

CHAPTER 4 – ENVIRONMENTAL SETTING

1.1 Introduction

This section describes existing environmental conditions within the study area for the proposed Viejo Substation site, the 220 kV transmission line improvements, and subtransmission line Alternatives 1A, 1B, and 1C. The purpose of this section is to characterize existing environmental conditions so that impacts associated with project construction, operation, and maintenance, can be accurately identified.

1.2 Aesthetics/Light and Glare

1.2.1 Proposed Substation Site

Currently, the proposed Viejo Substation site is a flat, graded, vacant parcel with some sparse areas of vegetation. There are no on-site sources of illumination or perimeter fencing. During hours of darkness, security lighting at adjacent light industrial facilities to the north/northwest and distant residential lighting can be seen from the site. Headlights from cars traveling along SR 241 Foothill Transportation Corridor and adjacent roadways are also visible. Because of the topography adjacent to the proposed site, the site is not visible from the residential properties located to the north/northeast. During hours of darkness, the site is not visible from neighboring light industrial properties. Figure 4-1 - Existing Project Site, shows the site looking northwest from south of the SR 241 Foothill Transportation Corridor.

1.2.2 Alternative 1A - Proposed Subtransmission Line

From the proposed Viejo Substation site south to the SR 241 Foothill Transportation Corridor, the 220 kV corridor is a mixture of disturbed bare ground and scrub (see Section 4.5 – Biological Resources). South of SR 241 Foothill Transportation Corridor, the 220 kV corridor passes through suburban areas and landscaped parklands with streets and residences located adjacent to both sides of the 220 kV corridor. Figure 4-2 – View of Existing Transmission/Subtransmission Line Corridor, shows a typical view of the 220 kV corridor looking south from a landscaped park area. As shown, the 220 kV structures and lines are clearly visible from neighboring residential properties, motorists and park users. There is no lighting along the 220 kV corridor. Security lighting within the parks illuminates the existing LSTs and TSPs making them partially visible during hours of darkness. There are no scenic views or resources located within the existing 220 kV corridor.

1.2.3 Alternative 1B - Subtransmission Line

Under this alternative, the 66 kV line would be installed overhead within the existing 220 kV corridor from the proposed Viejo Substation site south to Santa Margarita Parkway. The aesthetic character of this area is the same as that described above for the proposed 66 kV subtransmission line route. From Santa Margarita Parkway south to the Chiquita Substation, the line would be constructed underground within urban streets. Mixed-use commercial, residential and parklands are located along the Alternative 1B streets south of Santa Margarita Parkway. There are no scenic views or resources located within the existing roadways.

Insert Figure 4-1, Existing Project Site

Figure 1-1 Existing Project Site

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Insert Figure 4-2, View of Existing Transmission/Subtransmission Line Corridor

Figure 1-2 View of Existing Transmission/Subtransmission Line Corridor

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1.2.4 Alternative 1C - Subtransmission Line

The Alternative 1C route is entirely underground within SCE's proposed Viejo Substation site access road and urban roadways. The aesthetic character of the study area from Glen Ranch Road south to SR 241 is primarily undeveloped or light industrial. South of SR 241, the dominant visual features are urban roadways and adjacent sidewalks with associated landscaping, and mixed-use commercial, parklands and residential areas as described above for Alternative 1B. There are no scenic views or resources located along the Alternative 1C line route.

1.3 Agriculture Resources

There are no agricultural resources on or in the vicinity of the Viejo System Project.

1.4 Air Quality

1.4.1 Proposed Substation Site

The proposed Viejo Substation site and 220 kV corridor are located within the South Coast Air Quality Management District (SCAQMD). The SCAQMD's jurisdiction covers the South Coast Air Basin (SCAB) and is approximately 10,743 square miles in size, encompassing Los Angeles County, Orange County and the eastern portion of Riverside County.

The Federal Clean Air Act (CAA) of 1970 required the U.S. Environmental Protection Agency (EPA) to adopt ambient air quality standards. The National Ambient Air Quality Standards (NAAQS) represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. In addition to the federal NAAQS, states may establish ambient air quality criteria, as long as they are at least as stringent as the federal standards. Table 4-1, Federal and State Ambient Air Quality Standards, summarizes federal NAAQS and California Ambient Air Quality Standards (CAAQS). As shown, California standards for ozone and particulate matter are more stringent than the federal NAAQS.

Pursuant to the Clean Air Act as amended, the EPA is required to identify areas that fail to meet the NAAQS for the criteria pollutants listed in Table 4-1, Federal and State Ambient Air Quality Standards. Those areas are designated non-attainment areas for one or more pollutants. Air quality management agencies are required to prepare detailed plans defining how pollutant levels will be brought within the NAAQS.

The EPA in 2001, designated the SCAB as non-attainment for ozone (1-hour), carbon monoxide (CO), and PM10 (airborne particulates). The California Air Resources Board (CARB), the agency that oversees California air quality policies, further refined this designation based on jurisdictional boundaries and monitoring data finding that Orange County does meet federal and state carbon monoxide standards (California Air Resources Board, 2002).

Table 1-1 Federal and State Ambient Air Quality Standards

Air Pollutant	California	National	
	Standard	Primary	Secondary
Ozone (O_3)	0.09 ppm, 1-hr. average	0.12 ppm, 1-hr. average	0.12 ppm, 1-hr. average
Carbon Monoxide (CO)	9.0 ppm, 8-hr. average	9.0 ppm, 8-hr. average	9.0 ppm, 8-hr. average
	20 ppm, 1-hr. average	35 ppm, 1-hr. average	35 ppm, 1-hr. average
Nitrogen Dioxide (NO_2)	0.25 ppm, 1-hr. average	0.0534 ppm, annual average	0.0534 ppm, annual average
Sulfur Dioxide (SO_2)	0.25 ppm 1-hr.	0.03 ppm, annual average	0.50 ppm, 3-hr. average
	0.04 ppm, 24-hr. average	0.14 ppm, 24-hr. average	
Suspended Particulate Matter (PM10)	50 $\mu g/m^3$, 24-hr. average 30 $\mu g/m^3$ AGM	150 $\mu g/m^3$, 24-hr. average 50 $\mu g/m^3$ AAM	150 $\mu g/m^3$, 24-hr. average; 50 $\mu g/m^3$ AAM
Sulfates (SO_4)	25 $\mu g/m^3$, 24-hr. average		
Lead (Pb)	1.5 $\mu g/m^3$, monthly average	1.5 $\mu g/m^3$, calendar quarter	1.5 $\mu g/m^3$
Hydrogen Sulfide (H_2S)	0.03 ppm, 1-hr. average		
Vinyl Chloride	0.010 ppm, 24-hr. average		
Visibility-Reducing Particles	In sufficient amount to reduce prevailing visibility to less than 10 miles at relative humidity less than 70 percent, 1 observation		

ppm = parts per million by volume

AAM = annual arithmetic mean

AGM = annual geometric mean

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

Source: California Air Resources Board, 2002

The proposed Viejo Substation site is currently vacant; thus, no air emissions are directly generated by on-site equipment or operations. Because the site has been cleared and graded, some particulate matter in the form of fugitive dust may be generated during periods of high winds or other surface disturbance.

1.4.2 Alternative 1A - Proposed Subtransmission Line

The 220 kV corridor is located within the same air shed as the proposed Viejo Substation site. The air quality characteristics within the 220 kV corridor are the same as those described for the proposed Viejo Substation site.

The portion of the 220 kV corridor located adjacent to the SCE Viejo Conservation Bank traverses areas of disturbed native soils. Small quantities of fugitive dust may be generated during periods of high wind or during other surface disturbing maintenance activities. The southern portion of the 220 kV corridor traverses primarily landscaped parklands. These areas are not expected to contribute to pollutant or particulate concentrations within the surrounding air basin.

1.4.3 Alternative 1B - Subtransmission Line

Existing air quality characteristics are identical to those described for the proposed substation site and the existing 220 kV corridor described in Alternative 1A.

1.4.4 Alternative 1C - Subtransmission Line

Existing air quality characteristics are identical to those described for the proposed substation site and the existing 220 kV corridor described in Alternative 1A.

1.5 Biological Resources

This section summarizes the biological surveys conducted for each alternative. The proposed project is located within the Central and Coastal, and Proposed Southern Sub-regions of the County of Orange Natural Community Conservation Plan/Habitat Conservation Plan (NCCP) (Meade 1996). The proposed Viejo Substation site and 220 kV corridor areas north of El Toro Road are located within the Central and Coastal NCCP adjacent to the conservation bank designated by SCE. All areas south of El Toro Road, in the project area, are in the Proposed Southern NCCP. El Toro Road is the boundary between the Central and Coastal and Proposed Southern NCCP sub-regions. The Central and Coastal NCCP was approved by federal, state, and local entities in 1996 and SCE is a participating landowner. The Proposed Southern NCCP has not been approved. Figure 4-3 – Central and Coastal NCCP and Proposed Southern NCCP Boundary, shows the existing NCCP boundary related to the project study area.

Establishment of the Central and Coastal NCCP focused on coastal sage scrub, and three target species found predominantly in this habitat; the coastal California gnatcatcher (*Polioptila californica californica*), coastal cactus wren (*Campylorhynchus brunneicapillus*) and the orange-throated whiptail lizard (*Cnemidophorus hyperythrus beldingi*). A number of other habitat types and species were included in the planning process as “Covered Habitats” or “Identified Species” (Table 4-2 – NCCP Identified Species Including Conditionally Covered Species). Covered Habitats are those habitat types protected by the NCCP in a manner comparable to coastal sage scrub. Covered Habitats include: oak woodlands, Tecate cypress, chaparral, and cliff and rock habitats, none of which occur in the project area. Identified Species are species, including all life stages thereof, identified in the NCCP. The NCCP addresses these species as if they were listed as endangered species under the Federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA), and whose conservation and management is provided for in the NCCP. The Identified Species associated with coastal sage scrub habitat are covered through the regulatory process outlined in the NCCP. Generally, focused surveys for the Identified Species are not conducted, with the exception of Conditionally Covered species. Provisions for each of the Conditionally Covered species are detailed in the NCCP documents. Impacts to Conditionally Covered species are not fully mitigated by the NCCP process. Therefore surveys for these species must be conducted and appropriate mitigation measures applied.

Insert Figure 4-3 – Central and Coastal NCCP and Proposed Southern NCCP Boundary

Figure 1-3 Central and Coastal NCCP and Proposed Southern NCCP Boundary

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Table 1-2 NCCP Identified Species Including Conditionally Covered Species

Common Name	Scientific Name
Plant Species	
Catalina mariposa lily	<i>Calochortus catalinae</i>
Coulter's Matilija poppy	<i>Romneya coulteri</i>
Foothill mariposa lily ¹	<i>Calochortus weedii</i> var. <i>intermedius</i>
Heart-leaved pitcher sage	<i>Lepechinia cardiophylla</i>
Laguna Beach dudleya	<i>Dudleya stolonifera</i>
Nuttall's scrub oak	<i>Quercus dumosa</i>
Santa Monica Mts. Dudleya	<i>Dudleya cymosa</i> spp. <i>ovatifolia</i>
Small-flowered mountain mahogany	<i>Cercocarpus minutifolia</i>
Tecate cypress	<i>Cupressus forbesii</i>
Wildlife Species	
Arboreal salamander	<i>Aneides lugubris</i>
Arroyo toad ¹	<i>Bufo californicus</i>
Black-bellied salamander	<i>Batrachoseps nigrovittatus</i>
California horned lark	<i>Eremophila alpestris actia</i>
Coastal cactus wren	<i>Campylorhynchus brunneicapillus</i>
Coastal California gnatcatcher	<i>Polioptila californica californica</i>
Coastal rosy boa	<i>Lichanura trivirgata roseofusca</i>
Coastal western whiptail lizard	<i>Cnemidophorus tigris multiscutatus</i>
Coronado skink	<i>Eumeces skiltonianus interparietalis</i>
Coyote	<i>Canis latrans</i>
Golden eagle ¹	<i>Aquila chrysaetos</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Least Bell's vireo ¹	<i>Vireo bellii pusillus</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Northern harrier	<i>Circus cyaneus</i>
Orange-throated whiptail lizard	<i>Cnemidophorus hyperythrus beldingi</i>
Pacific pocket mouse ¹	<i>Perognathus longimembris pacificus</i>
Peregrine falcon	<i>Falco peregrinus</i>
Prairie falcon ¹	<i>Falco mexicanus</i>
Quino (Wright's) checkerspot ¹	<i>Euphydryas editha quino</i>
Red diamond rattlesnake	<i>Crotalus ruber ruber</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Riverside fairy shrimp ¹	<i>Streptocephalus woottoni</i>
Rough-legged hawk	<i>Buteo lagopus</i>
San Bernardino ringneck snake	<i>Diadophis punctatus modestus</i>
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>
San Diego fairy shrimp ¹	<i>Branchinecta sandiegensis</i>
San Diego horned lizard	<i>Phrynosoma coronatum blainvilliei</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Southern California rufous-crowned sparrow	<i>Aimophila ruficeps canescens</i>
Southwestern willow flycatcher ¹	<i>Empidonax traillii extimus</i>

¹ Conditionally covered species

Implementation of the Central and Coastal NCCP through the dedication of lands and endowment by the participating landowners mitigates the impacts of proposed and future development on covered habitats and Identified Species by these participating landowners. SCE is one of the participating landowners in the Central and Coastal NCCP. Participation in this NCCP mitigates the construction impacts of the Viejo Substation and 220 kV corridor areas north of El Toro Road on Covered Habitats and Identified Species. The Proposed Southern NCCP has not been approved and SCE is not currently a participating landowner. Notwithstanding, no significant impacts are anticipated in this area.

