CHAPTER 3: ENVIRONMENTAL SETTING

3.1 INTRODUCTION

This chapter provides a description of the existing environment potentially affected by the construction, operation, maintenance, and decommissioning of the Barren Ridge Renewable Transmission Project (BRRTP). As described in Chapter 2, five Project Alternatives—including the Proposed Action, three additional action Alternatives, and the No Action Alternative (Proposed Action and Alternatives)—are analyzed in detail in this Final EIS/EIR. The Proposed Action and action Alternatives would consist of the following components:

1. Expansion of the existing Barren Ridge Switching Station.
2. Construction of a new electrical switching station in Haskell Canyon.
3. Construction of a new double-circuit 230 kilovolt (kV) transmission line from the Barren Ridge Switching Station to a new switching station located within Haskell Canyon. The length of the new transmission line would vary for each action Alternative and would range from 61 to 83 miles.
4. Upgrade of 76 miles of the existing Barren Ridge – Rinaldi (BR-RIN) 230 kV transmission line with larger capacity conductors between the Barren Ridge Switching Station and Rinaldi Substation.
5. Addition of 12 miles of a new 230 kV circuit on the existing double-circuit structures from Haskell Canyon to the Castaic Power Plant.

The action Alternatives would cross a variety of public and private land within the jurisdictions of multiple federal, State and local agencies or political subdivisions. Potential impacts from the Proposed Action or an Alternative are addressed in Chapter 4 of this Final EIS/EIR.

3.1.1 ENVIRONMENTAL SETTING OVERVIEW

For the purpose of this Final EIS/EIR, and pursuant to the California Environmental Quality Act (CEQA) Guidelines (Section 15125(a)), the environmental setting used to determine the potential impacts associated with the Proposed Action and Alternatives is based on the environmental conditions that existed in the Project area beginning at the time the Notice of Preparation was distributed and the Notice of Intent was published. The National Environmental Policy Act (NEPA) requires that an EIS shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 CFR 1502.15).

The “Environmental Setting” section in each resource discussion describes existing conditions in the Project area at the time this Final EIS/EIR analysis was conducted. Except where indicated differently, the environmental setting reflects conditions in the Project area under the CEQA baseline identified above. The identification of impacts for the Alternatives is based on changes between existing conditions described in the “Environmental Setting” section and future conditions that could occur with the implementation of each Alternative.

The environmental setting that may be affected by the Proposed Action and Alternatives is described in terms of two environments:
Human Environment—those physical, social, and economic factors potentially affecting the quality of living conditions, employment, and health of those inhabiting, working in, or visiting the Project area:

- Air quality
- Noise
- Land use
- Agriculture
- Recreation
- Public services and utilities
- Hazardous waste and materials
- Traffic and transportation
- Visual resources
- Cultural resources
- Wildfire and fuels
- Electrical Effects
- Socioeconomics

Natural Environment—those resources related to all living and non-living things occurring naturally in the Project area:

- Biological resources (vegetation, wildlife, riparian, and threatened, endangered, and other special-status species)
- Earth Resources (geology, seismicity, soils, mineralogy, and paleontology)
- Water resources (hydrology and wetlands)

Resources within these two basic environments that may be affected by the Proposed Action or Alternatives were inventoried to describe and establish an environmental baseline against which to measure and evaluate the potential incremental impacts that may be caused by the BRRTP. Methods of inventory varied among the various resources; therefore, the inventory areas and methods are summarized in each resource section. The areas covered by each resource investigation along each of the Alternative routes are described as study corridors. The study corridors identified during the siting and routing evaluation should not be confused with agency planning or designated utility corridors, used by the USFS, BLM, and other federal land management agencies to consolidate utility rights-of-way. In some cases, however, the agency utility corridors and the study corridors do correspond.

Detailed inventory results for each resource are contained in the BRRTP Technical Reports in Volumes III (Human Environment) and IV (Natural Environment). The Technical Reports also include detailed text, maps (see Volume V), and data tables identifying the locations of environmental resource features mile by mile and values for each Project component of the action Alternatives, including the assumed centerline of the new 230 kV transmission line. The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.
3.2 HUMAN ENVIRONMENT

3.2.1 AIR QUALITY

Introduction
The purpose of the air quality analysis is to evaluate the potential for impacts associated with construction and operation of the Proposed Action, along with each of the proposed transmission line Alternative corridors and proposed new switching station, on the ambient air quality. The air quality analysis shall 1) present the regulatory framework; 2) provide an overview of the technical methodology used in collecting baseline conditions and evaluating impacts; 3) examine the affected environment with respect to air quality; 4) describe the potential impact on air quality from construction and operation of the Proposed Action and Alternatives; 5) evaluate the level of potential impacts on air quality from construction and operation of the Proposed Action and Alternatives; and 6) present specifically recommended mitigation measures, if needed, to reduce potential impacts.

Recent regulatory action on both the federal and State level addresses emissions of greenhouse gases and potential global climate change impacts. Under State CEQA guidelines, global climate change is addressed as a cumulative impact.

The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Air Quality Technical Report, contained in Volume III of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Air Quality Technical Report, please refer to that report for more detailed information on the Proposed Action and Alternatives’ effects on air quality and climate change.

Overview of Methodology and Analysis Area
The BRRTP would fall within portions of two different air basins. These are the Mojave Desert Air Basin (MDAB) and the South Coast Air Basin (SCAB). The MDAB includes the desert portions of Kern, Los Angeles, and San Bernardino Counties and the Palo Verde Valley portion of Riverside County. The SCAB includes the non-desert portions of Los Angeles, San Bernardino and Riverside County, and Orange County. These air basins are further broken down into planning areas by the U.S. Environmental Protection Agency (EPA) based upon various emission problems, political boundaries or watershed boundaries.

The EPA is responsible for enforcing the Federal Clean Air Act (CAA) of 1970 and its 1977 and 1990 Amendments. Under the CAA, the EPA established the National Ambient Air Quality Standards (NAAQS), which identify the emission thresholds for criteria pollutants (see Table 3.2.1-3). Criteria pollutants regulated under these standards include ozone (O$_3$), nitrogen dioxide (NO$_2$), carbon monoxide (CO), respirable particulate matter (PM$_{10}$), fine particulate matter (PM$_{2.5}$), and sulfur dioxide (SO$_2$). O$_3$ is not a directly emitted pollutant, but is formed through reactions in the atmosphere between ozone “precursors” (oxides of nitrogen [NO$_X$] and reactive organic gases [ROG]) catalyzed by the effects of sunlight. The EPA classifies areas as “attainment,” “nonattainment,” or “unclassified” depending on whether ambient air quality data collected in the area indicate that the area shows compliance with the NAAQS (attainment),
shows noncompliance with the NAAQS (nonattainment), or whether there are insufficient data to make a determination of the area’s classification relative to the NAAQS (unclassified).

The EPA has transferred a number of responsibilities to the states and in most cases, regional air quality management districts. The BRRTTP area falls within three different regional air districts. The Antelope Valley Portion of Los Angeles County is in the Antelope Valley Air Quality Management District (AVAQMD). The non-desert portion of Los Angeles County is within the SCAQMD. The eastern (desert) portion of Kern County is within the East Kern Air Pollution Control District (EKAPCD).

Table 3.2.1-1 presents a summary of the attainment status of the areas in which the BRRTTP would be located.

**Table 3.2.1-1. Attainment Status – BRRTTP Areas**

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Attainment Status South Coast Air Basin</th>
<th>Attainment Status Mojave Desert Air Basin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Federal</td>
<td>State</td>
</tr>
<tr>
<td>Ozone – 1 hour</td>
<td>N/A</td>
<td>Extreme Nonattainment</td>
</tr>
<tr>
<td>Ozone – 8 hour</td>
<td>Extrem e Nonattainment¹</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>CO</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>NO₂</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>SO₂</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>Serious Nonattainment</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>Nonattainment</td>
<td>Nonattainment</td>
</tr>
</tbody>
</table>

¹ The AVAQMD is in the process of being redesignated as a severe nonattainment area for O₃.

One of the pollutants of concern that is typically generated during construction is particulate matter. Respirable particulate matter, or PM₁₀, refers to particulate matter with an aerodynamic diameter of ten microns or less. Fine particulate matter, or PM₂.₅, refers to particulate matter with an aerodynamic diameter of 2.5 microns or less. Particulate matter in this size range has been determined to have the potential to lodge in the lungs and contribute to respiratory problems. PM₁₀ and PM₂.₅ arise from a variety of sources, including road dust, diesel exhaust, combustion, tire and brake wear, construction operations and windblown dust. Human activities that contribute to the PM₁₀ emissions include combustion sources such as stack emissions, diesel exhaust and smoke from prescribed fire and wild fire, fugitive dust sources such as construction and demolition activities, off highway vehicle (OHV) travel, unpaved public roads and parking lots, industrial activities, OHV open areas and military activities. Both PM₁₀ and PM₂.₅ can either be emitted directly, or formed from the interaction of precursor pollutants such as NOₓ, SOₓ, ROG, and ammonia in the atmosphere.

One of the reasons for the concern with PM₁₀ and PM₂.₅ emissions is their adverse effect on human health. PM₁₀ and PM₂.₅ can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases such as asthma and chronic bronchitis. PM₂.₅ is considered to have the potential to lodge deeper in the lungs. All of the PM₁₀ particles are considered respirable particulate because they can be inhaled into the nose, throat and/or lungs.
Fine PM$_{10}$ particles are the largest threat to health because they tend to deposit in the air sacks. In addition, many of the fine particles are from precursor emissions, many of which are toxic or carcinogenic. Fugitive dust is primarily coarse particulate that is not as likely to contain toxic materials.

In addition to particulate matter, toxic air contaminants (TACs) may be emitted from construction or operational activities. TACs are air contaminants that are not covered under the NAAQS or California Ambient Air Quality Standards (CAAQS) that are considered to have the potential to cause adverse health effects upon exposure. The California Air Resources Board (ARB) and the California Office of Environmental Health Hazard Assessment have the responsibility to identify TACs within the state of California. TACs are considered to have no safe level of exposure. There are currently 250 substances that are identified by the state of California as TACs. These include substances that are emitted from industrial processes, as well as substances that are emitted by vehicles and heavy equipment. TACs that may be emitted during construction include pollutants such as diesel particulate matter.

The goal of the air quality analysis was to identify air emission sources associated with construction and operation of the Proposed Action and Alternatives. The analysis involved identification of the portions of the Proposed Action and Alternatives construction that would fall within the Mojave Desert Air Basin and the South Coast Air Basin, and within the jurisdiction of the East Kern Air Pollution Control District, the Antelope Valley Air Quality Management District, and the South Coast Air Quality Management District.

