ca. 4,000 to 1,500 B.P.), the Rose Spring Period (ca. 1,500 to 800 B.P.), and the Late Prehistoric Period (ca. 800 B.P. to Historic Contact). These time periods reflect changing lifeways that are at least partly a result of environmental fluctuations; for example, the desiccation of Pleistocene lakes that severely impacted many mammal species. Each time period is characterized by different tool types (e.g., early spear points versus later arrow points) and subsistence emphasis (large game to smaller game at the end of the Pleistocene).

4.6.1.3 Historic Resources

The Project Area encompasses a large portion of the Antelope Valley in the western Mojave Desert. The Antelope Valley is a 3,000-square-mile, high desert that bridges northern Los Angeles County and southeast Kern County (City of Palmdale, 1998:1). The earliest historical documentation for the western Mojave Desert is found in the diary of Franciscan padre Francisco Garcés. In 1776, Garcés traversed Tehachapi and Oak Creek passes in his exploration of inland California, stopping at Willow Springs near Mojave on his return to Mexico from the San Joaquin Valley (Ingles, 1982).

Following the Mexican revolt of 1821, formerly Spanish lands fell under the flag of the Republic of Mexico (Rice et al., 2002:128). In 1846, Rancho La Liebre, located along the western edge of the Antelope Valley and composed of 11 square leagues of land, was granted by Mexico to Jose Maria Flores who, in partnership with Francisco Garcia, raised livestock (Boyd, 1972:8-9).

Jedediah Strong Smith is generally considered to have been the first American to enter what is now Kern County (Gavin and Leverett, 1987:12). Smith's journeys in the region began in 1827, followed in 1830 by Christopher "Kit" Carson and by Joseph Reddeford Walker in 1833 (for whom Walker's Pass is named). Then in 1844, John C. Frémont traveled into the desert from the valley, possibly by way of Oak Creek Pass as Garcés had before him. Oak Creek Pass was the only route through the eastern Tehachapi Mountains until construction of

the railroad through the Tehachapis. The railroad extends from Tehachapi to Willow Springs, the site of the 1900 gold strike (Ingles, 1982:50-53).

From 1874 to 1876, the Tehachapi section of the Central Pacific and Southern Pacific railroads was constructed to bridge the rail gap between the San Joaquin Valley and the Mojave Desert (Heath, 1982:64-67). On September 5, 1876, the Southern Pacific Railroad completed the first north-south line from San Francisco to Los Angeles in a ceremony at Lang Station, a few miles south of Acton (Heath, 1982:64-67). The community of Mojave was established in 1876 as a worker's camp during the period of railroad construction (Darling, 1988:88). A boom town during the mining rushes in the 1890s, Mojave was also the terminus for the 20-mule-team borax outfits from Death Valley (Darling 1988:88). Mojave also served as a freight and passenger center for the mine districts located in Inyo and Mono counties and the eastern Kern County mountains (Boyd, 1972:188).

Among the most important contributions to the welfare of modern California populations was the creation of the Los Angeles Aqueduct, which was constructed between 1908 and 1913 and carries water from Haiwee Reservoir to northern Los Angeles County (Darling, 1988:80). In 1909, a cement plant was erected at Monolith (near Tehachapi) to supply cement for construction of the aqueduct. The plant was designed and built by William Mulholland, and was later purchased by the Monolith Portland Cement Company of Los Angeles in 1919 (Darling, 1988:80-81).

4.6.1.4 Paleontological Resources

Paleontological resources, which are defined as the fossilized remains of prehistoric plants and animals, are non-renewable resources that may include fossilized bones, teeth, shells, tracks, trails, and casts, to name a few. Paleontological analysis for the Project Area was conducted by Dr. Grant Hurlburt, Department of Biology, California State University, Stanislaus, in order to determine the sensitivity of the Project Area with respect to known paleontological resources and the potential for the presence of such resources, in accordance with the California Environmental Quality Act of 1970 (13 PRC, 2100 et seq.), and the Public Resources Code, Section 5097.5 (Stats, 1965, c 1136, p. 2,792). This analysis also complies with guidelines and significance criteria specified by the Society for Vertebrate Paleontology (SVP). The paleontological technical report from which this section is based is provided in Appendix E of this proposal, including details on the study methods and qualifications of those conducting the analysis.

4.6.1.5 Records Search Results

4.6.1.5.1 Archaeology. Archaeological records searches were conducted for the entire Antelope Transmission Project (encompassing all proposed routes) at the Southern San

Joaquin Valley Historical Resources Information Center at CSUB (RS No. 03-225), and the South Central Coastal Information Center at CSUF (RS No. 2648). These searches indicated that there are 100 prehistoric archaeological sites and 34 historic archaeological sites, as well as 26 prehistoric isolates and one historic isolate, within a one-mile radius of the proposed and alternative T/L routes and substation sites for Segments 2 and 3. In addition, there have been a large number of cultural resource surveys within a mile of all of the proposed routes, in both Kern and Los Angeles counties.

4.6.1.5.2 Paleontology. Records searches were also conducted for paleontological resources in the Project Area. At the Natural History Museum of Los Angeles County, Dr. Sam Mcleod identified vertebrate paleontological localities in or near the Project Area from formations found in the area. Dr. Pat Holroyd, Curatorial Assistant, found no relevant records in a search of the University of California, Berkeley, Museum of Paleontology.

4.6.1.6 Field Procedures

The archaeological fieldwork for the project consisted of field checks of selected sample points within the Project Area. Given the scope and relatively large extent of the Project Area, which extended over several geographic and cultural zones, a detailed methodology was designed in order to maximize field efforts and to obtain spatially sound samples covering all of the proposed alternatives. As part of this methodology, a GIS-based approach was utilized to develop initial locations of sample points.

Based on the records searches and limited field checks conducted as part of the project, an Archaeological Sensitivity Index (ASI) model was developed for the Project Area to provide baseline data in order to identify areas of archaeological sensitivity based on several types of cultural and environmental variables. Refer to Appendix E for more information.

The field methodology for the paleontological study of the Project Area included a pedestrian reconnaissance of the transmission line routes, along with examination of geological formations. Foot surveys of approximately 20 percent of the routes were conducted, with 100 percent surveys of substations, where possible.

4.6.2 Segment 3

4.6.2.1 Ethnographic Resources

There is some overlap between the traditional territories of the Kawaiisu and the Kitanemuk, so their lands intersect in parts of the Project Area. The Kawaiisu were the predominant aboriginal group that inhabited a large part of the western Mojave Desert during the ethnographic period. The Kitanemuk and Tataviam lived to the south and southwest of the Kawaiisu, the Owens Valley Paiute and Tübatulabal resided to the north, and the Southern

Paiute lived to the east. Ethnographic data are available in Gifford (1917) and Driver (1937), and general summaries are presented in Kroeber (1925) and Zigmond (1986).

Several large ethnographic Kawaiisu villages have been documented in Sand Canyon, on the eastern side of the Tehachapi Valley. Two of these villages have been investigated archaeologically – *Ma'a'puts* (Pruett 1987) and the Nettle Spring Site Complex (Hinshaw and Rubin, 1996; Sutton, 1997, 2001). Although sites are known in the greater Tehachapi area, it seems that Sand Canyon may have been a central occupation area for the Kawaiisu. This hypothesis is supported by frequent references to Sand Canyon in Kawaiisu mythology (Zigmond, 1980) and by the presence of Kawaiisu Creation Cave (CA-KER-508; Sutton 1982) in Sand Canyon.

The Kawaiisu economy was one of hunting and gathering, utilizing a diversity of resources. No agriculture was practiced, but tobacco plants were pruned to stimulate growth and wild seed fields were burned to improve plant yields for the subsequent year (Zigmond, 1941). Acorns were a major staple (Zigmond, 1986), but many other plants were used as well, including acorns (*Quercus* spp.), pine nuts (from *Pinus monophylla*), yucca (*Yucca* spp.), and juniper (*Juniperus*). Several important resources were obtained in the desert areas, including deer (*Odocoileus hemionus*), chuckwalla (*Sauromalus obesus*), pronghorn (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), and the black-tailed hare (*Lepus californicus*) (Zigmond, 1986:400). Rodents were also consumed, along with a variety of birds, including quail (e.g., *Oreotyx pictus*; Driver, 1937:61).

It is also evident that the Kawaiisu exploited resources outside their core territory, on occasion journeying into the southern San Joaquin Valley and other areas (Zigmond, 1986:399). Koehn Lake in the Fremont Valley was identified as a regular destination for seasonal trips (Zigmond, 1980), and along the Mojave River, Victorville has been noted in Kawaiisu oral tradition as an area where people would go to gather "bug-sugar" (Zigmond, 1980:141).

The social organization of the Kawaiisu was centered around the family group (Zigmond, 1986). Although there were no formal political groupings (at least during the ethnographic period), the position of chief (or headman) was conferred "simply through tacit acknowledgment of the people about him" (Zigmond, 1986:405). The qualifications for chief depended upon wealth (Kroeber 1925:603), and the position might be passed from father to son (Zigmond, 1986:406). Families tended to live near each other and cooperate in some activities, and as such might be considered informal bands (Zigmond, 1986:405). Moieties apparently were not present.

Many groups sporadically passed through and/or utilized the western Mojave Desert, often interacting with the Kawaiisu in a variety of ways. To one extent or another, these

undoubtedly included the Owens Valley Paiute, Kitanemuk, Yokuts, Chumash, Mojave, Chemehuevi, Vanyume, Panamint Shoshone, and probably others. External relations between the Kawaiisu and other groups were generally friendly, although there were intermittent episodes of conflict or warfare, particularly with the Yokuts and the Tübatulabal (Smith, 1978:440). Exchange with other tribes was common; for example, acorns were traded for obsidian and salt from the Western Shoshone and the Panamint Shoshone (Zigmond, 1986:399).

While little is known of Kawaiisu material culture, ethnographic data indicate that it was varied and complex. This is especially true of their basketry, which Zigmond (1986:401) referred to as "an ever-present art." The Kawaiisu built several types of structures, depending on the time of year, the "winter house" (or *tomokahni*) being the most common (Zigmond 1980:123).

4.6.2.2 Archaeological Resources

Archaeological resources occurring within Segment 3 (including all alternatives) are described above in Section 4.6.1.2.

4.6.2.3 Historic Resources

Historic resources occurring within Segment 3 (including all alternatives) are described above in Section 4.6.1.3.

4.6.2.4 Paleontological Resources

Paleontological resources occurring within Segment 3 (including all alternatives) are described above in Section 4.6.1.4.

4.6.2.5 Records Search Results

Records search results for all of the proposed and alternative T/L routes and substation sites in the project area are described above in Section 4.6.1.5.

4.6.2.6 Field Procedures

Field procedures for all of the proposed and alternative T/L routes and substation sites in the project area are described above in Section 4.6.1.6.

4.7 GEOLOGICAL RESOURCES

4.7.1 Introduction

This section discusses existing geological and soil conditions, possible geologic hazards, and geotechnical considerations. Potential impacts and applicant-proposed mitigation measures for the project are discussed in Section 5.7.

4.7.2 Methodology

Existing conditions were determined from review of available published and unpublished literature and online sources. Descriptions of geologic units in the project area are based on published geologic quadrangle maps by Thomas Dibblee (1970, 1997) and State Geologic Maps for the Los Angeles and Bakersfield sheets. Other sources of geologic information include the Ritter Ranch Specific Plan (Robert Bein, William Frost & Associates, 1992) and the City Ranch (Anaverde) Specific Plan (Azeka De Almeida Planning, 1992c). Available geotechnical information was reviewed for the Antelope Substation (SCE, 1957; 1997).

Hazard evaluations for landslides and liquefaction derive primarily from published mapping by the Seismic Hazards Mapping Program (SHMP) from the California Geological Survey (CGS) geologic quadrangle mapping.

Assessment for fault rupture hazard and ground shaking hazard derive from fault mapping and catalogs and interactive maps primarily from CGS (formerly known as California Division of Mines and Geology, CDMG) and U.S. Geological Survey (USGS) sources. The primary sources derive from CGS and include:

- Probabilistic Seismic Hazard Assessment (PSHA) for the State of California
- Earthquake Fault Zones Maps
- Fault Evaluation Reports
- Probabilistic Seismic Hazards Mapping Ground Motion

Soils information presented here derives from the United States Department of Agriculture (USDA) STATSGO data set. Other sources of soil information reviewed include the following soil surveys by the USDA Natural Resources Conservation Service (NRCS) (formerly known as Soil Conservation Service):

- Soil Survey of Antelope Valley, California
- Soil Survey of Kern County, Southeastern Part, California
- Report and General Soil Map, Los Angeles County, California

Site-specific geotechnical investigations are necessary to evaluate subsurface conditions and support appropriate engineering design. Such studies would support the construction, operation, and maintenance of the proposed facilities.

4.7.3 Existing Conditions

4.7.3.1 Physiographic Setting

The project elements traverse three major physiographic provinces: the Transverse Ranges, the Mojave Desert, and the southern margin of the Sierra Nevada Batholith. The existing or proposed substations are located in each province. The existing Antelope Substation is located in the Antelope Valley, part of the Mojave Desert province. The Vincent Substation is located in the Transverse Ranges and proposed Substations One and Two are located in the Tehachapi Valley in the southwesterly portion of the Sierra Nevada Batholith. A regional geology map is presented on Figure 4.7-1, including the locations of Segments 2 and 3.

The T/Ls, Segment 2 (Antelope to Vincent) and Segment 3 (Antelope to Substations One and Two) originate at the Antelope Substation (refer to Figures 3-1, 3-2, and 3-3) within the western portion of the Mojave Desert and extend southward into the Transverse Ranges and the Vincent Substation and northward into the Sierra Nevada, respectively.

The Segment 2 route extends southeastward across the Antelope Valley and through the northwest-trending rift valley associated with the San Andreas fault zone. Alternative AV1 is a 2.1-mile-long alternative route offset to the east of the proposed Segment 2 just north of the San Andreas fault zone. Southeast of the fault zone the route enters the eastern margin of the San Gabriel Mountains, part of the Transverse Ranges. The proposed route jogs westward away from the western end of the Anaverde Valley and then extends southward across rugged ridge, canyon, and valley terrain before ending at the Vincent Substation. Alternative AV2 is a straighter route that passes through the western end of the Anaverde Valley. The existing Vincent Substation is situated at the southern end of Soledad Pass at the divergence of Kentucky Springs and Soledad Canyons.

The Segment 3 route and the associated two alternative routes (A, B) extend north from the Antelope Substation across Antelope Valley and the Mojave Desert. The three parallel routes extend just west of the Rosamond Hills before reaching Substation One along the eastern flanks of the Tehachapi Mountains. Between proposed Substations One and Two, the proposed 220 kV T/L route (and Alternative C) turn to the west into the Tehachapi Mountains along the Oak Creek drainage before turning north across the Garlock fault and entering the southern Sierra Nevada Province. The general route for these two alignments continues across the ridge and canyon terrain before dropping down the northern flanks of the Tehachapi Mountains into the Tehachapi Valley and Substation One.

4.7.3.2 Geologic Setting

The routes traverse diverse geologic conditions associated with the major physiographic provinces discussed above. Table 4.7-1 presents a summary of geologic conditions by milepost for the project routes.

Antelope Valley is a large, undrained topographic basin characterized by relatively flat lying topography and extensive valley fill deposits. Scattered buttes resulting from Miocene-age extrusive volcanic rocks form the only topographic break across the central portion of the valley. Near the southern margins of the Antelope Valley at the flanks of Portal Ridge the proposed route crosses sloping terrain underlain by older alluvial fan deposits shed off of the adjacent topographic highland. Portal Ridge is primarily comprised of a variety of metamorphic crystalline rocks associated with the Pelona Schist. On the southern side of the ridgeline the proposed route drops down and across the San Andreas rift zone in Leona Valley. The rift valley is underlain by Quaternary age surficial deposits and Pliocene and Pleistocene age sedimentary deposits. After crossing the rift zone the proposed route enters the Transverse Ranges and metamorphic terrain characterized by ridge and valley topography. The Alternative AV2 route starts just south of the rift zone and skirts the edge of the Anaverde Valley, which is underlain by recent alluvial deposits. As the proposed route extends southeasterly, it crosses into granitic terrain before dropping onto an older alluvial fan surface and into the recent alluvial deposits at the head of Soledad and Kentucky Springs Canyons.

The northerly-trending Segment 3 routes (proposed and alternative) traverse flat lying topography and valley fill deposits as they extend northward. The routes pass just to the west of the Rosamond Hills and reach Substation One, located on ancient alluvial fans near the mouth of Oak Creek along the toe of the Tehachapi Mountains. The proposed 220 kV Substation One to Substation Two route and the Alternative C route extend northwesterly up the flanks of the mountains. The northern end of the T/L route is situated within the Tehachapi Valley characterized by relatively flat lying topography and valley fill deposits. Within the southern margin of the valley along the flanks of the Tehachapi Mountains the route crosses sloping dissected terrain underlain by older alluvial fan deposits and eroded by active drainages. The Tehachapi Mountains are primarily composed of Cretaceous-age, crystalline granitic rock of similar composition to the Sierra Nevada range to the north. Within the central portion of the mountains the routes cross the Garlock fault and granitic terrain with scattered intrusive volcanics before dropping onto an older fan surface. From this point the routes extend over the granitic terrain of the Tehachapi Mountains and into Tehachapi Valley. Older alluvial fan deposits underlie the margins of the valley and Substation One lies within the central portion of the valley underlain by alluvium.

TABLE 4.7-1
GEOLOGIC CONDITIONS ALONG SEGMENTS 2 AND 3

Segment and Approximate Milepost[1]	Geologic Unit/Structure	Formation Name	Description/Comments
Segment 2 (500 kV)			
0.0 - 4.2	Qa	Alluvium	Antelope Substation: Alluvial gravels, sand and silt
4.2 - 4.4	Qoa	Older Alluvium	Sand and gravel fan deposits
4.4 - 4.5	Qa	Alluvium	Railroad Canyon; Unconsolidated alluvial gravels, sand and silt
4.5 - 4.9	gr	Granitic Rocks	Granitic rocks; fractured, variably weathered crystalline rock
4.9	Fault	San Andreas Fault	Branch fault off San Andreas rift zone; fault rupture hazard
4.9 - 6.5	psp, psq	Pelona Schist	Mica schist, out-of-slope dipping foliation; landslide hazard potential
6.5 - 6.6	Qa	Alluvium	Identified liquefaction potential
6.6 - 7.6	psp	Pelona Schist	Mica schist, into-slope dipping foliation
7.6 - 8.2	Fault Zone, Tas, Qos, Qa	San Andreas Fault, Anaverde Formation, Older and younger Alluvium	Rift zone of San Andreas fault with slivers of Anaverde Formation (sandstone), and older and younger alluvial deposits; identified liquefaction potential in alluvial deposits; active right-slip fault, significant fault rupture hazard
8.2	Fault	San Nadeau	Concealed fault, existence is uncertain; potential fault rupture hazard as coseismic with movement on San Andreas fault
8.2 - 13.3	Qa, Qos, ps	Alluvium, Older Alluvium, Pelona Schist	Mica schist, out-of-slope dipping foliation; landslide hazard potential; identified liquefaction potential in alluvial drainages
13.3 - 13.4	Qls	Landslide Deposits	Mapped landslide deposits
13.4 - 16.2	Qa, Qos, ps	Alluvium, Older Alluvium, Pelona Schist	Mica schist, out-of-slope dipping foliation; landslide hazard potential; identified liquefaction potential in alluvial drainages
16.2 - 16.3	my	Mylonitic Rocks	Mylonite
16.3 - 16.4	gr	Granitic Rocks	Granitic rocks; fractured, variably weathered crystalline rock
16.4 - 16.5	gnb	Gneiss	Banded gneiss
16.5 - 17.1	gr, Qa	Granitic Rocks, Alluvium	Granitic rocks, variable weathering profile, possible landslide hazard; identified liquefaction potential in alluvial drainages
17.1 - 17.3	di	Dioritic Rocks	Mafic granitic rocks; fractured, variably weathered crystalline rock
17.3 - 18.3	sy	Syenite	Granitic rocks, variable weathering profile, possible landslide hazard

TABLE 4.7-1 (CONTINUED)
GEOLOGIC CONDITIONS ALONG SEGMENTS 2 AND 3

Segment and Approximate Milepost[1]	Geologic Unit/Structure	Formation Name	Description/Comments
17.4	Fault	Unnamed fault	Likely inactive, indefinite location, no significant fault rupture hazard
18.3 - 19.2	Qoa	Older Alluvium	Sand and gravel fan deposits
19.2 - 19.3	di	Dioritic Rocks	Mafic granitic rocks; fractured, variably weathered crystalline rock
19.3 - 19.4	Qoa	Older Alluvium	Sand and gravel fan deposits
19.4 - 19.5	lgbd	Lowe Granodiorite	Granitic rocks; fractured, variably weathered crystalline rock
19.5 - 20.0	Qoa	Older Alluvium	Sand and gravel fan deposits
20.0 - 20.9	Qa	Alluvium	Soledad Pass: Alluvial sand and clay
20.9 - 21.0	Qoa	Older Alluvium	Sand and gravel fan deposits
21.0 - 21.2	Qa	Alluvium	Identified liquefaction potential
21.2 – 21.5	Qoa	Older Alluvium	Vincent Substation: Sand and gravel fan deposits
Segment 2, Alt. AV1			
0.0 - 0.7	psp, psq	Pelona Schist	Mica schist, out-of-slope dipping foliation; landslide hazard potential
0.7 - 0.8	Qa	Alluvium	Identified liquefaction potential
0.8 –2.1	psp	Pelona Schist	Mica schist, into-slope dipping foliation
Segment 2, Alt. AV2			
0.0 - 0.1	Tas, Qos, Qa	Anaverde Formation, Older and younger Alluvium	Anaverde Formation (sandstone), and older and younger alluvial deposits; identified liquefaction potential in alluvial deposits; active right-slip fault, significant fault rupture hazard
0.1	Fault	San Nadeau	Concealed fault, existence is uncertain; potential fault rupture hazard as coseismic with movement on San Andreas fault
0.1 - 1.6	Qa, Qos, ps	Alluvium, Older Alluvium, Pelona Schist	Mica schist, out-of-slope dipping foliation; landslide hazard potential; identified liquefaction potential in alluvial drainages
1.6 - 2.4	Qa	Alluvium	Anaverde Valley - Identified liquefaction potential
2.4 - 3.1	ps	Pelona Schist	Mica schist, out-of-slope dipping foliation; landslide hazard potential
Segment 3 (500 kV)			
0.0 - 3.0	Qa	Alluvium	Antelope Valley alluvial deposits: gravels, sands, and silts
3.0 - 3.3	Qs	Dune deposits	Non-cohesive, running sands
3.3 - 25.6	Qa	Alluvium	Antelope Valley alluvial deposits: gravels, sands, and silts