1.5.1 Methodology

The survey area consisted of a 300-foot wide band, which was 150 feet on either side of the centerline between the 66 kV subtransmission lines and the 220 kV transmission lines. Although the survey area was 300 feet wide, SCE would try to limit impacts to previously disturbed areas located in the 220 kV corridor during construction. Prior to the field survey, records from the California Natural Diversity Database (CDFG, 2002) were reviewed regarding the potential occurrence of any sensitive species or habitat within the study area. In addition, previous studies conducted within the northern portion of the study area were also reviewed, including Summary of Biological Resources, Southern California Edison Viejo Conservation Bank Property, June 2000, by PCR Services Corporation; A Biological Resources Analysis-Southern California Edison Property, February 1993, by P&D Technologies; and Biological Resources Technical Report Los Angeles-San Diego Fiberlink Project, June 2000, by AMEC Earth & Environmental. Field surveys were then conducted, which included vegetation mapping, sensitive plant and wildlife surveys, and focused surveys for coastal California gnatcatcher.

1.5.1.1 Vegetation Mapping

Field surveys for vegetation mapping were conducted on 3 June, 11 July, and 16 August 2002. Plant communities were mapped onto ortho-rectified aerial photographs of the study area provided by SCE (Figures 4-4a, 4-4b, 4-4c – Vegetation Mapping and Biological Resources). The surveys were conducted by walking all areas of proposed disturbance. The vegetation classification system follows the system adopted for Orange County (Jones & Stokes 1993), which is roughly equivalent to mapping at the association level and consists of using the common name of the two most common species in the designation along with the vegetation type. A plant species list was compiled during the vegetation mapping and is provided as Appendix C, Plant Species Observed Onsite List, to this document. Scientific nomenclature follows the *Jepson Manual, Checklist of the Vascular Plants of San Diego County*, and *California Native Plant Society's Inventory of Rare and Endangered Plants of California* (Hickman et. al. 1993; Simpson & Rebman 2001; CNPS 2001).

Insert Figure 4-4a, Vegetation Mapping and Biological resources

Figure 1-4a Vegetation Mapping and Biological Resources

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Insert Figure 4-4b, Vegetation Mapping and Biological resources

Figure 1-4b Vegetation Mapping and Biological Resources

"Blue hills.jpg"

Insert Figure 4-4c, Vegetation Mapping and Biological resources

Figure 1-4c Vegetation Mapping and Biological Resources

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1.5.1.2 Sensitive Plant Surveys

All plant species designated or listed by the California Department of Fish and Game (CDFG) and/or United States Fish and Wildlife Service (FWS) as endangered, threatened, rare, candidate, proposed, or listed as sensitive by the California Native Plant Society (CNPS) will be referred to as sensitive in this report. All Identified Species including conditionally covered species were included in the survey (Table 4-3). Sensitive plant surveys were also conducted for all other sensitive plant species with the potential to occur or that are known to occur in the vicinity of the proposed substation and 220 kV corridor, such as thread-leaved brodiaea (*Brodiaea filifolia*). Surveys were conducted in all areas proposed for disturbance such as the pole removal areas, the LST and TSP installation areas, and any other areas identified for disturbance that have the potential to support sensitive plant species. The majority of potentially suitable habitat for sensitive plant species occurs in the northern portion of the study area north of El Toro Road in the Central and Coastal NCCP. South of El Toro Road, only one area has potential to support sensitive plant species. Field surveys for sensitive plant species and Central and Coastal NCCP Identified Species were conducted on 16 August 2002. Since this survey was conducted in late summer, only late blooming annual species and perennial species would have been detected. Sensitive plant surveys will be conducted during the Spring of 2003 to detect annual and bulb species that were not found during the surveys performed in the Summer of 2002 due to drought conditions and the timing of surveys.

1.5.1.3 Sensitive Wildlife Surveys

Surveys were conducted for sensitive wildlife species known to occur within the vicinity of the study area and/or that have the potential to occur in the study area (Table 4-4). Reconnaissance level wildlife surveys were conducted on 12 June, 11 July, 16 August, and 23 August in conjunction with vegetation mapping. The project site was traversed on foot to survey each vegetation community for evidence of wildlife. All wildlife and wildlife signs, including tracks, fecal material, nests and vocalizations were recorded. A complete wildlife species list is provided in Appendix D to this document. All sensitive wildlife species encountered were mapped and added to project Geographic Information System (GIS) database along with attributes, such as number of individuals.

1.5.1.4 Focused Wildlife Surveys

Participation in the Central and Coastal NCCP allows for the authorized take of coastal sage scrub and many of the associated wildlife and plant species that are covered under the NCCP, namely the coastal California gnatcatcher. No focused surveys were conducted within the coastal sage scrub covered habitat in the Central and Coastal Subregion of the NCCP because take of these species is authorized. Focused surveys for the coastal California gnatcatcher were conducted in potentially suitable habitat in the study area located in the proposed Southern NCCP Subregion.

Coastal California Gnatcatcher Surveys: To determine the presence/absence, distribution and abundance of coastal California gnatcatchers in the study area, FWS protocol surveys were conducted for all potentially suitable habitat identified in the proposed Southern NCCP Subregion. AMEC biologists David King, TE-785148 and Julie Simonsen-Marchant, TE-007520

conducted the surveys. Surveys were conducted between June and August 2002 (Table 4-5), following coastal California gnatcatcher protocol guidelines issued by the FWS (FWS 1997). The surveys were conducted during the morning hours (prior to noon) on 12 June, 11 July, and 23 August, when the temperature exceeded 55°F. No more than 100 acres were surveyed by each biologist per day, and no surveys occurred during windy (>15 miles per hour), rainy, or extremely hot (>95°F) conditions. Each area was surveyed 3 times, with a minimum of 7 days between surveys.

Coastal California gnatcatcher locations were mapped on color aerial photographs and digitized using GIS (Figure 4-4A). Any other sensitive species that were observed onsite were noted.

Table 1-3 Sensitive Plant Species and NCCP Identified Species (IS) That Have the Potential to Occur in the Study Area, Protective Status and Habitat

Species	Status ¹	IS	Potential to Occur in Central and Coastal NCCP	Potential to Occur in Proposed Southern NCCP	Located During 2002 Survey in Study Area	Habitat
<i>Aphanisma blitoides</i> Aphanisma	Federal: None State: None CNPS: 1B	No	Medium	Low	No	Annual herb; blooms March-June; occurring in sandy soil in coastal bluff scrub, coastal dunes, and coastal scrub.
<i>Brodiaea filifolia</i> Thread-leaved Brodiaea	Federal: Threatened State: Endangered CNPS: 1B	No	High	Low	No	Herbaceous perennial; blooms March to June; occurring in heavy clay soils in native grasslands, nonnative annual grasslands, and vernal pools in the interior valleys.
<i>Calochortus catalinae</i> Catalina Mariposa Lily	Federal: None State: None CNPS: 4	Yes	Medium	Low	No	Perennial herb; blooms May to July; occurring in loamy soils in chaparral, coastal sage scrub, and montane coniferous forest.
<i>Calochortus plummerae</i> Plummer's Mariposa Lily	Federal: None State: None CNPS: 1B	No	High	Low	No	Perennial herb; blooms February to May; occurring in heavy soils, open grassy slopes and opening in brush in chaparral, coastal sage scrub, and valley and foothill grassland.
<i>Calochortus weedii var. intermedius</i> (Weed's) Foothill Mariposa Lily	Federal: None State: None CNPS: 1B	Yes	Medium	Low	No	Perennial herb; in bloom from May-July; habitat is dry rocky open slopes and hills in chaparral, coastal sage scrub, valley & foothill grassland.
<i>Centromadia parryi ssp. australis</i> Southern Spikeweed	Federal: None State: None CNPS: 1B	No	Low	Low	No	Annual herb; flowering between June and November; occurs in seasonally moist (saline) grassland, sometimes growing intertwined with <i>Deinandra fasciculata</i> in valley and foothill grasslands, marsh and swamp (estuary margins), and vernal pools; occasionally found along flood control ditches (Roberts 1990).

Species	Status ¹	IS	Potential to Occur in Central and Coastal NCCP	Potential to Occur in Proposed Southern NCCP	Located During 2002 Survey in Study Area	Habitat
<i>Chorizanthe parryi</i> var. <i>fernandina</i> San Fernando Valley Spineflower	Federal: Candidate State: Candidate CNPS: 1B	No	Medium	Low	No	Annual herb; blooms April-June; occurs in mostly sandy, sandstone outcrops to gravelly areas in coastal sage scrub and chaparral.
<i>Dichondra occidentalis</i> Western Dichondra	Federal: None State: None CNPS: 4	No	High	Low	No	Perennial herb; flowering from March-May; a fire follower, occurring in disturbed areas, in open areas and slopes and sandy banks, under shrubs or trees in chaparral, coastal sage scrub, southern oak woodland.
<i>Dudleya multicaulis</i> Many Stemmed Dudleya	Federal: None State: None CNPS: 1B	No	Low	Low	No	Perennial herb; flowering in May-July; microhabitat is rocky outcrops, clay soil in chaparral, coastal sage scrub, valley and foothill grassland.
<i>Harpagonella palmerii</i> Palmer's Grapplinghook	Federal: None State: None CNPS: 4	No	High	Low	No	Annual herb; flowering from March to May; occurring in chaparral, coastal scrub, and valley and foothill grassland.
<i>Nolina cismontana</i> Chaparral Nolina	Federal: None State: None CNPS: 1B	No	High	Low	No	Evergreen shrub; flowering from May to July; occurring in chaparral, coastal scrub on sandstone or gabbro soil.
<i>Quercus dumosa</i> Nuttall's Scrub Oak	Federal: None State: None CNPS: 1B	Yes	Medium	Low	No	Evergreen shrub; flowering from February-March; microhabitat is sandy or clay loam soil, sandstone, near coast in chaparral, or coastal sage scrub; occurs within 2 miles of the coast.

Federal-United States Fish and Wildlife:

Threatened: comprises species, subspecies, or varieties likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

Candidate: species, subspecies, or varieties are those plants being considered for listing as endangered or threatened, but for which a proposed regulation has not yet been published in the Federal Register.

State-California Department of Fish and Game:

Endangered: species in serious danger of becoming extinct throughout all, or a significant portion, of their range due to one or more causes, including loss of habitat, over exploitation, competition, or disease.

Rare plants: native California plant species, subspecies or varieties that, although not presently threatened with extinction, are in such small numbers throughout their range that they may become endangered if their present environment worsens.

Candidate: species that are under consideration for listing as threatened or endangered.

CNPS-California Native Plant Society (CNPS): List 1B indicates species rare, threatened, or endangered in California and elsewhere; CNPS List 4 denotes plants of limited distribution (a watch list).