Construction emissions would be generated from the use of heavy construction equipment, emissions from light- and heavy-duty trucks traveling to the construction sites, and emissions from worker vehicles traveling to staging areas and construction sites. For those portions of the route that require the use of helicopters, emissions would be generated from the helicopter itself. Fugitive dust emissions would also be generated from equipment and vehicles traveling on unpaved surfaces and surface disturbance required for construction.

Emission calculations were based on the following sources:

- South Coast Air Quality Management District (SCAQMD) CEQA Air Quality Handbook
- SCAQMD OFFROAD Emission Factors for heavy construction equipment
- EMFAC2007 Emission Factors for vehicle emissions
- EDMS Emission Factors for helicopters
- U.S. Environmental Protection Agency (EPA) AP-42 Emission Factors

The construction schedule provided information on the number and type of construction equipment, workforce requirements, and truck trips, based on the following construction phases:

- Construction of the new 230 kV line from Barren Ridge to the Haskell Canyon Switching Station.
- Reconductoring of the existing 230 kV line from the Barren Ridge Switching Station to the Rinaldi Substation.
- Construction of the new 230 kV line from the Haskell Canyon Switching Station to the Castaic Power Plant.
• Construction of the Haskell Canyon Switching Station.
• Expansion of the existing Barren Ridge Switching Station.

The operational emissions from the Proposed Action or an action Alternative would comprise occasional inspection and maintenance activities (line patrols assumed to occur annually at a minimum) and no new stationary-source operating emissions would be generated as part of this Project. Operational emissions would therefore increase only marginally as a result of the implementation of the Proposed Action or an action Alternative. Operational emissions would not increase as a result of the No Action Alternative.

Further information on methodology is provided in the Air Quality Technical Report in Volume III.

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

The federal action portion of the Project must demonstrate that it conforms with the most recently approved State Implementation Plan (SIP). The portion of the federal action that would traverse the Mojave Desert Air Basin (MDAB) would be within the jurisdiction of the EKAPCD and the AVAQMD. The most recently EPA-approved SIP for the EKAPCD is the 1994 SIP, which was approved by the EPA in 1997. The EKAPCD’s most recently adopted air quality management plan is its Ozone Air Quality Attainment Plan (AQAP) (EKAPCD 1992). The most recent Implementation Progress Report on the Plan was prepared by the EKAPCD in 2005 (EKAPCD 2005). That document demonstrated that the EKAPCD has adopted all control measures identified in the AQAP into its Rules and Regulations, and is demonstrating further progress toward attainment of the ambient air quality standards.

The AVAQMD’s most recently EPA-approved SIP for the AVAQMD is the 1996 SIP, which was approved by the EPA in 1997. The AVAQMD adopted its 2004 Ozone Attainment Plan (AVAQMD 2004) on April 20, 2004, and has developed a Draft 2008 Federal 8-Hour Ozone Attainment Plan (AVAQMD 2008) to address air quality attainment in its portion of the Western Mojave Desert nonattainment area. In the Draft Plan, the AVAQMD does not propose to adopt any additional control measures for direct ozone precursor reduction purposes. The AVAQMD’s portion of the 8-hour $O_3$ plan has been submitted to the ARB and was approved by the ARB in July 2008. The AVAQMD has adopted fugitive dust control measures in its Rule 403. As required by Senate Bill 656, the AVAQMD is also committed to adopting all feasible measures to control emissions identified by the State. The State requires that all feasible measures be analyzed, and the analysis may result in a rule adoption action depending on the outcome of the feasibility analysis. One of the measures under consideration is revision of the Fugitive Dust requirements (AVAQMD Rule 403) to include additional feasible measures. The AVAQMD is in the process of evaluating cost-effectiveness of additional fugitive dust control measures and revising Rule 403 to reflect the findings of the analysis; a specific date for completion of the revision of the rule is not available.
The portion of the federal action that would traverse the SCAB would be within the jurisdiction of the SCAQMD. The most recently EPA-approved SIP for the SCAB is the 1996 SIP, which was approved by the EPA in 1997, and subsequently updated in 1999. The SIP update has been partially approved by the EPA, pending revisions to the inspection and maintenance program for mobile sources.

The most recent air quality management plan adopted by the SCAQMD for the SCAB is the 2007 Air Quality Management Plan (AQMP) (SCAQMD 2007), which was adopted by the SCAQMD Governing Board on June 1, 2007. The 2007 AQMP focuses on strategies for attainment and maintenance of the ozone and PM$_{2.5}$ standards. The AQMP was submitted to the ARB in 2007, and approved by the ARB on November 28, 2007, following which it was submitted to the EPA for approval. The EPA has not yet acted on the SCAB portion of the SIP, pending action by the ARB to adopt final rules that apply to state-wide emission sources. The SCAB’s PM$_{10}$ maintenance plan has been submitted to the ARB, and the ARB is currently reviewing the plan.

**Summary of Inventory Results**

**Project Components Common to All Action Alternatives**

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

**New 230 kV Circuit**

The addition of a 230 kV circuit would occur between the proposed Haskell Canyon Switching Station and Castaic Power Plant. This Project component would be located entirely within the SCAB, under the jurisdiction of the SCAQMD. As discussed below, the SCAB is designated as an extreme nonattainment area for the NAAQS for O$_3$, a serious nonattainment area for the NAAQS for PM$_{10}$, a nonattainment area for the CAAQS for O$_3$, PM$_{10}$, and PM$_{2.5}$. The SCAB is also considered a maintenance area for CO.

**Reconductoring of BR-RIN Transmission Line**

Reconductoring of the BR-RIN transmission line would follow a route similar to that of Alternative 2, and would cross or run adjacent to land uses similar to Alternative 2 as described below. Reconductoring would occur in both the MDAB and the SCAB, under the jurisdiction of all three air districts.

**New Haskell Canyon Switching Station**

The proposed new Haskell Canyon Switching Station site is located at the southern terminus of the transmission route in an unincorporated portion of Los Angeles County, northerly of the city of Santa Clarita, in the unincorporated community of Bouquet Canyon in the Santa Clarita Valley. The site would be situated on LADWP-owned land generally west of Pettinger Canyon and north of Dry Canyon Reservoir near the southern border of the ANF. This Project component would be located entirely within the SCAB, under the jurisdiction of the SCAQMD. As discussed below, the SCAB is designated as an extreme nonattainment area for the NAAQS for O$_3$, a serious nonattainment area for the NAAQS for PM$_{10}$, a nonattainment area for the
NAAQS for PM$_{2.5}$, and a nonattainment area for the CAAQS for O$_3$, PM$_{10}$, and PM$_{2.5}$. The SCAB is also considered a maintenance area for CO.

**Expansion of Barren Ridge Switching Station**

The Barren Ridge Switching Station expansion area would be located at the northern terminus of the transmission route adjacent to the existing switching station on vacant land owned by LADWP. The Barren Ridge Switching Station expansion would occur entirely within the MDAB in Kern County, under the jurisdiction of the EKAPCD. As discussed below, this area is designated as a moderate nonattainment area for the NAAQS for O$_3$, and a nonattainment area for the CAAQS for O$_3$, PM$_{10}$.

**New 230 kV Double-Circuit Transmission Line**

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

**Alternative 1**

The 230 kV transmission line in Alternative 1 would originate at the Barren Ridge Switching Station located in Kern County. The Alternative 1 transmission line would traverse a portion of Kern County within the MDAB, in the area under the jurisdiction of the EKAPCD. As discussed below, this area is designated as a moderate nonattainment area for the NAAQS for O$_3$, and a nonattainment area for the CAAQS for O$_3$ and PM$_{10}$.

The Alternative 1 transmission line would continue southwest parallel to the Los Angeles Aqueduct to Lancaster Road. The route would cross from Kern County into Los Angeles County and into the jurisdiction of the AVAQMD. This area is designated as a severe nonattainment area for the NAAQS for O$_3$, and a nonattainment area for the CAAQS for O$_3$ and PM$_{10}$.

The transmission line would then cross into the Angeles National Forest (ANF) and cross the boundary between the AVAQMD and SCAQMD’s jurisdiction into the SCAB. The SCAB is designated as an extreme nonattainment area for the NAAQS for O$_3$, a serious nonattainment area for the NAAQS for PM$_{10}$, a nonattainment area for the NAAQS for PM$_{2.5}$, and a nonattainment area for the CAAQS for O$_3$, PM$_{10}$, and PM$_{2.5}$. The SCAB is also considered a maintenance area for CO.

**Alternative 2: LADWP’s Proposed Action and Federal Agency Preferred Alternative**

The 230 kV transmission line in Alternative 2 would originate at the Barren Ridge Switching Station located in Kern County. The Alternative 2 transmission line would traverse a portion of Kern County within the MDAB, in the area under the jurisdiction of the EKAPCD. As discussed below, this area is designated as a moderate nonattainment area for the NAAQS for O$_3$, and a nonattainment area for the CAAQS for O$_3$ and PM$_{10}$.

The transmission line would continue south-southwest within the existing utility corridor and land designated as an energy corridor. The route would cross from Kern County into Los Angeles County and into the jurisdiction of the AVAQMD. This area is designated as a severe
nonattainment area for the NAAQS for O₃, and a nonattainment area for the CAAQS for O₃ and PM₁₀.

The Alternative 2 transmission line would then cross into the ANF and cross the boundary between the AVAQMD and SCAQMD’s jurisdiction into the SCAB. The SCAB is designated as an extreme nonattainment area for the NAAQS for O₃, a serious nonattainment area for the NAAQS for PM₁₀, a nonattainment area for the NAAQS for PM₂.₅, and a nonattainment area for the CAAQS for O₃, PM₁₀, and PM₂.₅. The SCAB is also considered a maintenance area for CO.

**Alternative 2a**

The Alternative 2a 230 kV transmission line would be 63 miles long and would follow the same route as the Proposed Action, except that a 7 mile portion would be located to the north and around the unincorporated community of Green Valley (Green Valley Re-route). The Green Valley Re-route would occur within the jurisdictional boundaries of the ANF (Santa Clara/Mojave Rivers Ranger District) and Los Angeles County. The Green Valley Re-route would be located entirely within the SCAB, under the jurisdiction of the SCAQMD.

**Alternative 3**

The Alternative 3 230 kV transmission line would originate at the Barren Ridge Switching Station located in Kern County. The transmission line would traverse a portion of Kern County within the MDAB, in the area under the jurisdiction of the EKAPCD. As discussed below, this area is designated as a moderate nonattainment area for the NAAQS for O₃, and a nonattainment area for the CAAQS for O₃ and PM₁₀.