TABLE 4.7-1 (CONTINUED)
GEOLOGIC CONDITIONS ALONG SEGMENTS 2 AND 3

Segment and Approximate Milepost[1]	Geologic Unit/Structure	Formation Name	Description/Comments
14.2	Fault	Rosamond - Willow Springs Flt	Likely inactive, indefinite location, no significant fault rupture hazard
Segment 3 Proposed 220 kV			
25.6 - 29.1	Qoa	Older Alluvium	Sand and gravel fan deposits
29.1 - 29.2	ml	Metasedimentary Rocks	Limestone country rock inclusions within crystalline granitics
29.2 - 29.9	Qa	Alluvium	Unconsolidated alluvial deposits, possible liquefaction potential
29.9 - 30.8	Qoa	Older Alluvium	Sand and gravel fan deposits
30.8 - 31.1	Qa	Alluvium	Unconsolidated alluvial deposits, possible liquefaction potential
31.1 - 31.4	Qoa	Older Alluvium	Sand and gravel fan deposits
31.4 - 31.7	qm w/ Tf	Quartz monzonite with intrusive felsite volcanics	Granitic and volcanic rocks; fractured, variably weathered crystalline rock
31.7	Fault Zone, Qoa	Garlock Fault, Older Alluvium	Garlock Fault and older alluvial deposits; active left-slip fault, significant fault rupture hazard
31.7 - 33.8	qm	Quartz monzonite	Granitic rocks; fractured, variably weathered crystalline rock
33.8 - 34.45	Qa	Alluvium	Tehachapi Valley alluvial deposits: gravels, sands, and silts
34.45 - 34.7	Qoa	Older Alluvium	Sand and gravel fan deposits
34.7 – 35.2	Qa	Alluvium	Tehachapi Valley alluvial deposits: gravels, sands, and silts
Segment 3 Alternative A			
0.0 - 8.6	Qa	Alluvium	Antelope Valley alluvial deposits: gravels, sands, and silts
8.6 - 8.8	Mvp	Pyroclastic volcanics	Indurated volcanic rock
8.8 - 25.9	Qa	Alluvium	Antelope Valley alluvial deposits: gravels, sands, and silts
14.3	Fault	Rosamond - Willow Springs Flt	Likely inactive, indefinite location, no significant fault rupture hazard
Segment 3 Alternative B			
0.0 - 20.0	Qa	Alluvium	Antelope Valley alluvial deposits: gravels, sands, and silts
14.4	Fault	Rosamond - Willow Springs Flt	Likely inactive, indefinite location, no significant fault rupture hazard
20.0 - 21.2	Qoa	Older Alluvium	Sand and gravel fan deposits
21.2 - 26.0	Qa	Alluvium	Antelope Valley alluvial deposits: gravels, sands, and silts

TABLE 4.7-1 (CONTINUED)
GEOLOGIC CONDITIONS ALONG SEGMENTS 2 AND 3

Segment and Approximate Milepost[1]	Geologic Unit/Structure	Formation Name	Description/Comments
Segment 3 Alternative C			
0.0 - 3.5	Qoa	Older Alluvium	Sand and gravel fan deposits
3.5 - 3.6	ml	Metasedimentary Rocks	Limestone country rock inclusions within crystalline granitics
3.6 - 4.25	Qa	Alluvium	Unconsolidated alluvial deposits, possible liquefaction potential
4.25 - 4.9	Qoa	Older Alluvium	Sand and gravel fan deposits
4.9 - 5.8	qm w/ Tf	Quartz monzonite with intrusive felsite volcanics	Granitic and volcanic rocks; fractured, variably weathered crystalline rock
5.8 - 6.0	Fault Zone, Qa	Garlock Fault, Alluvium	Garlock Fault and younger alluvial deposits; identified liquefaction potential in alluvial deposits; active left-slip fault, significant fault rupture hazard
6.0 - 7.9	qm	Quartz monzonite	Granitic rocks; fractured, variably weathered crystalline rock
7.9 –9.5	Qa	Alluvium	Tehachapi Valley alluvial deposits: gravels, sands, and silts

[1] Refer to Figures 3-2 (Segment 2) and 3-3 (Segment 3) for milepost locations.

4.7.3.3 Geologic Structure

Segment 2 initiates at the Antelope Substation within the Mojave structural block and crosses the San Andreas fault zone; a major tectonic plate boundary characterized by right lateral movement. Across the San Andreas fault the routes enter the Sierra Pelona characterized by the compressional tectonics (north-south shortening) of the Transverse Ranges that results from the large bend in the San Andreas fault zone. The active compressional environment of the Transverse Ranges has resulted in significant uplift, tilting, folding and faulting. As a result, much of the route is underlain by moderate-to-steep terrain and moderate-to-steeply dipping bedding or foliation in the sedimentary and metamorphic units, respectively.

The ancestral tectonic setting of the area included extensional tectonics and the formation of deep sedimentary basins during Tertiary time. The southern end of the route enters the Soledad basin. The Tertiary sediments deposited in this basin were subsequently folded and uplifted by the current compressive tectonic regime that formed the Transverse Ranges.

Segment 3 extends northward across the Mojave structural block and the flat lying alluvial deposits laid down in the Antelope Valley. The routes reach Substation One located at the toe of the Tehachapi Mountains on southeastern-dipping alluvial fan deposits. The Substation

One to Substation Two route crosses the southwesterly-to-northeasterly-trending Garlock fault and the subparallel Tehachapi Mountains. This marks the transition into the Sierra Nevada structural block. The Tehachapi Mountains are primarily comprised of granitic rock with subparallel bodies of metamorphic rock and intruded dikes of Tertiary-age volcanic rock. The Tehachapi Valley is an east-west-trending alluvial basin.

4.7.3.4 Geologic Units

Geologic units encountered in the project area are presented in Table 4.7-1 and are based on the quadrangle-level geologic maps of Dibblee. The geologic units are described briefly below.

4.7.3.4.1 Surficial Deposits. Quaternary alluvium includes the valley fill deposits of the Antelope Valley and the older alluvial and alluvial fan deposits associated with adjacent mountain fronts. Alluvial deposits are present in the Soledad Valley on Segment 2. Landslides are present locally on the steeper slopes along the southern portion of Segment 2. Alluvial deposits are also present along the northern end of the Segment 3 proposed route and Alternative C in the Tehachapi Valley.

4.7.3.4.2 Tertiary Sediments. Tertiary-age rocks are found only as a minor occurrence along the Segment 2 route and Segment 3. Weakly to moderately lithified deposits of the Anaverde Formation are present solely within the San Andreas rift zone within Segment 2. A minor stretch of the Segment 3 Alternative A extends across Miocene age, indurated pyroclastic volcanic rock within the central portion of the Antelope Valley.

4.7.3.4.3 Granitic Rocks. Crystalline rocks of granitic origin are encountered in Segment 2 after crossing the San Andreas fault and in Segment 3 in the Tehachapi Mountains. Mapped rock units in or adjacent to the routes include quartz diorite and quartz monzonite, syenite, granodiorite, and dioritic rocks.

4.7.3.4.4 Metamorphic Rocks. The Pelona Schist is mapped along Segment 2 near the San Andreas rift. These crystalline rocks are extensively folded and faulted with moderately-to-steeply-dipping foliations. Mylonitic and gneissic rocks are found along Segment 2 in the Sierra Pelona.

4.7.4 Geologic Hazards

4.7.4.1 Seismicity

The project area is seismically active given the presence of the San Andreas fault system, the Garlock fault and the active faults of the Transverse Ranges. Notable historic seismic events affecting the project area are presented on Figure 4.7-2. It is likely that the project area would

experience minor to moderate earthquakes and potentially a major earthquake (moment magnitude M7, or greater) during the project's service life. A 1995 estimate by the Working Group on California Earthquake Probabilities gave an 80 to 90 percent probability of an M7 or greater earthquake in southern California before 2024.

4.7.4.1.1 Seismic Parameters. Earthquakes, their causative fault sources, and the resultant ground motions are measured by parameters, including magnitude, intensity, fault length, rupture area, slip rate, recurrence maximum considered earthquake, and peak ground acceleration. These seismic parameters are used to evaluate and compare earthquake events, seismic hazard potential, and ground shaking.

4.7.4.1.2 Magnitude. Magnitude refers to the size of an earthquake. A number of methods are used to measure magnitude, including Richter (M_L), surface wave (Ms), and body wave (M_b). These are instrumental methods, based on the measurement of amplitude of seismic waves recorded on a seismograph, and can yield inconsistent results when considered over wide ranges of magnitudes. A more consistent method of magnitude measurement is provided by moment magnitude, or Mw. Moment magnitude is based on the energy released across the area of the fault.

4.7.4.1.3 Maximum Considered Earthquake (MCE). Fault parameters are generally used to estimate the maximum considered earthquake (MCE) that can be generated by a given fault or fault segment. In some cases, historic earthquakes are used to characterize the MCE. In general, the MCE is a rational and believable event that can be supported by the seismic and paleoseismic geology of the area.

4.7.4.1.4 Ground Motions. Probabilistic seismic hazard estimates based on the USGS/CGS Probabilistic Seismic Hazards Assessment (PSHA) Model, (2002, revised April 2003) and presented on regional maps depict ground motions associated with a 10 percent probability of exceedance in a 50 year period.

For Segment 2 the ground motion estimate (given as the gravitational acceleration [g] for the peak ground acceleration) for the Antelope Substation is 0.66g and for the Vincent Substation it is approximately 0.59g. The ground motion estimates from this model peak at approximately 0.79g, along Segment 2 at the San Andreas fault zone.

Segment 3 begins at the Antelope Substation with the 0.66g probabilistic ground motion estimate described above and extends northward to Substation One with an estimated peak acceleration of 0.40g. Substation Two has an estimate peak ground acceleration of approximately 0.42g in the Tehachapi Valley.

4.7.4.2 Fault Rupture

Active and potentially active faults have been mapped in the project vicinity and documented by a number of government agencies and scientific entities. Numerous published maps and reports have been prepared by the USGS, the CGS, and other State or public agencies (i.e., Caltrans, Southern California Earthquake Center) that present information on fault location and activity. Table 4.7-2 presents a list of active and potentially active faults within the project vicinity and active faults within approximately 60 miles. Fault characteristics listed in Table 4.7-2 are based on published data.

Figure 4.7-2 presents a regional fault and epicenter map showing the approximate location of the project in the regional context of seismic sources. The San Andreas fault zone represents the primary component of the transform boundary between the North America and Pacific plates and the dominant seismic source in the project area. As discussed above there is a significant likelihood that there would be a large earthquake in the area within the near future. Specifically, the Mojave segment of the San Andreas has a significant potential to rupture with a large magnitude event within the project service life. The Garlock fault is an active left lateral slip fault with surface rupture potential. Segment 2 crosses the San Andreas fault zone at approximately MP 7.6 to 8.2. The Segment 3 Proposed 220 kV T/L crosses the Garlock fault at approximately MP 31.7 as noted in Table 4.7-1.

4.7.4.2.1 Earthquake Fault Zones. The Alquist-Priolo Special Studies Zones Act, passed in 1972, requires the establishment of "earthquake fault zones" (formerly known as "special studies zones") along known active faults in California. Strict regulations on development within these zones are enforced to reduce the potential for damage due to fault displacement. However, these restrictions apply only to occupied structures and none of the proposed project facilities would be manned.

In order to be designated as an "earthquake fault zone" a, fault must be "sufficiently active and well defined" according to State guidelines. As a result, only faults or portion of faults with relatively high potential for ground rupture are zoned, while other faults which may partially meet the criteria are not zoned. The potential for fault rupture, therefore, is not limited solely to faults or portions of faults delineated as "earthquake fault zones." Earthquake fault zones within the project area include the San Andreas and Garlock faults. Segment 2 and 3 fault crossings are listed in Table 4.7-1.

4.7.4.2.2 Fault Displacement. There is a significant potential for surface rupture within the project area given the potential for moderate or large earthquakes on the active Garlock and San Andreas faults. Estimates of likely surface displacement can be made based on empirical correlations from a catalog of worldwide earthquakes that includes measurements of ground rupture. Mean values of average and maximum displacement can be estimated for the San

TABLE 4.7-2
SEISMIC SOURCE CHARACTERISTICS
SEGMENTS 2 AND 3

Fault Name	Nearest Distance to Project Segment 2[1] Miles (km)	Nearest Distance to Project Segment 3[1] Miles (km)	Type of Faulting[2]	Fault Length[2] Miles (km)	Slip Rate Range[2] Inches/Year (mm/year)	Maximum Magnitude Earthquake[3] (M_{max})
Clamshell-Sawpit Canyon	23 (37)	42 (68)	reverse	11.2 (18)	0.02 - 0.04 (0.5 - 1)	6.5
Cucamonga	35 (56)	54 (87)	thrust	18.6 (30)	0.2 - 0.55 (5 - 14)	7.0
Elsinore	54 (87)	73 (118)	right-lateral strike-slip	112.0 (180)	0.16 (4)	6.8 - 7.1
Garlock	21 (34)	0 (0)	left-lateral strike-slip	155.0 (250)	0.08 - 0.43 (2-11)	7.1
Hollywood	28 (45)	45 (72)	left reverse	9.3 (15)	0.01 - 0.03 (0.33 - 0.75)	6.5
Holser	27 (43)	29 (47)	reverse	12.4 (20)	0.015 (0.4)	6.5
Malibu Coast	45 (72)	50 (81)	reverse	21.1 (34)	0.01 (0.3)	6.7
Newport-Inglewood	36 (58)	50 (81)	right-lateral strike-slip	46.6 (75)	0.024 (0.6)	6.9
Oak Ridge	39 (63)	37 (60)	thrust	55.9 (90)	0.14 - 0.24 (3.5 - 6)	6.9
Palos Verdes	47 (76)	60 (97)	right reverse	49.7 (80)	0.004 - 0.12 (0.1 - 3)	7.1
Pelona	17 (27)	17 (27)	left reverse	4.3 (7)	NA	NA
Pleito Thrust	37 (60)	24 (39)	thrust	28 (45)	0.06 (1.4)	6.8
Raymond	24 (39)	44 (71)	left-lateral reverse	16.2 (26)	0.004 - 0.009 (0.1 - 0.22)	6.5
San Andreas	0 (0)	7 (11)	right-lateral strike-slip	745 (1,200)	0.79 - 1.38 (20-35)	7.9
San Cayetano	35 (56)	35 (56)	thrust	28 (45)	0.05 - 0.35 (1.3 - 9)	6.8
San Fernando	20 (32)	33 (53)	thrust	10.56 (17)	0.2 (5)	6.8
San Gabriel	15 (24)	17 (27)	right-lateral strike-slip	87 (140)	0.04 - 0.2 (1 - 5)	7.0
San Jacinto	40 (64)	53 (85)	right-lateral strike-slip	130.5 (210)	0.28 - 0.67 (7 - 17)	6.9
Santa Monica	31 (50)	46 (74)	left reverse	14.9 (24)	0.01 - 0.015 (0.27 - 0.39)	6.6
Santa Susana	26 (42)	33 (53)	thrust	23.6 (38)	0.2 - 0.28 (5 - 7)	6.6
Sierra Madre	19 (31)	35 (56)	reverse	46.6 (75)	0.014 - 0.16 (0.36 - 4)	7.0
Simi (Santa Rosa)	31 (50)	35 (56)	reverse	24.9 (40)	0.04 (1)	6.7
Whittier	35 (56)	54 (87)	right-lateral strike-slip	24.9 (40)	0.098 - 0.12 (2.5 - 3)	6.8
White Wolf	42 (68)	15 (24)	left-lateral reverse	37.3 (60)	0.12 - 0.335 (3 - 8.5)	7.2

Sources:
1 Jennings, 1994.
2 SCEC.
3 ICBO, 1998.

Andreas and the Garlock faults based on correlations to fault magnitude (Wells and Coppersmith, 1994). The mean value of the maximum displacement for an Mw 7.8 on the central portion of the San Andreas (repeat of 1857 rupture length) is approximately 10m and the mean value of the average displacement is approximately 5m. Values for the mean maximum and mean average displacements for the Garlock fault are approximately 1.9m and 1.2m respectively.

These estimates are based on statistical regressions and the computed displacements are mean values. The mean plus one standard deviation displacement is approximately twice the mean value, which indicates the wide range of possible displacements for a given magnitude event. Some comparable worldwide events on strike-slip faults provide additional insight into possible slip scenarios for hazard evaluation. For example, greater than 5m of slip was measured for the 1992 Landers Mw 7.3 earthquake, the 1999 Hector Mine Mw 7.1 event and the 1999 Turkey Mw 7.3 event.

4.7.4.3 Landslides

Landslides, earth flows, and debris flows are relatively common features in the steep ridge, valley, and canyon terrain of the Transverse Ranges. A portion of the Segment 2 T/L route has been mapped by the recent State Seismic Hazards Mapping Program. This program was instituted because "the effects of strong ground shaking, liquefaction, landslides, or other ground failure account for approximately 95 percent of economic losses caused by an earthquake." Segment 2 extends across one mapped landslide between MP 13.3 and MP 13.4. A review of the quadrangle-level hazard mapping for the areas that are mapped shows minor zones of potential landslide hazard in the areas of sloping terrain. These areas are listed in Table 4.7-1.

Quadrangle hazard mapping is not available for Segment 3. Segment 3 does traverse steeper terrain of the Tehachapi Mountains along the Substation 1 to Substation 2 routes. This type of granitic terrain is not typically as susceptible to landslide hazards as bedded sedimentary or foliated metamorphic rock. Some landslide hazard remains because of the sloping terrain, but overall the landslide hazard along this reach so Segment 3 is anticipated to be minor.

4.7.4.4 Liquefaction and Lateral Spreading

Seismically-induced soil liquefaction is a phenomenon in which loose to medium dense, saturated, granular materials undergo matrix rearrangement, develop high pore water pressure, and lose shear strengths due to cyclic ground vibrations induced by earthquakes. This rearrangement and strength loss is followed by a reduction in bulk volume. Manifestations of soil liquefaction can include loss of bearing and lateral capacities for foundations, and surface settlements and tilting in level ground. Soil liquefaction can also

result in instabilities and lateral deformation in areas of sloping ground. Liquefaction-induced failure and lateral movements of slopes or free faces are referred to as lateral spreading.

Liquefaction is a potential hazard at various locations along the Segment 2 T/L route based on the State seismic hazard mapping. These hazards are most significant in the Leona Valley, Anaverde Valley and the Soledad Canyon area near the Vincent Substation. The substation site is underlain by older alluvium and is not included within the liquefaction hazard zone. Lateral spreading is a potential hazard only if structures are placed near slopes or free faces underlain by liquefiable deposits.

Segment 3 is not underlain by significant liquefiable deposits based on our review of available information.

4.7.4.5 Expansive and Collapsible Soils

Expansive soils are those that contain significant amounts of clays that expand when wetted and can cause damage to foundations if moisture collects beneath structures. Some potential for fine-grained expansive materials may be present in the Antelope Valley.

Soils that collapse during wetting may be encountered in alluvial deposits when re-wetting causes chemical or physical bonds between soil particles to weaken. This allows the structure of the soil to collapse and the ground surface to subside. In order to collapse, soils must have a weak cementation or cohesive structure that can be modified by the addition of water. Collapsible soils, if present within the project area, are most likely in the fine-grained desert soils of Antelope Valley.

4.7.4.6 Subsidence

Land subsidence is a result of fluid withdrawal from compressible sediments. As fluid is withdrawn the effective pressure in the drained sediments increases. Compressible sediments are then compacted because the over-burden pressure is no longer compensated by hydrostatic pressure. This effect is most pronounced in younger, uncompacted sediments.

Land subsidence is generally characterized by a broad zone of deformation where differential settlements are small. This type of deformation is not generally a significant hazard to overhead T/Ls or substation facilities because the individual foundation elements of these types of structures would not experience significant differential settlement as a result of regional subsidence. Subsidence is not considered a significant hazard for Segments 2 or 3 based on the geologic setting.

4.7.5 Soils

Soils result from both the physical and chemical weathering of the geologic deposits at and near the earth's surface. Soil formation is a complex phenomenon and is affected by the dynamic interaction of physical, chemical, and biological processes. Soil surveys classify soil characteristics based on soil associations, specifically, distinct combinations of soil types (soil series). Soil associations have been mapped by the USDA Natural Resources Conservation Service (NRCS) in the project area.

Soil Associations mapped within the project area are tabulated in Table 4.7-3. The map units present in the project area represent soil associations from four distinct groups; Mojave Desert soils, upland soils, soils on the eastern slopes of the Tehachapi Mountains, and alluvial soils. The Mojave Desert soil group is represented by the Hanford-Ramona-Greenfield, Cajon-Wasco-Rosamond, and Neuralia-Garlock-Cajon soil associations. Upland soils are present along the southern end of Segment 2 and include Cieneba-Caperton-Gaviota, Lodo-Sobrante-Gaviota, and Cieneba-Pismo-Caperton soil associations. Soils in the Tehachapi Mountains include the Rock Outcrop-Trigger-Torriorthents and Pajuela-Whitewolf-Rock Outcrop soil associations. The alluvial soils in the Tehachapi Valley are in the Havala-Steuber-Tehachapi soil association.

Some generalized characteristics for these associations are presented in Table 4.7-3.