Table 1-4 Federal and State Endangered, Threatened and Sensitive Wildlife Species and NCCP Identified Species (IS) That Have the Potential to Occur in the Study Area, Protective Status, and Habitat

Scientific Name	Status ¹	IS	Potential to Occur in Central and Coastal NCCP	Potential to Occur in Proposed Southern NCCP	Located During 2002 Survey in Study Area	Habitat
<i>Accipiter cooperii</i> Cooper's Hawk	CSC	No	High	High	No	Mature forests, open woodlands, wood edges, river groves, riparian woodland.
<i>Accipiter striatus</i> Sharp-shinned Hawk	CSC	Yes	High	High	No	Wide variety of habitats used by wintering and migrating birds, but mostly associated with woodland and scrubland; breeds in mountains.
<i>Aimophila ruficeps canescens</i> Southern California Rufous-crowned Sparrow	CSC	Yes	High	Moderate	No	Sage scrub with interspersed grassy or rocky open areas.
<i>Anniella pulchra pulchra</i> Silvery Legless Lizard	CSC	No	High	Low	No	Sandy or loose soils in beaches, chaparral, oak woodland, coastal sage scrub.
<i>Aquila chrysaetos</i> Golden Eagle	CSC	Yes	High	High	No	Open mountains, foothills, plains, open country.
<i>Buteo lineatus</i> Red-shouldered Hawk	None	Yes	High	High	No	Riparian woodland specialist, oak and sycamore woodlands.
<i>Buteo regalis</i> Ferruginous Hawk	CSC	No	High	High	No	Plains, prairies, grasslands.
<i>Campylorhynchus brunneicapillus</i> Coastal Cactus Wren	CSC	Yes	High	Low	Yes	Sage scrub with extensive stands of cacti species such as prickly-pear (<i>Opuntia</i> spp.) and cholla (<i>Cylindropuntia</i> spp.).
<i>Circus cyaneus</i> Northern Harrier	CSC	Yes	High	High	No	Grassland, marshes, agricultural land, open areas in scrub and chaparral; ground or shrub nesting.

Scientific Name	Status ¹	IS	Potential to Occur in Central and Coastal NCCP	Potential to Occur in Proposed Southern NCCP	Located During 2002 Survey in Study Area	Habitat
<i>Clemmys marmorata pallida</i> Southwestern Pond Turtle	CSC	No	Low	Low	No	Slow-water aquatic habitats, ponds, marshes, rivers, streams and irrigation ditches, adjacent open habitats for nesting.
<i>Cnemidophorus hyperythrus beldingi</i> Orange-throated Whiptail	CSC	Yes	High	Low	No	Open, sparsely covered land, often with well-drained sandy or loose soils in coastal sage scrub, grassland, chaparral, oak woodland and riparian habitats.
<i>Crotalus ruber ruber</i> Northern red-diamond Rattlesnake	CSC	Yes	High	Moderate	No	Openings or edges in chaparral, sage scrub, woodlands and other habitats with heavy brush- often associated large rocks or boulders.
<i>Elanus leucurus</i> White-tailed Kite	CSC	No	High	High	No	Forages in grasslands; nests and roosts in oak and riparian woodland.
<i>Eremophila alpestris actia</i> California Horned Lark	CSC	No	High	High	Yes	Grasslands and open habitats such as agricultural fields, beaches and disturbed areas.
<i>Eumeces skiltonianus interparietalis</i> Coronado Island Skink	CSC	Yes	High	Low	No	Mesic areas of coastal sage scrub, chaparral, grasslands and woodlands.
<i>Euphydryas editha quino</i> Quino Checkerspot Butterfly	FE	Yes	High	Low	No	Scrub and chaparral habitats with openings containing host plant and nectar species.
<i>Phrynosoma coronatum blainvilliei</i> San Diego Horned Lizard	CSC	Yes	High	Moderate	No	Sandy washes and open sandy areas within coastal sage scrub, grassland, chaparral, oak and riparian woodland.
<i>Polioptila californica californica</i> Coastal California Gnatcatcher	FT	Yes	High	Moderate	Yes	Sage scrub with California sagebrush and flat-topped buckwheat as the dominant species.
<i>Salvadora hexalepis virgulnea</i> Coast Patch-nosed Snake	CSC	No	High	Low	No	Associated with brushy or shrubby vegetation, often near drainages.

Scientific Name	Status ¹	IS	Potential to Occur in Central and Coastal NCCP	Potential to Occur in Proposed Southern NCCP	Located During 2002 Survey in Study Area	Habitat
<i>Scaphiopus hammondi</i> Western Spadefoot Toad	CSC	Yes	High	Low	No	Grassland, open habitats with sandy or gravelly soil; temporary rainpools for breeding.
<i>Taricha torosa torosa</i> Coast Range Newt	CSC	No	Moderate	Low	No	Scrub, chaparral, woodland; ponds, reservoirs and slow moving streams for breeding.
Federal-United States Fish and Wildlife:						
Endangered: comprises species, subspecies, or varieties in danger of extinction throughout all or a significant portion of their range.						
Threatened: comprises species, subspecies, or varieties likely to become endangered within the foreseeable future throughout all or a significant portion of their range.						
State-California Department of Fish and Game:						
Species of Concern (CSC): : wildlife species that are not listed under California or federal Endangered Species Act, but are known to be declining and/or have historically occurred in low numbers and have known threats to their existence that could eventually lead to listing.						

Table 1-5 Coastal California Gnatcatcher Surveys in the Study Area within Proposed Southern NCCP Sub-region

Date	Personnel ¹	Patch	Notes	Weather
6/12/02	JSM	South of Los Alisos Road;	No CAGN observed	Morning survey; 68°F; 0% cloud cover and hazy, 1-3 mph winds
		South of El Toro Road	No CAGN observed	
7/11/02	JSM	South of Los Alisos Road;	No CAGN observed	Morning survey; 72°F, 100% cloud cover, 0-3 mph winds
		South of El Toro Road	No CAGN observed	
8/23/02	DK/JW	South of Los Alisos Road;	No CAGN observed	Mid-morning survey; 78°F; 0% cloud cover, 1-3 mph winds
		South of El Toro Road	No CAGN observed	

¹ JSM= Julie Simonsen-Marchant, DK= David King, JW= Jessica Walker

1.5.2 Existing Biological Conditions

The following discussion outlines the existing vegetation and habitats, sensitive plant species, wildlife, and sensitive wildlife. These existing conditions are then summarized as they pertain to the proposed Viejo Substation site, Subtransmission Line Alternative 1A, Alternative 1B, and Alternative 1C.

1.5.2.1 Vegetation and Habitats

The vegetation classification system follows the system adopted for Orange County (Jones & Stokes 1993). The vegetation associations are discussed below and then the associations are identified as they occur at the proposed Viejo Substation site and Subtransmission Line Alternative 1A, Alternative 1B and Alternative 1C (Figures 4-4a, 4-4b, and 4-4c).

California Sagebrush-California Buckwheat Scrub: The dominant species in a California Sagebrush-California Buckwheat Scrub California association are California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) with white sage (*Salvia apiana*), black sage (*Salvia mellifera*), bush monkey flower (*Mimulus aurantiacus*), California encelia (*Encelia californica*), deerweed (*Lotus scoparius*), and others as the associated species. The understory consists of foothill needle grass (*Nassella lepida*), fescue (*Vulpia* sp.), brome grass (*Bromus* spp.), cudweed (*Gnaphalium bicolor*), blue dicks (*Dichelostemma capitatum*), and bedstraw (*Galium* spp.) (Jones and Stokes 1993). California Sagebrush-California Buckwheat Scrub is located in the Central and Coastal NCCP.

Southern Cactus Scrub: Southern cactus scrub consists of scrub vegetation dominated by cacti and coastal sage scrub species. The presence of coast prickly pear cactus (*Opuntia littoralis*) and/or tall coastal prickly pear (*Opuntia oricola*) at 20% or more relative cover defines this

community. Codominant or subdominant species include California encelia, California sagebrush, California buckwheat, black sage, and Mexican elderberry (*Sambucus mexicana*). The understory is comprised of foothill needle grass, bent grass (*Agrostis* sp.), and forb species (Jones and Stokes 1993). Southern Cactus Scrub is only located in the Central and Coastal NCCP.

Southern Cactus Scrub/Toyon-Sumac Chaparral: Southern Cactus Scrub/Toyon-Sumac Chaparral is a combination of the two associations. Toyon-Sumac Chaparral is dominated by toyon (*Heteromeles arbutifolia*), laurel-leaf sumac (*Malosma laurina*), and lemonadeberry (*Rhus integrifolia*) in dense stands that are often on mesic north-facing slopes near the coast. Other species include hollyleaf red-berry (*Rhamnus ilicifolia*), and fuchsia-flowered gooseberry (*Ribes speciosum*) (Jones and Stokes 1993). Southern Cactus Scrub/Toyon-Sumac Chaparral is only located in the Central and Coastal NCCP.

Sage Scrub-Grassland Ecotone: Sage Scrub-Grassland Ecotone is an open shrub/grassland with 5-20% shrub cover. Common shrubs include goldenbush (*Isocoma menziesii*), California sagebrush, Palmer's goldenbush (*Ericameria palmeri*), and California buckwheat. Subshrubs and forbs are key elements and include boundary goldenbush (*Ericameria brachylepis*), virgate cudweed-aster (*Lessingia filaginifolia* var. *virgata*), California matchweed (*Gutierrezia californica*), Spanish-clover (*Lotus purshianus*), and perennial mustard (*Hirschfeldia incana*), in addition to other species. Grasses such as wild oats (*Avena* spp.), brome grass, rattle fescue (*Vulpia myuros*), and purple needle grass (*Nassella pulchra*) often dominate the cover in this association (Jones and Stokes 1993). Sage Scrub-Grassland Ecotone is only located in the Central and Coastal NCCP.

Toyon-Sumac Chaparral: See the discussion for Southern Cactus Scrub/Toyon-Sumac Chaparral for the description of Toyon-Sumac Chaparral.

Willow Riparian Scrub (Southern Willow Scrub): Willow species (*Salix* spp.) and saplings of riparian forest species dominate Willow Riparian Scrub. Common willow scrub dominants include arroyo willow (*Salix lasiolepis*) and narrow-leaved willow (*Salix exigua*) with lesser amounts of mulefat (*Baccharis salicifolia*). Willow Riparian Scrub (Southern Willow Scrub) is located in the Central and Coastal NCCP and Proposed Southern NCCP.

Sycamore Riparian Woodland (Southern Sycamore Riparian Woodland): Sycamore Riparian Woodland consists of open to dense woodlands dominated by California sycamore (*Platanus racemosa*) with coast live oak (*Quercus agrifolia*) and scalebroom scrub, mulefat scrub, or willow riparian scrub as an understory, as well as hollyleaf red-berry, laurel-leaf sumac, elderberry, fuchsia flowered gooseberry, toyon, poison oak (*Toxicodendron diversilobum*), giant rye grass (*Leymus condensatus*), beardless wild rye (*Leymus triticoides*), and lemonadeberry. Large areas dominated by brome grass are often present (Jones and Stokes 1983). Sycamore Riparian Woodland (Southern Sycamore Riparian Woodland) is located in the Central and Coastal NCCP.

Mulefat Scrub: Mulefat Scrub consists of dense stands of mulefat with lesser amounts of willow species. It usually occurs on intermittent streambeds, seeps, and in areas of disturbance. Some

associated species include Bermuda grass (*Cynodon dactylon*), California mugwort (*Artemisia douglasiana*), nightshade (*Solanum* sp.), cocklebur (*Xanthium strumarium*), and other disturbance related native and nonnative species (Jones and Stokes 1993). Mulefat Scrub is located in the Central and Coastal and the Proposed Southern NCCP.

Annual Grassland: Annual Grasslands are characterized by disturbance and are dominated by annual grass species that are mostly of nonnative, Mediterranean origin. The dominant species include brome grass, wild oats, ratail fescue, and barley species (*Hordeum* spp.). Many native forbs and herbs are also found in annual grasslands, but the level of disturbance in these annual grasslands often impacts the species' richness. Annual Grassland is located in the Central and Coastal and the Proposed Southern NCCP.

Disturbed Coastal Sage Scrub: Disturbed Coastal Sage Scrub is characterized by mechanically disturbed soils and subsequent regrowth of both nonnative and sage scrub species. This community applied to portions of the study area when sage scrub species were present in a disturbed area but not enough of the characteristic species were present for it to be considered a subassociation outlined in the Orange County habitat hierarchical habitat classification system. Disturbed Coastal Sage Scrub is located in the Proposed Southern NCCP.

Disturbed Riparian: Disturbed Riparian is classified for this report as riparian areas that have less than 10 percent native riparian plant species and dominated by nonnative plant species. Nonnative grass dominants the understory and nonnative, woody species such as ash (*Fraxinus* sp.) and ornamental almond (*Prunus* sp.) dominate the canopy. Disturbed riparian does not correspond to a subassociation from the Orange County habitat hierarchical habitat classification system. Disturbed riparian is located west of the Chiquita Substation.