The Alternative 3 transmission line would continue south-southwest within the existing utility corridor and land designated as an energy corridor. The route would cross from Kern County into Los Angeles County and into the jurisdiction of the AVAQMD. The transmission line would proceed south for six miles where it would then turn to the southeast towards California State Route 138 and travel through portions of the cities of Lancaster and Palmdale, and the unincorporated community of Quartz Hill. This area is designated as a severe nonattainment area for the NAAQS for O₃, and a nonattainment area for the CAAQS for O₃ and PM₁₀.

The Alternative 3 transmission line would then turn in a west-southwesterly direction towards the Vasquez Canyon Road area. The transmission line would then generally proceed in a westerly direction towards the proposed Haskell Canyon Switching Station site. The route would cross the boundary between the AVAQMD and SCAQMD’s jurisdiction into the SCAB. The SCAB is designated as an extreme nonattainment area for the NAAQS for O₃, a serious nonattainment area for the NAAQS for PM₁₀, a nonattainment area for the NAAQS for PM₂.₅, and a nonattainment area for the CAAQS for O₃, PM₁₀, and PM₂.₅. The SCAB is also considered a maintenance area for CO.

Table 3.2.1-2 presents a summary of the air basins and jurisdictions for the Project components of each action Alternative.
### Table 3.2.1-2. BRRTP Components by Jurisdiction

<table>
<thead>
<tr>
<th>Project Component</th>
<th>MDAB - EKAPCD</th>
<th>MDAB - AVAQMD</th>
<th>SCAB - SCAQMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Components Common to All Action Alternatives</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>New 230 kV Circuit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reconductoring of BR-RIN Transmission Line</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Haskell Canyon Switching Station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion of Barren Ridge Switching Station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New 230 kV Double-Circuit Transmission Line in Each Action Alternative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative 1</td>
<td>X</td>
<td>X</td>
<td>x</td>
</tr>
<tr>
<td>Alternative 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative 2a</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Alternative 3</td>
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<tr>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### 3.2.2 NOISE

**Introduction**

This section describes audible and radio noise in the area of the Proposed Action and Alternatives. Specifically, this section presents the conditions of the affected environment, and describes regulations, plans, and standards that pertain to ambient noise and noise from the transmission facilities in the BRRTP area.

The noise assessment shall: 1) provide an overview of the technical methodology used in collecting baseline conditions; 2) examine the affected environment with respect to noise; and 3) present the regulatory framework.

**Overview of Methodology and Analysis Area**

Corona noise results when the voltage gradient surrounding energized conductors or hardware exceeds the breakdown strength of air, resulting in electrical discharges. The voltage gradient can be perturbed and enhanced by surface imperfections such as water drops, insects, and scarred metal protrusions. The discharge activity and intensity depend on the type and number of discontinuities and how close the unperturbed surface gradient approaches the corona inception threshold.

Corona is a recognized phenomenon and it is considered in the design of electrical hardware and equipment as well as in the specific design of the BRRTP transmission line. The primary corona effects that are addressed in this investigation are Audible Noise (AN) and Radio Noise (RN). RN is composed of two components, Radio Interference (RI) and Television Interference (TVI).

**Audible Noise**

Transmission lines can generate a small amount of sound energy. The audible noise produced by corona from AC transmission lines is generally highest in fog or rain (considered as foul weather) and decreases during fair weather. AN from line sources is composed of two components: 1) A broadband (random) component characterized as having high frequency...
content (different from more common environmental noises), and 2) Pure tone (hum) components: most noticeably, second and fourth harmonics of the power frequency are superimposed on the broadband noise.

Sound magnitudes are measured in decibels (dB). In terms of the sensitivity of human hearing, there are generally three noise rating scales: the A-weighted, B-weighted, and C-weighted scales. The A-weighted sound level (dB(A)) is used as the noise rating scale for power line noise as it most accurately represents human sensitivity to sound levels.

Concern about noise is related to negative impacts on humans and animals. Human response to noise is most commonly expressed as an annoyance, and the level of annoyance may be affected by the intensity of the noise, its frequency (pitch), its duration of exposure, and/or its recurrence. Ambient noise is the total noise in an environment and usually comprises sounds from many sources.

Typical ranges of ambient sound levels for some common sources of noise are shown in Table 3.2.2-1.

**Table 3.2.2-1. Ambient Noise Sources**

<table>
<thead>
<tr>
<th>SOURCES OF NOISE</th>
<th>AMBIENT NOISE LEVEL (dB(A))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loud Automobile Horn</td>
<td>110 to 120</td>
</tr>
<tr>
<td>Inside Bus</td>
<td>80 to 90</td>
</tr>
<tr>
<td>Average traffic on Street Corner</td>
<td>70 to 80</td>
</tr>
<tr>
<td>Conversational Speech</td>
<td>60 to 70</td>
</tr>
<tr>
<td>Typical Business Office</td>
<td>50 to 60</td>
</tr>
<tr>
<td>Living Room Suburban Area</td>
<td>40 to 50</td>
</tr>
<tr>
<td>Library</td>
<td>30 to 40</td>
</tr>
<tr>
<td>Bedroom at Night</td>
<td>20 to 30</td>
</tr>
</tbody>
</table>

Audible noise decreases with distance from the line. Each transmission line phase conductor may be considered as a separate line source. Beyond a distance of approximately 50 feet from the outer phase conductor, this conductor would dominate and completely obscure the contributions of the other phase conductors. Overall, the attenuation of noise from the transmission line is somewhat greater than 3 dB per doubling of the distance from the line.

One way that AN levels are typically described is in statistical terms. For example, the $L_{50}$ sound level is the noise level exceeded 50 percent of the time. It is also common to evaluate sound levels over time. The time-variant noise levels take into account all types of noise sources, including what is produced from foul weather (such as rain). $L_{eq}$ is the equivalent, average sound level of a varying sound over a period of time, typically a period of 24 hours. The Day-Night Average Sound Level ($L_{dn}$) is a 24-hour sound level that accounts for noise intrusions at night by adding a 10-dB(A) penalty to all sounds occurring between 10 p.m. and 7 a.m. In California, the Community Noise Equivalent Level (CNEL) is similar to the $L_{dn}$, except that it further adds a 5-dB(A) penalty to all sounds occurring between 7 p.m. and 10 p.m.
Radio Noise

Radio Interference (RI) refers to interference primarily in the 535 to 1605 kilohertz (kHz) frequency range, and Television Interference (TVI) refers to interference in the 54 to 88 megahertz (MHz) range. Corona and gap discharges are two potential sources of interference from the proposed 230 kV line. Corona discharges induce trains of short-duration current pulses that propagate along the line conductors, away from the point of generation. Gap discharges result from electrical discharges between broken or poorly fitting hardware, such as insulators, clamps and brackets.

RI and TVI are measured in decibels and are referenced to a signal input of one microvolt tuned to a certain measurement frequency (the unit is decibel microvolt per meter or dBμV/m). The RI level of the line at any particular location and measurement frequency varies based on many factors, primarily weather conditions and time. RI is described in statistical terms and is typically denoted as the percentage of the total time that the RI level is less than a certain level. For example, an RI level often referred to is the “50 percent fair weather level” ($L_{50}$), meaning that the RI from the line can be expected to be less than this level for 50 percent of the total fair weather period. TVI is strictly a foul weather phenomenon and is characterized on the basis of an $L_{50}$ foul weather level.

The criteria for establishing limits of interference take into account: 1) the definition of the quality of radio/television service to be protected; 2) the zone in which a specified quality of service is to be protected; and 3) the fraction of time during a year that a specified quality of service is protected. The FCC (Federal Communications Commission) governs the radio and television interference from power transmission systems, simply by saying there can be no harmful interference.

Numerous tests conducted in the past in North America and other parts of the world have identified signal-to-noise ratios (SNRs) for different reception grades (that refer to quality of reception or degree of annoyance). For example, the Grade A (or 5) indicates a strong radio signal, relating to an SNR of 31 dB or greater, which signifies entirely satisfactory service.

This data relating to reception quality is based upon the results of listening tests performed by an Institute of Electrical and Electronic Engineers (IEEE) committee and is summarized in Table 3.2.2-2. The original IEEE data was based upon comparing quasi-peak (QP) signals to quasi-peak noise (quasi-peak refers to measurement of slightly lower than peak levels for signal strength and noise). Based on changes to measurement procedures, the grades are now based upon signals measured with a root mean square (RMS) average field intensity (FI) detector, based on the FCC preference for measuring AM radio signal strength. Also, the new standard for measuring QP signals is from International Electrotechnical Commission/ Special International Committee on Radio Interference (IEC/CISPR) Publication 16, whereas the old QP detector used American National Standards Institute (ANSI) standards. This older detector can be used, but the values must be reduced by 2 dB to agree with the present standards.
### Table 3.2.2-2. AM Radio Reception Quality Versus Signal-to-Noise Ratio\(^1\)

<table>
<thead>
<tr>
<th>CODES</th>
<th>DESCRIPTION</th>
<th>SIGNAL-TO-NOISE RATIO (dB)(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (5)</td>
<td>Entirely satisfactory</td>
<td>31 or greater</td>
</tr>
<tr>
<td>B (4)</td>
<td>Very good, background unobstructive</td>
<td>26 or greater</td>
</tr>
<tr>
<td>C (3)</td>
<td>Fairly satisfactory, background plainly evident</td>
<td>21 or greater</td>
</tr>
<tr>
<td>D (2)</td>
<td>Background very evident, but speech easily understood</td>
<td>15 or greater</td>
</tr>
<tr>
<td>E (1)</td>
<td>Speech understandable with severe concentration</td>
<td>4 or greater</td>
</tr>
<tr>
<td>F (0)</td>
<td>Speech unintelligible</td>
<td>Below 4</td>
</tr>
</tbody>
</table>

\(^1\)Values presented are based on the IEC/CISPR Pub 16 standards for the measurement of QP signals.

The quality of reception in the presence of man-made noise is primarily a function of the SNR at the receiver’s antenna. Typically the SNR is determined based on measurements of the radio or television signal and the noise from the transmission line at a particular location. The radio and television interference calculations for the proposed 230 kV line provide a basis for the measurement of the radio and television signals in order to evaluate the SNRs.

Interference generated at television frequencies from power lines and stations may be due to corona or gap type discharges. At the present time, there are no standards established for the measurement of TVI from power transmission systems. Early studies on the subjective evaluation of picture quality have been made using a random noise environment. The results of these studies have not been sufficient either to standard power line TVI measurements or to establish criteria for acceptable signal-to-noise ratios.