TABLE 4.7-3
GENERAL CHARACTERISTICS OF SOIL ASSOCIATIONS PRESENT IN THE PROJECT AREA

Soil Association	Segment 2 Location (Milepost)[1]	Alternative AV1 (Milepost)[1]	Alternative AV2 (Milepost)[1]	Shrink-Swell Potential	Erosion Hazard	Corrosion Concrete	Corrosion Steel
Segment 2 Antelope to Vincent							
Hanford-Ramona-Greenfield	Antelope Sub. 0.0 to 4.3			Low	Slight and Moderate	Low and Moderate	Moderate and High
Cieneba-Caperton-Gaviota	4.3 to 7.9	0.0 - 2.07		Low	Moderate and High	Moderate	Low and Moderate
Lodo-Sobrante-Gaviota	7.9 to 16.5		0.0 - 3.1	Low and Moderate	Moderate and High	Low and Moderate	Moderate
Cieneba-Pismo-Caperton	16.5 - 21.5 Vincent Sub			Low	Moderate and High	Moderate	Moderate
Segment 3 Antelope to Substation One							
Soil Association	**Segment 3 Location (Milepost)[1]**	**Alternative A (Milepost)[1]**	**Alternative B (Milepost)[1]**	**Shrink-Swell Potential**	**Erosion Hazard**	**Corrosion Concrete**	**Corrosion Steel**
Hanford-Ramona-Greenfield	Antelope Sub 0.0 to 8.6	Antelope Sub 0.0 to 9.2	Antelope Sub 0.0 to 8.6	Low	Slight and Moderate	Low and Moderate	Moderate and High
Cajon-Wasco-Rosamond	8.6 - 21.8	9.2 - 22.3	8.6 - 20.4	Low	Slight and Moderate	Low	Moderate and High
Hanford-Ramona-Greenfield			20.4 - 21.2	Low	Slight and Moderate	Low and Moderate	Moderate and High
Cajon-Wasco-Rosamond			21.2 - 22.2	Low	Slight and Moderate	Low	Moderate and High
Neuralia-Garlock-Cajon	21.8 - 23.4	22.3 - 22.7	22.2 - 22.6	Low	Slight and Moderate	Low	Moderate and High
Cajon-Wasco-Rosamond	23.4 - 25.4	22.7 - 25.7	22.6 - 25.7	Low	Slight and Moderate	Low	Moderate and High
Neuralia-Garlock-Cajon	25.4 - 25.6 Substation One	25.7 - 25.9 Substation 1A	25.7 - 26.04 Substation 1B	Low	Slight and Moderate	Low	Moderate and High

TABLE 4.7-3 (CONTINUED)
GENERAL CHARACTERISTICS OF SOIL ASSOCIATIONS PRESENT IN THE PROJECT AREA

Segment 3

Soil Association	Proposed 220 kV (Milepost)[1]	Alternative C (Milepost)[1]	Shrink-Swell Potential	Erosion Hazard	Corrosion Concrete	Corrosion Steel
Neuralia-Garlock-Cajon	Substation One 25.6 - 26.2	Substation One 0.0 to 0.6	Low	Slight and Moderate	Low	Moderate and High
Pajuela-Whitewolf-Rock Outcrop	26.2 - 29.6	0.6 to 4.0	Low	Slight and Moderate	Low	Moderate and High
Rock Outcrop-Trigger-Torriorthents	29.6 - 34.6	4.0 to 8.0	Low	Slight and Moderate	Low	Moderate and High
Havala-Steuber-Tehachapi	34.6 - 35.2 Substation Two	8.0 to 9.5 Substation Two: 9.5 to 9.9 Substation 2A: 8.0 to 10.7 Substation 2B	Low	Moderate	Low	High

[1] Refer to Figures 3-2 (Segment 2) and 3-3 (Segment 3) for milepost locations.

4.8 HAZARDS AND HAZARDOUS MATERIALS

4.8.1 Proposed Project

This section describes the existing hazards and hazardous materials in the project area for Segments 2 and 3 of the Antelope Transmission Project (refer to Figure 3-1). Segment 2 consists of 21.0 miles of 500 kV T/L and 0.5 mile of 220 kV T/L between the Antelope and Vincent Substations as well as T/L tie-ins at both substations (refer to Figures 3-1 and 3-2). Segment 2 also includes approximately 4.4 miles of 66 kV subtransmission line relocation south of the Antelope Substation. Segment 3 consists of a proposed 25.6-mile-long 500 kV T/L between the Antelope Substation and Substation One (new), and a new 9.6-mile-long 220 kV T/L between the two new substations, Substation One and Substation Two (refer to Figures 3-1 and 3-3).

The proposed T/L routes, as well as the proposed substation sites for Segments 2 and 3, are not known to contain hazardous materials, wastes, or other related risks to human health and safety. SCE would perform a Phase I Environmental Site Assessment (ESA) prior to acquisition of new property to confirm that no soil contamination exists in areas to be graded or excavated as part of this project.

The proposed T/L routes for Segments 2 and 3 traverse area with seasonally high fire hazard.

4.8.2 Alternatives

Similar to the proposed 500 and 220 kV T/L and 66 kV subtransmission line relocation routes and substations, the alternative T/L routes and substation sites are not known to contain hazardous materials, wastes, or other related risks to human health and safety. If an alternative T/L route or substation site were selected, SCE would perform a Phase I ESA prior to construction to confirm that no soil contamination exists. The seasonally high fire hazard present along portions of the proposed T/L routes is also applicable to the corresponding portions of the alternative T/L routes.

4.9 HYDROLOGY AND WATER QUALITY

4.9.1 Introduction

This section describes the existing surface water and groundwater hydrology, use, and quality in the project area for proposed Segments 2 and 3, including alternatives. Surface water and groundwater in the project area were evaluated by reviewing maps showing the water bodies and drainages, by reviewing studies completed by and for state and local water agencies, and by obtaining information from city, regional, county, and state water agencies.

Areas of existing soil and water quality degradation were identified by searching federal and state regulatory agency databases that track sites with known, suspected, or potential hazardous substance contamination (for example, underground storage tanks or landfills). For sites that were identified in these databases, local regulatory agencies were contacted and files were reviewed for specific information regarding existing soil and groundwater conditions.

4.9.2 Watershed and Regulatory Issues

The proposed project and its alternatives are located in three major watersheds that drain into separate basins. Groundwater and surface water in the southern end of the project flow to the Santa Clara River Basin, while the northern end of the project drains to the Antelope Valley and Fremont Valley Basin. The Santa Clara and Antelope Valley watersheds are separated by the northwest portion of the San Gabriel Mountains, which provide a topographic and hydrologic divide. The Antelope Valley and Fremont Valley watersheds are separated by a topographic and hydrologic divide present in the Antelope Valley.

The Santa Clara River Basin is under the jurisdiction of the Los Angeles Regional Water Quality Control Board (RWQCB). The Antelope Valley and Fremont Valley Basins are under the jurisdiction of the Lahontan RWQCB. Segment 2 is located in Los Angeles County. Segment 3 and its alternatives are located partially in Los Angeles County and partially in Kern County.

4.9.2.1 Los Angeles County

Segment 2 is located in Los Angeles County, and Segment 3 and its alternatives are located within both Los Angeles County and Kern County (see Figure 4.9-1). Surface water and groundwater quality and use in Los Angeles County are under the jurisdiction of the Los Angeles County Department of Public Works (LACDPW). LACDPW operates and maintains 15 major dams and nearly 500 miles of open channel, 2,500 miles of underground storm drains, over 70,000 catch basins, about 300 debris retaining structures and 230 concrete stream bed stabilization structures, 40 pumping plants, and nearly 27 spreading

grounds throughout Los Angeles County. They also monitor water quality at a network of stream stations and supply wells as well as coordinating responsibilities with 88 separate jurisdictions under the National Pollutant Discharge Elimination System (NPDES) Permit Program. Drainage and floodplain permits are required by the LADPW before constructions of certain facilities can begin. The permits require the developer to provide measures that keep peak 100-year storm flows at or below pre-development levels. The LADPW identifies flood control improvements required of new development and applies fees or conditions to ensure the improvements are built. Water quality in this area is also under the jurisdiction of the Los Angeles RWQCB.

4.9.2.2 Kern County

The proposed 500 kV T/L portion of Segment 3 between the Antelope Substation and Substation One, including Alternatives A and B, are partially located in Kern County (see Figure 4.9-1). The proposed 220 kV T/L between Substations One and Two, including T/L route Alternative C and all substation location alternatives, are located solely in Kern County. Surface water and groundwater quality and use in Kern County are under the jurisdiction of the County of Kern Engineering and Survey Service (KCESS). KCESS's authority gives them the right to make water available for any beneficial use or uses of lands or inhabitants, provide flood control, and prevent contamination of water, among others. They have the authority to maintain and monitor pollutant discharges from the County's storm water management infrastructure for the NPDES program. KCESS also reviews and inspects street, sewer, water, drainage, and grading plans for County projects and development permits and they collect floodplain mapping and hydrologic data. They are the floodplain manager for the unincorporated areas and they implement and oversee the National Flood Insurance Program. Water quality in this area is also under the jurisdiction of the RWQCB, South Lahontan Region.

4.9.2.3 Federal and State Requirements

The RWQCBs implement water quality regulations under the Federal Clear Water Act (CWA) and the State Porter-Cologne Act. The regulations require compliance with the NPDES program. Construction activities for this project require an NPDES General Construction Permit for discharges of storm water runoff associated with construction activity. A Notice of Intent (NOI) to the State Water Resources Control Board (SWRCB) to be covered by the General Permit would be required for Segments 2 and 3 prior to the initiation of construction. The General Permit requires the implementation of a Storm Water Pollution Prevention Plan (SWPPP), which must be prepared before construction begins. The SWPPP requirements include:

- Specifications for best management practices (BMPs) that would be implemented during project construction to minimize the potential for accidental releases and to minimize runoff from the construction areas, including storage and maintenance areas and building material laydown areas
- A description of a plan for communicating appropriate work practices to field workers
- A plan for monitoring, inspecting, and reporting any release of hazardous materials

During construction, the RWQCBs would oversee and inspect the project for the SWRCB.

4.9.2.3.1 Section 404 Permits. Waters of the United States (including wetlands) are subject to U.S. Army Corps of Engineers (Corps) jurisdiction under Section 404 of the CWA. Section 404 regulates the filling and dredging of U.S. waters. The limits of nontidal waters extend to the Ordinary High Water (OHW) line, defined as the line on the shore established by the fluctuation of water and indicated by physical characteristics such as a natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, presence of litter or debris, or other appropriate means. In general, ditches excavated on dry land that do not convey flows from historical streams are considered non-jurisdictional as determined by the Corps on a case-by-case basis. A Section 404 permit would be required for project construction activities involving excavation of, or placement of fill material into, waters of the United States. A Water Quality Certification pursuant to Section 401 of the CWA is required for Section 404 permit actions. If applicable, construction would also require a request for Water Quality Certification (or Waiver thereof) from the RWQCB.

4.9.2.3.2 Streambed Alteration Agreements. Sections 1600-1616 of the California Fish and Game Code stipulate that a governmental or private entity may not substantially divert or obstruct the natural flow of, or change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit debris or waste materials into such waterbodies, until a permit has been issued by the California Department of Fish and Game (CDFG) to authorize such activity.

The permit application process includes submitting a complete Lake and Streambed Alteration Program Notification Package that includes the Notification of Lake or Streambed Alteration Form (FG 2023), Project Questionnaire (FG 2024), and an appropriate processing fee based upon total project cost. The information is available on the CDFG website at http://www.dfg.ca.gov/1600/notification_pkg.html.

4.9.3 Surface Water

The proposed project area for Segments 2 and 3, including alternatives, are located in three major watersheds that drain into separate basins. Surface water in the southern end of the project area flows to the Santa Clara River Basin in the South Coast Hydrologic Region. The proposed facilities in the northern end of the project drain to the Antelope Valley and Fremont Valley Basin in the South Lahontan Hydrologic Region. The Santa Clara and Antelope Valley watersheds are separated by the northwest portion of the San Gabriel Mountains, which provide a topographic and hydrologic divide. The Antelope Valley and Fremont Valley watersheds are separated by a topographic and hydrologic divide present in Antelope Valley.

4.9.3.1 Segment 2

The Segment 2 alignment proceeds generally in a southeasterly direction from the Antelope Substation located in the western portion of the City of Lancaster. From MP 0 to approximately MP 16.5 (refer to Figure 3-2), Segment 2 crosses the surface water Antelope Valley Hydrologic Unit in the South Lahontan Hydrologic Region as defined by the Lahontan RWQCB (2002). From MP 16.5 to its terminus at the Vincent Substation (MP 21.5), Segment 2 crosses the surface water Santa Clara Hydrologic Region as defined by the Los Angeles RWQCB.

4.9.3.1.1 South Lahontan Region Surface Water – Antelope Valley Hydrologic Unit. The major portions of the proposed 500 kV T/Ls and other project facilities for Segment 2 are located in the South Lahontan Hydrologic Region/ Antelope Valley Hydrologic Unit (Figure 4.9-1). This Unit receives runoff from Big Rock and Little Rock Creeks from the San Gabriel Mountains and from Oak Creek and Cottonwood Creek in the Tehachapi Mountains. This area receives average annual rainfall ranging from 4.04 to 6.89 inches per year based on LACDPW rain gauge data. Segment 2 traverses several intermittent and ephemeral streams that generally infiltrate all of their runoff into alluvial fans at their canyon outlets. In extreme storm events, the streams eventually convey storm runoff to Rosamond Lake located northeast of the City of Lancaster within the boundaries of Edwards Air Force Base. Rosamond Lake is generally dry much of the year. When inundated, the streams and lake provide recharge to the underlying groundwater basin. The area is subject to high-intensity thunderstorms and intense general rains in the summer, fall, and winter.

Segment 2 crossed the California Aqueduct at MP 4.5. The East Branch of the California Aqueduct alignment along the northeastern margin of the San Gabriel Mountains delivers State Water Project water to the Antelope Valley-East Kern Water Agency (AVEK) and to the Mojave Water Agency further east. AVEK is a State Water Contractor and has received water from the aqueduct since 1972 for delivery to 22 water purveyors for agricultural,

municipal, and industrial use. AVEK's maximum allocation is 141,400 acre-feet per year. In 1995 and 1996 they received approximately 49,000 and 58,000 acre-feet of water, respectively (Woodward-Clyde, 1997). Currently, AVEK's water customers are using about 75,000 acre-feet per year (Kern County, 2003a), which corresponds to an average flow rate in the aqueduct of about 103.5 cubic feet per second (cfs).

4.9.3.1.2 South Coast Region Surface Water – Santa Clara Hydrologic Unit. The small portion of Segment 2 located in the South Coast Region is in the upper Santa Clara River Basin in the Santa Clara Hydrologic Unit (Figure 4.9-1). Based on data obtained from the LACDPW, the project area in the headwaters of the Santa Clara River Basin has an average annual precipitation of 9.63 inches. Most of the precipitation occurs during the wet season extending from November through April.

The Santa Clara River watershed is approximately 1,630 square miles within Los Angeles and Ventura counties with about 40 percent of the watershed in Los Angeles County. The watershed extends from the San Gabriel Mountains to its outlet in the Pacific Ocean in Ventura County. Approximately 90 percent of the watershed consists of rugged mountains of up to 8,800 feet in elevation; the remainder consists of valley floor and coastal plain (AMEC Environmental, 2003). Portions of the upper Santa Clara River are perennial due to baseflow occurring from groundwater.

4.9.3.2 Segment 3 and Alternatives – South Lahontan Region Surface Water

The Segment 3 alignment and its alternatives proceed northerly from the Antelope Substation located in the western portion of the City of Lancaster into Los Angeles and Kern counties. From the Antelope Substation to all three proposed Substation 1, 1A, and 1B sites, the T/L routes are located in the surface water Antelope Valley Hydrologic Unit in the South Lahontan Hydrologic Region as defined by the Lahontan RWQCB (2002) (Figure 4.9-1). The Proposed 220 kV Substation One to Substation Two route and the Alternative C route are located in the Antelope Valley Hydrologic Unit from the Substation One location to mile 31.5 and mile 7.3, respectively. The remaining portions of the proposed T/Ls and project facilities are located in the East Tehachapi Hydrologic Area tributary to the Fremont Valley Hydrologic Unit (Figure 4.9-1).

4.9.3.2.1 Antelope Valley Hydrologic Unit. The Antelope Valley Hydrologic Unit has been discussed above in Section 4.9.3.1.1. In addition, the westernmost portions of the Hydrologic Unit receive average annual rainfall amounts ranging from 10 to 14 inches (DWR, 2003). The largest floods recorded were those of 1932, 1938, and 1945. The 1932 and 1945 storms occurred as convective storms in late summer, while the 1938 event occurred in the winter as a series of high-intensity, long-duration storms. One of the largest intermittent streams crossed by the project, Oak Creek, has a drainage area of 15.8 square

miles (KCPD, 1986). The Kern County Water Agency reports that peak flows of 1,740 cfs occurred in Oak Creek during the winter of 1972, and a peak flow of 750 cfs occurred in the winter of 1978. The highest flow reported during the months of June through October from 1959 to 1984 was 235 cfs in the summer of 1972.

4.9.3.2.2 Fremont Valley Hydrologic Unit. The Fremont Valley Hydrologic Unit (HU) identified in the Lahontan RWQCB Basin Plan overlies the Fremont Valley groundwater basin. The HU receives runoff from Lone Tree Canyon, Cache Creek, and adjacent ridges. Surface water drains toward generally dry Koehn Lake located about 20 miles northeast of the Community of Mojave. However, surface drainage in the watershed overlying the most southwestern part of the Fremont Valley drains southward toward the community of Rosamond. One of the largest streams in the HU is Cache Creek, with a drainage area of 96.5 square miles and which has an estimated peak flow of 34,400 cfs for a 100-year event (KCPD, 1986). The Kern County Water Agency reports that peak flows of 2,100 cfs occurred during the summer of 1972 and winter of 1978, and a peak flow of 2,245 cfs occurred in the winter of 1983.

The portion of the project area in the Fremont HU is in the East Tehachapi Hydrologic Area (HA). This HA overlies the Tehachapi Valley East groundwater basin, which is separated by an alluvial high topographic boundary from the Tehachapi Valley West groundwater basin that is part of the San Joaquin Hydrologic Region. Surface water east of the divide either ponds in Proctor Dry Lake or flows eastward down Cache Creek toward the Fremont Valley. Water ponds in Proctor Dry Lake due to a slight surface drainage divide between the lake and Cache Creek. Normally dry during the summer, Proctor Lake is one of the lowest points in the Tehachapi Valley and receives a significant portion of the winter runoff.

4.9.3.3 FEMA 100-Year Floodplain Boundaries

The Federal Emergency Management Agency (FEMA) has estimated areas subject to flooding in the project areas in the Fremont Valley and Antelope Valley Hydrologic Units as shown on Figure 4.9-2. FEMA's Flood Insurance Rate Maps (FIRMs) define the predicted boundaries of 100-year (Zone A) floods. Many of the areas of potential flooding shown on the map were not delineated through detailed hydrologic and hydraulic analyses and, therefore, have approximate limits. Although the proposed T/Ls cross 100-year floodplain areas, the proposed and alternative substation locations are not located within 100-year floodplain areas.

The abrupt discontinuity in the 100-year floodplain zone at the Kern-Los Angeles County boundary is not a result of detailed hydraulic studies, based on information provided by the Kern County Department of Engineering and Survey Services (Farr, 2004). This boundary was based on approximate hydrologic information for Kern County developed by the Corps

during the 1980s. However, a detailed study that would refine the boundaries to reflect updated peak flows and realistic flow patterns was never performed, so the boundaries have never been revised.

4.9.3.4 Dam Failure Inundation Area

To help local jurisdictions develop evacuation plans for areas below dams, the State Office of Emergency Services (OES) and the Department of Water Resources (DWR) require dam owners to evaluate areas of potential inundation in the event of dam failures and estimate when floodwaters would arrive at downstream locations. Projected inundation limits are approximate and assume severe hypothetical failures, thus showing a conservative estimate of potential flooding in the improbable occurrence of failure and resulting flooding. There are no dams that would inundate the proposed Segments 2 and 3 facilities in the event of a dam failure.

4.9.4 South Lahontan Hydrologic Region Groundwater

As depicted on Figure 4.9-1, most of the Segment 2 proposed and alternative routes occur in the Antelope Valley Groundwater Basin. The southern terminus of Segment 2 crosses a groundwater subbasin that is located in the South Coast Hydrologic Region, but is hydrologically connected to the Antelope Valley Groundwater Basin even though surface water runoff flows to the Santa Clara River. The proposed Segment 3 project and its alternatives are located in two major groundwater basins, the Antelope Valley and Fremont Valley Groundwater Basins (Figure 4.9-1). The proposed and Alternative C 220 kV T/L routes also enters the Tehachapi Valley East Groundwater Basin (Figure 4.9-1).

There is a discrepancy in the boundary between the Fremont Valley and Antelope Valley groundwater basins. Although the GIS map obtained from DWR shows the boundary to the be located to the Northeast of the City of Mojave, DWR's Updated Bulletin 118 (2003) describes the boundary as located "…at a groundwater divide approximated by a southeastward-trending line from the mouth of Oak Creek through Middle Butte to exposed bedrock near Gen Hill." Based on this description, the proposed T/Ls and substations northeast of Oak Creek are located in the Fremont Valley Groundwater Basin. For this report, it is assumed that these facilities are located in the Fremont Valley Groundwater Basin.

4.9.4.1 Segment 2 – Antelope Valley Groundwater Basin

As depicted by the colored area on Figure 4.9-1, the major portion of Segment 2 is located in the Antelope Valley Groundwater Basin in the South Lahontan Hydrologic Region as defined by DWR (Bulletin 118, 2003). The non-colored areas along the T/L route coincide with the Portal Ridge and the Sierra Pelona geologic formations where no groundwater basins are indicated. The Antelope Valley Basin is the principal water basin for southeastern Kern

County and the portion of Los Angeles County in the vicinity of the City of Lancaster. The surface area of the basin is approximately 1,580 square miles extending across Kern, Los Angeles, and San Bernardino counties. This basin is bounded to the northwest by the Garlock fault zone and on the southwest by the San Andreas fault zone. The eastern boundary is a surface and groundwater drainage divide, and to the north is the Fremont Valley Groundwater Basin.