Ruderal: Ruderal grassland (Ruderal) consists of early successional grassland dominated by pioneering herbaceous plants that readily colonized disturbed ground. Ruderal grassland is dominated by many grassland species such as star thistle (*Centaurea* spp.), mustard (*Brassica* spp.), Russian thistle (*Salsola tragus*), turkey mullein (*Eremocarpus setigerus*), and other disturbance related species (Jones and Stokes 1993). Ruderal is located in the Central and Coastal NCCP and the Proposed Southern NCCP.

Disturbed: Disturbed areas are cleared or graded areas that lack vegetation or are dominated by a sparse cover of ruderal vegetation, such as star thistle, wild oats, black mustard, and other disturbance related species (Jones and Stokes 1993). Disturbed is located in the Central and Coastal NCCP and the Proposed Southern NCCP.

Landscaped: Ornamental landscaping such as parks and ornamental plantings consist of introduced trees, shrubs, flowers, and turf grass (Jones and Stokes 1993). Landscaped is located in the Proposed Southern NCCP.

Revegetated Coastal Sage Scrub: There are two locations with Revegetated Coastal Sage Scrub in the study area, south of El Toro Road and south of Los Alisos Road. The dominant species south of El Toro Road were California sagebrush and rock-rose (*Cistus* sp.). The dominant species south of Los Alisos Road was brittle-bush (*Encelia farinosa*). The majority of

the species in both locations are not native to coastal sage scrub in Southern California. Revegetated Coastal Sage Scrub does not correspond to a subassociation from the Orange County habitat hierarchical habitat classification system. Revegetated Coastal Sage Scrub is located in the Proposed Southern NCCP only.

Developed: The developed areas include all infrastructures, commercial, nonurban commercial, industrial, and institutional areas (Jones and Stokes 1993). Developed is located in the Proposed Southern NCCP.

- *Proposed Substation Site*

The proposed Viejo Substation site was graded in 1994 (Marwah 2002) and is considered disturbed.

- *Alternative 1A - Proposed Subtransmission Line*

This alternative would be constructed above ground. The vegetation associations that occur in the vicinity of this alternative in the Central and Coastal NCCP generally consist of California sagebrush-California buckwheat scrub, southern cactus scrub, southern cactus scrub/toyon-sumac chaparral, toyon-sumac chaparral, willow riparian scrub, sycamore riparian woodland, mule fat scrub, annual grassland, ruderal, and disturbed. The vegetation associations that occur in the vicinity of this alternative in the Proposed Southern NCCP south of El Toro Road consist primarily of revegetated coastal sage scrub, disturbed, disturbed riparian, landscaped and developed areas.

- *Alternative 1B – Subtransmission Line*

The northern segment of this alternative would be constructed above ground. Conditions are the same as described for the Alternative 1A route between the proposed Viejo Substation and Santa Margarita Parkway. The above ground portion of this alternative consists of mostly developed and landscaped areas. Annual grassland, disturbed areas, and a minor amount of revegetated coastal sage scrub also occur. The segment south of Santa Margarita Parkway would be underground within urban streets.

- *Alternative 1C – Subtransmission Line*

Alternative 1C would be constructed underground within urban streets. Developed and landscaped areas occur adjacent to the streets but would not be affected by construction of this alternative.

1.5.2.2 Sensitive Plants

This section discusses the results of sensitive plant species surveys that were conducted and discusses whether suitable habitat for these species was located within the study area. It was not possible to fully detect sensitive annual plant or bulb species in the study area during surveys conducted in the year 2002 due to drought conditions. Subsequent surveys will be

performed during the spring of 2003 for these species. Refer to Table 4-3, for a more detailed description of the sensitive plant species that have the potential to occur in the study area, including a ranking of potential occurrence. A species list of plant species observed on site is included in Appendix C.

- *Proposed Substation Site*

Due the disturbed nature of the site, no sensitive plant species are known to occur on the proposed Viejo Substation site. Field surveys confirmed that no sensitive species or suitable habitat occurs on the proposed Viejo Substation site.

- *Alternative 1A - Proposed Subtransmission Line*

One sensitive plant species, thread-leaved brodiaea, is known to occur in the vicinity of the Central and Coastal NCCP portion of this alternative (CDFG 2002). This species is listed as threatened under the Federal Endangered Species Act of 1973 as amended. This species is also listed as endangered under the California Endangered Species Act. Although this species was not detected in the study area during the AMEC surveys, suitable habitat does exist in the Annual Grassland located in the Central and Coastal NCCP portion of the study area. Suitable habitat also exists for this species in heavy clay soils located south of El Toro Road in a transition zone between Revegetated Coastal Sage Scrub and Annual Grassland.

Several dry Mariposa lily stems (*Calochortus* sp.) were located within the 220 kV corridor adjacent to the substation site during a field survey performed for the Viejo System Project. The stems could not be identified to a species since the plant material had senesced. The species could be a common Mariposa lily or a sensitive Mariposa lily, as suitable habitat exists for both common and sensitive Mariposa lily species in the study area.

Suitable habitat was located in the Central and Coastal NCCP portion of this alternative for several species, including: aphanisma, thread-leaved brodiaea, Catalina mariposa lily, foothill mariposa lily, Plummer's mariposa lily, western dichondra, many-stemmed dudleya, Palmer's grapplinghook, chaparral nolina, and Nuttall's scrub oak (see Table 4-3). Of these species, chaparral nolina and Nuttall's scrub oak are perennial and would have been detected despite drought conditions and timing of surveys. None of these sensitive species were located in the study area during the 2002 field surveys.

- *Alternative 1B - Subtransmission Line*

The underground portion of this alternative is not expected to have sensitive plant species or suitable habitat associated with it because it is located entirely within city streets. The above ground portion of this alternative is identical to Alternative 1A as described between the proposed Viejo Substation and Santa Margarita Parkway and may contain sensitive species as noted above.

- Alternative 1C - Subtransmission Line

Alternative 1C would be underground within urban streets. Developed and landscaped areas occur adjacent to these streets.

1.5.2.3 Wildlife

This section discusses the general wildlife species known to occur in the study area and discusses whether suitable habitat for these species was located within the study area. A species list of wildlife observed on site is included in Appendix D.

- *Proposed Substation Site*

The disturbed habitat at the proposed Viejo Substation site is relatively open and provides some foraging habitat for small mammals such as Audubon's cottontail (*Sylvilagus audubonii*), and California pocket mouse (*Perognathus californicus*). This area could also support larger mammals such as coyote (*Canis latrans*) that tend to forage in open areas. Avian species observed on the substation site include house finch (*Carpodacus mexicanus*), mourning dove (*Zenaida macroura*), and western meadowlark (*Sturnella neglecta*).

- *Alternative 1A - Proposed Subtransmission Line*

The Central and Coastal NCCP portion of this alternative is comprised of several plant associations and habitats. This area ranges from very open in the annual grassland to moderately open in the coastal scrub vegetation associations. Smaller, foraging mammals such as Audubon's cottontail, California pocket mouse, California ground squirrel (*Spermophilus beecheyi*), and Botta's pocket gopher (*Thomomys bottae*) could occur in the Annual Grassland and scrub associations in the Central and Coastal NCCP portion of the study area. Woodrat nests (*Neotoma* sp.) were also located throughout the Central and Coastal NCCP. Larger mammals such as mule deer (*Odocoileus hemionus*), coyote, and bobcat (*Felis rufus*) may also use this area to forage. Avian species observed include California quail (*Callipepla californica*), mourning dove, bushtit (*Psaltriparus minimus*), and greater roadrunner (*Geococcyx californianus*).

- *Alternative 1B - Subtransmission Line*

The underground segment of this alternative is not expected to have any wildlife species associated with it since it would be below ground. Small mammals and reptiles may occasionally occur in the vicinity of the paved roads and landscaped areas where the underground portion of this alternative would be constructed. The above ground portion of this alternative is identical to Alternative 1A in relation to the presence of wildlife species and associated habitat.

- Alternative 1C - Subtransmission Line Route

Mammals and reptiles may occasionally occur in the vicinity of the paved road portion of this alternative even though it is all within paved streets and surrounded by developed and landscaped areas.

1.5.2.4 Sensitive Wildlife

This section discusses the sensitive wildlife species known to occur in the study area and discusses whether suitable habitat was located within the study area for these species.

Sensitive wildlife species that were included in the field surveys, including a ranking of potential occurrence, are outlined in Table 4-4. Results of the surveys were also mapped and are presented on Figures 4-4a, 4-4b, and 4-4c.

- *Proposed Substation Site*

Several coastal California gnatcatchers were heard calling from a revegetated slope dominated by Sydney golden wattle (*Acacia longifolia*) adjacent to the proposed Viejo Substation site on 3 June and 16 August 2002. A California sensitive avian species, horned lark (*Eremophila alpestris*) was also observed foraging on the proposed substation site. A small group, greater than five individuals was observed on 3 June 2002.

- *Alternative 1A - Proposed Subtransmission Line*

No sensitive wildlife species were observed along the study area in the Proposed Southern NCCP portion of this alternative; however, at least one raptor nest was located in a LST in the Southern NCCP. Under the Migratory Bird Treaty Act, nesting raptors are protected. Active nests (i.e., nests with eggs or young) are protected under the Migratory Bird Treaty Act.

Two sensitive wildlife species, coastal California gnatcatcher and coastal cactus wren (*Campylorhynchus brunneicapillus*) were located inside of the Central and Coastal NCCP portion of Alternative 1A during surveys conducted in 2002. Two coastal cactus wren individuals, two coastal California gnatcatcher individuals, and four coastal California gnatcatcher pairs were observed during the surveys. There are also historic records of Coastal California gnatcatchers occurring in the survey area in the Central and Coastal NCCP (CDFG 2002). Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) was historically observed in the study area (CDFG 2002). Approximately five pairs were observed during a survey in 1992 in the study area (P & D Technologies 1993). This species was not detected during surveys conducted in 2002.

Peter Bloom, an independent consultant, performed surveys for least Bell's vireo in Aliso Creek. Aliso Creek is located on the southern boundary of the Central and Coastal NCCP adjacent to El Toro Road. No least Bell's vireo was located during the survey (Alsobrook 2002). However, habitat for this species is present in Aliso Creek approximately 800 feet from the southernmost LST in the Central and Coastal NCCP.

In addition to sensitive wildlife species detected in the area, habitat for other sensitive wildlife species was also located, including habitat for coast range newt, western spadefoot toad, San Diego horned lizard, Coronado skink, orange-throated whiptail, silvery legless lizard, coast patch-nosed snake, northern red-diamond rattlesnake, white-tailed kite, Cooper's hawk and red-shouldered hawk. Foraging habitat for several sensitive raptor species was also detected including northern harrier, sharp-shinned hawk, ferruginous hawk and golden eagle. None of these species were observed in the study area during the 2002 surveys.

- *Alternative 1B - Subtransmission Line*

The sensitive wildlife species associated with the above ground segment of Subtransmission Line Alternative 1B located in the Central and Coastal Sub-area NCCP portion of this alternative are the same as the sensitive wildlife species discussed for Subtransmission Line Alternative 1A. The remainder of the alternative would be underground and no sensitive wildlife species are expected to occur in the vicinity of the underground portion of this alternative aside from raptors, which may forage over these areas.

- *Alternative 1C - Subtransmission Line*

This alternative would be constructed underground within existing paved roadways. No sensitive wildlife species are expected to occur in the vicinity of the underground portion of this alternative aside from raptors, which may forage over these areas.

1.6 Cultural Resources

For the purpose of this discussion, the term cultural resources is used as a general heading covering environmental elements labeled ethnographic (Native American) resources, archaeological (prehistoric) resources, historic (post-European contact) resources, and paleontological (fossil plant and animal) resources. Each of these topics is discussed individually below with regard to the Viejo System Project. Figure 4-5 – Cultural Resources in Viejo System Project Vicinity, illustrates a large culturally sensitive area north of El Toro Road. This culturally sensitive area encompasses several specific resource sites that have been buffered. The scientific ethno-cultural and aesthetic values of archaeological resources can 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).

1.6.1 Proposed Substation Site

1.6.1.1 Ethnographic Resources

At the time of European contact, the Viejo System Project area was within the traditional territory of the Juaneño, a name derived from their association with Mission San Juan Capistrano. The Luiseño, named for their association with Mission San Luis Rey, were close neighbors and were originally separated based on linguistic differences but were later identified

as ethnologically and linguistically one ethnic nationality (Bean and Shipek 1978). The Juaneño-Luiseños belong to the Cupan group of the Takic linguistic subfamily, which was earlier called Southern California Shoshonean. It is part of the wider Uto-Aztec language family.