Television services are classified in two categories: Grades A and B. An FCC television service of Grade A signal level was assumed for evaluating TVI generated by the proposed line, as this Grade is protected by FCC rules and has the lowest signal-to-noise ratio allowed. Grade A levels are 68 dBμV/m for channels 2 through 6, 71 dBμV/m for channels 7 through 13, and 74 dBμV/m for channels 14 through 83. For the Grade A signal levels, an SNR of at least 30 is required if corona noise is not to cause objectionable interference. An SNR level from 20 to 30 would have somewhat-to-definitely objectionable television interference levels.

### Regional Setting

The following section discusses the current noise environment within and adjacent to the facilities that would be associated with the Proposed Project and alternatives.

The Proposed Action and Alternatives, with the exception of the reconductoring proposed south of Haskell Canyon Switching Station, are located in primarily rural areas with few activities that generate substantial sustained noise events. South of Haskell Canyon Switching Station, the Project would be located in an urban environment. Community noise levels are usually closely related to the intensity of nearby human activity.

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\(^1\)The latest reception quality versus SNR plot (from the Electric Power Research Institute [EPRI] “Red Book” 3rd Edition, Chapter 9), from which Table 3.2.2-2 was derived, is shown.
Noise levels are generally considered low when ambient levels are below 45 dB(A), moderate in the 45 to 60 dB(A) range, and high above 60 dB(A). In small towns or wooded and lightly used residential areas, day-night levels can be below 35 dB(A). Levels around 75 dB(A) are more common in busy urban areas (e.g., downtown areas), and levels up to 85 dB(A) occur near major freeway and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be adverse to public health (EPA 1974).

The surrounding land uses dictate what future noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night differences can be considerably less. Nighttime noise in areas with full-time human occupation is often considered objectionable because of the likelihood of disrupting sleep. Noise levels above 45 dB(A) at night can result in the onset of sleep interference effects. At 70 dB(A), sleep interference effects become considerable (EPA 1974).

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

**Summary of Inventory Results**

**Project Components Common to All Action Alternatives**

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

**Reconductoring**

Reconductoring of the existing BR-RIN would occur from Barren Ridge Switching Station that is located 12 miles north of the City of Mojave to the Rinaldi Substation located in the City of San Fernando. Because the reconductoring corridor from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station is identical to the proposed 230 kV transmission line corridor for Alternative 2 analyzed in detail below, this analysis focuses only on the reconductoring section between the proposed Haskell Canyon Switching Station and the existing Rinaldi Substation.

**Noise Sources**

From the proposed Haskell Switching Station to the Rinaldi Substation, the transmission line corridor would be located in an urban environment, and major noise sources include roadways and rail systems. During peak use periods, State Highways 14 and 210 and Interstate 10 would be expected to produce traffic noise levels in the range from 80 to 90 dB(A) at 50 feet from the shoulder. The Santa Clarita Metrolink Rail and Sylmar/San Fernando Metrolink Rail would be in close proximity to the southern portion of the reconductoring corridor and expected to produce noise levels of 60 to 70 dB(A) from 50 feet.
There are 11 Federal Aviation Administration (FAA)-registered air facilities within 20,000 feet of the reconductoring corridor that also contribute to the existing noise environment and are listed below. The California Division of Aeronautics is in charge of enforcing airport noise regulations for all airports within the State of California and airports are not to expose residences to a community noise equivalent level (CNEL) of greater than 65 decibels.

- Dept. of Water and Power Granada Hills Heliport in the city of Granada Hills.
- A heliport in the Devonshire area.
- Whiteman Airport near the city of San Fernando.
- Barton Heliport in the unincorporated community of Pacoima.
- Holy Cross Medical Center Heliport in the city of San Fernando.
- Spears Heliport in the city of San Fernando.
- Merle Norman Cosmetics Heliport in the unincorporated community of Sylmar.
- Olive View Medical Center Heliport in the unincorporated community of Sylmar.
- Camp 14 Heliport in the unincorporated community of Saugus.
- Henry Mayo Newhall Memorial Hospital Heliport in the unincorporated community of Valencia.
- The Sheriff’s Station Heliport in the unincorporated community of Valencia.

**Sensitive Receptors**

Sensitive receptors along the reconductoring corridor include the Placerita State Park and Rosedell High School. There are also 1,980 residences within 1,000 feet from the Haskell Canyon Switching Station to Rinaldi Substation. The noise levels are generally found to range between 55 dBA and 75 dBA in most communities.

**Haskell Canyon Switching Station**

The proposed Haskell Canyon Switching Station site would be located on a vacant site within the ANF just north of the City of Santa Clarita. There are no existing noise sources within the area. The closest noise receptors are the Veluzat Motion Picture Ranch to the east and a residential community to the south.

**Barren Ridge Switching Station**

The existing Barren Ridge Switching Station is located 12 miles north of the City of Mojave. Noise sources include State Route 14 and electrical transformers within the station and their associated transmission lines. State Route 14 to the east is a major transportation artery through the Mojave Desert and contributes the greatest noise levels. During peak use periods, traffic noise levels can range from 80 to 90 dB(A) at 50 feet from the shoulder. There are no sensitive receptors in close proximity to the switching station.

**New 230 kV Circuit**

A new 230 kV circuit from the existing Castaic Power Plant to the proposed Haskell Canyon Switching Station would be placed on existing LADWP 230 kV transmission line structures located in unincorporated areas of Los Angeles County.
Noise Sources
Within the same transmission line corridor is another LADWP 230 kV transmission line to the south. Operation of the high voltage transmission lines and electric substation equipment can create audible corona noise, but it is barely heard in fair weather conditions.

The alignment of the new 230 kV circuit would generally parallel Interstate 5. It would also cross or come in close proximity to a few local roadways with low traffic and areas of off-highway vehicle use in the ANF. Interstate 5 is a major transportation artery that can have significant localized noise levels, especially from large diesel long-haul trucks. During peak use periods, traffic noise levels can range from 80 to 90 dB(A) at 50 feet from the shoulder of the interstate. The local roadways would typically be used by local residents, delivery trucks and other vendors, and recreationalists. Noise levels along these roadways when vehicles are present would be expected to range from 50 to 70 dB(A) at 50 feet from the shoulder of the road. Dispersed recreation within the ANF occurs and may allow for off-highway vehicle (OHV) use. Noise levels of these vehicles can vary from 50 to over 80 dB(A) at a distance of 25 feet, depending upon the activity.

The Castaic Dam Heliport, an FAA-registered air facility, would be located in the unincorporated community of Castaic and within 20,000 feet of the proposed new 230 kV circuit corridor. The California Division of Aeronautics is in charge of enforcing airport noise regulations for all airports within the State of California and airports are not to expose residences to a community noise equivalent level (CNEL) of greater than 65 decibels.

Sensitive Receptors
Sensitive receptors to the addition of a new 230 kV circuit include 20 residences within 1,000 feet of the new 230 kV circuit, the Castaic Lake State Recreation Area, and camping areas within the ANF. The general noise environment of areas within and adjacent to residences would likely be typical of rural to suburban locations, normally averaging from 30 to 50 dB(A). Outdoor average nighttime noise levels would be typically five dB(A) quieter than daytime averages.

New 230 kV Double-Circuit Transmission Line
The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

Alternative 1
The Alternative 1 transmission line would traverse rural areas.

Noise Sources
Existing noise sources for the Alternative 1 transmission line would include roadways and airports. The Alternative 1 transmission line would come in close proximity to State Highway 14 and Interstate 5, and cross State Highway 58. During peak use periods, traffic noise levels can range from 80 to 90 dB(A) at 50 feet from the shoulder of the roadway. The local roadways noise levels, when vehicles are present, would be expected to range from 50 to 70 dB(A) at 50 feet from the shoulder of the road. Three FAA-registered air facilities would be located within 20,000 feet of the Alternative 1 transmission line and are listed below.

- Castaic Dam Heliport in the unincorporated community of Castaic.
• Quail Lake Sky Park Airport in the unincorporated community of Gorman and the city of Lancaster in close.
• Sheriff’s Wayside Heliport in the unincorporated community of Valencia, near the unincorporated community of Rosamond.

Sensitive Receptors
The Alternative 1 transmission line has the following sensitive receptors: 106 residences within 1,000 feet, the Pacific Crest Trail, Castaic Lake State Recreation Area, Neenach Elementary School and Veluzat Motion Picture Ranch. The Pacific Crest Trail is a 2,650 mile long trail that the United States Congress designated as the first scenic trail in the National Trails System. The Castaic Lake State Recreation Area is home to one of the largest State Water Project reservoirs in Southern California and allows for many different types of recreation, such as boating, fishing, picnicking, and camping. The Veluzat Motion Picture Ranch is a 750-acre ranch that operates as an active studio for films, television shows, and music videos.

The general noise environment of areas within and adjacent to residences would be typical of rural to suburban locations, normally averaging from 30 to 50 dB(A). Outdoor average nighttime noise levels would be typically five dB(A) quieter than daytime averages.

Alternative 2
The Alternative 2 transmission line would traverse rural and suburban areas.

Noise Sources
The Alternative 2 transmission line would have the following noise sources: roadways, the Drinkwater OHV Staging Area, and airports. It would come into close proximity to State Route 14 and cross State Route 58. Drinkwater Flat OHV area is a High Impact Recreational Area (HIRA) per the USFS and is open to motorcycles, ATVs, and four-wheel drive vehicles. Four FAA registered air facilities would be within 20,000 feet of the Alternative 2 transmission line and are listed below:
• Lloyd’s Landing Airport in the unincorporated community of Rosamond
• Mojave Airport in unincorporated community of Mojave
• Skyotee Ranch Airport in the unincorporated community of Rosamond
• Little Buttes Antique Airfield in the city of Lancaster

Sensitive Receptors
Sensitive receptors along the Alternative 2 transmission line would include: 110 residences within 1,000 feet of the transmission line; the Pacific Crest Trail; and the Antelope Valley Poppy Reserve. The Antelope Valley California Poppy Reserve includes 1,745 acres of protected land to allow the California Poppy (California state flower) to flourish every spring and allow visitors to enjoy the trails located within.

Alternative 2a
The Alternative 2 transmission line would be located in a rural and suburban noise environment.

The transmission line for Alternative 2a would be very similar to Alternative 2. They would share 56 miles of the same alignment and would have the same roadway, OHV, and airport noise
sources. The difference would be the seven-mile re-route around the unincorporated community of Green Valley that would be located along an existing fire road and create a new transmission line corridor within the ANF. There would be no existing noise sources except from the fire road, which experiences very low traffic.