The primary water-bearing materials are the Pleistocene and Holocene age unconsolidated alluvial and lacustrine deposits. An upper aquifer is generally unconfined and supplies most of the groundwater for the valley, while a lower aquifer is generally confined. Wells typically have moderate to high yields (DWR, 2003). The Antelope Valley groundwater basin receives recharge from Big Rock and Little Rock creeks from the San Gabriel Mountains and from Oak Creek and Cottonwood Creek in the Tehachapi Mountains.

Hydrographs of wells located in the vicinity of Soledad Mountain near the Fremont Valley/Antelope Valley basin boundary show that the unconfined groundwater table has been decreasing steadily from 1981 through 1997 at a rate of 0.25 to 0.50 feet per year (KCPD, 1997).

4.9.4.2 Segment 3 and Alternatives – Groundwater

4.9.4.2.1 Antelope Valley Groundwater Basin. The Segment 3 proposed and alternative T/L routes are within the Antelope Valley Groundwater Basin (Figure 4.9-1). The Antelope Valley Groundwater Basin has been described above in Section 4.9.4.1.

4.9.4.2.2 Fremont Valley Groundwater Basin. The Substation One to Substation Two Alternative C 220 kV route intercepts the westernmost extent of the Fremont Valley Groundwater Basin in the vicinity of Cameron Canyon (Figure 4.9-1). The Fremont Valley Groundwater Basin underlies Fremont Valley in eastern Kern County and northwestern San Bernardino County. The basin is bounded by impermeable crystalline rocks to the north, west, and east, and by the Antelope Valley Groundwater Basin groundwater divide to the south. The basin has a surface area of approximately 523 square miles and an estimated storage capacity of 4,800,000 acre-feet, and receives recharge from Lone Tree Canyon, Cache Creek, and other adjacent intermittent streams that drain toward Koehn Lake, which is generally dry. Average annual groundwater recharge to the basin has been estimated as 18,000 acre-feet per year (Kern County, 1997).

The most important water-bearing deposit is Quaternary alluvium up to about 1,190 feet thick along the margin of the basin. Groundwater in the alluvium is generally unconfined, although locally confined conditions occur near Koehn Lake due to the thick layers of lacustrine silt and clay found there. Average well yield is about 530 gallons per minute (gpm)

with a maximum yield of 2,580 gpm (DWR, 2003). Well hydrographs indicate that historic declines have largely stopped, with declines of only about 5 to 6 feet in the period from 1980 through 1999.

4.9.4.2.3 Tehachapi Valley East Groundwater Basin. The proposed Substation One to Substation Two 220 kV T/L route intercepts the Tehachapi Valley East Groundwater Basin in the approximate vicinity of MP 33.0. The Alternative C 220 kV T/L route intercepts the basin boundary in the approximate vicinity of MP 8.0 (Figure 4.9-1).

The Tehachapi Valley East Groundwater Basin is a northeast-southwest-trending basin with a surface area of approximately 37 square miles. It is bounded on the north by the Sierra Nevada Mountains and on the south and east by the Tehachapi Mountains. The Tehachapi Valley East Groundwater Basin is separated by an alluvial high topographic boundary from the Tehachapi Valley West Groundwater Basin that is part of the San Joaquin Hydrologic Region. Surface drainage either ponds in Proctor Dry Lake or is drained by Cache Creek from eastward to the Fremont Valley Groundwater Basin.

This basin consists primarily of younger alluvium that extends to a depth of 750 feet. The basin is reported to have a storage capacity of 150,000 acre-feet (DWR, 2003) and a specific yield ranging from seven percent at its center to 10 percent on the alluvial fan margins. Groundwater levels dropped about 58 feet from 1951 through 1978, but have since recovered by 55 feet as of 1999 (DWR, 2003). The Tehachapi-Cummings County Water District has jurisdiction over the aquifer.

4.9.5 South Lahontan Region Surface and Groundwater Quality

4.9.5.1 Segment 2 – Surface and Groundwater Quality

Surface water beneficial uses identified within the greater Fremont Valley Hydrologic Unit include municipal and agricultural supply, groundwater recharge, water contact and non-contact recreation, warm freshwater habitat, and wildlife habitat (Lahontan RWQCB, 2002). Surface water quality data in the Antelope Valley Hydrologic Unit from a point just upstream of AVEK's first turnout on the California Aqueduct showed that TDS levels ranged from 80 to 404 milligrams per liter (mg/L) with an average of 214 mg/L over the period from January 1995 through July 1997. Arsenic averaged 2 ppm over the same period, less than the maximum contaminant level allowed in drinking water of 5 ppm.

Groundwater quality data from public supply wells in the Antelope Valley Groundwater Basin show an average total dissolved solids (TDS) content of 374 mg/L, with a range from 123 to 1,970 mg/L. The Lahontan Basin plan (Lahontan RWQCB, 2002) lists the beneficial uses for groundwater from this basin as municipal, agricultural, and industrial supply and freshwater replenishment.

4.9.5.2 Segment 3 – Surface and Groundwater Quality

4.9.5.2.1 Antelope Valley Surface and Groundwater Quality. Surface water quality for the Antelope Valley Hydrologic Unit and groundwater quality for the Antelope Valley Groundwater Basin were discussed above in Section 4.9.5.1.

4.9.5.2.2 Fremont Valley Surface and Groundwater Quality. Surface water beneficial uses identified within the greater Fremont Valley Hydrologic Unit include municipal and agricultural supply, groundwater recharge, water contact and non-contact recreation, warm freshwater habitat, and wildlife habitat (Lahontan RWQCB, 2002). TDS content in Fremont Valley groundwater averages from 350 to 1,100 mg/L, with areas of very high TDS levels near Koehn Lake. The Lahontan Basin plan (Lahontan RWQCB, 2002) lists the beneficial uses for groundwater from this basin as municipal, agricultural, and industrial supply and freshwater replenishment.

4.9.5.2.3 East Tehachapi Surface and Groundwater Quality. Surface water beneficial uses identified within the East Tehachapi HA include municipal and agricultural supply, groundwater recharge, navigation, water contact and non-contact recreation, warm freshwater habitat, and wildlife habitat (Lahontan RWQCB, 2002). TDS levels in groundwater are reported to range from 298 to 405 mg/L with an average concentration of 361 mg/L (DWR, 2003). The Lahontan Basin plan (Lahontan RWQCB, 2002) lists the beneficial uses for groundwater from this basin as municipal, agricultural, and industrial supply, and freshwater replenishment.

4.10 LAND USE AND PLANNING

4.10.1 Introduction

This section describes the existing zoning and land use designations in the project area (refer to Figures 3-1, 3-2, and 3-3) for Segments 2 and 3 of the proposed Antelope Transmission Project. Zoning and land use in the project area were evaluated by reviewing Los Angeles County, Kern County, and local general plans and specific plans, and by obtaining information from city, regional, county, and state agencies. This section also summarizes relevant information from these plans. Zoning information along Segments 2 and 3 is summarized in Tables 4.10-1 and 4.10-3, respectively. Land use information along Segments 2 and 3 is summarized in Tables 4.10-2 and Table 4.10-4, respectively.

4.10.2 Regulatory Issues

The CPUC has primary jurisdiction over the Antelope Transmission Project because it authorizes the construction, operation, and maintenance of public utility facilities in the State of California. Although such projects are exempt from local land use and zoning regulations and permitting, General Order (GO) No. 131-D, Section III C requires "the utility to communicate with, and obtain the input of, local authorities regarding land use matters and obtain any non-discretionary local permits."

The proposed Segment 2, 500 kV T/L route traverses lands within the jurisdiction of the City of Lancaster, the City of Palmdale including the Ritter Ranch Specific Plan (Robert Bein, William Frost & Associates, 1992) and Anaverde Specific Plan (Azeka De Almeida Planning, 1992c) areas, and unincorporated areas of Los Angeles County. The Alternative AV1 route traverses lands within the jurisdiction of the City of Palmdale, Los Angeles County, and the Ritter Ranch Specific Plan area. The Alternative AV2 T/L route traverses the Ritter Ranch Specific Plan area and the Anaverde Specific Plan area. The Antelope Substation is located in western Lancaster and the Vincent Substation is located in unincorporated Los Angeles County. The proposed Segment 3, 500 kV T/L (and Alternatives A and B 500 kV T/L routes) traverses lands within the City of Lancaster, unincorporated areas of Los Angeles County, and unincorporated areas of Kern County. The Segment 3 Proposed 220 kV Substation One to Substation Two route and Alternative C 220 kV T/L route traverse lands within unincorporated areas of Kern County. Proposed Substations One and Two are located in the existing Eastern Wind Resource Area in unincorporated Kern County.

Pursuant to GO 131-D Section XIV B., local agencies were consulted regarding land use matters. SCE met with pertinent local agencies in the project area to review the Antelope Transmission Project. Documentation of these consultations are presented in Appendix C.

TABLE 4.10-1
SEGMENT 2 – ANTELOPE TO VINCENT 500 kV ZONING DESIGNATIONS

Approximate Milepost[1]	Zoning Designation[2]	Notation
	Proposed	
0.0-2.3[3]	RR-2.5	City of Lancaster
2.3-3.5	R-10,000	City of Lancaster
3.5-4.5	R-1-20,000	City of Palmdale
4.5	-	California Aqueduct
4.5-4.8	A-1-1	City of Palmdale
4.8-5.2	QR	City of Palmdale
5.2-6.0	A-1-1	City of Palmdale
6.0-7.6	A-2-2	Los Angeles County
7.6-9.3	SP	Ritter Ranch Specific Plan
9.3-9.5	R-1-1	City of Palmdale
9.5-10.0	SP	City of Palmdale
10.0-10.65	?	City of Palmdale
10.65-13.9	SP	City of Palmdale
13.9-15.0	SP	City of Palmdale
15.0-16.3	A-2-1	Los Angeles County
16.3-16.85		Palmdale 1000 Development
16.85-20.25	A-2-1	Los Angeles County
20.25-21.5[4]	A-1-1	Los Angeles County
	Alternative AV1	
0.0-0.4	A-1-1	City of Palmdale
0.4-1.8	A-2-2	Los Angeles County
1.8-2.1	SP	Ritter Ranch Specific Plan
	Alternative AV2	
0.0-1.85	SP	Ritter Ranch Specific Plan
1.85-3.1	SP	Anaverde Specific Plan

1 Refer to Figure 3-2 for milepost locations.

2 Legend

City of Lancaster
RR-2.5 = Rural Residential 1 unit/2.5 acres.
R-10,000 = Single Family Residential on 10,000 sq. ft. lots.
City of Palmdale
R-1-20,000 = Single Family Residential.
A-1-1 = Light Agricultural.
QR = Quarry and Reclamation.
SP = Specific Plan.
Los Angeles County
A-1-1 = Light Agriculture (1 acre).
A-2-1 = Heavy Agriculture (1 acre).
A-2-2 = Heavy Agriculture (2 acres).

3 Milepost 0.0 corresponds to SCE's existing 220 kV Antelope Substation.

4 Milepost 21.5 corresponds to SCE's existing 500 kV Vincent Substation.

TABLE 4.10-2
SEGMENT 2 – ANTELOPE TO VINCENT 500 kV LAND USE DESIGNATIONS

Approximate Milepost[1]	Land Use Designation[2]	Notation
	Proposed	
0.0-2.3 [3]	NU (0.4-2.0 DU/AC)	City of Lancaster
2.3-3.5	UR (2.1-6.5 DU/AC)	City of Lancaster
3.5-4.5	SFR-2	City of Palmdale
4.5	-	California Aqueduct
4.5-4.8	LDR	City of Palmdale
4.8-5.2	MRE	City of Palmdale
5.2-6.0	LDR	City of Palmdale
6.0-7.6	N1	Los Angeles County
7.6-9.3	SP-3	Ritter Ranch Specific Plan
9.3-9.5	LDR	City of Palmdale
9.5-10.0	SP-3	City of Palmdale
10.0-10.65	No Data Available	City of Palmdale
10.65-13.9	SP-3	City of Palmdale
13.9-15.0	SP-2	City of Palmdale
15.0-16.3	-	Los Angeles County
16.3-16.85	–	Palmdale 1000 Development
16.85-21.5[4]	N1	Los Angeles County
	Alternative AV1	
0.0-0.4	LDR	City of Palmdale
0.4-1.8	N1	Los Angeles County
1.8-2.1	SP-3	Ritter Ranch Specific Plan
	Alternative AV2	
0.0-1.85	SP-3	Ritter Ranch Specific Plan
1.85-3.1	SP-2	Anaverde Specific Plan

1 Refer to Figure 3-2 for milepost locations.

2 Legend

DU/AC = dwelling units/acre.

City of Lancaster
NU = Non Urban Residential (0.4-2.0 DU/AC).
UR = Urban Residential (2.1-6.5 DU/AC).
City of Palmdale
LDR = Low Density Residential.
MRE = Mineral Resource Extraction.
Los Angeles County
N1 = Non Urban 1 (0.5 dwelling units/acre).
Ritter Ranch and Anaverde Specific Plans
LDR = Low Density Residential (1.0 DU/AC).
SFR-2 = Single Family Residential (0-3 DU/AC).
SP-2 = Specific Plan Area 2 Anaverde SP.
SP-3 = Specific Plan Area 3 Ritter Ranch.

3 Milepost 0.0 corresponds to SCE's existing 220 kV Antelope Substation as well.

4 Milepost 21.5 corresponds to SCE's existing 500 kV Vincent Substation as well.

TABLE 4.10-3
ZONING DESIGNATIONS
SEGMENT 3 – ANTELOPE TO SUBSTATIONS ONE AND TWO

Route ID[1]	Approximate Milepost[1]	Zoning Designation[2]	Notation
Proposed Route (500 kV)	0.0	RR-2.5	Antelope Substation
	0.0 – 0.4	RR-2.5	City of Lancaster
	0.4 – 1.0	A-2-2	Los Angeles County
	1.0 – 1.3	RR-2.5	City of Lancaster
	1.3 – 2.6	A-1-1	Los Angeles County
	2.6 – 2.9	R-15,000	City of Lancaster
	2.9 – 3.1	A-1-1	Los Angeles County
	3.1 – 3.4	RR-2.5	City of Lancaster
	3.4 – 4.2	A-1-1	Los Angeles County
	4.2 – 5.6	RR-2.5	City of Lancaster
	5.6 – 6.6	A-1-1	Los Angeles County
	6.6 – 8.6	A-1-2	Los Angeles County
	8.6 – 9.65	A-2-2	Los Angeles County
	9.65	-	Los Angeles/Kern border
	9.65 – 10.15	E (2½) RS FPS	Kern County to T/L end
	10.15 – 12.4	A FPS	
	12.4 – 13.00	E (2½) RS FPS	LADWP Easement
	13.0 – 13.1	-	LADWP Easement
	13.1 – 13.8	A FPS	
	13.8 – 14.4	A FPS GH	
	14.4 – 14.6	A FPS	
	14.6 – 14.8	E (5) RS FPS	
	14.8 – 15.8	E (2½) RS FPS	
	15.8 – 16.8	A FPS	
	16.8 – 18.8	-	
	18.8 – 19.85	A FPS	
	19.85 – 20.1	A	
	20.1	-	Los Angeles Aqueduct
	20.1 – 20.9	A	
	20.9 – 21.1	PL RS	
	21.1 – 21.85	A	
	21.85 – 23.0	E (20) RS	
	23.0 – 25.6	M-3	
	24.5	M-3	Union Pacific Railroad
	25.4 – 25.6	M-3	Proposed Substation One
Alternative A (500 kV)	0.0 [3]	RR-2.5	Antelope Substation
	0.0 – 0.4	RR-2.5	City of Lancaster
	0.4 – 1.0	A-2-2	Los Angeles County
	1.0 – 1.3	RR-2.5	City of Lancaster
	1.3 – 2.6	A-1-1	Los Angeles County
	2.6 – 2.9	R-15,000	City of Lancaster

TABLE 4.10-3 (CONTINUED)
ZONING DESIGNATIONS
SEGMENT 3 – ANTELOPE TO SUBSTATIONS ONE AND TWO

Route ID[1]	Approximate Milepost[1]	Zoning Designation[2]	Notation
Alternative A (500 kV)	2.9 – 3.1	A-1-1	Los Angeles County
(Continued)	3.1 – 3.4	RR-2.5	City of Lancaster
	3.4 – 4.2	A-1-1	Los Angeles County
	4.2 – 4.7	RR-2.5	City of Lancaster
	4.7 – 7.2	A-1-1	Los Angeles County
	7.2 – 10.2	A-1-2	Los Angeles County
	10.2		Los Angeles County/Kern County Border
	10.2 – 11.5	E (2½) RS FPS	Kern County to T/L end
	11.5 – 11.6	E (2½) RS MH FPS	
	11.6 – 12.2	E (2½) RS FPS	
	12.2 – 15.25	-	
	15.25 – 16.0	E (2½) RS MH FPS	
	16.0 – 16.25	E (5) RS MH FPS	
	16.25 – 17.25	AFP	
	17.25 – 18.25	-	
	18.25 – 18.5	AFP	
	18.5 – 18.73	PL RS FP	
	18.73 – 19.25	AFP	
	19.25 – 20.25	AFPS	
	20.25 – 20.75	PL RS FP	
	20.75 – 21.27	AFP	
	20.8	-	Los Angeles Aqueduct
	21.27 – 22.0	A	
	22.0 – 22.2	PL RS	
	22.2 – 22.25	A	
	22.25 – 23.7	A-1	
	23.7 – 25.9	M-3	
	24.9	-	Union Pacific Railroad
	25.6 – 25.9	M-3	Alternate Substation 1A
Alternative B (500 kV)	0.0	RR-2.5	Antelope Substation
	0.0 – 0.4	RR-2.5	City of Lancaster
	0.4 – 1.0	A-2-2	Los Angeles County
	1.0 – 1.3	RR-2.5	City of Lancaster
	1.3 – 2.6	A-1-1	Los Angeles County
	2.6 – 6.8	A-2-2	Los Angeles County
	6.8 – 8.8	A-1-2	Los Angeles County
	8.8 – 9.8	A-2-2	Los Angeles County
	9.8	-	Los Angeles County/Kern County Border
	9.8 – 10.26	E (2½) RS FPS	Kern County to T/L end
	10.26 – 10.8	A FPS	
	10.8 – 13.7	A FPS	

TABLE 4.10-3 (CONTINUED)
ZONING DESIGNATIONS
SEGMENT 3 – ANTELOPE TO SUBSTATIONS ONE AND TWO

Route ID[1]	Approximate Milepost[1]	Zoning Designation[2]	Notation
Alternative B (500 kV) (Continued)	11.6	-	LADWP Easement
	13.7 – 14.00	A FPS GH	
	14.00 – 14.23	A FPS	
	14.23 – 14.46	A FPS GH	
	14.46 – 14.8	A FPS	
	14.8 – 15.8	E (5) RS FPS	
	15.8 – 16.3	AFPS	
	16.3 – 16.33	PL RS FPS	
	16.33 – 16.4	A FPS	
	16.4 – 16.5	PL RS FPS	
	16.5 – 16.8	A FPS	
	16.8 – 18.8	-	
	18.8 – 19.5	PL RS FPS	
	19.5 – 19.2	PL RS FPS	
	19.2	-	Los Angeles Aqueduct
	19.2 – 19.93	A	
	19.93 – 19.6	PL RS	
	19.6 – 22.2	A	
	22.2 – 22.3	E (20) RS	
	22.3 – 23.5	A-1	
	23.5 – 25.1	M-3	
	25.05	-	Union Pacific Railroad
	25.1 – 26.04	A-1	
	25.8 – 26.04	A-1	Alternate Substation 1B
Proposed Route (220 kV) – Substation One to Two	25.6 – 26.6	M-3	
	26.6 – 27.3	A WE	
	27.3 – 29.5	A-1	
	29.5 – 29.95	NR (20)	
	29.95 – 30.1	FPP	
	30.1 – 30.8	A	
	30.8 – 31.1	FPP	
	31.1 – 31.2	A	
	31.2 – 31.6	E (20) RS	
	31.6 – 31.85	A WE GH	
	31.85 – 32.0	E (20) RS	
	32.0 – 32.1	A WE	
	32.1 – 32.6	E (20) RS	
	32.6 – 35.2	A WE	
	35.2	A	Proposed Substation Two
Alternative C (220 kV) - Substation One to Two	0.0 – 1.0	M-3	
	1.0 – 1.8	A WE	

TABLE 4.10-3 (CONTINUED)
ZONING DESIGNATIONS
SEGMENT 3 – ANTELOPE TO SUBSTATIONS ONE AND TWO

Route ID[1]	Approximate Milepost[1]	Zoning Designation[2]	Notation
Alternative C (220 kV) - Substation One to Two (Continued)	1.8 – 3.85	A-1	
	3.85 – 4.35	NR (20)	
	4.35 – 4.4	FPP	
	4.4 – 4.85	A	
	4.85 – 5.4	A WE	
	5.4 – 5.8	E (20) RS	
	5.8 – 6.0	E (20) RS GH	
	6.0 – 6.4	E (5) RS MH	
	6.4 – 6.8	E (20) RS	
	6.8 – 7.7	A WE	
	7.7 – 8.0	A	
	8.0 – 9.5	A WE	
	9.5	A	Proposed Substation Two
Alternative C (220 kV) - Substation Two to 2A	9.5 – 9.7	A	
	9.7 – 9.9	A WE	
	9.9	A WE	Alternate Substation 2A
Alternative C (220 kV) - Substation Two to 2B	9.5 – 9.7	A	
	9.7 – 10.7	-	
	10.7	A-1	Alternate Substation 2B

1 Refer to Figure 3-3 for milepost locations.

2 Legend Zoning Codes:

City of Lancaster

RR-2.5 = Rural Residential (1 unit/2.5 acres).
R-15,000 = Single Family Residential (15,000 sq. ft. lot).