The Juaneño-Luiseño territory is traditionally described as extending for 1,500 square miles, bounded on the north by the Gabrielino, another member of the Takic language family, at Aliso Creek. This is an ambiguous boundary at best with differing accounts of where one's territory began and the other ended. The territory continued to Agua Hedionda Creek on the South, inland to Santiago Peak and across to the eastern side of Elsinore Fault Valley, southward to east of Palomar Mountain, then around the southern slope above the Valley of San Jose.

Insert Figure 4-5, Cultural Resources in Viejo System Project Vicinity

Figure 1-5 Cultural Resources in Viejo System Project Vicinity

"Blue hills.jpg"

Prehistorically, the Juaneño-Luiseños were primarily hunter/gatherers who also fished for their subsistence. The majority of these activities were divided by gender: women gathered items such as acorns, considered the most important consumable plant resource for its nutritional value as well as its storability, and men fished and hunted for the higher caloric consumables. Acorns, piñon nuts, honey mesquite, yucca roots, cacti fruits, and various seeds, nuts, bulbs, and shoots, were utilized more depending on whether the hamlet locale was in the foothills, coast, or near the desert. Extensive trade was conducted between these areas for regionally specific foodstuffs and exotic materials.

Hunters concentrated on deer, mountain sheep, antelope, rabbits, small rodents, and game birds such as quail. Earth ovens were used to cook the meat, using boiling water and/or heated rocks, or by parching the meat by mixing it with hot coals. Some meat was dried and stored for later consumption. Tools assemblages were comprised of utensils made for acquisition, storage, and preparation. More exotic materials such as steatite from Catalina were used for bowls, and obsidian from northern and eastern neighbors was used for blanks and points.

Juaneño-Luiseño villages were autonomous with specific hunting, collecting and fishing areas located in the aforementioned ecological zones. More specifically, villages were found in valley bottoms, along streams or coastal strands, and near mountain ranges. There were many named places associated with villages, which were owned by an individual, a family, the chief, or by the group. Satellite sites where Juaneño-Luiseño could fish, hunt, and/or gather and collect food were often within one day's walk from the village or were in other tribelet areas, where permission was given for access.

1.6.1.2 Archaeological Resources

William Wallace (1995) and Claude Warren (1968) proposed the most frequently cited major culture chronologies for southern California. These chronologies are defined in Table 4-6 – Archaeological Chronologies. They emphasized past life-ways, protohistoric, and historical interpretations to establish a chronology of coastal occupation by Native American groups. Whether culture history is divided into horizons or traditions, the terminology describing the chronological sequences does not detract from the fact that specific tool assemblages catering to different resource bases define, in their view, separate periods in Southern California's Native American culture history.

1.6.1.3 Historic Resources

The first European contact with the project region was the exploratory expedition of Gaspar de Portola, when it entered what is now Orange County on July 22, 1769, heading north to find the Port of Monterey. On July 23 the expedition encountered a lush green valley full of willow, alders, live oaks, and other unidentifiable species and called it the valley of Santa María Madalena. Father Juan Crespi used those words to describe the valley of San Juan Capistrano. The mission of the same name was erected only a few hundred yards from this spot. Juan Bautista de Anza visited the same spot on April 21, 1770, on his way from Mission San Gabriel to San Diego (Hoover et al. 1990:249-250).

Table 1-6 Archaeological Chronologies

Early Man Horizon: pre-6000 B.C	This horizon is characterized by the presence of large, well-made projectile points and scrapers, and an apparent reliance on hunting rather than gathering.
Milling Stone Horizon: 6000-1000 B.C.	The Milling Stone Horizon is characterized by the presence of handstones and milling stones, used for seed grinding. There are few projectile points, those present are crudely made. Chipped stone tools include core tools, choppers, hammerstones, and scraper planes. The assumption is plant food dominated the Native diet during this period.
Intermediate Horizon: 1000 B.C.-A.D. 750	This horizon represents the transitional period between the Milling Stone Horizon and the late Prehistoric Horizon.
Late Prehistoric Horizon: A.D. 750-1769 (Spanish Contact)	This horizon is characterized by a complex artifact assemblage which includes the bow and arrow, small projectile points, steatite containers, use of asphaltum, cremations, gravegoods, mortars and pestles.

The Portola trail extended to the foothills east of the Santa Ana Valley and across the Puente Hills into Los Angeles County. The expedition made camp on Aliso Creek on July 24th, where they rested for two days and encountered local Native Americans. Subsequent rests were taken at Tomato Springs, Santiago Creek, north of the Viejo System Project area and near the modern City of Orange, and eventually the Santa Ana River, which was reached on July 28th. But it wasn't until November 1, 1776, after several attempts, that the formal founding of Mission San Juan Capistrano took place. The original mission location is believed by some to be up the stream four or five miles from the present site at a place known as Misión Vieja (Ibid: 249-250).

The town of Orange was laid out by Glasell and Chapman in the 1870s and was first called Richland. Due to an already existing Richland in Sacramento, the town was renamed Orange to accent the developing citrus industry, though some believed it was because the Glasell family was raised in Orange County, Virginia. Neither Richland nor Orange appears on an 1873 map but the Orange post office was established in 1873. Seven years later there were Orange counties in six other states. The name for California's was first proposed in 1872 in an attempt to encourage immigration with the theme of a semi-tropical paradise with a Mediterranean flavor. It took six attempts at division before Orange County was created out of southern Los Angeles in 1889 (Gudde 1998:370). Mission Viejo takes its name from a Rancho Mission Viejo, which was granted in 1845 from former lands of Mission San Juan Capistrano. By the 1960s, the name was applied to a new master planned community, which is the present day incorporated City of Mission Viejo (Ibid: 241).

1.6.1.4 *Paleontological Resources*

Paleontological resources, defined as the fossilized remains of prehistoric plants and animals, are limited, non-renewable resources of scientific, cultural, and educational value. Common examples of paleontological resources include fossilized bones, teeth, shells, tracks, trails,

casts, molds and impressions. Fossils are considered scientifically significant because they provide important morphological and phylogenetic information on extinct organisms, as well as valuable data on ancient paleoenvironments and the local and regional geologic history of an area.

Paleontological analysis was conducted by SWCA Environmental Consultants (SWCA) to determine the sensitivity of the project area with regard to paleontological resources and the potential for important resources to occur, in accordance with the California Environmental Quality Act of 1970 (13 PRC, 2100 et seq), and Public Resources Code, Section 5097.5 (Stats 1965, c 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by the Society for Vertebrate Paleontology (SVP) and the County of Orange, California. The paleontological technical report from which this section is based is provided in Appendix H, and provides details on study methods and qualifications of persons conducting the analysis.

Geologic Setting and Stratigraphy

Geologic studies and mapping in the area have been summarized on the Geologic Map of the Orange County California, Showing Mines and Mineral Deposits (Morton and Miller, 1981). Geologic units underlying the project area include the Middle Miocene Topanga Formation (17 to 12 million years old), the Middle to Upper Miocene Monterey Formation (15 to 5 million years old), the Soquel and La Vida Members of the Middle to Upper Miocene Puente Formation (12 to 7 million years old), the Oso Sand Member of the Upper Miocene to Lower Pliocene Capistrano Formation (10 to 4.5 million years old), Quaternary Non-Marine Terrace Deposits (500,000 to 10,000 years old), Quaternary Alluvium and Colluvium (10,000 years old to Recent) and Quaternary Landslide Deposits (10,000 years old to Recent).

Topanga Formation

The Topanga Formation, present in the southern most tip of the subtransmission line route Alternatives 1A, 1B, and 1C, was deposited in a shallow to deep marine basin in the middle Miocene (17 to 12 million years ago). The general lithology of the Topanga Formation consists of up to 690 meters of white to tan arkosic fossiliferous sandstone, with interbeds of gray to brown siltstone and conglomerate (Sundberg 1986, Minch 1997). The formation is divided into three formal members, including (from oldest to youngest): the Bommer Member, Los Trancos Member and Paularino Member.

The Topanga Formation is one of the most fossiliferous formations in Orange County, producing abundant and diverse marine vertebrate and invertebrate faunas, as well as abundant terrestrial plant fossils (Raschke, 1984). Plant and invertebrate fossils found include magnolias, sycamores, maples, oaks, willows, avocados, palms, pectinids (scallops), oysters, gastropods (snails), corals, sand dollars, sea urchins, brachiopods, barnacles, crabs, and shrimp. Additionally, vertebrate fossils found include sharks, rays, bony fish, sea turtles, marine crocodile, desmostylians, sperm whales, shark-toothed whales, baleen whales, dolphins, sirenians, seals, sea lions, walruses, rodents and birds (Lander 1994, Fisk and Roeder 1996, Raschke 1984, Minch 1997, Conkling et al. 1997). Several biostratigraphically important terrestrial mammals have also been found in the Topanga Formation that indicate a late Hemingfordian to early late Barstovian Land Mammal Age, approximately 17 to 13.5 million

years ago (Lander, 1994). These include primitive three-toed horse (*Merychippus sp.*), stilt-legged camel (*Aepycamelus sp.*), small pronghorn and primitive deer (paleomerycid) (Lander 1994, Fisk and Roeder, 1996). Due to the abundant marine invertebrate, marine and terrestrial vertebrate and plant faunas, the Topanga Formation has been assigned a high sensitivity level in Orange County (Cooper and Eisentraut, 2000).

Monterey Formation

The Middle to Late Miocene Monterey Formation (15 to 7 million years old) underlies portions of the subtransmission line route in Alternatives 1A, 1B and 1C, and is one of the most prolific fossil-producing rock units in California (Raschke, 1992). Blake first described the Monterey Formation in 1856 from a sequence of diatomaceous and siliceous shales and siltstones near Monterey, California. Composed primarily of thinly bedded diatomaceous, silty and siliceous shale and siltstone, interbedded with sandstone and minor inclusions of chert and limestone, the Monterey Formation ranges from approximately 365 to 460 meters thick (1,200 to 1,500 feet) (Morton et al. 1974, Edgington 1974).

The Monterey Formation has been assigned a high paleontological sensitivity level due to the numerous invertebrate, fish and marine-mammal fossils that have been recovered in Orange County (Cooper and Eisentraut, 2000). Orange County localities have produced a wide array of fossils including coprolites, algae, plant fragments, pollen (pine, primrose, dune grass, willow), foraminiferans, diatoms, sponges, bryozoan colonies, serpulid worms, pectens, oysters, clams, marine snails, ostracods, barnacles, sand dollars, sharks, bat rays, fish, turtles, crocodiles, dolphins, baleen whales, sea lions, manatees, desmostylians, horses, primitive squirrels, primitive dogs, primitive deer and birds (Raschke, 1984).

Puente Formation

Upper Miocene (12 to 7 million years old) Puente Formation is up to 230 meters thick and is composed of deep-water marine siltstone with minor interbedded sandstone and conglomerates. Four formal members are recognized: the La Vida, Soquel, Yorba, and Sycamore Canyon. Two Members of the Puente Formation, the La Vida and the Soquel, underlie the northern portion of the proposed subtransmission line in Alternatives 1A and 1B.

The La Vida is the oldest member of the Puente Formation and is characterized by deep-water marine, white to yellowish-gray, well-indurated siltstones and shales with minor sandstone beds (Fife 1974). The Soquel Member is a sequence of interbedded white to yellowish-orange, angular to subangular, medium- to coarse-grained, poorly sorted, arkosic sandstone, with rare thinly bedded diatomaceous shale and siltstone, deposited in a deep-water turbidite system (Fife 1974). The Puente Formation has produced an extensive collection of both marine invertebrates and vertebrates, including fossil fish and whales, and has been assigned a high paleontological sensitivity level (Cooper and Eisentraut, 2000)

Capistrano Formation

The Capistrano Formation was deposited approximately 10 to 4.5 million years ago during the Late Miocene to Early Pliocene as part of a submarine fan complex associated with the subsidence of the Los Angeles Basin. General lithology is characterized by over 2,100 feet of well-sorted, yellow-gray to light brownish-gray siltstone with interbedded lenticular white fine-

grained sandstone. In Orange County, only one formal member, the Oso Sand, is accepted, although two informal facies, a siltstone facies and a turbidite facies, are also recognized in Orange County (Morton and Miller, 1981). The proposed substation site and vicinity, as well as most of the subtransmission line route in Alternative 1C overlies the Oso Member of the Capistrano Formation.