Sensitive receptors would include the Antelope Valley California Poppy Reserve, the Pacific Crest Trail, and 70 residences within 1,000 feet of the transmission line (the lowest number of all the Action Alternatives).

**Alternative 3**

The northern portion of the Alternative 3 transmission line would traverse rural and suburban areas. The southern portion would be located near urban areas that include the cities of Lancaster, Palmdale, and Santa Clarita.

**Noise Sources**

Noise sources would include State Routes 14 and 58, three FAA-registered air facilities listed below, and Rowher Flats OHV area. The Rowher Flats OHV area is a HIRA that consists of 10,000 acres and is open to motorcycles, ATVs, and four-wheel drive vehicles.

- Agua Dulce Airport in the unincorporated community of Agua Dulce in close proximity to the Alternative 3 transmission line route.
- Bohunk’s Airpark Airport in the city of Lancaster in close proximity to the Alternative 3 transmission line route.
- Little Buttes Antique Airfield in the city of Lancaster adjacent to the central portion of the Alternative 3 transmission line.

**Sensitive Receptors**

Alternative 3 would have the following sensitive receptors: the Pacific Crest Trail, three movie studios, Ritter Ranch Park, and 242 residences within 1,000 feet of the transmission line (the most residences of all the Action Alternatives). The S.O.S FilmWorks, Veluzat Motion Picture and Blue Cloud Movie Ranch are movie studios used in films, television, and music videos. Ritter Ranch Park contains over 4,000 acres perched at the eastern end of the Sierra Pelona Mountains.

### 3.2.3 LAND USE

**Introduction**

This section identifies and describes the land uses affected by implementation of the Proposed Action and Alternatives. It provides an overview of the technical methodology used in establishing baseline conditions, examines the affected environment within a defined study area and vicinity context, and presents the regulatory framework that is relevant to land use. While agricultural, recreational, and open space uses were identified, the analyses of these resources are presented separately in Section 3.2.4 (Agriculture) and Section 3.2.5 (Recreation). A discussion of Significant Ecological Areas (SEAs), Habitat Conservation Plans (HCPs), and Natural Community Conservation Plans (NCCPs) are also presented separately in Section 3.3.1 (Biological Resources).
The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Land Use Technical Report, and contained in Volume III of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Land Use Technical Report, please refer to that report for more detailed information on Proposed Action and Alternatives effects on land uses.

**Overview of Methodology and Analysis Area**

The objective of the land use inventory was to identify, map, describe, and document the existing, planned, and designated land uses within the land use study area (study area). This was accomplished by collecting data for land use types within a one-mile wide study corridor (0.5 mile on each side of the centerline of the transmission line) for the Proposed Action and Alternatives.

Initially, base maps were prepared at a scale of 1:12,000. Land use data collected from a number of environmental studies in the region were reviewed, refined, and updated. Agency land and resource management and planning documents were also reviewed for applicable data and land management regulations and policies. In addition, on-line database searches of the BLM LR2000 system were conducted.

Following this initial step in the inventory, key federal, State, and local land and resource management agencies were contacted to update information and to solicit further input. Contacts were established by telephone, letter, e-mail, or personal interview. Current data was compiled and mapped utilizing a geographic information system (GIS). Aerial Photography (National Agriculture Imagery Program 2005 color aerial photography and Google Earth 2009), and national, State, and local agency GIS data layers were utilized to identify and more accurately assess surface land uses and land cover types.

General and area land use designations were determined from local plans within the Proposed Action and Alternatives impact corridor. Land uses for the BLM and ANF were identified through review of the California Desert Conservation Plan, including the West Mojave Plan, and Forest Service Land Management Plan for the ANF. Field investigations were conducted to verify and supplement selected existing land uses during September 2007 and from September 2008 through May 2009.

Airports and airstrips in the vicinity of the Proposed Action and Alternatives were also identified from information provided by the Federal Aviation Administration (FAA) and review of published maps and aerial photography (National Agriculture Imagery Program 2005 color aerial photography and Google Earth 2009).

The Proposed Action and Alternatives are located in portions of southern Kern County and northern Los Angeles County (refer to Figures 3.2.3-1 and 3.2.3-2). The geography of the area is diverse, containing mountainous areas, agricultural lands, and desert areas. Land use planning, management and jurisdictional authority fall under federal, State, and local agencies, including the BLM (Ridgecrest and Palm Springs-South Coast Field Offices), USFS (Angeles National Forest), Department of Defense (DoD), California State Lands Commission, California Department of Parks and Recreation, California Department of Fish and Game, California
Department of Transportation, Kern County, Los Angeles County, City of Lancaster, City of Palmdale, City of Santa Clarita, City of Los Angeles, and City of San Fernando.

Primary existing land uses located within the southern Kern County study area and vicinity include utility and transportation rights-of-way, scattered residential development, open space, agriculture, and military uses. Scattered parcels of BLM public lands administered by the Ridgecrest Field Office are located in the area. Land use authorizations granted by the BLM allow for private entities to utilize public lands for specific purposes. BLM land use authorizations (authorized and pending) identified in the study area are presented in Table 3.2.3-1.

**Table 3.2.3-1. Authorized and Pending Land Use Authorizations - BLM**

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<thead>
<tr>
<th>Serial Number</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CACA 048820</td>
<td>Pending</td>
<td>First Solar Development Inc – ROW-Solar Dev Fac</td>
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<tr>
<td>CACA 048871</td>
<td>Pending</td>
<td>Los Angeles Dept Water &amp; Power – ROW-Power Tran-FLPMA</td>
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<tr>
<td>CACA 049576</td>
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<td>Power Partners Southwest LLC – ROW-Solar Dev Fac</td>
</tr>
<tr>
<td>CACA 008183</td>
<td>Authorized</td>
<td>BLM CAL SO – WDL-Stock Driveway</td>
</tr>
<tr>
<td>CACA 008184</td>
<td>Authorized</td>
<td>BLM CAL SO – Small Tract Class</td>
</tr>
<tr>
<td>CALA 008876</td>
<td>Authorized</td>
<td>Los Angeles Dept Water &amp; Power – ROW-Misc &amp; Special</td>
</tr>
<tr>
<td>CALA 0119205</td>
<td>Authorized</td>
<td>Continental Telephone Co of CA - ROW-Telephone-Telegraph</td>
</tr>
<tr>
<td>CARI 000231</td>
<td>Authorized</td>
<td>Los Angeles Dept Water &amp; Power – ROW-Water Plants</td>
</tr>
<tr>
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<td>CACA 051723</td>
<td>Pending</td>
<td>AES Seawest Inc – ROW- Wind Proj Test</td>
</tr>
<tr>
<td>CACA 023812</td>
<td>Pending</td>
<td>Mojave Public Utility Dist – Unauth Act –ROW-Other</td>
</tr>
<tr>
<td>CACA 012452</td>
<td>Authorized</td>
<td>CA Dept Transportation – Fed Aid Highway(Sec 317)</td>
</tr>
<tr>
<td>CACA 016650</td>
<td>Authorized</td>
<td>Southern California Edison Co – ROW-Power Tran-FLPMA</td>
</tr>
<tr>
<td>CACA 020234</td>
<td>Authorized</td>
<td>Kern Cnty Of – ROW-Other-FLPMA</td>
</tr>
<tr>
<td>CACA 044611</td>
<td>Authorized</td>
<td>Alta Windpower Dev., LLC – ROW- Wind Proj Test</td>
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<tr>
<td>CACA 047096</td>
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<td>Cary Norman Mellott Lynn W – ROW-Other-FLPMA</td>
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<td>CARI 000231</td>
<td>Authorized</td>
<td>Los Angeles Dept Water &amp; Power – ROW-Water Plants</td>
</tr>
<tr>
<td>CAS 0036175</td>
<td>Authorized</td>
<td>CA Dept of Transportation – Fed Aid Highway(Sec 17)</td>
</tr>
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</table>

Source: BLM Land & Mineral Legacy Rehost 2000 System – Run Date: March 31, 2010

Communities within the Kern County study area include the unincorporated communities of Willow Springs and Rosamond and unincorporated community of Mojave. A number of renewable energy projects (solar and wind) are planned or have been recently approved. General Plan land use designations in this area of Kern County are predominantly Intensive and Extensive Agriculture, Resource Management, and Residential.

Existing land uses in the northern Los Angeles County study area and vicinity consist of the cities of Lancaster, Palmdale, Santa Clarita, Los Angeles, and San Fernando. These urban areas include residential, commercial, public/quasi-public, industrial, and military uses. Unincorporated communities within the region in Los Angeles County include Agua Dulce, Antelope Acres, Bouquet Canyon, Canyon Country, Castaic, Castaic Junction, Del Sur, Elizabeth Lake, Green Valley, Lake Hughes, Leona Valley, Mint Canyon, Neenach, Newhall, Quartz Hill, Saugus, Valencia, and Vasquez Rocks. Residential parcel sizes tend to become larger as the distance from incorporated areas or unincorporated urban community areas increases.
Commercial, public/quasi-public, and industrial development is primarily found in or around incorporated and unincorporated communities. Commercial uses exist near the on/off ramps of Interstate 5 (I-5) and along State highways. Commercial microwave, cellular and radio towers are generally located in and around communities, along major roadways, and on mountain peaks. Film production is found in the area and includes three movie ranches (Veluzat Motion Picture Ranch, Blue Cloud Movie Ranch, and Agua Dulce Movie Ranch – S.O.S. FilmWorks). Industrial uses include business parks and light manufacturing uses located in the unincorporated community of Castaic and along the Sierra Highway. Oil wells are located in the Placerita Canyon area.

The area has seen much growth and annexation over the last 20 years, such as the incorporation of the City of Santa Clarita and the expansion of the cities of Palmdale and Lancaster, especially along the Highway 14 corridor. The area contains numerous tracts of land planned for future development.

Primary General Plan land use designations within the northern Los Angeles County study area consist of Urban Mixed, Residential, and Agriculture. The ANF is also located in the area and existing land uses include undeveloped lands utilized for recreational, natural resource, and fire management purposes. Other uses include rural residential, and non-recreation special-uses (public and private road rights-of-way, apiaries, telephone and electric service rights-of-way, oil and gas pipeline rights-of-way, and hydroelectric power-generating facilities). Special Use Authorizations allow their use and occupancy on National Forest System (NFS) land. Management of NFS lands within the ANF is guided by the 2005 ANF Land Management Plan (LMP), adopted pursuant to planning regulations of the National Forest Management Act (NFMA).
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Figure 3.2.3-1. LAND USE—NORTHERN PORTION OF PROJECT AREA
Figure 3.2.3-2. Land Use—Southern Portion of Project Area
Eight land use zone designations have been established in the ANF LMP to identify suitable development in the ANF: Developed Area Interface (DAI), Back Country (BC), Back Country Motorized Use Restricted (BCMUR), Back Country Non-Motorized (BCNM), Critical Biological (CB), Existing Wilderness (EW), Recommended Wilderness (RW), and Experimental Forest (EF). Table 3.2.3-2 provides a description of these land use zones.