Los Angeles County

A-1-1 = Light Agriculture (1 acre).
A-1-2 = Light Agriculture (2 acre).
A-2-2 = Heavy Agriculture (2 acres).

Kern County

A-1 = Limited Agriculture.
E (2½) = Estate (2½ acres).
E (5) = Estate (5 acres).
E (20) = Estate (20 acres).
M-3 = Heavy Industrial.
FPP = Floodplain Primary.
RS = Residential Suburban Combining.
MH = Mobile Home Combining.
FPS = Floodplain Secondary Combining.
FP = Floodplain Combining.
A = Exclusive Agriculture.
WE = Wind Energy Combining.
NR (20) =Natural Resources (20 acres).
GH = Geological Hazard Combining.
PL = Platted Lands.

TABLE 4.10-4
LAND USE DESIGNATIONS
SEGMENT 3 – ANTELOPE TO SUBSTATIONS ONE AND TWO

Route ID[1]	Approximate Milepost[1]	Land Use Designation[2]	Notation
Proposed Route (500 kV)	0.0	NU	Antelope Substation
	0.0 – 0.4	NU	City of Lancaster
	0.4 – 1.0	N1	Los Angeles County
	1.0 – 1.3	NU	City of Lancaster
	1.3 – 2.6	N1	Los Angeles County
	2.6 – 2.9	UR	City of Lancaster
	2.9 – 3.1	N1	Los Angeles County
	3.1 – 3.4	NU	City of Lancaster
	3.4 – 4.2	N1	Los Angeles County
	4.2 – 5.6	NU	City of Lancaster
	5.6– 9.65	N1	Los Angeles County
	9.65	-	Los Angeles County/Kern County border
	9.65 – 10.15	2.5 gross acres/unit	Kern County to T/L end
	10.15 – 11.65	Intensive Agriculture	
	11.65 – 12.2	2.5 gross acres/unit	
	12.2 – 12.4	10 units/net acre	
	12.4 – 12.8	2.5 gross acres/unit	
	12.8 – 13.0	General Commercial	
	13.0 – 13.1	Other Facilities	LADWP easement
	13.1 – 15.8	10 units/net acre	
	15.8 – 16.8	Intensive Agriculture	
	16.8 – 18.8	Resource Management	
	18.8 – 23.0	Extensive Agriculture	
	23.0 – 25.6	Heavy Industrial	
	25.6	Heavy Industrial	Proposed Substation One
Alternative A (500 kV)	0.0	NU	Antelope Substation
	0.0 – 0.4	NU	City of Lancaster
	0.4 – 1.0	N1	Los Angeles County
	1.0 – 1.3	NU	City of Lancaster
	1.3 – 2.6	N1	Los Angeles County
	2.6 – 2.9	UR	City of Lancaster
	2.9 – 3.1	N1	Los Angeles County
	3.1 – 3.4	NU	City of Lancaster
	3.4 – 4.2	N1	Los Angeles County
	4.2 – 4.7	NU	City of Lancaster
	4.7– 10.2	N1	Los Angeles County
	10.2	-	Los Angeles County/Kern County border
	10.2 – 10.35	General Commercial	Kern County to T/L end
	10.35 – 10.45	Light Industrial	
	10.45 – 10.95	Service Industrial	
	10.95 – 11.2	Light Industrial	

TABLE 4.10-4 (CONTINUED)
LAND USE DESIGNATIONS
SEGMENT 3 – ANTELOPE TO SUBSTATIONS ONE AND TWO

Route ID[1]	Approximate Milepost[1]	Land Use Designation[2]	Notation
Alternative A (500 kV)	11.2 – 13.9	2.5 gross acres/unit	
(Continued)	13.9 – 14.0	Other Facilities	LADWP Easement
	14.0 – 15.7	2.5 gross acres/unit	
	15.7 – 16.2	10 units/net acre	
	16.2 – 18.25	Intensive Agriculture	
	18.25 – 22.25	Extensive Agriculture	
	22.25 – 23.7	Resource Management	
	23.7 – 25.9	Heavy Industrial	Alternative Substation 1A location
Alternative B (500 kV)	0.0	NU	Antelope Substation
	0.0 – 0.4	NU	City of Lancaster
	0.4 – 1.0	N1	Los Angeles County
	1.0 – 1.3	NU	City of Lancaster
	1.3 – 9.8	N1	Los Angeles County
	9.8	-	Los Angeles County/Kern County border
	9.8 – 9.9	General Commercial	Kern County to T/L end
	9.9 – 10.46	2.5 gross acres/unit	
	10.46 – 11.6	Intensive Agriculture	
	11.6 – 11.75	Other Facilities	
	11.75 – 12.3	2.5 gross acres/unit	
	12.3 – 12.66	10 units/net acre	
	12.66 – 12.76	General Commercial	
	12.76 – 14.8	10 units/net acre	
	14.8 – 15.8	5 gross acres/unit	
	15.8 – 18.8	Resource Management	
	18.8 – 22.3	Extensive Agriculture	
	22.3 – 23.6	Resource Management	
	23.6 – 26.04	Heavy Industrial	
	26.04	Resource Management	Alternate Substation 1B location
Proposed Route (220 kV) –	25.6	Heavy Industrial	Proposed Substation One
Substation One to Two	25.6 – 26.6	Heavy Industrial	
	26.6 – 29.9	Mineral and Petroleum	
	29.9 – 31.4	Resource Reserve	
	31.4 – 31.8	Resource Management	
	31.8 – 35.1	Resource Reserve	
	35.1 – 35.2	Intensive Agriculture	
	35.2	Intensive Agriculture	Proposed Substation Two location

TABLE 4.10-4 (CONTINUED)
LAND USE DESIGNATIONS
SEGMENT 3 – ANTELOPE TO SUBSTATIONS ONE AND TWO

Route ID[1]	Approximate Milepost[1]	Land Use Designation[2]	Notation
Alternative C (220 kV)	0.0	Heavy Industrial	Alternative 1A Location
Substation One to Two	0.0 – 1.0	Heavy Industrial	
	1.0 – 4.3	Mineral and Petroleum	
	4.3 – 5.4	Resource Reserve	
	5.4 – 6.4	5 gross acres/unit	
	6.4 – 9.45	Resource Reserve	
	9.45 – 9.5	Intensive Agriculture	Proposed Substation Two location
Alternative C –	9.5	Intensive Agriculture	Proposed Substation Two location
Substation Two to 2A	9.5 – 9.7	Intensive Agriculture	
	9.7 – 9.9	Resource Reserve	
	9.9	Resource Reserve	Alternate Substation 2A location
Alternative C –	9.5	Intensive Agriculture	Proposed Substation Two location
Substation Two to 2B	9.5 – 10.2	Intensive Agriculture	
	10.2 – 10.6	Resource Reserve	
	10.6 – 10.65	Other Facilities	
	10.65 – 10.7	Light Industrial	
	10.7	Mineral and Petroleum	Alternate Substation 2B location

1 Refer to Figures 3-1 and 3-3 for route and milepost locations.

2 Legend of Land Use Designations

City of Lancaster

NU = Non Urban Residential (0.4 – 2.0 dwelling units/acre).
UR = Urban Residential (2.1 – 6.5 dwelling units/acre).

County of Los Angeles

N1 = Non Urban 1 (0.5 dwelling units/acre).

Kern County

Designations as given.

4.10.3 Segment 2

4.10.3.1 Antelope to Vincent 500 kV T/L

The proposed 500 kV T/L route for Segment 2 begins at the Antelope Substation site located within the City of Lancaster at MP 0.0 and traverses City land to MP 3.5. From MP 3.5 to 6.0, the route is within the City of Palmdale, and from MP 6.0 to MP 7.6, the route traverses Los Angeles County unincorporated lands. Between MP 7.6 and MP 13.9, the route is within

the Ritter Ranch Specific Plan (Robert Bein, William Frost & Associates, 1992) area, and between MP 13.9 and MP 15.0, the route is within the Anaverde Specific Plan (Azeka De Almeida Planning, 1992c) area. Both of these specific plan areas are contained within the City of Palmdale General Plan, adopted in 1993 (1993a). The route from MP 15.0 to the Vincent Substation at MP 21.5, is within unincorporated Los Angeles County. Other landmark features along the route include the California Aqueduct (MP 4.5), the Antelope Valley Freeway corridor (MP 20.45), and the Union Pacific/Metrolink corridor (MP 20.7).

4.10.3.2 Alternative AV1 500 kV T/L

This alternative route departs from the proposed route at MP 5.7 located in the City of Palmdale. From alternate route MP 0.0 to MP 0.4, the route is within the City. Between alternate route MPs 0.4 and 1.8, the route traverses County land. Between MPs 1.8 and 2.0, the route is within Ritter Ranch, rejoining the proposed route at proposed route MP 7.65.

4.10.3.3 Alternative AV2 500 kV T/L

This alternative departs from the proposed route at MP 8.1, located within Ritter Ranch, and traverses lands mostly within the ranch boundary to alternative route MP 1.85. Between alternative route MPs 1.85 and 3.1, the route traverses the Anaverde Specific Plan area, rejoining the proposed route at approximately MP 14.8.

4.10.4 Segment 3

4.10.4.1 Proposed 500 kV T/L (Antelope to Substation One)

The proposed Antelope to Substation One 500 kV T/L route begins at the Antelope Substation site located within the City of Lancaster at MP 0.0 and traverses City land to the Los Angeles County boundary at MP 0.4. The route transects a series of alternating City and County boundaries between MP 0.4 to 5.6. The route proceeds through Los Angeles County from MP 5.6 to the border with Kern County at MP 9.65 and thereafter remains in Kern County to the Substation One terminus at MP 25.6. Other landmark features along the route include the Los Angeles Aqueduct (MP 20.1) and the Union Pacific railroad (MP 24.5).

The proposed 220 kV T/L route between proposed Substation One at MP 25.6 and proposed Substation Two at MP 35.2 is described in Section 4.10.5.1.

4.10.4.2 Alternative A 500 kV T/L (Antelope to Substation 1A)

The Alternative A 500 kV T/L route begins at the Antelope Substation site located within the City of Lancaster at MP 0.0 and traverses City land to the Los Angeles County boundary at MP 0.4. The route transects a series of alternating City and County boundaries between MPs

0.4 and 4.7. The route proceeds through Los Angeles County from MP 4.7 to the border with Kern County at MP 10.2 and thereafter remains in Kern County to the alternate Substation 1A terminus at MP 25.9. Other landmark features along the route include the Los Angeles Aqueduct (MP 20.85) and the Union Pacific railroad (MP 24.9).

4.10.4.3 Alternative B 500 kV T/L (Antelope to Substation 1B)

The Alternative B 500 kV T/L route begins at the Antelope Substation site located within the City of Lancaster at mile 0.0 and traverses City land to the Los Angeles County boundary at MP 0.4. The route transects County land between MPs 0.4 and 1.0, then City land between MP 1.0 and 1.3. The route proceeds through Los Angeles County from MP 1.3 to the border with Kern County at MP 9.8, and thereafter remains in Kern County to the alternate Substation 1B terminus at approximately MP 26. Other landmark features along the route include the Los Angeles Aqueduct (MP 19.2) and the Union Pacific railroad (MP 25).

4.10.5 Segment 3 - Substation One & Substation Two

4.10.5.1 Proposed 220 kV T/L (Substation One to Substation Two)

The proposed Substation One to Substation Two 220 kV T/L route begins at proposed Substation One at MP 25.6 of the proposed Antelope to Substation Two route and proceeds westward along Oak Creek Road to MP 27.4. The route then follows the alignment of the Cal Cement-Monolith-Windpark 66 kV T/L alignment to the proposed Substation Two location at MP 35.2.

4.10.5.2 Altemative C 220 kV T/L (Substation One to Substation Two)

The Alternative C Substation One to Substation Two T/L route begins at the new Substation One at MP 0.0 and proceeds westward along Oak Creek Road to MP 1.75. The route follows the alignment of the Cal-Cement-Monolith-Windpark 66kV T/L to approximately MP 4.35. The route then follows the alignment of the Cal Cement/Goldtown/Monolith/Windlands 66 kV T/L alignment to either the new Substation Two location at MP 9.5, or the alternate Substation 2B location at MP 10.7. An additional alternate alignment that is a potential component of Alternative C is a 0.2-mile-long 220 kV T/L route that extends eastward from MP 9.7 to the alternate Substation 2A site at MP 9.9.

4.10.6 General Plans

The proposed Segment 2 500 kV T/L route occurs within planning areas subject to the jurisdiction of the cities of Lancaster and Palmdale, and Los Angeles County. The Antelope Substation is within the planning area of the City of Lancaster and the Vincent Substation is within the planning area of Los Angeles County. The proposed Segment 3 500 kV T/L route

(including Alternatives A and B), are within the planning areas of the City of Palmdale, Los Angeles County, and Kern County. Lastly, the proposed Substation One to Substation Two 220 kV T/L route and the Alternative C route are within the planning area of Kern County.

Los Angeles County and Kern County have emphasized the development of relatively detailed land use plans for the majority of unincorporated communities. Similarly, the cities of Lancaster and Palmdale incorporate two levels of planning into their long-term development strategy. These include general plans that provide broad policies and objectives to guide development within the cities and specific plans that provide detailed policies and site development standards for planning areas. The general and specific plan elements that pertain to the Antelope Transmission Project, Segments 2 and 3 (including alternatives), are described in the following sections.

4.10.6.1 City of Lancaster General Plan

The zoning and land use designations for portions of the Segment 2 and Segment 3 500 kV T/L routes that occur within the City of Lancaster are described below and the information is summarized in Tables 4.10-1 and 4.10-2 for Segment 2, and in Tables 4.10-3 and 4.10-4 for Segment 3.

4.10.6.1.1 Segment 2 (Antelope to Vincent 500 kV T/L). The proposed Segment 2 500 kV T/L route extends from the Antelope Substation site located at mile 0.0 within the City of Lancaster to the City of Palmdale border at MP 3.55. The Lancaster General Plan Zoning Map (City of Lancaster, 1998) depicts Rural Residential-2.5 (1 unit/2.5 acres) and R-10,000 Single Family Residential (10,000 square foot lots) zoning designations along the route. The Lancaster General Plan Land Use Map (City of Lancaster, 1997c) depicts Non-Urban Residential [0.4-2.0 DU/AC (dwelling units/acre)] and Urban Residential (2.1-6.5 DU/AC) land use designations along the route.

4.10.6.1.2 Segment 3 Proposed 500 kV T/L (Antelope to Substation One). The Segment 3 proposed T/L route transects a series of alternating City and County boundaries between MPs 0.4 to 5.6. The Lancaster General Plan Zoning Map (City of Lancaster, 1998) depicts Rural Residential 2.5 (1 unit/2.5 acres), and R-15,000 Single Family Residential (15,000 square foot lots) zoning designations along the route. The Lancaster General Plan Land Use Map (City of Lancaster, 1997) depicts Non-Urban Residential (0.4-2.0 DU/AC) and Urban Residential (2.1-6.5 DU/AC) land use designations along the route. The T/L route occurs along the western boundary of the proposed Del Sur Ranch Specific Plan area between MPs 2.1 and 3.6. This plan area is discussed in Section 4.10.7.2, below.

4.10.6.1.3 Segment 3 Alternative A 500 kV T/L (Antelope to Substation 1A). The route transects a series of alternating City and County boundaries between MPs 0.4 and 4.7. The

Lancaster General Plan Zoning Map (City of Lancaster, 1998) depicts Rural Residential 2.5 (1 unit/2.5 acres), and R-15,000 Single Family Residential (15,000 square foot lots) zoning designations along the route. The Lancaster General Plan Land Use Map (City of Lancaster, 1997) depicts Non-Urban Residential (0.4-2.0 DU/AC) and Urban Residential (2.1-6.5 DU/AC) land use designations along the route. The T/L route occurs along the western boundary of the proposed Del Sur Ranch Specific Plan area between MPs 2.1 and 3.6. This plan area is discussed in Section 4.10.7.3, below.

4.10.6.1.4 Segment 3 Alternative B 500 kV T/L (Antelope to Substation 1B). The route occurs on City lands from mile 0.0 to 0.4 and from MP 1.0 to 1.3. The Lancaster General Plan Zoning Map (City of Lancaster, 1998) depicts a Rural Residential 2.5 (1 unit/2.5 acres) zoning designation along the route. The Lancaster General Plan Land Use Map (City of Lancaster, 1997) depicts a Non-Urban Residential (0.4-2.0 DU/AC) land use designation along the route.

4.10.6.2 City of Palmdale General Plan

The zoning and land use designations for the portions of the proposed Segment 2 500 kV T/L route and the two alternative route segments within the City of Palmdale are described below, and the information is summarized in Tables 4.10-1 and 4.10-2. There are no portions of Segment 3 that occur within the City of Palmdale.

4.10.6.2.1 Segment 2 (Antelope to Vincent 500 kV T/L). The proposed Segment 2 500 kV T/L route traverses City of Palmdale lands from MPs 3.55 to 6.0. The route also traverses the Ritter Ranch Specific Plan and Anaverde Specific Plan areas (from MP 7.6 to MP 15.0) which are included in the Palmdale General Plan area (see Section 4.10.7.1, below). The City of Palmdale, General Plan, Zoning Map, adopted December 14, 1994 (City of Palmdale, 1994), depicts Single Family Residential (R-1-20,000), Light Agriculture (A-1-1), Quarry and Reclamation (QR), and Specific Plan (SP) zoning designations along the route. The City of Palmdale, General Plan, Land Use Map, adopted January 25, 1993 (City of Palmdale, 1993d), depicts Low Density Residential, California Aqueduct, Mineral Resource Extraction, and Specific Plan land use designations along the route.

4.10.6.2.2 Alternative AV1 500 kV T/L. The alternative route departs from the proposed route at MP 5.7 within City lands, and crosses into Los Angeles County lands at the alternative route MP 0.4. The alternative route reenters City jurisdiction in the Ritter Ranch Specific Plan area at MP 1.8. At MP 2.1, the alternative route rejoins the proposed route at MP 7.7.

4.10.6.2.3 Alternative AV2 500 kV T/L. The alternative route departs from the proposed route at MP 8.1 and traverses the Ritter Ranch and Anaverde Specific Plan areas subject to City jurisdiction to a juncture with the proposed route at MP 14.8.

4.10.6.3 Los Angeles County General Plan

The Los Angeles County General Plan provides general land use policies for unincorporated areas in the County. The General Plan Land Use Element (1979) serves as a key tool for improving inter-jurisdictional coordination and provides a basis for specific land use planning within unincorporated areas. Development plans within Los Angeles County are subject to approval by a discretionary land use permitting process.

The zoning and land use designations for the portions of the proposed Segment 2 500 kV T/L route and the Alternative AV1 route within the County of Los Angeles are described below, and the information is summarized in Tables 4.10-1 and 4.10-2. As described previously, the Alternative AV2 route is wholly within lands subject to City of Palmdale jurisdiction. The zoning and land use designations for the proposed Segment 3 T/L routes that occur within the County of Los Angeles are described below and the information is summarized in Tables 4.10-3 and 4.10-4.

4.10.6.3.1 Segment 2 (Antelope to Vincent 500 kV T/L). The T/L route traverses Los Angeles County unincorporated lands between MPs 6.0 and 7.6 with the Agriculture zone code designation (A-2-2) and the land use designation Non-Urban 1 (0.5 DU/AC). The route from MP 15.0 to the Vincent Substation at MP 21.5 includes the Agriculture zoning code designations A-2-1 and A-1-1 and the land use designation Non-Urban 1 (0.5 DU/AC).

4.10.6.3.2 Alternative AV1 500 kV T/L. The T/L route traverses County land between alternate route MPs 0.4 and 1.8, as described previously in Section 4.10.3.2.

4.10.6.3.3 Segment 3 Proposed 500 kV T/L (Antelope to Substation One). The route transects a series of alternating County and City of Lancaster boundaries between MPs 0.4 to 5.6. Thereafter, the route is within Los Angeles County to the border with Kern County at MP 9.65. The County zoning designations that occur along this route include Agriculture codes A-1-1, A-1-2, and A-2-2. The County land use designation along this route is Non-Urban 1 (0.5 DU/AC).

4.10.6.3.4 Segment 3 Alternative A 500 kV T/L (Antelope to Substation 1A). The route transects a series of alternating County and City of Lancaster boundaries between MPs 0.4 to 4.7. The route proceeds through Los Angeles County from MP 4.7 to the border with Kern County at MP 10.2. The County zoning designations that occur along this route include Agriculture codes A-1-1, A-1-2, and A-2-2. The County land use designation along this route is Non-Urban 1 (0.5 DU/AC).

4.10.6.3.5 Segment 3 Alternative B 500 kV T/L (Antelope to Substation 1B). The route transects County land between MPs 0.4 and 1.0, then City of Lancaster land between mile 1.0 and 1.3. The route proceeds through Los Angeles County from mile 1.3 to the border with Kern County at MP 9.8. The County zoning designations that occur along this route include Agriculture codes A-1-1 and A-2-2. The County land use designation along this route is Non-Urban 1 (0.5 DU/AC).

4.10.6.4 Kern County General Plan

The land use and zoning designations for portions of the Segment 3 T/L routes that occur within Kern County are described below and the information is summarized in Tables 4.10-3 and 4.10-4. There are no portions of Segment 2 that occur within Kern County.

4.10.6.4.1 Segment 3 Proposed 500 kV T/L (Antelope to Substation One). From the Kern County and Los Angeles County border at MP 9.65, the route crosses several different zoning and land use classifications to the Substation Two terminus at MP 25.6. The most frequently occurring zoning classifications along the route include: Exclusive Agriculture (A), Estate-2 1/2 acres (E 2 1/2), Platted Lands (PL), Residential Suburban Combining (RS), Floodplain Secondary Combining (FPS), and Heavy Industrial (M-3). The most frequently occurring land use classifications include: Low-density Residential (2.5 gross acres/unit), Agriculture (Intensive and Extensive), Resource Management, and Heavy Industrial.