The Oso Sand Member of the Capistrano Formation has yielded some of the most important fossil finds in Orange County and has been assigned a high paleontologic sensitivity level. Fossils found include shark teeth, littoral mollusks, shore birds and a diverse collection of marine vertebrate fossils that include many previously unknown species of baleen and toothed whales, sea lions, dolphins, seals, sharks, teleost fish and primitive walrus. Additionally, fossils of terrestrial animals, including horses, rabbits, rhinos, and camels, have also been collected.

Quaternary Non-Marine Terrace Deposits

Quaternary non-marine terrace deposits, dated at between 500,000 to 10,000 years old (Late Pleistocene), underlie parts of the proposed substation parcel, as well as the subtransmission line route in Alternatives 1A, 1B, and 1C. Non-marine terrace deposits are the fluvially deposited remnants of Pleistocene age stream channels and/or floodplains, left in a stair step sequence, most commonly above an active stream channel that has downcut further into the topography. The non-marine terrace deposits in Orange County are composed of poorly sorted, reddish-brown to yellow-brown silty gravel, with clayey silt and sand lenses, with thicknesses varying from less than 40 feet to over 150 feet (Morton et al., 1974).

Fossil remains of large Pleistocene mammals such as horses, elephants, camels and sloths are rare but have been known to occur within these deposits throughout the surrounding region (Gust and Burres, 2000). Because of this, Quaternary non-marine terrace sediments are considered to have a high potential to contain non-renewable paleontologic resources throughout Orange County and thus have been assigned high paleontologic sensitivity level.

Quaternary Alluvium and Colluvium and Landslide Deposits

Younger alluvium and colluvium, present in low lying valleys and stream channels throughout the project area, are generally defined as fluvial sediments in an active stream channel and its flood banks. These sediments are generally considered too young to contain fossils, but have the potential to contain cultural remains. The paleontological sensitivity of the Quaternary Alluvium and Colluvium is considered to be low.

Landslide material, present in the southern end of the subtransmission line routes in Alternative 1A, 1B, and 1C, generally has a low paleontological sensitivity rating; however, the actual sensitivity of the deposit is dependent on a number of factors, including the source rock parent material. Because of the variability of factors surrounding the size, age, distance traveled, shear forces, subsequent erosion and weathering of landslides, landslide deposits must be considered on an individual basis in terms of the possibility of recovery and potential significance of paleontological resources.

1.6.1.5 Record Search Results

Archaeology

An archaeological record search conducted for the proposed project by the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS), housed at the Department of Anthropology, California State University, Fullerton, revealed the presence of the Upper Aliso Creek Historic District (McCoy and Phillips 1980), which contains eight prehistoric archaeological sites (CA-ORA-438, -447, -725, -825, -826, -827, -828, and -905). The sites in question are within one-half mile of the Viejo System Project area. Several other previously recorded archaeological sites are within the same distance of alternative subtransmission corridors. The vast majority of these sites are small lithic scatters and non-sedentary workstations and campsites. Typically, these resources are found at the valley-hill/mountain interface zone where greater diversity of floral and faunal resources is found; near water (e.g., springs, former lakes or marshes, and the more active streams), and available natural shelter and fuel (e.g., wood).

The record search also showed that the 220 kV corridor was the subject of previous archaeological investigations (McCoy and Phillips 1980, McCoy and Kirkish 1982). The areas of recorded archaeological sites near the proposed H-Frame centerline and those project areas not previously surveyed for archaeological resources were surveyed for this project by SCE archaeologists. No previously unrecorded archaeological resources were encountered.

Paleontology

SWCA examined records maintained by the Natural History Museum of Los Angeles County (LACM), as well as previous technical studies in the region to complete this study. Numerous fossil localities are located in the area surrounding the substation site and the alternative subtransmission line routes. Additionally, based on the sensitivity of the geologic units underlying the project area, there is a potential for significant fossils to occur at depth within the project area based on the units' previous history of producing significant paleontological resources (Cooper and Eisentraut, 2000).

1.6.1.6 Field Survey

Archaeology

Archaeological field survey was conducted on August 16 and 23 of 2002. Subsequent field visits were conducted in November and December of 2002. The substation site and subtransmission line alternatives were observed using 5-10 meter transects. Visibility was good to poor depending on ground vegetation. A trowel was periodically used to examine rodent backdirt piles and exposed soils. No new resources were identified as a result of the project survey. Previously recorded archaeological resources were reexamined for artifact concentrations and site boundaries. Results of the archaeological survey indicated the presence of a National Register eligible archaeological district north of El Toro Road.

Paleontology

The field survey was conducted on February 21, 2003. During the field survey the substation site and the subtransmission line alternatives were examined for fossils and to determine the

geology of the site. No significant paleontological resources were found during the field survey. Results of the field survey indicated that the entire substation parcel and subtransmission line corridors have been previously disturbed

1.6.2 Alternative 1A - Proposed Subtransmission Line

Cultural, historic, and paleontologic resources occurring within the Alternative 1A subtransmission line route are described above in Section 4.6.1 Substation Site.

1.6.3 Alternative 1B - Subtransmission Line

Cultural, historic, and paleontologic resources occurring within the overhead portion of Alternative 1B are described above in Section 4.6.1 Substation Site .No known cultural or historic resources occur within the underground portion of Alternative 1B. Paleontological resources that may occur within the underground portion of Alternative 1B are described above in Section 4.6.1 Substation Site.

1.6.4 Alternative 1C - Subtransmission Line

No known cultural or historic resources occur within the Alternative 1C route. Paleontological resources that may occur within this Alternative 1C are described above in Section 4.6.1 Substation Site

1.7 Geologic Conditions

1.7.1 Proposed Substation Site

Geology: The Viejo Substation site and 220 KV corridor lie within the easterly foothills of the Irvine-Tustin plain as it merges structurally northward into the central Santa Ana Mountains. The geologic composition underlying the site is a basement complex of crystalline and semi-crystalline rocks of Mesozoic age overlain by upper Cretaceous and Cenozoic sedimentary rock (Pacific Soils Engineering, Inc. W.O. 500071GP, 1994). Sampling and analysis of soils on the proposed Viejo Substation site were performed in 1994 by Pacific Soils Engineering, Inc. Soils were found to have predominately silty to clayey sands and alluvial sediments varying in thickness from a few inches to 1 to 2 feet. Subsurface geologic features and soil characteristics along the 220 kV corridor are similar.

Landslide Potential: The proposed Viejo Substation site is flat with cut-slopes rising to the east towards the 220 KV corridor. Natural slopes descend to the southwest to the SR 241 Foothill Transportation Corridor. The southern portion of the Foothill Ranch Planned Community is free of any significant slope stability problems (Southern California Edison, 1994). Landslide potential on site and within the 220 KV corridor is considered remote.

Active Faults: The inactive Cristianitos fault zone is the major feature in proximity to the study area and the larger Foothill Ranch Planned Community. The fault zone approaches the Foothill Ranch planning area from the southeast and smaller branches of the Cristianitos fault enter the area at the northernmost corner. Faults within the Foothill Ranch Planned Community are not known to be active and are not located in proximity to the proposed Viejo Substation site.

The closest known active faults are the Whittier-Elsinore, Newport-Inglewood, San Jacinto and the San Andreas Fault zones (see Figure 4-6, Regional Fault Map). The approximate distances between the Viejo System Project area and known fault zones are as follows:

Faults	Distance
Whittier-Elsinore	12 miles north of site
Newport-Inglewood	12 miles southwest of site
San Jacinto	32 miles northwest of site
San Andreas	40 miles northwest of site

Liquefaction Potential: Liquefaction occurs when high groundwater, relatively loose, non-cohesive soils and earthquake-generated seismic waves are simultaneously present. When liquefaction occurs, the soil supporting building foundations and walls loosens and causes structural collapse. No evidence of liquefaction potential occurs on site. Liquefaction within the alluvial sediments of the proposed Viejo Substation site is considered remote (Pacific Soils Engineering, Inc. W.O. 500071GP, 1994).

1.7.2 Alternative 1A - Proposed Subtransmission Line

There are no changes in surface features along the 220 kV corridor that would indicate geologic or soil features are substantively different from those described above for the substation site. The geologic and soil features within the 220 kV corridor are similar to those described for the proposed Viejo Substation site.

1.7.3 Alternative 1B - Subtransmission Line

Geologic features within this route are similar in characteristic to those described for the proposed Viejo Substation site and 220 kV corridor.

1.7.4 Alternative 1C - Subtransmission Line

Geologic features within this route are similar in characteristic to those described for the proposed Viejo Substation site and 220 kV corridor.

Insert Figure 4-6 – Regional Fault Map

Figure 1-6 Regional Fault Map

"Blue hills.jpg"

1.8 Hazards and Hazardous Materials

1.8.1 Proposed Substation Site

The proposed Viejo Substation site is located on a vacant 12.5-acre parcel that has never been developed. SCE's Environmental Engineering Group performed an Environmental Site Assessment, attached as Appendix E to this document for the proposed Viejo Substation site on 14 September 2002. The assessment was based on the property's history and physical observations.

Based on the fact that the property has not been developed and that there is no visible evidence of illegal dumping or other contamination, SCE determined that the property is free of hazardous materials or wastes that may pose a threat to construction workers or operations personnel.

1.8.2 Alternative 1A - Proposed Subtransmission Line

There is no evidence within the 220 kV corridor that would indicate the presence of hazardous materials or waste. The 220 kV corridor is adjacent to the SCE Viejo Conservation Bank north of the Foothill Transportation Corridor and primarily in parklands between the Foothill Transportation Corridor and Chiquita Substation. No hazardous material or waste occurs within the 220 kV corridor.

1.8.3 Alternative 1B - Subtransmission Line

The northern segment of this alternative is located within the 220 kV corridor as described above. South of Santa Margarita Parkway, the 66 kV subtransmission line would be installed underground within urban streets. No known hazardous material or waste is located within these streets.

1.8.4 Alternative 1C - Subtransmission Line

This alternative would be installed underground within urban streets. No known hazardous material or waste is located within these streets.

1.9 Hydrology and Water Quality

1.9.1 Proposed Substation Site

The Viejo Substation site is located within Santa Ana Regional Water Quality Board (SRWQB) jurisdiction. There are no surface water features located on or immediately adjacent to the proposed substation site that would be adversely impacted by project construction.

All drainage structures were constructed when the proposed site was graded in 1994. The hill on the neighboring property to the east of the proposed site is crossed by a system of concrete drainage swales and down drains designed to bring surface runoff to catch basins and into a below ground pipe system to the nearest street. However, overgrown vegetation restricts

performance of the existing system. Further, drainage system deficiencies cause soil and debris to be carried onto the proposed substation pad and down the access road.

1.9.2 Alternative 1A - Proposed Subtransmission Line

Aliso Creek runs perpendicular to the 220 kV corridor and is shown in Figure 4-7 – Water Resources. Construction of the proposed 66 kV subtransmission structures would not occur within or in proximity to Aliso Creek and conductors would span over it. Since the Viejo System Project would not involve removal or placement of dredge or fill material or disturb streambeds, the project would not be subject to Section 404 of the Clean Water Act or Section 1600 of the California Fish & Game Code.

1.9.3 Alternative 1B - Subtransmission Line

Existing conditions would be the same as described for the proposed Alternative 1A subtransmission line.

1.9.4 Alternative 1C - Subtransmission Line

Under this alternative, the 66 kV subtransmission line would cross Aliso Creek at the Portola Parkway crossing. The 66 kV subtransmission line would be placed within a conduit and attached to the existing bridge rather than within or under the streambed.

1.10 Land Use and Planning

Future Plans and Land Use

The CPUC has primary jurisdiction over the Viejo System Project because it authorizes the construction, operation, and maintenance of public utility facilities. Although such projects are exempt from local land-use and zoning regulations and permitting, General Order 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.” SCE has considered local and state land-use plans as part of the current environmental review process.

The Cities of Lake Forest and Mission Viejo incorporate two levels of planning into their long-term development strategy. These include the General Plan that provides broad policies and objectives to guide development within the cities and Specific Plans that provide detailed policies and site development standards for planning areas. Those general and specific plan elements pertaining to the Viejo System Project area are defined below.

Zoning

The Viejo Substation site and immediate area is zoned Planned Community 8 (PC 8) and is designated Light Industrial in the City of Lake Forest General Plan (June 21, 1994, as amended July 17, 2001).