### Table 3.2.3-2. Angeles National Forest Land Use Zones

<table>
<thead>
<tr>
<th>Land Use Zone</th>
<th>Land Use Zone Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed Area Interface (DAI)</td>
<td>The DAI zone includes areas adjacent to communities or concentrated developed areas with more scattered or isolated community infrastructure. The level of human use and infrastructure is typically higher than in other zones. This zone may have a broad range of higher intensity uses; however, the management intent is to limit development to a slow increase of carefully designed facilities to help direct use into the most suitable areas and improving existing facilities before developing new ones.</td>
</tr>
<tr>
<td>Back Country (BC)</td>
<td>The BC zone includes areas that are generally undeveloped with few roads. The level of human use and infrastructure is low. Most of the ANF’s remote recreational and administrative facilities are found in this zone. Although the BC zone generally allows for a broad range of uses, its management intent is to retain its natural character and limit the level and type of development. Additionally, it is anticipated that this zone will be managed for no increase, or a very low level of increase, in its road system.</td>
</tr>
<tr>
<td>Back Country Motorized Use Restricted (BCMUR)</td>
<td>The BCMUR zone includes areas of the ANF that are generally undeveloped with few roads. Few facilities are found in this zone, but some may occur in remote locations. The level of human use and infrastructure is low to moderate. Although this zone allows a range of low intensity land uses, its management intent is to retain its natural character and limit the level and type of development. Some roads may be constructed and maintained, but the intent is to manage the zone for no increase, or a very low level of increase, in its road system.</td>
</tr>
<tr>
<td>Back Country Non-Motorized (BCNM)</td>
<td>The BCNM zone generally includes areas of the ANF that are undeveloped with few, if any roads. Developed facilities supporting dispersed recreation activities are minimal and generally limited to trails and signage. The level of human use and infrastructure is low. While a range of non-motorized public uses are generally allowed, the management intent of this zone is to retain its undeveloped character and limit development to a low level of increase. Facility construction (except trails) is generally not allowed, but may occur in remote locations where roaded access is not needed for maintenance.</td>
</tr>
<tr>
<td>Critical Biological (CB)</td>
<td>The CB zone includes the most important areas in the ANF for the protection of species-at-risk. Facilities are minimal to discourage human use. The level of human use and infrastructure is low to moderate. The management intent of this zone is to retain its natural character and habitat characteristics and limit the level of human development. Activities and modifications to existing infrastructure are allowed if they are beneficial or neutral to the species for which the zone is primarily managed. Human uses are more restricted in this zone than in BCNM zone in order to protect species needs, but are not excluded. Low impact uses, such as hiking, mountain biking and hunting are generally allowed. Road density will not be increased.</td>
</tr>
<tr>
<td>Existing Wilderness (EW)</td>
<td>The EW zone includes Congressionally designated wildernesses. Only uses consistent with all applicable wilderness legislation and the zone’s primitive character are allowed. Road access is limited. The management intent of this zone is focused on public use and enjoyment while preserving its wilderness character and natural conditions.</td>
</tr>
<tr>
<td>Recommended Wilderness (RW)</td>
<td>The RW zone includes lands which are recommended to Congress for wilderness designation. These lands are managed in the same manner as EW zone. If RW lands are not designated as wilderness by Congress, they are zoned BCNM until modified by a subsequent amendment to the Forest Service Land Management Plan. No inventoried roads are found in the RW zone.</td>
</tr>
<tr>
<td>Experimental Forest (EF)</td>
<td>The EF zone provides for research and demonstration areas. The EF zone is generally closed to the public except by permit. Within the ANF, only the San Dimas Experimental Forest is zoned EF.</td>
</tr>
</tbody>
</table>

Within each land use zone of the ANF are special designation overlays that identify suitable land uses. Special designation overlays include Wild and Scenic Rivers, Inventoried Roadless Areas, Research Natural Areas, Special Interest Areas, and Other Designations (communication sites.
utility corridors, transportation corridors, recreation residence tracts, shooting areas, and sediment disposal sites).

The ANF is also divided into eleven geographical units of different landscape character, known as “Places.” Places reflect the overall impression of landscape attributes, physical appearance, and cultural context of a landscape.

The USFS has created an overall theme, setting, desired condition, and management program emphasis for each Place. Table 3.2.3-3 summarizes the desired conditions for the Places traversed by the Proposed Action and Alternatives.

**Table 3.2.3-3. Desired Conditions for Angeles National Forest Places Traversed by the Proposed Action and Alternatives**

<table>
<thead>
<tr>
<th>Place</th>
<th>Desired Conditions for Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liebre-Sawmill Place</td>
<td>The desired condition for the Liebre-Sawmill Place is the natural undeveloped appearance of the landscape, with dramatic desert panoramas and open space areas. The management program for the Liebre-Sawmill Place emphasizes the preservation of forest health and aims to maintain the area's sense of remoteness and minimal use.</td>
</tr>
<tr>
<td>Santa Clara Canyon</td>
<td>The desired condition for the Santa Clara Canyon Place is the natural appearance and pastoral landscape, with dramatic canyon panoramas, rugged mountain backviews, and oak woodlands. The management program emphasizes a focus on community protection, recreation use, and urban and forest infrastructure that is sustainable, sympathetic to the natural setting and integrity, and has nominal effects to wildlife habitat as well as heritage resources.</td>
</tr>
<tr>
<td>Soledad Front Country</td>
<td>The desired condition for the Soledad Front Country Place is to maintain its function as a scenic backdrop, with dramatic canyons and rugged mountains. The management program emphasizes fire protection for surrounding communities, and the accommodation of recreational use. Management is also focused on protecting open space areas in this place from encroachment by adjacent development. The Pacific Crest Trail traverses the entire width of the Soledad Front Country Place.</td>
</tr>
<tr>
<td>I-5 Corridor</td>
<td>The desired condition for the I-5 Corridor Place is a scenic transportation gateway that provides canyon and rugged mountain views to visitors traveling along I-5. The management program emphasizes sustainable urban and forest infrastructure that preserves the integrity of the natural setting and minimizes the effects to species of concern, as well as heritage resources.</td>
</tr>
</tbody>
</table>

Other land uses common to both the southern Kern County and northern Los Angeles County study areas and vicinity include:

**Military Facilities**

Department of Defense (DoD) military facilities identified in the region include China Lake Naval Air Weapons Station and Edwards Air Force Base (AFB). The China Lake Naval Air Weapons Station and Edwards AFB are located in an area referred to as “the R-2508 complex,” which is used for the advancement of weapons systems technology and tactical training.

The R-2508 Complex provides the largest single area of Special Use Airspace over land in the United States, covering a land area of 20,000 square miles in eastern Kern, San Bernardino, Los Angeles, Ventura, Tulare, and Inyo Counties. The complex consists of restricted areas (R-2508, R-2502N, R-2502E, R-2505, R-2506, R-2515, and R-2524), Military Operations Areas (MOA), Air Traffic Control Assigned Airspace (ATCAA) areas, Controlled Firing Areas (CFAs), and
other special airspace, such as the CORDS Road, the Precision Impact Range Area, the Black Mountain Supersonic Corridor, the North Hypersonic Corridor, the South Hypersonic Corridor, and the Airfield Approach and Departure Corridors.

In addition to the China Lake Naval Air Weapons Station and Edwards AFB, other military installations use this air space, including the Fort Irwin Military Reservation near the city of Barstow and Air Force Plant 42 in the city of Palmdale.

**Linear Facilities**

Linear facilities in the area include electrical transmission lines owned and operated by LADWP and Southern California Edison (SCE) as well as numerous sub-transmission and distribution lines (both aerial lines and buried cable), petroleum pipelines, and other utility features. Other utility features consist of long distance and local telephone aerial wires, buried copper and fiber optic cables, aerial and buried cable television lines, gas lines, and domestic water lines. The California Aqueduct, part of the State Water Project, traverses the area mostly underground and in a primarily north-south direction. Highways and roads consist of Interstate highways, U.S. highways, State highways, county and other local roads, as well as USFS and BLM roads.

**Air Facilities**

Air facilities (public and private airports) are located near and in the vicinity of the Proposed Action and Alternatives. Other air facilities may exist as part of agricultural and/or movie production operations. Twenty FAA-registered air facilities within 20,000 feet of the Proposed Action and Alternatives were identified (see Appendix F, Table F-16 of this Final EIS/EIR). In addition, aircraft operations associated with BLM’s National Aviation Office and the USFS’ Office of Fire and Aviation Management provide aircraft support for wildfire suppression and resource management on public lands.

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

**Summary of Inventory Results**

**Project Components Common to All Action Alternatives**

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

**New 230 kV Circuit**

The addition of a 230 kV circuit between the proposed Haskell Canyon Switching Station and Castaic Power Plant would not require a new or additional right-of-way (ROW). This Project component would traverse land uses similar to Alternative 1 (between mileposts 74.8 and 82.7) and Alternative 2 (between mileposts 60.3 and 60.8). The new 230 kV circuit would be located in an ANF-designated utility corridor (Castaic to Haskell).
Reconductoring of BR-RIN Transmission Line

Reconductoring of the BR-RIN transmission line would cross or run adjacent to land uses similar to Alternative 2 as described below.

New Haskell Canyon Switching Station

The proposed new Haskell Canyon Switching Station site is located in an unincorporated portion of Los Angeles County, northerly of the city of Santa Clarita, in the Bouquet Canyon area of the Santa Clarita Valley. The site would be situated on LADWP land generally west of Pettinger Canyon and north of Dry Canyon Reservoir near the southern border of the ANF. The subject parcel is relatively flat, with gently sloping hills situated immediately to the north, south, east, and west. Land to the north and west is vacant and undeveloped with the exception of LADWP transmission lines traversing horizontally and diagonally across the property. Paralleling the LADWP transmission lines is an unpaved maintenance access road. USFS roads are also present, allowing access to and egress from the site. In addition, two Veluzat Movie Ranch lease-hold properties are situated on private lands within the limits of the ANF, generally east and west of the proposed switching station site. A third Veluzat Movie Ranch (Blue Cloud) is located to the southeast.

Recent growth in the Santa Clarita Valley has caused new residential nodes to expand northward towards the southern boundary of the ANF, and the nearest subdivision is located approximately 0.5 mile southwest of the proposed switching station site.