4.10.6.4.2 Segment 3 Alternative A 500 kV T/L (Antelope to Substation 1A). From the Kern County and Los Angeles County border at MP 10.2, the Alternate A route crosses several different zoning and land use classifications to the alternate Substation 1A terminus at MP 25.9. The most frequently occurring zoning classifications along the route include: Exclusive Agriculture (A), Limited Agriculture (A-1), Estate-2 1/2 acres (E 2 1/2), Platted Lands (PL), Residential Suburban Combining (RS), Floodplain Combining (FP), Floodplain Secondary Combining (FPS), and Heavy Industrial (M-3). The most frequently occurring land use classifications include: Agriculture (Intensive and Extensive), Low-density Residential (2.5 gross acres/unit), Resource Management, and Industrial (Service and Light).

4.10.6.4.3 Segment 3 Alternative B 500 kV T/L (Antelope to Substation 1B). From the Kern County and Los Angeles County border at MP 9.8, the route crosses several different zoning and land use classifications to the alternate Substation 1B terminus at MP 26.04. The most frequently occurring zoning classifications include: Exclusive Agriculture (A), Limited Agriculture (A-1), Platted Lands (PL), Residential Suburban Combining (RS), Floodplain Secondary Combining (FPS), and Heavy Industrial (M-3). The Copa De Oro Estate Specific Plan Area that occurs adjacent to the T/L route is discussed in Section 4.10.7.4, below. The most frequently occurring land use classifications include: Agriculture (Intensive and

Extensive), Low- and Medium-density Residential (2.5, 5, and 10 gross acres/unit), Resource Management, and Heavy Industrial.

4.10.6.4.4 Proposed 220 kV T/L (Substation One to Substation Two). This route begins at the new Substation One at MP 25.6 of the Proposed 500 kV T/L (Antelope to Substation One) route and continues with that route's milepost system to the new Substation Two location at MP 35.2. The most frequently occurring zoning classifications along the route include: Heavy Industrial (M-3), Exclusive Agriculture (A), Estate (E20), Residential Suburban Combining (RS), Limited Agriculture (A-1), and Wind Energy Combining (WE). The most frequently occurring land use classifications include: Heavy Industrial, Minerals and Petroleum, Resource Reserve, and Intensive Agriculture.

4.10.6.4.5 Alternative C 220 kV T/L (Substation One to Substation Two). This route begins at proposed Substation One at MP 0.0 and ends at the proposed Substation Two location at MP 9.5. The most frequently occurring zoning classifications along this route include: Exclusive Agriculture (A), Limited Agriculture (A-1), Heavy Industrial (M-3), Wind Energy Combining (WE), Estate (E5; E20), Floodplain Primary (FPP), and Residential Suburban Combining (RS). The most frequently occurring land use classifications include: Minerals and Petroleum, Heavy Industrial, Resource (Reserve and Management).

The zoning and land use classifications for the two Alternative C (220 kV) T/L linkage routes from Substation 2 to Substation 2A and 2B are presented in Tables 4.10-3 and 4.10-4, respectively.

4.10.7 Specific Plans

The currently adopted specific plan areas that the Segment 2 and Segment 3 T/L routes traverse, or occur adjacent to, are discussed in this section by segment. The zoning and land use designations for the Segment 2 T/L route are described below and the information is summarized in Tables 4.10-1 and 4.10-2. The zoning and land use designations for the Segment 3 T/L routes are described below and the information is summarized in Tables 4.10-3 and 4.10-4.

4.10.7.1 Segment 2 (Antelope to Vincent 500 kV T/L)

The proposed T/L route traverses the Ritter Ranch Specific Plan area between MPs 7.6 and 13.9, and the Anaverde Specific Plan area between MPs 13.9 and 15.0. As stated in Section 4.10.6.2, above, these specific plan areas are included in the Palmdale General Plan area. The Ritter Ranch Community Concept Plan (Azeka De Almeida Planning, 1991), specifies land use designations within planning areas along the proposed T/L route to include Single-family Residential-1 (0.22 DU/AC) and Low Density Residential (1.0 DU/AC). By contrast, the Alternative AV2 route would also traverse a planning area with a Single-family Residential-3

(4 DU/AC) designation. The City Ranch (Anaverde) Specific Plan (Azeka De Almeida Planning, 1992c) identifies the proposed T/L route as Natural Open Space and the Alternative AV2 route within the existing utility corridor easement as Open Space and Natural Open Space. Both specific plan areas have SP zoning designations.

4.10.7.2 Segment 3 Proposed 500 kV T/L (Antelope to Substation One)

The route occurs along the western boundary of the proposed Del Sur Ranch Specific Plan area between MPs 2.1 and 3.6. The Del Sur Ranch Specific Plan area is included within the City of Lancaster General Plan area. The Zoning Map (City of Lancaster, 1998) indicates R-10,000 Single Family Residential (10,000 square foot lots) and R-7000 Single Family Residential (7,000 square foot lots) zoning designations occurring adjacent to the T/L route. The area is designated on the General Plan Map (City of Lancaster, 1997) as Urban Residential (2.1-6.5 DU/AC).

4.10.7.3 Segment 3 Alternative A 500 kV T/L (Antelope to Substation 1A)

This alternative T/L route occurs along the western boundary of the proposed Del Sur Ranch Specific Plan area between MPs 2.1 and 3.6. The discussion under Section 4.10.7.2, above, also applies to Alternative A.

4.10.7.4 Segment 3 Alternative B 500 kV T/L (Antelope to Substation 1B)

This alternative T/L route occurs along the eastern boundary of the Copa De Oro Estate Specific Plan area between approximately MPs 10.3 and 10.8, which is located in Kern County. The development was approved by the Kern County Board of Supervisors on April 27, 2004. The Specific Plan area is designated as Special Planning by the Kern County, Department of Planning and Development Services Zoning Map 232, updated July 12, 2004. The Specific Plan area has General Commercial, Minimum 2.5 Gross Acre/Unit, and Maximum 10 Unit/Net Acre land use designations in the Kern County General Plan.

4.10.8 Regulatory Approvals

In addition to the need for SCE to obtain a Certificate of Public Convenience and Necessity (CPCN) from the CPUC, it is anticipated that the following land use-related approvals may be required prior to implementation of Segment 2 or Segment 3 of the proposed Antelope Transmission Project:

- Road encroachment permits from Caltrans, Los Angeles and Kern counties, and applicable local jurisdictions
- Grading permits

- Easements including rail line crossings in Los Angeles and Kern counties

4.11 MINERAL RESOURCES

4.11.1 Introduction

This section presents existing conditions for mineral resources relative to Segments 2 and 3 of the Antelope Transmission Project. Existing conditions were determined from review of available published and unpublished literature and online sources. Sources of information include various sources within the California Department of Conservation (CDOC), including published and online references from the California Geological Survey (CGS) (formerly California Division of Mines and Geology) and the Division of Oil, Gas, and Geothermal Resources. In addition, data were obtained from the City of Palmdale General Plan (2004), Ritter Ranch Specific Plan (Robert Bein, William Frost & Associates, 1992), and by reviewing USGS quadrangle maps covering the project area.

4.11.2 Existing Conditions

4.11.2.1 Sand and Gravel Resources

While potential sand and gravel resources may be present in the project area there are no significant resources identified by the State and there are no current production areas in the project area (CDOC, 1987). The nearest production areas lie to the west in the Soledad production area (Saugus-Newhall resource area) or to the east in the Little Rock Creek Fan production area (Palmdale resource area) (Beeby, 1999). No significant production areas are located in or near the project area and none are anticipated in the future (Kohler, 2002).

4.11.2.2 Oil and Minerals

There are no oil or gas resources identified in the eastern Transverse Ranges or the western Antelope Valley. Significant mineral resources have not been identified in the vicinity of Segment 2. There are mineral resources identified in the vicinity of Segment 3. The Rosamond Hills are east of and adjacent to the proposed Segment 3 500 kV T/L route and the Alternative A and B routes. Gold and uranium resources have been mined from this area in the past. Gold is still listed as a principal mineral resource in this area; uranium is not (CGS, 2000). Limestone and dolomite are being mined along the flanks of the Tehachapi Mountains southeast of the alignments. In addition, limestone quarries are located adjacent to the Cal Cement facility (refer to Figure 3-3; sheet 6 of 7), which is located to the south of the proposed 220 kV T/L between Substations One and Two. A limestone quarry is also located northwest of Monolith, approximately 1.4 miles northwest of Alternative 220 kV Substation 2B (refer to Figure 3-3; Sheet 7 of 7). None of the aforementioned mineral resource extraction areas are located in the immediate vicinity of proposed or alternate Antelope Transmission Project T/L or substation facilities.

4.12 NOISE

4.12.1 Background

Noise levels and standards are expressed on a logarithmic scale in units called decibels (dBA), using a frequency-weighting pattern that duplicates the sensitivity of the human ear. Since noise levels from various sources vary over time, they are frequently expressed as an equivalent noise level (Leq), which is a computed steady noise level that represents the same energy transmission over a specified time. Leq values are commonly expressed for one-hour periods, but different averaging times may be specified.

For the evaluation of environmental or community noise effects, it is customary to define a 24-hour-long noise level based on hourly Leq values, and to apply an excess or "penalty" noise during the evening and/or nighttime hours to account for the added nuisance of noise during those periods. Depending on the exact penalty scheme, the resulting noise descriptor is either a Community Noise Equivalent Level (CNEL) or a Day-Night Average Noise Level (Ldn). The two ways of expressing such noise levels are nearly equivalent, and are often used interchangeably.

For local governments, noise standards are specified within the mandated Noise Element of their General Plan, which usually defines maximum noise levels that are considered compatible with various land uses. Frequently, local governments also have a specific Noise Ordinance designed to regulate specific noise-producing activities such as construction work.

4.12.2 Noise Environment

The following subsections discuss existing noise conditions and applicable noise regulations by area and jurisdiction.

4.12.2.1 City of Lancaster

The Antelope Substation and northerly extent of the proposed Segment 2 500 kV T/L route are located within the western limit of the City of Lancaster. Additionally, the southern portion of Segment 3 is located in Lancaster (refer to Figure 3-1). This area is generally rural or low density residential, and existing noise levels are generally low.

In the City of Lancaster, noise standards are set forth in the Noise chapter of the Plan for Public Health and Safety, one of the elements of the Lancaster General Plan (City of Lancaster, 1997b: Table III-1). These standards are presented in Table 4.12-1.

TABLE 4.12-1
CITY OF LANCASTER NOISE ELEMENT STANDARDS

Land Use	Maximum Exterior CNEL	Maximum Interior CNEL
Rural, Single Family, Multiple Family Residential	65 dBA	45 dBA
Schools:		
Classrooms	65 dBA	45 dBA
Playgrounds	70 dBA	
Libraries		50 dBA
Hospitals/Convalescent Facilities:		
Living Areas		50 dBA
Sleeping Areas		40 dBA
Commercial and Industrial Office Areas	70 dBA	50 dBA

The City of Lancaster Noise Ordinance is set forth in Chapter 8.24 of the municipal code. The code includes a general prohibition against loud, unnecessary, and unusual noises (Section 8.24.030), and a prohibition against performing specified construction and building work between the hours of 8:00 p.m. and sunrise, and on Sundays. No grading with heavy equipment or construction with loud mechanical equipment is allowed within 500 feet of an occupied dwelling during the specified times.

4.12.2.2 City of Palmdale

The proposed Segment 2 500 kV T/L route traverses the western portion of the City of Palmdale, but it is located well away from developed areas. South of the California Aqueduct, the route crosses the Ritter Ranch and Anaverde properties, both within the City of Palmdale.

Noise and land use compatibility standards are contained in Table N-3 of the City of Palmdale Noise Element (City of Palmdale, 1993c). For all residential areas, the maximum acceptable Community Noise Equivalent Level (CNEL) is 65 dBA.

Section 8.28 of the Palmdale City Municipal Code restricts building construction hours and operation between the hours of 8:00 p.m. and 6:30 a.m. to minimize the effects of construction noise.

4.12.2.3 Los Angeles County Unincorporated Areas

The unincorporated areas through which the proposed Segments 2 and 3 (including the southern portion of Alternatives A and B) 500 kV T/L routes pass are predominantly vacant land or rural residential in nature. Existing noise levels are generally low, and due to distant roadway traffic and aircraft. In the vicinity of State Route (SR) 14 near the southerly end of

the Segment 2 T/L route, noise levels are louder due to SR 14 traffic. Based on the assumptions shown in Table 4.12-2, and using the Federal Highway Administration Noise Model (Barry and Regan, 1978), the existing Day-Night Average Noise Level at 100 feet from the centerline of the freeway is approximately 77 dBA. SCE's existing Vincent Substation is the southern terminus of Segment 2 and is located south of SR 14.

TABLE 4.12-2
ASSUMPTIONS FOR SR 14 Ldn ESTIMATE

Input	Source
Average Daily Traffic – 93,000	Caltrans data for 2003
Heavy Duty Truck Traffic – 3%	Caltrans data for 2001
Medium Duty Truck Traffic	Caltrans data for 2001
Speed – 55 miles per hour	Assumed
Daytime: 15 hours, 7:00 am to 10:00 pm, 85% of ADT	Assumed
Nighttime: 9 hours, 10:00 pm to 7:00 am, 15% of ADT	Assumed

The existing (1987) Noise Element of the Los Angeles County General Plan provides background information regarding noise and general policy guidance, but does not contain any numerical standards for the compatibility between land uses and noise levels. Policy 2 of the Noise Element states that the County should: "Establish acceptable noise standards consistent with health and quality of life goals and employ effective techniques of noise abatement through such means as building code, noise, subdivision and zoning ordinances."

Los Angeles County is in the process of updating its General Plan. The Noise Element of the draft General Plan Goals and Policies provides somewhat more specific guidance. Draft Policy N-1.2 states: "Avoid development of residential and other noise-sensitive uses in areas of the County where outdoor ambient noise levels exceed 55 CNEL unless interior noise levels from exterior sources can be mitigated to less than 45 CNEL".

The Los Angeles County Noise Ordinance is reflected in Chapter 12.08 of the County Code. The County Noise Ordinance has a somewhat complex system of allowable noise limits, which is summarized in the following paragraphs.

Activities may not generate noise levels above specified limits, both at the exterior and interior areas of neighboring land uses. The limits are derived from tabulated values that depend on the sensitivity of the land use, with adjustments to create a series of noise Standards. The basic exterior limits are presented in Table 4.12-3.

TABLE 4.12-3
LOS ANGELES COUNTY NOISE ORDINANCE
STANDARDS (SECTION 12.08.390)

Noise Zone	Designated Noise Zone Land Use (Receptor property)	Time Interval	Exterior Noise Level (dB)
I	Noise sensitive area	Anytime	45
II	Residential properties	10:00 pm to 7:00 am (nighttime)	45
		7:00 am to 10:00 pm (daytime)	50
III	Commercial properties	10:00 pm to 7:00 am (nighttime)	55
		7:00 am to 10:00 pm (daytime)	60
IV	Industrial properties	Anytime	70

Adjustments are made to the above allowable limits depending on the nature of the ambient noise, or the duration of the noise. The ambient noise is specified as a statistical noise level or Lx, where x is the percentage of time that the noise levels exceed the limit L. For example, an L80 is the noise level in dBA that is exceeded 80 percent of the time. The adjusted standards, derived from the above limits are as follows:

Standard 1. The above exterior limits, for any generated noises that occur for a cumulative period of more than 30 minutes in any hour. If the ambient L50 exceeds this limit, then the L50 becomes the exterior noise level limit for Standard 1.

Standard 2. The above exterior limits, plus 5 dBA, which may not be exceeded for a cumulative period of more than 15 minutes in any one hour. If the ambient L25 exceeds this limit, then the L25 becomes the exterior noise level limit for Standard 2.

Standard 3. The above exterior limits, plus 20 dBA [sic, probably 10 dBA], which may not be exceeded for a cumulative period of more than 5 minutes in any one hour. If the ambient L8.3 exceeds this limit, then the L25 becomes the exterior noise level limit for Standard 3.

Standard 4. The above exterior limits, plus 15 dBA, which may not be exceeded for a cumulative period of more than 1 minute in any one hour. If the ambient L1.7 exceeds this limit, then the L25 becomes the exterior noise level limit for Standard 4.

Standard 5. The above exterior limits, plus 20 dBA, which may not be exceeded for any period of time. If the ambient L0 exceeds this limit, then the L0 becomes the exterior noise level limit for Standard 5.

There are additional specifications in the Noise Ordinance that relate to limits for noise levels between two different land use zones, limits for interior noise levels, and corrections for pure tone or impulsive sounding noises (limits are 5 dBA more restrictive).

In addition to these measures, the Noise Control Ordinance of Los Angeles County also prohibits construction activities and noise during certain times, in areas that would affect a residential or commercial property line. The prohibited times are between the weekday hours of 7:00 p.m. and 7:00 a.m., and any time on Sundays or holidays (Section 12.08.440).

4.12.2.4 Kern County and Tehachapi

The Segment 3 proposed 500 kV T/L route extends northward from Los Angeles County into the southern portion of Kern County where it connects with proposed Substation One at MP 25.6, and with Substation Two at MP 35.2 (refer to Figure 3-1). The region through which the 500 kV T/L portion of Segment 3 passes in Kern County is generally agricultural and/or undeveloped and rural residential in nature. There are few residences, and noise levels are generally low. Typical noise levels in such rural areas are below 50 dBA in the daytime and below 40 dBA at nighttime. Distant roadway traffic and occasional aircraft overflights are usually the only notable noise sources. Willow Springs Raceway is located approximately 2.25 miles to the east of the proposed 500 kV T/L route (MP 13.6; refer to Figure 3.3, sheet 3 of 7), and Edwards Air Force Base is located approximately 9 miles to the east of the majority of the proposed 500 kV T/L route (refer to Figure 3-1).

The Kern County General Plan Noise Element (2004d, page 149) establishes 65 dBA as the maximum Day-Night Average Noise Level (Ldn) considered compatible with residential uses or development.

The Noise Control Ordinance in the Kern County Code (Section 8.36.020 et seq.) prohibits a variety of nuisance noises, but does not specifically mention construction or related noise.

The northerly portions of Segment 3 between Substations One and Two (220 kV T/L route), including proposed Substation Two (and alternatives), remain outside of the City of Tehachapi, so the noise standards and requirements of Kern County govern in this area. The Tehachapi General Plan Noise Element has standards that are very similar to those in Kern County. The standards establish maximum Ldn values, which vary depending on the sensitivity of the land use that must not be exceeded. For "sensitive" land uses, which include residences, schools, and parks, the maximum Ldn is 65 dBA (City of Tehachapi General Plan Noise Element, 1999).

Existing noise sources in the northerly portions of Segment 3 include the existing wind turbines, the Cal Cement facility and associated rail spur, and Highway 58 (refer to Figure 3-1).

4.13 POPULATION AND HOUSING

4.13.1 Introduction

This section describes the existing and forecasted conditions of population and housing in the project area for the proposed Segment 2 500 kV T/L route (including route Alternatives AV1 and AV2) and 220 kV T/L route, and the proposed Segment 3 500 kV and 220 kV T/L routes (including route Alternatives A, B, and C, and Substations One and Two) (refer to Figure 3-1). Modification and expansion of the Antelope Substation is addressed in the separate CPCN Application/PEA for Segment 1 of the proposed Antelope Transmission Project. The proposed Segment 2 500 kV T/L route begins at the Antelope 220 kV substation, located toward the west end of the City of Lancaster, and proceeds southeast through the City of Palmdale and approximately 1 mile east of the small community of Acton, before terminating at the existing SCE Vincent 500 kV Substation. The proposed Segment 2 parallels an existing T/L corridor over the majority of its length, except for the curve to the west near the City of Palmdale where the T/L corridor curves from its linear course for approximately 7 miles, to minimize or avoid impacts to the Ritter Ranch Development.

Segment 3 also begins at the Antelope Substation and proceeds north through northern Los Angeles County into Kern County. Segment 3 reaches proposed Substation One west of the community of Mojave, and extends northwest to proposed Substation Two, southeast of the City of Tehachapi (refer to Figure 3-1). Alternatives A and B (for Segment 3) mainly parallel the proposed Segment 3 corridor, to the east and west, respectively. Both Segments 2 and 3 would require the acquisition of new R-O-W.

Population and housing conditions were evaluated by reviewing the Los Angeles and Kern County General Plans, as well as the General Plans for the Cities of Palmdale, Lancaster, and Tehachapi. Data were also obtained from statistical reports from the State of California Department of Finance, the U.S. Department of Housing and Urban Development, the State of California Employment Development Department (EDD), and the Southern California Association of Governments (SCAG).

4.13.2 Population – Segment 2

The 21.5 miles of proposed 500 kV and 220 kV T/L between the Antelope and Vincent substations begins at the west end of the City of Lancaster and ends north of the Angeles National Forest boundary and a little over 1 mile east of the community of Acton. The majority of Segment 2 is located in sparsely populated unincorporated portions of Los Angeles County.

The population of Los Angeles County was recorded to be 9,519,338 by the 2000 Census. This was a 7.4 percent increase in population from the 1990 Census. In 2005, the population

is estimated to be 10,226,506, which is a 1.2 percent increase from 2004 (California Department of Finance, 2004a, 2004b). Los Angeles County is expected to experience the largest share of both regional population and household growth in all of southern California. The County population is expected to increase to 12.2 million by 2030. The number of households in the county is expected to increase by 980,000 from 2000 to 2030. However, although Los Angeles County is projected to continue to be the most populous county in southern California, its percentage of the total population will continue to move downward, to 54 percent in 2025 (compared to 83 percent in 1950 and 58 percent in 2000).

Ethnically, the majority of the population throughout Los Angeles County is White or of Hispanic or Latino origin. In Lancaster, however, the Hispanic population is approximately 24 percent. Lancaster has consistently displayed high population growth over the past decade. The U.S. Census Bureau reports Lancaster as the third fastest-growing city in Los Angeles County between 1990 and 2000. The City of Palmdale, (which the Segment 2 corridor traverses, but most of the population is located to the east), is currently the fastest growing city in Los Angeles County, with a growth rate of 69.29 percent from 1990 to 2000. The state Department of Finance estimates Lancaster's population at 129,200 people in 2004 (a 2.6 percent increase from 2003) and Palmdale's population at 131,300 people in 2004 (a 3.3 percent increase from 2003).