Orange County General Plan (1999 Update)

The General Plan is a blueprint for growth and development. California state law (Government Code Section 65300) requires each city and county to adopt a comprehensive, long-term General Plan for its own physical development and for any land outside its boundaries related to its planning activities. Government Code Section 65302 requires that general plans contain seven elements: land use, circulation, housing, conservation, open space, noise and safety. The General Plan is largely implemented through zoning and subdivision decisions.

General Plans

Figures 4-8a to 4-8c show existing general plan land use classifications for the proposed Viejo Substation site, subtransmission line Alternative 1A, 1B and 1C and adjacent properties. The proposed Viejo Substation site is designated light industrial in the City of Lake Forest General Plan (June 21, 1994, as amended July 17, 2001). The *Public Facilities/Growth Management Element* of the general plan addresses nine “major issues” including provision of natural gas, electricity and telephone services.

Goal 2.0 of the *Public Facilities/Growth Management Element* requires “effective coordination with providers of natural gas, electricity, telephone and cable television service.” This would be accomplished through implementation of Policy 2.1, which requires the city to coordinate with energy and communication service providers (City of Lake Forest General Plan, 2001).

Pursuant to GO 131-D Section XIV B., local agencies were consulted regarding land use matters. SCE met with the Cities of Lake Forest and Mission Viejo to review the Viejo System Project. Position statements were obtained from these cities and are included in Appendix B.

Specific Plans

Foothill Ranch Planned Community Specific Plan. The proposed Viejo Substation site is located within the Foothill Ranch Master Planned Community and is consistent with the Foothill Ranch Specific Plan (Foothill Ranch Planned Community Development Plan and supplemental text). The substation site is zoned as light industrial per the City of Lake Forest General Plan.

Section XIV, subsection (A) (20) (b) lists electrical distribution facilities as an allowed use within the Specific Plan area. Section XIV, subsection (A)(20)(f) lists production, distribution, storage or treatment facilities for electricity, water, sewage, telephone or telegraph as allowed uses (Foothill Ranch Planned Community Development Plan and Supplemental Text, Foothill Ranch Company, April-1988).

Development of the proposed Viejo System would be consistent with the allowed uses within the Specific Plan area and with applicable goals, policies and objectives contained with in the Lake Forest General Plan and the Foothill Ranch Master Planned Community Development Plan. There are no specific plan areas located adjacent to the 220 kV corridor within the City of Mission Viejo (City of Mission Viejo Planning Department, 2002).

1.10.1 Proposed Substation Site

The proposed Viejo Substation site is located within the City of Lake Forest and the Foothill Ranch Master Planned Community. The site is currently vacant. It was graded in 1994. Surrounding land use to the north and northwest is light industrial/business park. The SR 241 Foothill Transportation Corridor is located to the south/southwest. The SCE Viejo Conservation Bank and 220 kV corridor are located immediately adjacent to and east/northeast of the site (see Figure 4-8a – Study Area Land Use – City of Lake Forest).

Insert Figure 4-7, Water Resources

Figure 1-7 Water Resources

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Insert Figure 4-8a, Study Area Land Use City of Lake Forest

Figure 1-8a Study Area Land Use City of Lake Forest

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1.10.2 Alternative 1A - Proposed Subtransmission Line

The 220 kV corridor traverses generally northwest to southeast and crosses the City of Lake Forest/City of Mission Viejo boundary at the SR 241 Foothill Transportation Corridor and El Toro Road intersection. The majority of the 220 kV corridor within the study area is located in the City of Mission Viejo. The portion of the 220 kV corridor adjacent to the substation site borders SCE's Viejo Conservation Bank. The Viejo Conservation Bank is undeveloped open space established by SCE as a conservation bank and extends south of Glenn Ranch Road to the SR 241 Foothill Transportation Corridor (see Figures 4-8a, 4-8b and 4-8c, Study Area Land Use City of Lake Forest and Mission Viejo) (City of Lake Forest, 2001 land use map) (City of Mission Viejo, 2001 – land use map).

South of SR 241 Foothill Transportation Corridor, the 220 kV corridor is located adjacent to and runs through open space and developed parklands south to Santa Margarita Parkway. From Santa Margarita Parkway to the southeast corner of Alicia Parkway and Olympiad Road, the 220 kV corridor is located within open space and developed parklands and is bordered on both sides by residential development until it terminates at the Chiquita Substation.

1.10.3 Alternative 1B - Subtransmission Line

As previously stated, Alternative 1B would follow the northern portion of the proposed Alternative 1A subtransmission line route to Santa Margarita Parkway and then continue underground as described in Section 3.3.2.3.2. Land use for the northern segment of this alternative is shown in Figure 4-8a – Study Area Land Use City of Lake Forest.

Land use south of Santa Margarita Parkway is shown in Figures 4-8b and 4-8c – Study Area Land Use City of Mission Viejo). As shown, land use near El Toro Road is primarily residential with small areas of open space and developed parklands. At the Aliso Creek crossing, the stream corridor and associated riparian area located north of El Toro Road are designated as regional park/open space. Further east/southeast along Santa Margarita Parkway, Trabuco Hills High School is located to the south with residential areas to the north. A commercial area is located at the intersection of Santa Margarita Parkway and Marguerite Parkway.

Along Marguerite Parkway from Santa Margarita Parkway to Olympiad Road, land use is primarily residential. Along Olympiad Road east of Marguerite Parkway, land uses are primarily residential and developed recreation areas. These land uses include William S. Craycraft Sports Park located to the north of Olympiad Road and Lake Mission Viejo to the southwest. Single-family residential areas dominate the area just west of Olympiad Road while developed recreation areas including Florence Joyner Olympiad Park are located adjacent to and east of Olympiad Road. Development surrounding the Chiquita Substation includes residential development with some commercial development located at the intersection of Olympiad Road and Alicia Parkway.

Insert Figure 4-8b – Study Area Land Use City of Mission Viejo.

Figure 1-8b Study Area Land Use City of Mission Viejo

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Insert Figure 4-8c – Study Area Land Use City of Mission Viejo.

Figure 1-8c Study Area Land Use City of Mission Viejo

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1.10.4 Alternative 1C - Subtransmission Line

With the exception of approximately 200 linear feet which would be located underground within SCE's existing access road, Alternative 1C would be located underground within public roadways in the Cities of Lake Forest and Mission Viejo. General land use along Alternative 1C is shown in Figure 4-8a, 4-8b and 4-8c - Study Area Land Use City of Lake Forest and Mission Viejo)(City of Lake Forest, 2001 land use map) (City of Mission Viejo, 2001 – land use map).

In the vicinity of Definition Road and Glenn Ranch Road, land use consists of light industrial/business park development. The SCE Viejo Conservation Bank is located to the east of Definition Road. Existing land use along Portola Parkway consists primarily of commercial development on the west side of Portola Parkway north of the SR 241 Foothill Transportation Corridor. The El Toro Materials Sand and Gravel Quarry is located southwest of the SR 241 Foothill Transportation Corridor on the west side of Portola Parkway. Commercial development is located to the east and southeast. Land use south from Santa Margarita Parkway is the same as described for Alternative 1B.

1.11 Mineral Resources/Energy

1.11.1 Proposed Substation Site

The current Viejo Substation site is vacant. There are no activities on site that consume energy. Additionally, there are no known mineral resources on the proposed Viejo Substation site. The closest known resources are located at the El Toro Materials sand and gravel quarry located west of Portola Parkway just south of the SR 241 Foothill Transportation Corridor.

1.11.2 Alternative 1A - Proposed Subtransmission Line

The purpose of the existing 220 kV corridor is to transfer electricity throughout portions of the SCE system. No energy is consumed by operations within the existing 220 kV corridor.

There are no known mineral resources that occur in the existing 220 kV corridor.

1.11.3 Alternative 1B - Subtransmission Line

There are no existing SCE facilities within this route that consume energy resources. No known mineral resources occur with the Alternative 1B subtransmission line route.

1.11.4 Alternative 1C - Subtransmission Line

There are no existing SCE facilities within this route that consume energy resources. No known mineral resources occur with the Alternative 1C subtransmission line route.

1.12 Noise

Noise is generally defined as unwanted sound. Sound travels through the air as waves of minute air pressure fluctuations caused by some type of vibration. In general, sound waves travel away from the noise source as an expanding spherical surface. Thus, the energy contained in a sound wave is spread over an increasing area as it travels away from the source resulting in a reduction in noise as the distance from the noise source increases.

The human ear does not respond equally to all sound frequencies. Thus, when considering the effects of noise on people, it is necessary to consider the frequency response of the human ear. The frequency weighting most often used to evaluate environmental noise is A-weighting, which reduces the measured sound pressure level for low-frequency sounds while slightly increasing the measured pressure level for some high-frequency sounds. Measurements from instruments using this system are reported in "A-weighted decibels" or dBA. Table 4-9 shows some common noise sources and the sound levels they produce.

1.12.1 Proposed Substation Site

The Viejo Substation site is located within the City of Lake Forest. On-site operations would comply with the City of Lake Forest Noise Ordinance (Chapter 11.16, Section 11.16.4-6 *Exterior Noise Standards*). The Ordinance is designed to protect sensitive properties such as residences and does not apply to commercial or light industrial receivers. Activities on site must not cause noise levels at receiving property lines to exceed 55 dBA during the daytime (i.e., 7:00 a.m. to 10:00 p.m.) or 50 dBA during nighttime hours (i.e., 10:00 a.m. to 7:00 a.m.), Lake Forest Noise Ordinance.

In March 2002 a noise survey was performed on the substation site and existing noise levels were documented in the *Viejo Substation Pre-Construction Noise Survey*. (See Appendix F) The noise survey measured and documented existing ambient noise levels at the proposed Viejo Substation site to predict potential changes associated with substation operation. The measurements were taken over a two-day period using a B&K Model 2230 sound level meter and a Larson Davis Model 820 noise monitoring system placed on site over a 25-hour period. During the monitoring period, short-term measurements were taken to determine sources of the background noise.

Monitoring data show that daytime sound levels average near 45 dBA, which is typically considered quiet (see Table 4-7 – Weighted Sound Levels and Human Response). During nighttime hours, sound levels dropped to a minimum of 32.8 dBA between 3 and 4 a.m. Noise sources in the Viejo System Project area include traffic noise from SR 241, aircraft flyovers, local traffic and activities at business locations adjacent to the site. Other activities in the area that may contribute to background noise levels for short periods of time include mountain bike riding, motorcycle riding, hiking and other outdoor activities (Veneklasen Associates, 2002).

1.12.2 Alternative 1A - Proposed Subtransmission Line

Existing noise along the 220 kV corridor is limited to traffic on adjacent roadways and other sources common to developed urban environments. Typical transmission/subtransmission line noise consists of corona noise created by high voltage discharge from conductors and/or insulators and magnetostriction hum from conductors. Corona noise is characterized by a buzzing or humming sound. Both types of noise will usually increase when the conductors and insulators are wet, such as during rain or fog.

1.12.3 Alternative 1B - Subtransmission Line

Existing noise along the Alternative 1B overhead section is limited to traffic on adjacent roadways and other sources common to developed urban environments. Typical transmission/subtransmission line noise consists of corona noise created by high voltage discharge from conductors and/or insulators and magnetostriction hum from conductors. Corona noise is characterized by a buzzing or humming sound. Both types of noise will usually increase when the conductors and insulators are wet, such as during rain or fog.

Existing noise along the Alternative 1B subtransmission line underground route is limited to traffic along the roadways. Traffic noise along these roadways range between 60 and 70 dBA depending on vehicle volumes, speeds and distance from the roadway. Higher volume roadways such as Portola Parkway generate more noise than lower volume roadways like Olympiad Road.

1.12.4 Alternative 1C - Subtransmission Line

Noise conditions are identical to those described for the underground portion of Alternative 1B.

Table 1-7 Weighted Sound Levels and Human Response

Examples of Sound Sources	DBA*	Response Criterion
	0	Threshold of hearing
	10	Just audible
Broadcasting studio background	20	
Soft whisper at 15 feet (5 meters)	30	Very quiet
In living room, bedroom, or library	40	
	50	Quiet
Air conditioner at 6 meters (20 feet); light auto traffic at 50 feet (15 meters)	60	
Freeway traffic at 50 feet (15 meters)	70	Intrusive, with telephone use difficult
Passenger train at 31 meters (100 feet); freight train at 15 meters (50 feet); helicopter at 500 feet (152 meters)	80	Annoying
Heavy truck at 50 feet (15 meters); pneumatic drill at 50 feet (15 meters)	90	Hearing damage at 8 hours
Shout at 0.5 feet (0.2 meters); inside New York subway station	100	Very annoying
Riveting machine; jet takeoff at 2,000 feet (610 meters)	110	
Jet takeoff at 200 feet (61 meters); auto horn at 3 feet (1 meter); inside discotheque	120	Threshold of feeling and pain, with maximum vocal effort
	130	Painfully loud
Carrier deck jet operation	140	Limit of amplified speech

*Typical A-weighted sound levels taken with a sound-level meter and expressed as decibels (dBA) on the "A" scale, which approximates the frequency response of the human ear.