The proposed new switching station would be located on OS (Open Space)–NF (National Forest) land as designated in the Santa Clarita Valley Area Plan, a component of the Los Angeles General Plan. Open spaces are considered to be lands under public and private ownership that are primarily managed for recreation purposes, the protection of natural resources, and/or for purposes of safeguarding public health and safety.

Development proposals would be applicable to hillside management and flood protection performance standards and criteria. Proposed private and public development projects within the National Forest boundaries would be reviewed by both the Regional Planning Commission and the USFS for compliance with applicable land use and resource management plans.

The proposed new switching station site is also located within the A-2-2 (Heavy Agriculture-Two Acre Minimum Required Lot Area) Zoning District. Utility substations are permitted subject to a Conditional Use Permit.

Expansion of Barren Ridge Switching Station

The Barren Ridge Switching Station expansion area would be located adjacent to the existing switching station on vacant land owned by LADWP. Existing land uses within 0.5 mile of the Barren Ridge Switching Station include vacant and electrical power facilities. BLM public lands are situated west and north of the expansion area. Staging areas would also be located on vacant land near the switching station. Existing access roads would be used for construction and maintenance activities.
The Barren Ridge Switching Station expansion area would be located on land designated Resource Management in the Kern County General Plan: Land Use, Open Space and Conservation Element. These areas may be characterized by physical constraints, may constitute an important watershed recharge area or wildlife habitat, or may have value as a buffer between resource areas and urban areas. Other lands with this resource attribute are undeveloped, non-urban areas that do not warrant additional planning within the foreseeable future because of current population (or anticipated increase), marginal physical development, or no subdivision activity.

The expansion area would also be located within the Platted Lands (PL) and Residential Suburban (RS) Zoning Districts. Utility substations in these districts are permitted subject to a conditional use permit.

New 230 kV Double-Circuit Transmission Line

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

Alternative 1

The proposed route would traverse BLM public land designated as a utility corridor (Corridor A) and Section 368 energy corridor (multi-modal corridor 23-106). The Alternative 1 transmission line would also fall within proximity to public aviation-related uses for the Mojave Airport as well as Special Use Airspace for the R-2508 Complex. This area and the area further to the southwest are generally undeveloped and planned for future renewable energy development (see Appendix F, Table F-6 of this Final EIS/EIR). Land uses within and adjacent to the transmission line include the Los Angeles Aqueduct, a railroad, and scattered residential housing units.

The Alternative 1 transmission line would continue southwest parallel to the Los Angeles Aqueduct to Lancaster Road. The route would then proceed west until it reaches the ANF’s Old Ridge Route designated utility corridor. At this point, the transmission line would turn southeast, where it would parallel several existing high-voltage transmission lines within portions of two designated utility corridors (Old Ridge Route and I-5). Land uses within these corridors include I-5, the Old Ridge Route, California State Water Project facilities, electric transmission lines, oil and gas pipelines, and fiber optic systems. Residential uses traversed by the Alternative 1 transmission line would include Paradise Ranch Mobile Home Park, and the unincorporated communities of Castaic, Neenach, and Holiday Valley Estates. A private airport, Quail Lake Sky Park, is also located east of Quail Lake.

The Alternative 1 transmission line would traverse the following ANF Places: 1-5 Corridor and Santa Clara Canyons. The transmission line would traverse mainly BC and DAI land use zones, with shorter crossings of BCMUR and BCNM zones. The Alternative 1 transmission line is entirely within a designated utility corridor across the ANF.

The Alternative 1 transmission line would terminate at the proposed Haskell Canyon Switching Station. A film production area near this terminus includes the existing 750-acre Veluzat Motion Picture Ranch. The ranch operates as an active studio, and has been used for a number of feature films, television shows, and music videos. The natural scenery is also advertised as an integral
element of the sets, and includes desert, pine forests, an open area mesa, meadows, and a lake. No film sets would be directly crossed by this Alternative.

Land use plan designations crossed by the Alternative 1 transmission line are found in Table 3.2.3-4 and listed by milepost in Appendix F, Table F-2 of this Final EIS/EIR.

**Table 3.2.3-4. Land Use Plan Designations Crossed by the Alternative 1 230 kV Transmission Line**

<table>
<thead>
<tr>
<th>Land Jurisdiction</th>
<th>Applicable Land Use Plan</th>
<th>Designation within Impact Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM</td>
<td>California Desert Conservation Area, West Mojave Plan</td>
<td>Multiple Use Class Limited</td>
</tr>
<tr>
<td>California Department</td>
<td>Property Undesignated</td>
<td></td>
</tr>
<tr>
<td>of Fish and Game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kern County</td>
<td>Kern County General Plan</td>
<td>Extensive Agriculture (Min. 2.0 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 4 Units/Net Acre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mineral 10 Gross Acres/Unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mineral and Petroleum (Min. 5 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimum 20 Gross Acres/Unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Management (Min. 20 acres parcel size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Agriculture (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other Facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specific Plan Required</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>Antelope Valley Area Plan</td>
<td>Non-Urban 1 (0.5 du/ac)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open Space</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Body</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>Santa Clarita Valley Area Plan</td>
<td>National Forest</td>
</tr>
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<td></td>
<td>Hillside Management</td>
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<td>Specific Plan</td>
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<td></td>
<td>Public Service Facilities</td>
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<td></td>
<td>Open Space</td>
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<td></td>
<td>Non-Urban 1 (0.15 du/ac)</td>
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<td></td>
<td>Floodway/floodplain</td>
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<td>State of California</td>
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<tr>
<td>USFS</td>
<td>Angeles National Forest Land Management Plan Land Use Zones*</td>
<td>Back Country</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Developed Area Interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Back Country Motorized Use Restricted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Back Country Non-Motorized</td>
</tr>
</tbody>
</table>

Existing and planned residential and non-residential development projects would be traversed by the Alternative 1 transmission line. It would traverse four specific plan areas (Mojave, Willow Springs, Centennial, and Northlake). The Centennial Specific Plan envisions a 23,000-home master-planned community with civic squares, parks, shops, fire stations, schools, and other services. The Northlake Specific Plan, approved by the County of Los Angeles in 1992, provides for the development of a master-planned, mixed-use community of 1,330 acres in the unincorporated community of Castaic. Development is currently proposed on 670 acres of a Phase One area depicted on Vesting Tentative Tract Map (VTTM) No. 51852.

There are 106 residences located within 1,000 feet of the Alternative 1 transmission line centerline.
Existing and planned residential and non-residential development projects traversed by the Alternative 1 transmission line are presented below (Table 3.2.3-5) and listed by milepost in Appendix F, Table F-6 of this Final EIS/EIR.

**Table 3.2.3-5. Existing and Planned Development Projects Traversed by the Alternative 1 230 kV Transmission Line**

<table>
<thead>
<tr>
<th>Project</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kern County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alta-Oak Creek Mojave Wind Energy Project</td>
<td>public facilities and utilities</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Avalon Wind Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Enxco MET Tower</td>
<td>public facilities and utilities</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Mojave Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Pacific Wind Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Ridge Rider Solar Park Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>PdV Wind Energy Project</td>
<td>public facilities and utilities</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Willow Springs Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Windstar Wind Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>PM 10207</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 1757</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2107</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2385</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2490</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2958</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 3600</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 3763</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 4389</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 467</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 5064</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 6145</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 9106</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 9755</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 985</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 1</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 2</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 3</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR2494</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR2507</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR2508</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centennial Specific Plan</td>
<td>multi-use</td>
<td>pending/under review</td>
</tr>
<tr>
<td>PM060021</td>
<td>multi-use</td>
<td>pending/under review</td>
</tr>
<tr>
<td>PM060022</td>
<td>multi-use</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Northlake Specific Plan</td>
<td>residential</td>
<td>pending/under review</td>
</tr>
<tr>
<td>TR51852</td>
<td>residential</td>
<td>pending/under review</td>
</tr>
<tr>
<td>TR51644</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
</tbody>
</table>

Alternative 2: LADWP’s Proposed Action and Federal Agency Preferred Alternative

The proposed route would traverse BLM public land designated as a utility corridor (Corridor A) and Section 368 energy corridor (multi-modal corridor 23-106).
Land that would be traversed or within 0.5 mile of the Alternative 2 transmission line in unincorporated Kern County consists of predominantly open, undeveloped patches of desert and desert flora. Land improvements (development) within 0.5 mile include scattered rural residential, recreation (county trails), and agricultural uses. The Alternative 2 transmission line would also fall within proximity to public aviation-related uses for the Mojave Airport and a private airstrip (Lloyd’s Landing), as well as Special Use Airspace for the R-2508 Complex. Sailplane activities are also conducted daily from the Mojave Airport. In addition, the Antelope Valley Water Bank (AVWB) would be traversed by the transmission line. The AVWB encompasses an 18-square mile area totaling 13,440 acres, of which 1,482 acres would be dedicated for spreading basins and the rest of the property would be undisturbed except for the construction of recovery wells and associated pipelines. Development and operation responsibilities for the AVWB are through the Semitropic-Rosamond Water Bank Authority.

Land in the study area and vicinity in northern Los Angeles County includes open space, existing rural low-density unincorporated communities (i.e., Antelope Acres, Lake Hughes, Elizabeth Lake, and Leona Valley), the California Aqueduct, and some recreation-related uses (i.e., trails). Horse ranches, non-irrigated croplands, and improved pasture lands are also located along San Francisquito Canyon and Bouquet Canyon Roads. The Antelope Valley California Poppy Reserve is located 0.5 mile west of Alternative 2, near Lancaster Road.

The Alternative 2 transmission line would continue south through the ANF Santa Clara/Mojave Rivers Ranger District. The route through this area is designated as a utility corridor (Oregon-Sylmar) and 368 energy corridor (electric-only corridor 264-265). The Alternative 2 transmission line would traverse the following ANF Places: Liebre-Sawmill and Santa Clara Canyons. ANF Land use zones crossed by the Alternative 2 transmission line are found in Table 3.2.3-6 and listed by milepost in Appendix F, Table F-3 of this Final EIS/EIR.