City	2000 Census	1990 Census	Increase	Percent
Palmdale	116,670	68,917	47,753	69.29%
Lancaster	118,718	97,291	21,427	22.02%

Source: U.S. Census Bureau, 2000.

SCAG projects the populations of Lancaster and Palmdale to reach 168,032 and 176,506, respectively, in 2010.

Demographic information for Acton is based on estimates due to Acton's unincorporated status. The estimated current population is approximately 9,175 people, 86.43 percent of which are white, and 24.54 percent of which are Hispanic (Community of Acton website, 2004). The 2000 U.S. Census reported Acton's population at 2,390.

Alternative AV1 is a short 2.1-mile-long segment, located parallel to and east of the proposed Segment 2 route, beginning at MP 5.7 and ending at MP 7.7. Alternative AV1 would avoid three existing homes that would need to be removed if the corresponding portion of the proposed T/L route were implemented instead. Alternative AV2 is 3.1 miles long, departing from the proposed T/L route at MP 8.1 and traversing the Ritter Ranch and Anaverde specific plan areas to a juncture with the proposed T/L route at MP 14.8. These specific plan areas are included in the Palmdale General Plan area. The Ritter Ranch Community Concept Plan (1991) specifies Residential land use designations within planning areas along the proposed

T/L route. The City Ranch (Anaverde) Specific Plan (Azeka De Almeida Planning, 1992c) identifies the proposed T/L route as Natural Open Space and the Alternative AV2 route within the existing utility corridor easement as Open Space and Natural Open Space.

4.13.3 Population – Segment 3

Segment 3 extends north from the City of Lancaster through northern Los Angeles County into Kern County. Current and projected population estimates for Lancaster are presented above in Section 4.13.2. The proposed Segment 3 T/L route and associated alternatives lead through unincorporated areas of Rosamond, Mojave, and Tehachapi. All of these cities are located in Kern County.

The population of Kern County was recorded to be 661,645 by the 2000 Census. This was a 7.4 percent increase in population from the 1990 Census. In 2005, the estimated population for the County is 753,070 people, which is a 2.8 percent increase from 2004, and the County is projected to have a population of 808,808 by 2010 and 950,112 by 2020 (California Department of Finance, 2004a, 2004b). The majority of the population throughout the County is White (61.6 %) or of Hispanic or Latino origin (32.4 %).

As the proposed Segment 3 T/L route proceeds north into Kern County, the first city near its corridor (approximately 1 mile west) is Rosamond (10 miles north of Lancaster). Rosamond has experienced rapid residential growth over the past 20 years. The U.S. Census Bureau reported the population of Rosamond at 14,349 people in 2000. Projections based on the number of houses in the planning stage could have Rosamond's population doubling over the next 5 years (www.jpbroker.com). At this rate, the population may reach approximately 29,000 by 2010.

The boundaries of Mojave are 1-2 miles to the east of the northern portion of the proposed Segment 3 T/L route. The community of Mojave is unincorporated, and had a population of approximately 4,000 people in 2000 (U.S. Census Bureau 2000a, 2000b). The northern end of Segment 3, including proposed Substation Two (220 kV), is located east of the City of Tehachapi (refer to Figure 3-1). Tehachapi had an estimated population of 11,700 in 2004 and 11,907 in 2005 (California Department of Finance 2004a, 2004b). Both of these Kern County communities anticipate substantial population growth over the next decade, as the Los Angeles basin reaches maximum capacity. However, growth in Mojave and Tehachapi is not anticipated to be as substantial as that in the Antelope Valley portion of Los Angeles County (which includes the cities of Lancaster and Palmdale). SCAG estimates that the Antelope Valley portion of Los Angeles County will grow from approximately 300,000 people (currently) to 1.2 million by the year 2020; an average growth rate of 6.8 percent compounded annually.

Segment 3 500 kV T/L route Alternatives A and B roughly parallel the proposed 500 kV T/L approximately 0.5 to 1 mile to the east and west, respectively (refer to Figure 3-1). These alternatives do not traverse or approach any additional cities or communities that have not already been discussed previously in this section for the proposed 500 kV T/L route along Segment 3. Therefore, the population information presented in the previous subsections above also applies to Alternatives A and B. Alternative C is located approximately 2 miles west of the proposed 220 kV T/L route between proposed Substations One and Two, and does not traverse or approach any additional cities or communities that have not already been discussed in this section.

4.13.4 Housing – Segment 2

Even prior to the 1990s, housing production was lagging behind population growth in Los Angeles County. This last decade only increased the gap. Consequently, the shortage of housing has led to escalating housing prices and fewer housing opportunities for low and moderate-income households. Due to the high demand for housing in the County, the number of households in the unincorporated area is projected to increase by 12 percent between 1997 and 2005. More specific to this project, the north county area, where the proposed 500 kV T/L route is located, is predicted to experience a 49 percent growth in households (Los Angeles County General Plan, Housing Element 2001).

As of the year 2000, Los Angeles County had approximately 3,300,181 housing units, 47.9 percent of which were owner-occupied. The median value of owner-occupied housing units was approximately $209,300 in 2000 (U.S. Census Bureau 2000a, 2000b). Segment 2 is entirely within the County of Los Angeles, and extends through the cities of Lancaster and Palmdale.

Lancaster had approximately 41,682 housing units in 2000, 23,394 of which were owner-occupied, and about 3,500 were vacant. The median house value was approximately $103,700 (U.S. Census Bureau, 2000a, 2000b). SCAG predicts the housing units in Lancaster to reach 51,418 housing units by 2010, an approximate 10,000-unit increase. Palmdale had approximately 37,096 housing units in 2000, 24,346 of which were owner-occupied, and about 2,811 were vacant. The median house value was approximately $116,400 (U.S. Census Bureau, 2000a, 2000b). SCAG predicts the housing units in Palmdale to reach 48,628 units by 2010, an approximate 11,500-unit increase. Household projections for Palmdale and Lancaster are summarized below.

City	Households in 2000	2005 Projection	2010 Projection
Palmdale	37,096	39,553	48,628
Lancaster	41,682	42,673	51,418

Source: U.S. Census Bureau 2000 and SCAG 2004b.

It is the public policy of California to ensure that local governments provide adequate sites to accommodate the construction of housing to meet the needs for all income groups. The Los Angeles County review process for granting entitlements for new residential development is designed not only to ensure that a full range of adequate public services and facilities, including water and sewage, are available for each new project, but also to ensure that hazards are avoided or mitigated and vital natural resources are preserved or protected.

The Segment 2 T/L route Alternatives AV1 and AV2 do not traverse or approach any populated areas that have not been discussed previously in this section. Therefore, the housing data presented previously in this section apply to Alternatives AV1 and AV2 as well.

4.13.5 Housing – Segment 3

Segment 3 extends north from the Antelope Substation in Lancaster through northern Los Angeles County into Kern County. Current and projected housing estimates for Los Angeles County and Lancaster were presented previously in Section 4.13.4. The proposed Segment 3 T/L routes and associated alternatives lead through or near the unincorporated areas of Rosamond and Mojave, and the City of Tehachapi. All of these communities are located in Kern County.

Kern County had 231,564 total housing units in 2000, 208,652 of which were occupied, and 22,912 were vacant (U.S. Census Bureau, 2000a, 2000b). Kern County has some of the lowest cost housing in California, with the median price of a home at only 44 percent of the California state average (Kern County Housing Profile, Census 2000 data). The home ownership rate is higher in Kern County, 62 percent, relative to 57 percent across the State, due to the fact the median household income in Kern County is 75 percent of the California average, making home prices affordable to a much broader segment of the population than elsewhere in the State. The inexpensive and relatively young housing stock is one of the drivers of the County's high population growth rates.

The community of Rosamond reported a total of 5,597 housing units in the year 2000, 4,988 of which were occupied (3,440 were owner-occupied) and 609 units were vacant (U.S. Census Bureau, 2000b). The median single-family home value was $89,000. The community of Mojave reported a total of 1,806 housing units in the year 2000, 1,408 of which were occupied (729 were owner-occupied) and 398 units were vacant (U.S. Census Bureau, 2000a, 2000b). The median single-family home value was $56,500. The City of Tehachapi reported a total of 2,914 units in the year 2000, 2,533 of which were occupied (1,387 were owner-occupied), and 381 units were vacant (U.S. Census Bureau, 2000a, 2000b). The median value for owner-occupied housing was $90,000.

The City of Tehachapi has demonstrated a growth rate of housing units that is higher than Rosamond and Mojave, and slightly higher than Kern County, overall. Between the years 1990 and 2000, a total of 484 housing units were added within the City (an increase of 16.6 percent), while Kern County as a whole experienced a 14 percent increase.

As discussed in Section 4.13.3, Segment 3 T/L route Alternatives A and B generally parallel the proposed Segment 3, 500 kV T/L route. These route alternatives do not traverse or approach any populated areas that have not been discussed previously in this section. Therefore, the housing data presented in the previous sections apply to Alternatives A and B as well. Alternative C (220 kV) is located approximately up to 2 miles east of the proposed 220 kV T/L route from proposed Substation One to Substation Two, and does not traverse or approach any urban areas. Alternative C is located southeast of the City of Tehachapi as shown on Figure 3-1.

4.14 PUBLIC SERVICES/UTILITIES

4.14.1 Introduction

This chapter describes pertinent public services and utilities that could be affected by the proposed project. Public services include fire and police protection and maintenance of public facilities such as schools and hospitals. Utilities and service systems include power, natural gas, water treatment and distribution, sewer facilities, storm water drainage, solid waste disposal, and local and regional water supplies.

4.14.2 Segments 2 and 3

The Segment 2 T/L alignment proceeds generally in a southeasterly direction from the existing Antelope Substation located in the western portion of the City of Lancaster and terminates at the Vincent Substation near Acton (refer to Figure 3-1). The proposed Segment 2 500 kV T/L route also passes through the western portion of the City of Palmdale and unincorporated portions of Los Angeles County between the Antelope and Vincent Substations. Segment 2 parallels an existing T/L corridor over much of its length.

The proposed Segment 3 T/L route alignment (and its alternatives) proceeds northerly from the Antelope Substation in western Lancaster through unincorporated portions of northern Los Angeles and southern Kern Counties to proposed Substations One and Two. Refer to Figure 4.14-1 for the locations of public services (i.e., fire stations, police stations, hospitals, and schools) along the proposed T/L routes and substations for Segments 2 and 3 (including alternatives).

4.14.2.1 Fire Protection

The Los Angeles County Fire Department (LACFD) provides protection for the unincorporated areas of Los Angeles County and has contracts with the City of Palmdale and City of Lancaster (Koller, 2004). The Kern County Fire Department (KCFD) provides protection for the unincorporated areas of Kern County (Dunn, 2004).

4.14.2.2 Police Protection

The Los Angeles County Sheriff's Department provides protection for the unincorporated areas of Los Angeles County and has a contract arrangement with the City of Palmdale and the City of Lancaster. The Palmdale station has a total of 175 staff, including 86 staff that specifically serve the City of Palmdale (Hill, 2004). The Lancaster station has a total of 185 staff, including 77 staff that specifically serve the City of Lancaster (Low, 2004).

The Kern County Sheriff's Department provides protection for the unincorporated areas of Kern County and has a contract arrangement with the Rosamond area, Mojave, and Tehachapi. The Rosamond Station has 8 deputies, 2 investigators, and 1 sergeant (Price, 2004). The Mojave Station has 9 deputies, 1 senior deputy, 2 sergeants, 5 detention officers, and 2 bailiffs (Perlis, 2004). The Tehachapi Station has 8 deputies, 2 investigators, and 1 sergeant (Rodrigues, 2004).

4.14.3 Schools

The Lancaster Elementary School District serves the incorporated and unincorporated areas of the High Desert Region. The District operates 17 schools and has an enrollment of 15,576 (www.greatschools.net).

The Antelope Valley School District serves 1,100 square miles of Los Angeles County including the incorporated and unincorporated areas of the High Desert region from the Ventura County line east to the San Bernardino County line and south to Palmdale. The District operates 7 high schools and has an enrollment of 21,087 (Freeze, 2004).

The Southern Kern Unified School District serves the unincorporated areas of Southern Kern County. The District operates 19 schools and has an enrollment of 16,000 (Nancy, 2004).

There are no schools located within 0.25 mile of the proposed or alternative Segments 2 and 3 T/L routes or substations.

4.14.4 Hospitals

The Palmdale Hospital Medical Center is the major hospital in the City of Palmdale. The High Desert Medical Center is the major hospital in the City of Lancaster. The Tehachapi Hospital is the major hospital in the Kern County area.

4.14.5 Utilities

Significant infrastructure located along or near the proposed T/L routes for Segments 2 and 3 (including alternatives) is depicted on Figure 4.14-1. Southern California Gas Company (SCG) provides gas service and SCE provides electricity for the City of Lancaster, City of Palmdale, Los Angeles County, and Kern County. Water service for the City of Lancaster and City of Palmdale is provided by L.A. County Water Works and sewer service is provided by L.A. County Sewer Maintenance.

4.14.5.1 Segment 2

The proposed Segment 2 T/L route passes between the Antelope Substation, located in a sparsely developed portion of western Lancaster, and the Vincent Substation, located in unincorporated Los Angeles County. Segment 2 parallels existing T/L corridors over much of its length. Two 30-inch gas pipelines, owned by Southern California Gas intersect Segment 2 near MP 15.6 (refer to Figures 3-2 and 4.14-1).

The East Branch of the California Aqueduct alignment along the northeastern margin of the San Gabriel Mountains delivers State Water Project water to the Antelope Valley-East Kern Water Agency (AVEK) and to the Mojave Water Agency further east. Segment 2 crosses the California Aqueduct near MP 4.5 (refer to Figures 3-2 and 4.14-1).

4.14.5.2 Segment 3 and Alternatives

The proposed Segment 3 T/L route (and alternatives) connect between the Antelope Substation, located in the City of Lancaster, and Substations One and Two, located in unincorporated Kern County (refer to Figures 3-1, 3-3, and 4.14-1).

An existing 500 kV T/L follows along or near the route for Segment 3 (proposed and alternative routes) between MP 0.0 (Antelope Substation) and MP 1.8. Segment 3 crosses two existing 220 kV T/Ls near MP 1.5. The Segment 3 proposed route also parallels 800 kV and 230 kV T/Ls within the LADWP easement, between MPs 11.9 and 13.1. Alternative routes A and B cross this LADWP easement at MP 13.9 and MP 11.6, respectively.

The Los Angeles Aqueduct conveys water from the Owens Valley/Mono Lake area to the City of Los Angeles. The proposed Segment 3 T/L crosses the Los Angeles Aqueduct near MP 20.1. Alternative A traverses the aqueduct near MP 20.9, and Alternative B at MP 19.2.

Based upon available data, the northern portions of the proposed Segment 3 T/L route and Alternatives A, B, and C cross and/or are located near several large natural gas transmission pipelines. The primary gas pipelines consist of two Pacific Gas & Electric Company (PG&E) 34-inch pipelines, one Kern River Gas Transmission Company 42-inch pipeline, and a Mojave Pipeline Company 12-inch diameter pipeline. Data from USGS topographic maps also indicate that gas pipelines cross through the proposed sites for alternate Substations 1A and 1C (refer to Figure 3-3).

Based upon further assessment by SCE, the originally identified sites for Substation One and Substation Two have been relocated to avoid these gas pipelines as well as other utilities. Refer to Section 5.14 for additional discussion. The relocation of both substation sites was also due to other considerations, such as natural drainage patterns, ease of access, and topography.

4.15 RECREATION

This section describes recreation resources and opportunities within the proposed project area for Segments 2 and 3 of the Antelope Transmission Project (refer to Figure 3-1).

4.15.1 Segment 2 (Antelope to Vincent)

The proposed Segment 2 T/L route originates at the Antelope Substation in the western end of the City of Lancaster. From there the route extends to the southeast through the western area of Lancaster and into the City of Palmdale. After crossing the southern area of Palmdale, including the recently annexed Ritter Ranch area and the proposed Anaverde development area, the route extends for another 5.5 miles to the southeast to SR 14. After crossing SR 14, the T/L route turns to the south for 1 mile, and terminates at the Vincent Substation adjacent to the Angeles Forest Highway. The proposed Segment 2 500 kV T/L route parallels an existing T/L corridor over much of its length. However, within the Ritter Ranch and Anaverde areas, the route generally follows the northern, western, and southern boundaries, thereby avoiding the central major development area (Figure 3-2, sheet 2 of 3). If the Alternative AV2 T/L route was selected, then the T/L would traverse the core development area of the Ritter Ranch Specific Plan.

There are no major recreational areas or features crossed by this route. It does traverse some relatively remote hilly areas in the south end of Palmdale, and it skirts federal land administered by the Bureau of Land Management southeast of Palmdale.

The following paragraphs describe recreational features in the region, and their relationship to the proposed Segment 2 route in more detail.

4.15.1.1 Lancaster

There are many city parks within Lancaster, but none are located near the Antelope Substation or any portion of the proposed Segment 2 T/L route. The nearest park is George Lane Park, approximately 5 miles to the southeast of the Antelope Substation and about 2 miles northeast of the Segment 2 route at its closest point.

4.15.1.2 Palmdale

The City of Palmdale also has many parks, but none are along the proposed route for the Segment 2 T/L between the Antelope and Vincent substations. The nearest Palmdale park is the A.C. Warnack Nature Park, which is east of Goode Hill Road and south of the California Aqueduct between 50th Street West and 55th Street West. This hilly and undeveloped park occupies about 120 acres covered mainly with native vegetation, and is accessible via a series

of trails from Goode Hill Road. Existing 500 kV and 220 kV T/Ls pass approximately 0.5 mile to the southwest of the park.

As described above, the proposed T/L route would loop around the core residential development areas of the Ritter Ranch and Anaverde specific plan areas. This route would be within proposed natural open space areas; however, the route would likely intercept various equestrian/bicycling/hiking trails, views/vistas, and special use areas. For reference, the depictions of those recreational features are presented in Exhibit 5 of the Ritter Ranch Specific Plan (Robert Bein, William Frost & Associates, 1992) and Exhibit 16 of the City Ranch (Anaverde) Specific Plan (Azeka De Almeida Planning, 1992c). If the Alternative AV2 T/L route were selected, there would be the potential that the T/L would be in proximity to a community center, elementary school, park, and swim center.

4.15.1.3 Los Angeles Unincorporated Areas

There are two regional parks in the northern unincorporated areas of Los Angeles County. These are the Castaic Lake Recreation area, and the William S. Hart Regional Park in Newhall. Neither is in the vicinity of any portion of the project. Both are 15 to 20 miles to the southwest.

Specialty parks or reserves in the region include:

- Vasquez Rocks Park, County Park along SR 14 approximately 10 miles west of the Vincent Substation at the southern end of the Segment 2 route
- Placerita Canyon Nature Center, a State-County preserve, located east of SR 14 and about 15 miles southwest of the Vincent Substation
- Antelope Valley Poppy Preserve, a State preserve located 4 miles northwest of the Antelope Substation

The Antelope Valley Trails Plan, within the Antelope Valley Area-wide General Plan (County of Los Angeles, 1986) designates a County-proposed trail generally along the California Aqueduct in the vicinity of the Segment 2 – Antelope to Vincent T/L route.

The Los Angeles County Department of Parks and Recreation owns eight wildlife sanctuaries in the Antelope Valley high desert area. These are:

- Alpine Butte
- Big Rock Wash
- Butte Valley

- Carl O. Gerhardy
- Jackrabbit Flat
- Mescal
- Phacelia
- Theodore Payne

None of these areas, which are used for passive recreation, are crossed by or in the vicinity of the proposed T/L, or either of the two substations associated with Segment 2 of the project.

4.15.1.4 Antelope Substation

The Antelope Substation is in the general vicinity of some of the regional recreational lands described above, but is not adjacent to or close by any of them.

4.15.1.5 Vincent Substation

The Vincent Substation is located south of SR 14 near its junction with the Angeles Forest Highway, which is a major access route to the Angeles National Forest. Although the substation is accessed from the Angeles Forest Highway, none of the transmission route or substation improvements would directly affect the highway.

4.15.2 Segment 3 (Antelope to Substations One and Two)

The Segment 3 proposed and Alternative A and Alternative B T/L routes originate at the Antelope Substation in the western end of the City of Lancaster. All three routes proceed in a northward direction through Los Angeles County and in a northward and northeastern trending direction within Kern County to their junctures with Proposed Substation One, 1A, and 1B, respectively (Figure 3-3).

The proposed 220 kV Substation One to Substation Two and Alternative C T/L line routes trend westward and northward over the Tehachapi Mountains to proposed and alternative Substation Two locations in the Tehachapi Valley (Figure 3-3).

From a regional perspective, all of the Antelope to Substation One and Two proposed alternative T/L routes and substation locations are within a relatively narrow corridor, little more than 2 miles apart at their widest. Unless noted otherwise herein, the Segment 3 project is discussed as a single corridor or facility when discussing its relationship to regional recreational facilities.

There are several parks and recreational facilities in the area, but none are located on or even adjacent to, any of the T/L route alternatives or substation location alternatives. The most notable is Tehachapi Mountain Park. Operated by Kern County, Tehachapi Mountain Park contains about 5,000 acres of picturesque hillsides, located about 6 miles to the southwest of the Substation Two site. Camping, hiking, equestrian activities, and nature exploring are all available at the park.

The proposed 220 kV T/L route between Substations One and Two crosses the Pacific Crest National Scenic Trail at approximately MP 30.5 (refer to Figure 3-3) of Segment 3, and the Alternative C 220 kV T/L route crosses the trail at approximately MP 5.2. In addition, the Pacific Crest Trail traverses the middle of Alternate Substation 1C. The area where the proposed (and alternate) project components intersect the Pacific Crest Trail are in the vicinity of existing roads and/or existing and planned wind farm development.

At the southern end of the Segment 3 project, the Antelope Valley California Poppy Preserve is located about 6 miles northwest from the Antelope Substation. The preserve is owned by the State of California and is used for passive recreation. At its closest approach, the Alternative B alignment for Segment 3 would be about 2 miles east of the preserve. There are two other T/L corridors between the preserve and the Segment 3 corridor (refer to Figure 3-1).