Source: Council of Environmental Quality, 1970 Environmental Quality: The First Annual Report of the Council on Environmental Quality. U.S. Government Printing Office, Washington D.C.

1.13 Population and Housing

Population and housing data was obtained from the City of Lake Forest, the City of Mission Viejo and the United States Census Bureau (year 2000 Census). This data is summarized below in tables 4-8 thru 4-11. Because the proposed Viejo Substation, 220 kV corridor and alternative routes are located within the cities of Lake Forest and Mission Viejo, the existing population and housing conditions described in tables 4-8 thru 4-11 are the same for the proposed substation site and each of the 66 kV subtransmission line route alternatives.

1.13.1 Proposed Substation Site and 66 kV Subtransmission Line Route Alternatives 1A, 1B, and 1C

1.13.1.1 Population

Tables 4-8 and Table 4-9 show the current (i.e., 2002) and projected 2007 populations of the City of Lake Forest and Foothill Ranch Planned Community. As shown, the 2002 Lake Forest population is anticipated to grow by approximately 6.4 percent over the next five years with an average annual growth rate of 1.2 percent and the Foothill Ranch Planned Community population is expected to increase by approximately 35 percent between 2002 and 2007 with an average annual growth rate of 7 percent.

Table 1-8 2002 Population and Demographics for the City of Lake Forest

	Lake Forest	Foothill Ranch
Population:	59,577	12,647
Race:		
White	76.70%	80.70%
Black	2.30%	2.50%
Asian or Pacific Islander	11.40%	12.70%
American Indian, Eskimo, Aleut	0.00%	0.10%
Other	9.50%	4.10%
Total	100.00%	100.00%
Hispanic Ethnicity:		
Hispanic Origin	22.80%	14.60%
Not of Hispanic Origin	77.20%	85.40%
Total	100.00%	100.00%

*City of Lake Forest Demographic Trend Report, May 28, 2002

Table 1-9 2007 Population and Demographics for the City of Lake Forest and Foothill Ranch CDP

	Lake Forest	Foothill Ranch
Population:	62,016	17,103
Race:		
White	85.10%	83.90%
Black	4.10%	3.80%
Asian or Pacific Islander	6.40%	9.20%
American Indian, Eskimo, Aleut	0.20%	0.20%
Other	4.10%	2.90
Total	100.00%	100.00%
Hispanic Ethnicity:		
Hispanic Origin	25.50%	20.10%
Not of Hispanic Origin	74.50%	79.90%
Total	100.00%	100.00%

*City of Lake Forest Demographic Trend Report, May 28, 2002

Table 4-10 shows the current (i.e., 2001) and projected population within the City of Mission Viejo for years 2005 and 2010. The population is expected to decrease by less than 1 percent between 2001 and 2010.

Table 1-10 City of Mission Viejo

	2001	2005	2010
Total Population	96,568	96,044	96,390

*City of Mission Viejo Demographics

1.13.1.2 Housing

The Viejo Substation site and the area immediately surrounding the proposed substation site are either undeveloped or developed for light industrial use. However, vacant land primarily to the east beyond the 220 kV corridor and the SCE Viejo Conservation area is planned for residential development as part of the Foothill Ranch Planned Community. Much of the land adjacent to and primarily to the east of the current 220 kV corridor within the City of Mission Viejo has been developed for residential use. Table 4-11 shows housing data for the Cities of Lake Forest and Mission Viejo.

Table 1-11 Housing Data

	City of Lake Forest (2000)	City of Mission Viejo (2000)
Total Housing units	20,588	32,985
Occupied	20,008	32,449
Owner Occupied	14,407	26,423
Rented	5,601	6,026
Vacant	478	536
Single Unit	13,753	28,190
Multiple Unit	5,543	4,617
Mobile	1,292	79
Median value (\$)	\$278,000	\$293,300

*U.S. Bureau of the Census, Census 2000

1.14 Public Services/Utilities

1.14.1 Proposed Substation Site

There are no utilities currently located on the Viejo Substation site. However, utilities (i.e., water, sewer and telephone) are available at the intersection of Definition and Icon Road for extension to the site.

Fire, police and emergency medical services would be provided by the City of Lake Forest. Two fire stations are located in close proximity to the proposed Viejo Substation site. Station 54, which is located on Pauling Avenue, is approximately 1 mile from the proposed Viejo Substation site and Station 42, located on Ridgeline Road is approximately 2.5 miles from the proposed Viejo Substation site.

There are no schools located in proximity to the proposed Viejo Substation site or along the 220 kV corridor and the project will not create a need for new schools. Trabuco Hills High School is located along Santa Margarita Parkway approximately .75 miles from the 220 kV corridor. No other schools are located in the study area.

1.14.2 Alternative 1A - Proposed Subtransmission Line

Within the 220 kV corridor, a water line and gas line cross perpendicular to the 220 kV transmission and 66 kV subtransmission lines.

1.14.3 Alternative 1B - Subtransmission Line

For the northern overhead segment of this alternative, the public services and utilities are the same as described for Alternative 1A.

There are municipal water, sewer, electrical and other utilities currently located within and adjacent to Santa Margarita Parkway and the other roads along this alternative route. If this alternative was constructed, the existing utility lines would be located prior to excavation and the duct bank corridors would be designed to avoid them. Fire Station 31 is located on the northern side of Olympiad Road just south of Melinda Road. Construction of the underground line would occur on the opposite side of the road or in the far lane to avoid obstruction of emergency plans and/or routes.

Multiple bus routes are located along the Alternative 1B route.

1.14.4 Alternative 1C - Subtransmission Line

Municipal water, sewer, electrical, and other utilities are currently located within and adjacent to the roadways along this route. If this alternative was constructed, utility lines would be located prior to excavation and the duct bank corridors would be designed to avoid them. As noted, Fire Station 31 is located on the northern side of Olympiad Road just south of Melinda Road. Construction of the underground line would occur on the opposite side of the road or in the far lane to avoid obstruction of emergency plans and/or routes.

Multiple bus routes are located along the Alternative 1C route.

Trabuco Hills High School is located along Santa Margarita Parkway (the route for Alternative 1C). However, the main access to the school is not from Santa Margarita Parkway.

1.15 Recreation

1.15.1 Proposed Substation Site

The SCE Viejo Conservation Bank is located adjacent to and east of the proposed Viejo Substation site and Whiting Ranch Wilderness Park northeast of the substation site. While these are not designated recreation areas, some informal hiking and mountain bike riding occurs in these areas. No developed recreational lands are located in proximity to the Viejo Substation site.

1.15.2 Alternative 1A - Proposed Subtransmission Line

The 220 kV corridor traverses the City of Mission Viejo. Figure 4-9, Existing Recreational Facilities, shows existing developed recreational lands along the 220 kV corridor. As shown, the 220 kV corridor runs adjacent to or through designated parklands including Pinecrest Park, Flamenco Park and Florence Joyner Olympiad Park located near the southern project terminus.

Pinecrest Park is a 15.3-acre park containing several sport fields, playgrounds, picnic tables, barbecues, and walking trails. This is a formal park with a groomed lawn and parking lot. There are currently two 220 kV LSTs and three 66 kV TSPs located within the groomed lawn area. Residential development occurs along both sides of the 220 kV corridor adjacent to Pinecrest Park.

Flamenco Park is a neighborhood park classified as open space by the City of Mission Viejo. There are no formal amenities within this park; however, walking trails are present. There are currently two 220 kV LSTs and three 66 kV TSPs located within the groomed lawn area.

Mission Viejo Athletic Park is located west of the existing 220 kV corridor northwest of the intersection of Olympiad Road and Melinda Road. This park would not be impacted by project construction within the existing 220 kV corridor.

Florence Joyner Olympiad Park is located adjacent to and along the eastern side of Olympiad Road and north of Alicia Parkway. This is a 19.67-acre park that contains a baseball field, soccer and football fields, a playground, a parking lot and walking trail. There are currently two 220 kV LSTs and three 66 kV TSPs located within the groomed lawn area (City of Mission Viejo Website, 2002).

1.15.3 Alternative 1B - Subtransmission Line

There is only one recreational area within the vicinity of the Alternative 1B above ground segment. Pinecrest Park is situated between Los Alisos Boulevard and Santa Margarita Parkway in the existing 220 kV corridor. There are two developed recreational parks adjacent to the proposed underground route for Alternative 1B. Mission Viejo Athletic Park is located west of the existing 220 kV corridor and northwest of the intersection of Olympiad Road and Melinda Road. Florence Joyner Olympiad Park is located along the east side of Olympiad Road north of Alicia Parkway (see Figure 4-9, Existing Recreation Facilities).

Insert Figure 4-9, Existing Recreational Facilities

Figure 1-9 Existing Recreational Facilities

"Blue hills.jpg"

1.15.4 Alternative 1C - Subtransmission Line

No recreational facilities occur along this route north of Santa Margarita Parkway. South of Santa Margarita Parkway the recreational facilities are the same as described for the underground portion of Alternative 1B.

1.16 Transportation and Circulation

1.16.1 Proposed Substation Site

The proposed Viejo Substation site is located within the Trabuco Canyon area of Orange County approximately one-quarter mile north of El Toro Road and one mile east of Santa Margarita Parkway. The site is currently accessed via a gravel road that extends south of the Definition and Icon street intersection. As noted in Section 3.3.2.1, a 30-foot wide asphalt paved driveway would be constructed as part of site development.

To characterize current traffic volumes within the study area, traffic counts for 2001 were obtained from the City of Lake Forest and the City of Mission Viejo. These data are show in Table 4-12 – Current Traffic Counts.

Table 1-12 Current Traffic Counts

Roadways	Average Daily Traffic	Number of Lanes
Glenn Ranch Road		
Definition Road to Portola Parkway	16,000	4
Portola Parkway		
Glenn Ranch Road to 241 Toll Road	32,000	6
241 Toll Road to El Toro Road	26,000	6
Santa Margarita Parkway		
El Toro Road to Los Aliso Boulevard	25,000	6
Los Alisos Boulevard to Marguerite Parkway	27,200	6
Marguerite Parkway		
Santa Margarita Parkway to Olympiad Road	21,600	4
Olympiad Road		
Marguerite Parkway to Melinda Road	9,900	4
Melinda Road to Alicia Parkway	10,000	4

Currently the proposed substation site is vacant. Thus, with the exception of periodic site visits by SCE staff or contractors, current on-site activities have no impact on transportation/circulation resources in the area.

1.16.2 Alternative 1A - Proposed Subtransmission Line

Alternative 1A would be constructed within the 220 kV corridor. Maintenance to the 220 kV transmission lines and 66 kV subtransmission lines would generate approximately one vehicle trip per month along the 220 kV corridor. This corridor is accessed by vehicle from Definition Road and El Toro Road. Within developed areas, structures are accessed by foot or vehicle. With the exception of periodic site visits by SCE staff or representatives, operation and maintenance activities have no impact on transportation and/or circulation resources in the area.

1.16.3 Alternative 1B - Subtransmission Line

The northern segment of Alternative 1B would be located within the existing 220 kV corridor. Inspection and maintenance activities currently generate approximately one vehicle trip per month along the 220 kV corridor. Thus, with the exception of periodic site visits by SCE staff or representatives, operation and maintenance activities have no impact on transportation/circulation resources in the area.

The southern segment of Alternative 1B would be located underground within existing roadways. The roadways are main arterials through the City of Mission Viejo. Table 4-12 – Current Traffic Counts, shows average daily traffic volumes along roadways within the study area. As shown, traffic volumes vary from 25,000 along Santa Margarita Parkway to 9,900 along Olympiad Road near the southern project terminus.

1.16.4 Alternative 1C - Subtransmission Line

With the exception of Definition located just north of the Viejo Substation site, all the roadways along the Alternative 1C are main arterials through the Cities of Lake Forest and Mission Viejo. Table 4-12 – Current Traffic Counts, shows average daily traffic volumes along the proposed Alternative 1C route. As shown, daily traffic volumes vary from 38,000 along Portola Parkway to 9,900 along Olympiad Road near the southern project terminus.