4.16 TRAFFIC AND TRANSPORTATION

4.16.1 Segment 2 500 kV and 220 kV T/L

4.16.1.1 Freeways and State Highways

The proposed new 20.0 miles of 500 kV T/L and 0.5 mile of 220 kV T/L between SCE's existing Antelope and Vincent Substations would be adjacent to existing T/L corridors over the majority of their lengths. Near its southern end, approximately 1 mile north of the Vincent Substation, the proposed T/L route crosses State Route 14 (refer to Figure 3-1). This portion of SR 14 is a 4-lane divided highway, and had a 2003 annual average daily traffic (ADT) volume of 93,000 vehicles. SR 14 is located in an important travel corridor, Soledad Pass, that connects the Santa Clarita and Los Angeles area to the Antelope Valley region containing the cities of Palmdale and Lancaster. There are also two frontage roads adjacent to the highway, Forest View Road on the north (or west) side and Sierra Highway on the south (or east).

4.16.1.2 Transit and Rail Service

4.16.1.2.1 Lancaster, Palmdale, and Nearby Areas. Local bus service is provided by the Antelope Valley Transit Authority (AVTA). AVTA operates 16 routes throughout the cities of Lancaster and Palmdale, and nearby communities. All of the operations of the AVTA are to the east of the proposed Segment 2 T/L route. The nearest current AVTA operations are in Lancaster and include Route 7, which extends westward to 60th Street W where it runs between Avenues H and L-8, and Route 5, which extends westward along Avenue L-12 to the Mayflower Gardens convalescent hospital and 67th Street W. At its point of closest approach, the Segment 2 T/L route is approximately 1.25 miles to the west of the nearest Route 5 stop.

AVTA also operates a commuter bus service between the Lancaster Transfer Center, where connections with local service are available, and employment centers in Los Angeles. Other park-and-ride facilities and a transfer center are located in Palmdale. Service is provided along the following routes:

Route	Destination
785	Downtown Los Angeles
786	West LA/Century City
787	West San Fernando Valley

This commuter bus service uses SR 14, which would be crossed by the proposed T/L route near its southern end.

The Amtrak and Metrolink station in Lancaster is at 44812 N. Sierra Highway, approximately 7 miles to the east of the Antelope Substation. Amtrak operates motor coaches that connect between Bakersfield and Palmdale. Metrolink is operated by the Southern California Regional Rail Authority, and offers commuter rail service to downtown Los Angeles, with stops at cities and communities between there and Lancaster. Another Metrolink Station is located at Vincent Grade/Acton, east of the southerly end of the proposed Segment 2 T/L route. Existing 500 kV and 220 kV lines pass from north to south, just west of the Metrolink Station parking lot, and the proposed new R-O-W would be immediately to the west of the existing lines.

The Union Pacific Railroad line is located approximately 10 miles east of the Antelope Substation, and east of SR 14 through Lancaster. This line carries freight traffic and the Metrolink commuter trains southward from Lancaster, as described above. Amtrak does not use this segment of rail line.

4.16.1.2.2 Los Angeles County Unincorporated Areas. The Los Angeles Metropolitan Transit Authority (MTA) provides transit bus service as far north as Sylmar, which is about 30 miles southwest of the southern terminus of the Segment 2 T/L route. The unincorporated areas of Los Angeles County north of this extent are served by the agencies and facilities described above. There are no Los Angeles MTA facilities or services in the area that would be affected by the Segment 2 T/L route.

4.16.1.3 Air Transportation

In the Lancaster area, General William J. Fox Airfield is a regional general aviation airport owned by Los Angeles County, and operated under contract by American Airports Corporation. There is no scheduled air service at this airport, but charter service and pilot support services are available. It is located approximately 5 miles northeast of the Antelope Substation.

The joint use Palmdale/Airforce Plant 42 airport is located approximately 15 miles southeast of the Antelope Substation, and about 10 miles northeast of the center portion of the Segment 2 T/L route. No passenger air service occurs at this airport, and prior permission is required for its use by the public.

There are no other general aviation or larger airports near the Segment 2 – Antelope to Vincent proposed T/L route.

4.16.1.4 Local Roadways

4.16.1.4.1 City of Lancaster. The northern end of the proposed Segment 2 500 kV T/L route is in the western portion of the City of Lancaster. Between its start at the Antelope

Substation, and its entrance into the City of Palmdale to the south, the existing R-O-W and proposed route for the new Segment 2 T/L crosses roads as summarized in Table 4.16-1.

TABLE 4.16-1
LOCAL ROADS, LANCASTER

Roadway	Description	Segment 2 Route Milepost[1]
Several unpaved local streets	2 lanes	0.0-0.9 (crosses)
West Ave. K	2 lanes	1.1 (crosses)
90th Street W	2 lanes	1.55 (crosses)
Ave K-8	2 lanes, unpaved	1.7 (crosses)
Ave K-12	2 lanes, unpaved	2.0 (crosses)
West Avenue L	2 lanes	2.3 (crosses)
80th Street W	2 lanes	3.35 (crosses)
City Limits	cross into Palmdale	3.55

[1] Refer to Figure 3-2 for locations.

These roadways are two-lane rural roads, or rural collectors, generally carrying less than 2,000 ADT.

4.16.1.4.2 City of Palmdale. The central portion of the Segment 2 T/L route passes through the western portion of the City of Palmdale. The developed neighborhoods of Palmdale are generally east of the Segment 2 route, and north of the California Aqueduct. Areas within the City and south of the aqueduct are more rural in character, and include the Ritter Ranch and Anaverde specific plan areas that are undergoing development. The City of Palmdale streets that are crossed by or near the proposed Segment 2 route are summarized in Table 4.16-2.

Godde Hill Road serves as a major road connecting Palmdale to Elizabeth Lake Road and the Leona Valley community to the southwest. Elizabeth Lake Road is another major connector through the Leona Valley, between the Elizabeth Lake community to the northwest and Palmdale to the east.

4.16.1.4.3 Los Angeles County Unincorporated Area. South of the City of Palmdale, the route for Segment 2 remains along the existing T/L corridor and continues towards the southeast through unincorporated Los Angeles County lands. The area is rural in nature, and crossed by a number of formal and informal unpaved roads and utility access trails. The named or more prominent local roads in this area are summarized in Table 4.16-3.

TABLE 4.16-2
LOCAL ROADS, PALMDALE

Roadway	Description	Segment 2 Route Milepost[1]
Pico Way, Dana Drive	2 lanes, residences	4.0 (1/8 mile sw of roads)
75th Street W	2 lanes	4.2 (crosses)
(crosses CA Aqueduct)		4.5 (crosses)
Poor Rd.	2 lanes, along Portal Ridge (restricted)	5/6-6.25 (crosses and adjacent to)
Godde Hill Road	2 lanes	6.5 crosses
Cherry Tree Lane	2 lanes	7.2 (0.2 mile n of road)
none	Cross into Ritter Ranch area	7.6
Elizabeth Lake Road (N2)	2 lanes	7.95 (crosses)
Anaverde Motorway	2 lanes, unpaved	12.3 (crosses)
Sierra Pelona Motorway	Cross into Anaverde area, unpaved	13.9
	Cross into L.A. County unincorporated area	15.0

[1] Refer to Figure 3-2 for locations.

TABLE 4.16-3
LOCAL ROADS, LOS ANGELES UNINCORPORATED AREA

Roadway	Description	Segment 2 Route Milepost[1]
Peaceful Valley Road	2 lanes, unpaved	17.1 (crosses)
Tuckerway Ranch Rd.	2 lanes, unpaved	18.6 (crosses)
Peaceful Valley Rd.	2 lanes, paved	19.9 (crosses)
Forest View Rd.	2 lanes	20.4 (crosses)
(frontage nw side of SR 14)		
SR 14	4 lanes, divided	20.45 (crosses)
Sierra Hwy.	2 lanes	20.5 (crosses)
(frontage se side SR 14)		
UR Railroad/Metrolink		20.7
Carson Mesa Rd.	2 lanes	20.7 (crosses)
Rockyford Road	2 lanes, unpaved	21.1 (crosses)
Vincent Substation		21.5 (end of route)

[1] Refer to Figure 3-2 for locations.

From Table 4.16-3, the most important roads are the paved frontage roads on either side of SR 14. This portion of SR 14, its frontage roads, and the Union Pacific Railroad all run through Soledad Canyon and Soledad Pass. This is an important travel corridor connecting the greater Los Angeles area and the Santa Clarita Valley from the southwest to the Palmdale and Antelope Valley region to the north.

4.16.2 Segment 2 Substations

4.16.2.1 Modifications to Antelope Substation

The Antelope Substation is located south of W. Avenue J, and east of 100th Street W., about 5 miles west of the center of Lancaster. There are no public roads in this area that would be permanently affected by the project.

4.16.2.2 Modifications to Vincent Substation

The Vincent Substation is located off of Angeles Forest Highway, approximately 1.5 miles south of its interchange with SR 14. The substation is accessed on a short driveway off of the Angeles Forest Highway. Rockyford Road and a series of service trails provide access around the perimeter of the substation. All of the modifications proposed at the Vincent Substation are within the property; no expansion of the substation area is proposed.

4.16.3 Segment 3 Antelope – Substations One and Two

4.16.3.1 Freeways and State Highways

The proposed alignment of the Segment 3 route crosses SR 138 on the western side of 105th Street. Alternatives A and B cross SR 138 on the eastern side of 100th and 110th Street W, respectively. All of these crossings are rural 2-lane unpaved roads. SR 138 is a 2-lane undivided highway, and carries an ADT volume of 4,200 vehicles. This portion of SR 138 is a regionally important east-west route across the Antelope Valley, connecting the north-south corridors of SR 14 on the east with Interstate 5 near Tejon Pass on the west.

In Kern County, only the most northerly portion of the Alternative C 220 kV T/L alignment to alternate Substation 2B (if selected) would cross a state highway: SR 58, east of Tehachapi. This portion of SR 58 is a 4-lane divided highway, and carries an ADT volume of 19,600.

4.16.3.2 Transit and Rail Service

4.16.3.2.1 Lancaster and Nearby Areas. The transit and rail service discussion presented in Section 4.16.1.2.1 is also applicable to Segment 3

4.16.3.2.2 Kern County and Tehachapi. The Kern Regional Transit service is operated by Kern County. Express bus service is provided from Bakersfield to Tehachapi, Rosamond, and Lancaster. Within Rosamond and Tehachapi, dial-a-ride service only is provided. During the summer months, Kern Regional Transit provides community service throughout Tehachapi.

The main line of the Union Pacific Railroad line (UPRR) occurs to the east and north of the Segment 3 route. The northernmost reach of the Alternative C 220 kV route between Substations One and Substation 2B crosses the UPRR.

A spur line from the UPRR main line serves the Cal Cement plant southeast of Tehachapi. This spur railroad line would be crossed by the proposed 500 kV T/L alignment and both Alternatives A and B. The points where the proposed and alternative Segment 3 500 kV T/L routes cross the Cal Cement spur rail line are shown in Table 4.16-4.

TABLE 4.16-4
CAL CEMENT RAILROAD SPUR T/L CROSSING LOCATIONS

Segment 3 Alternative	Approximate Milepost[1]	Approximate Miles East of Cal Cement
Proposed alignment	24.5	1
Alternative A	24.9	1.5
Alternative B	25.1	2

[1] Refer to Figure 3-3 for locations.

4.16.3.3 Air Transportation

In the Lancaster area, General William J. Fox Airfield is a regional general aviation airport owned by Los Angeles County, and operated under contract by American Airports Corporation. There is no scheduled air service at this airport, but charter service and pilot support services are available. It is located approximately 5 miles northeast of the Antelope Substation.

Mojave Airport is located about 6 miles to the east of the northerly portion of Segment 3. Mojave Airport is operated by the East Kern Airport District. Although there is no commercial air service, Mojave Airport is very active and serves general aviation and heavy transport. The airport property is also used by several major airlines to store large aircraft.

Mountain Valley Airport is located approximately 2 miles west of the proposed location for Substation Two. This is a privately owned airport that is open to public. Mountain Valley Airport serves general aviation, but is predominantly used for sailplane operations.

The Tehachapi Municipal Airport is located about 3 miles to the northwest of the proposed location for Substation Two (or about 2.5 miles west of alternative Substation 2B). This airport is operated by City of Tehachapi and is open to the public. It serves general aviation.

4.16.3.4 Local Roadways

4.16.3.4.1 City of Lancaster and Northern Los Angeles County. The southern end of Segment 3 is in the western portion of the City of Lancaster and unincorporated areas of northern Los Angeles County. Between its start at the Antelope Substation, and its entrance into Kern County to the north, the proposed route for the new Segment 3 T/L crosses roads as summarized in Table 4.16-5.

TABLE 4.16-5
LOCAL ROADS, LANCASTER AND NORTHERN LA COUNTY

		Segment 3 Route Approximate Milepost[1]		
Roadway	**Description**	**Proposed Route**	**Alternative A**	**Alternative B**
W. Ave. J	2 lanes, paved	0.4 (crosses)	Same	Same
100th St. W.	2 lanes, unpaved	0.5 (crosses)	Same	Same
Lancaster Bl.	Planned	1.0 (crosses	Same	Same
W Ave. I	2 lanes, paved	1.6 (crosses)	Same	Same
105th St.	2 lanes, paved	1.7 (crosses)	1.7 (crosses)	1.7 (crosses)
110th St. W.	2 lanes, paved	NA	NA	2.6 (crosses &/or along side)
W. Ave. H	2 lanes, unpaved	2.6 (crosses)	Same	2.75 crosses
W. Ave. G	2 lanes, paved	3.6 (crosses)	Same	4.85 crosses
W. Ave. F	2 lanes, unpaved	4.6 (crosses)	Same	4.75 crosses
W. Ave. E-8	2 lanes, unpaved	5.1 (crosses)	5.7 crosses	5.25 crosses
W. Ave. E	2 lanes, unpaved	5.6 (crosses)	6.2 crosses	5.75 crosses
W. Ave. D-8	unimproved & 2 lanes, unpaved	6.1 (crosses, unpaved)	7.7 crosses, unimproved	6.25 crosses, unpaved
SR 138	2 lanes, paved, undivided	6.6 (crosses)	7.2 crosses	6.75 crosses
W. Ave. C-8	2 lanes, unpaved	7.1 (crosses)	7.7 crosses	7.25 crosses
W. Ave. C	2 lanes, paved	7.6 (crosses)	8.2 crosses	7.75 crosses
W. Ave. B-8	2 lanes, unpaved	8.1 (crosses)	8.7 crosses (unimproved)	8.25 crosses (unimproved)
W. Ave. B	2 lanes, paved	8.6 (crosses)	9.2 crosses	8.8 crosses
W. Ave. A (Kern County Line)	2 lanes, unpaved	9.7 (crosses)	10.2 crosses	9.8 crosses

[1] Refer to Figure 3-3 for locations.

These named roadways are 2-lane rural roads, or rural collectors, generally carrying less than 2,000 ADT. There are many other unimproved dirt roads crossing the area, many providing access to agricultural fields.

4.16.3.4.2 Kern County West of Rosamond. The unincorporated areas of southern Kern County, through which the proposed Segment 3 T/L route would pass, are generally rural in nature. Relative to the adjacent lands in Los Angeles County, there is more irrigated agriculture land in Kern County, so the access roads surrounding farm fields are generally somewhat more improved. Table 4.16-6 summarizes the main roadways in the unincorporated Kern County areas that would be near to or affected by the project. There are many other unpaved roads throughout the routes, mainly providing access to agricultural areas, open recreational areas, and the wind resource area east of Tehachapi.

The proposed and alternative routes for Segment 3 all terminate east and outside of the City of Tehachapi.

4.16.4 Segment 3 Substations

The Antelope Substation is located south of W Avenue J, and east of 100th Street W., about 5 miles west of the center of Lancaster. There are no public roads in this area that would be permanently affected by the project.

The alternative locations for Substation One are all located south of Oak Creek Road, in southern Kern County, southeast of Tehachapi. There are a few narrow unpaved private roads in this area. Near the point where Oak Creek Road joins Tehachapi-Willow Springs Road, about 3.5 miles northwest of the Substation One location, is the location for Substation Alternative 1C. This area lies north of Oak Creek Road (2-lane, paved), and southeast of and adjacent to Cameron Canyon Road (2-lane, paved).

Highline Road is a paved 2-lane road west of Tehachapi Willow Springs Road, but is unpaved in the vicinity of the Substation Two and 2A sites.

The proposed location for Substation Two is another 4 miles to the northwest, at the easterly end of Highline Road. This is about 0.75 mile east of Tehachapi Willow Springs Road.

Finally, one more mile to the north is the Substation 2B alternative location. The Substation 2B site is north of Tehachapi Boulevard, and west of Williamson Road. Tehachapi Boulevard is a 4-lane arterial that roughly parallels SR 58. Williamson Road is a two lane unpaved road. None of the alternative locations for Substation Two would be directly on public streets, and all are accessible from the adjacent roadways.

TABLE 4.16-6
LOCAL ROADS – SOUTHERN KERN COUNTY

		Segment 3 Route Approximate Milepost[1]		
Roadway	**Description**	**Proposed Route**	**Alternative A**	**Alternative B**
Gaskell Road	2 lanes, paved	10.7 (crosses)	11.2 crosses	10.8 crosses
Sue Ave.	2 lanes, unpaved	NA	12.0	NA
Holiday Ave	2 lanes, unpaved	11.7 crosses	12.2 crosses	11.8 crosses
Barbham Ave., Matra Ave., Astoria Ave., Mojave Ave., Gobi Ave., Sahara Ave. Leslie Ave.	unimproved, unpaved local roads	NA	12.3-13.9 (crosses)	NA
LADWP Easement Road	unpaved	11.9-13.1 (parallels and crosses)	13.9-14.0 (crosses)	11.6-11.8 (crosses)
W. Rosamond Bl.	2 lanes, paved	12.75 (crosses)	13.2 crosses	12.8 crosses
Truman Rd.	2 lanes, unpaved	NA	14.0 (crosses)	NA
Lodestar Ave., Brightstar Ave., Ave. of the Stars., Starbuck Ave., Constellation Ave., Stardust Ave.,	2 lanes, unpaved	NA	14.4-15.1 (crosses)	NA
Sweetser Rd./ Hamilton Rd.	2 lanes, paved from 100th St. W. eastward	14.8 (crosses)	15.2 crosses	14.8 crosses (unpaved)
El Dorado Rd.	unimproved	NA	15.5	NA
Favorito Ave.	2 lanes, unpaved	15.3 (crosses)	15.7 (crosses)	15.3 (crosses)
Dawn Rd.	2 lanes, unpaved	15.8 (crosses)	16.25 (crosses)	15.8 (crosses)
McConnell Ave.	2 lanes, not continuous	NA	16.85 (crosses)	NA
Billie Ave	2 lanes, unpaved	NA	NA	16.4 (crosses)
Champagne Ave.	2 lanes, unpaved	16.9 (crosses)	17.3 crosses	16.8 crosses
Vim, Bright, Highgate, Troy, Sunbow Ave.	2 lanes, unpaved	16.9-17.7 (crosses)	17.4-18.1 (crosses)	16.9-17.7 (crosses)
Montiverde Rd.	2 lanes, unpaved	17.9 (crosses)	18.25 crosses	17.8 crosses
Champagne Rd.	2 lanes, unpaved	18.4 (crosses)	18.75 crosses	18.3 (crosses)
Backus Rd.	2 lanes, paved east of 100th St. W.	18.9 (crosses)	19.25 crosses	18.8 (crosses)

TABLE 4.16-6 (CONTINUED)
LOCAL ROADS – SOUTHERN KERN COUNTY

		Segment 3 Route Approximate Milepost[1]		
Roadway	**Description**	**Proposed Route**	**Alternative A**	**Alternative B**
General Petroleum Rd.	2 lanes, unpaved	19.4 (crosses)	20.1 (crosses)	NA
Trotter Ave.	2 lanes, unpaved	NA	20.3 (crosses)	19.8 (crosses)
LA Aqueduct	& service road	20.1 (crosses)	20.9 (crosses)	19.2 (crosses)
Reed Ave.	2 lanes, unpaved	20.9 (crosses)	21.3 (crosses)	20.8 (crosses)
Tehachapi Willow Springs Rd.	2 lanes, paved	21.0 (crosses)	21.0 (crosses)	21.5 (crosses)
Laguna Ave.	2 lanes, unpaved	NA	21.75 (crosses)	NA
100th St.	2 lanes, unpaved	23.0 (crosses)	NA	22.3 (crosses)
90th St. W.	2 lanes, unpaved	24.4 (crosses)	23.75 (crosses)	23.7 (crosses)
80th St. W.	2 lanes, unpaved	NA	NA	25.1 (joins from sw, then adj. to road)
Substation One, 1A, 1B		25.4 enters substation	25.65 enters 1A	25.8 enters 1B

		Segment 3 Route Approximate Milepost[1]	
Roadway	**Description**	**Proposed 220 kV**	**Alternative C**
Oak Creek Rd.	2 lanes, paved	25.6-27.4 (parallels then crosses)	0.0-1.8 (parallels then crosses)
90th St. W.	2 lanes, unpaved	26.2 (crosses)	0.6 (crosses)
Oak Creek Rd.	2 lanes, paved	29.2-30.0 (parallels)	3.6-4.3 (parallel)
Substation 1C		NA	4.4
Tehachapi-Willow Springs Rd.	2 lanes, paved	30.7 and 31.4 (two crossings)	NA
Cameron Cn. Rd	2 lanes, paved	NA	5.6
Substation Two/2A		35.2/NA	9.5 and 9.9
SR 58	4 lanes, divided	NA	10.1 (crosses)
Williamson Rd.	2 lanes, unpaved, portion unimproved	NA	10.6 (crosses)
E. Tehachapi Bl.	4 lanes, paved	NA	10.6 (crosses)
Substation 2B		NA	10.7

[1] Refer to Figure 3-3 for locations.
NA = not applicable.