The Alternative 2 transmission line would terminate at the proposed Haskell Canyon Switching Station. A film production area near this terminus includes the existing 750-acre Veluzat Motion Picture Ranch. The ranch operates as an active studio, and has been used for a number of feature films, television shows, and music videos. The natural scenery is also advertised as an integral element of the sets, and includes desert, pine forests, an open area mesa, meadows, and a lake. No film sets would be directly crossed by the Alternative transmission line.
## Table 3.2.3-6. Land Use Plan Designations Crossed by the Alternative 2 230 kV Transmission Line

<table>
<thead>
<tr>
<th>Land Jurisdiction</th>
<th>Applicable Land Use Plan</th>
<th>Designation within Impact Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM</td>
<td>California Desert Conservation Area, West Mojave Plan</td>
<td>Multiple Use Class Limited</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extensive Agriculture (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Greenbelt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General Commercial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intensive Agriculture (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td>Kern County</td>
<td>Kern County General Plan</td>
<td>Low Density Residential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 1 Unit/Net Acre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 4 Units/Net Acre</td>
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<tr>
<td></td>
<td></td>
<td>Maximum 10 Units/Net Acre</td>
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<td>Maximum 16 Units/Net Acre</td>
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<td>Maximum 29 Units/Net Acre</td>
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<tr>
<td></td>
<td></td>
<td>Mineral 2.5 Gross Acres/Unit</td>
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<tr>
<td></td>
<td></td>
<td>Mineral and Petroleum (Min. 5 Acre Parcel Size)</td>
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<tr>
<td></td>
<td></td>
<td>Other Facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Agriculture (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Management (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specific Plan Required</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>Antelope Valley Area Plan</td>
<td>Non-Urban 1 (0.5 du/ac)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Urban 2 (1.0 du/ac)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open Space</td>
</tr>
<tr>
<td></td>
<td></td>
<td>National Forest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Body</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>Santa Clarita Valley Area Plan</td>
<td>National Forest</td>
</tr>
<tr>
<td>USFS</td>
<td>Angeles National Forest Land Management Plan</td>
<td>Back County</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Developed Area Interface</td>
</tr>
</tbody>
</table>

Existing and planned residential and non-residential development projects would be traversed by the Alternative 2 transmission line. The transmission line would traverse three specific plan areas in southwest Kern County (Mojave, Soledad Mountain-Elephant Butte, and Willow Springs). Of note is the presence of the Willow Springs Specific Plan (WSSP) adopted in 1992. The 16-by-6-mile, 50,560-acre plan area is six miles west of the unincorporated community of Rosamond and is bounded on the south by Avenue “A” (Los Angeles/Kern County Line), on the east by the alignment of 50th Street West, and on the north by a township line which is the projection of Dawn Road. The westerly boundary is a section line (190th Street West) and a northeast trending desert trail (State Road 5381 that generally parallels the Los Angeles Aqueduct).

The unincorporated community of Willow Springs is open, primarily undeveloped, and consists of agriculture. Onions, sugar beets, carrots, and alfalfa are predominantly grown commercially in the region. Present structural development consists of a number of residences scattered throughout the area along with limited commercial services. Other land uses include a motor racetrack, poultry farms, private airstrips, and ore mining.
The existing land division pattern reflects the existing zoning classification, established in 1970, of E (2 1/2) RS (formerly A-1 and A-2), which allowed areas with a combining zone to allow large animals. Most land divisions in the unincorporated community of Willow Springs occurred prior to the 1973 Kern County General Plan and 1973 Parcel Map Ordinance. Overall, there are 12 tracts and 28 records of survey tracts in the plan area. Since 1973, 136 parcel maps have been recorded.

The WSSP is anticipated to be a long-term plan with development occurring well into the next century. Ultimate build-out of the plan would be determined by market demand, availability of financing, and provision of infrastructure. Future market conditions may either accelerate or delay implementation of the plan.

Existing and planned residential and non-residential development projects traversed by the Alternative 2 transmission line are There are 156 residences located within 1,000 feet of the transmission line.

Existing and planned residential and non-residential development projects traversed by the Alternative 2 transmission line are presented below (Table 3.2.3-7) and listed by milepost in Appendix F, Table F-7 of this Final EIS/EIR.

**Table 3.2.3-7. **Existing and Planned Development Projects Traversed by the Alternative 2 230 kV Transmission Line

<table>
<thead>
<tr>
<th>Project</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kern County</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alta-Oak Creek Mojave Wind Energy Project</td>
<td>public facilities and utilities</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Antelope Valley Water Bank Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Avalon Wind Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Mojave Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Ridge Rider Solar Park Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Soledad Mountain-Elephant Butte Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Willow Springs Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Rosamond Solar Array Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>PM 11055</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2385</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2957</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2958</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 6145</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 7901</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 9213</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 9755</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR 3263</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR 3474</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 1</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 2</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 3</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR T3253</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
</tbody>
</table>
Alternative 2a

The Alternative 2a transmission line is 63 miles long and would follow the same route as the transmission line in the Proposed Action, except that a 6.6 mile portion would be located to the north and around the unincorporated community of Green Valley (Green Valley Re-route). The Green Valley Re-route would occur within the jurisdictional boundaries of the ANF (Santa Clara/Mojave Rivers Ranger District) and Los Angeles County.

The Green Valley Re-route would exit the 1,000-foot ANF designated utility corridor and rejoin with the existing utility corridor southwest of the unincorporated community Green Valley. The Alternative 2a transmission line would traverse the following ANF Places: Liebre-Sawmill and Santa Clara Canyons.

The Green Valley Re-route would be located on lands having an ANF zoning of Back Country and Back Country Non-Motorized. The Bypass would also have a Los Angeles County General Plan (Antelope Valley Areawide General Plan) land use designation of Non-Urban 2 (1.0 du/ac) – N2. Land use plan designations crossed by Alternative 2a are found in Table 3.2.3-8 and listed by milepost in Appendix F, Table F-4 of this Final EIS/EIR.

**Table 3.2.3-8. Land Use Plan Designations Crossed by the Alternative 2a 230 KV Transmission Line**

<table>
<thead>
<tr>
<th>Land Jurisdiction</th>
<th>Land Use Plan</th>
<th>Designation within Impact Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM</td>
<td>California Desert Conservation Area, West Mojave Plan</td>
<td>Multiple Use Class Limited</td>
</tr>
<tr>
<td>Kern County</td>
<td>Kern County General Plan</td>
<td>Extensive Agriculture (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Greenbelt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>General Commercial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intensive Agriculture (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Density Residential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 1 Unit/Net Acre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 4 Units/Net Acre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 10 Units/Net Acre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 10 Units/Net Acre/Comprehensive Plan Area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 16 Units/Net Acre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 29 Units/Net Acre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mineral 2.5 Gross Acres/Unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mineral and Petroleum (Min. 5 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other Facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Agriculture (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Management (Min. 20 Acre Parcel Size)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specific Plan Required</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>Antelope Valley Area Plan</td>
<td>Non-Urban 1 (0.5 du/ac)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Urban 2 (1.0 du/ac)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open Space</td>
</tr>
<tr>
<td></td>
<td></td>
<td>National Forest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Water Body</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>Santa Clarita Valley Area Plan</td>
<td>National Forest</td>
</tr>
</tbody>
</table>
### Land Jurisdiction | Land Use Plan | Designation within Impact Corridor
---|---|---
USFS | Angeles National Forest Land Management Plan | Back Country
|  |  | Back County Non-Motorized Developed Area Interface

Existing and planned residential/non-residential development projects traversed by the Alternative 2a transmission line would be the same as Alternative 2 (see Appendix F, Table F-7). No additional existing or planned residential/non-residential development projects would be traversed by the Green Valley Re-route.

There are 70 residences located within 1,000 feet of the Alternative 2a transmission line centerline.

**Alternative 3**

The proposed route would traverse BLM public land designated as a utility corridor (Corridor A) and Section 368 energy corridor (multi-modal corridor 23-106).

Land that would be traversed or within 0.5 mile of the Alternative 3 transmission line in unincorporated Kern County consists of predominantly open, undeveloped patches of desert and desert flora. Land improvements (development) within 0.5 mile include scattered rural residential, recreation (county trails), and agricultural uses. The Alternative 3 transmission line would also fall within proximity to public aviation-related uses for the Mojave Airport and a private airstrip (Lloyd’s Landing), as well as Special Use Airspace for the R-2508 Complex. Sailplane activities are also conducted daily from the Mojave Airport. In addition, the AVWB would be traversed by the transmission line. The AVWB encompasses an 18-square mile area totaling 13,440 acres, of which 1,482 acres would be dedicated for spreading basins and the rest of the property would be undisturbed except for the construction of recovery wells and associated pipelines. Development and operation responsibilities for the AVWB are through the Semitropic-Rosamond Water Bank Authority.

The Alternative 3 transmission line would proceed south for six miles where it would then turn to the southeast towards California State Route 138. Lands that would be traversed by this portion of the route include the unincorporated community of Quartz Hill and the cities of Lancaster and Palmdale. The unincorporated community of Quartz Hill is the largest of the unincorporated communities in the Antelope Valley and is bounded by the city of Lancaster. Located south of the city of Lancaster is the city of Palmdale. The developed portions of the city of Palmdale occupy an area generally bounded by the California Aqueduct on the south and 70th Street West on the west. The northern extent of urban development in the city of Palmdale follows an irregular path from Avenue M in the northwest portion, around existing rural residential areas in the north, and south along Avenue P.

The Alternative 3 transmission line would also traverse two partially constructed large specific plan development areas (Ritter Ranch and City Ranch [Anaverde]), located in the southwestern portion of the city of Palmdale. The route would pass through portions of both specific plans.
The Alternative 3 transmission line would then turn in a west-southwesterly direction towards the Vasquez Canyon Road area. This portion of the route would traverse the unincorporated community of Agua Dulce and two separate areas of the ANF. Alternative 3 would traverse and/or be located adjacent to numerous residences and the S.O.S. FilmWorks (a 174 acre filming site). No active film sets would be directly crossed by the transmission line. Within the ANF, the route would be located in a designated utility corridor (Victorville to Rinaldi). The Alternative 3 transmission line would traverse the following ANF Places: Soledad Front Country.

The Alternative 3 transmission line would then generally proceed in a westerly direction towards the proposed Haskell Canyon Switching Station site where two movie ranches (Veluzat and Blue Cloud) are located in the vicinity.

Land use plan designations crossed by the Alternative 3 transmission line are found in Table 3.2.3-9 and listed by milepost in Appendix F, Table F-5 of this Final EIS/EIR.

| Table 3.2.3-9. Land Use Plan Designations Crossed by the Alternative 3 230 kV Transmission Line |
|---|---|---|
| **Land Jurisdiction** | **Land Use Plan** | **Designation within Impact Corridor** |
| BLM | California Desert Conservation Area, West Mojave Plan | Extensive Agriculture (Min. 20 Acre Parcel Size) Greenbelt General Commercial Intensive Agriculture (Min. 20 Acre Parcel Size) Low Density Residential Maximum 1 Unit/Net Acre Maximum 1 Unit/Net Acre/Comprehensive Plan Area Maximum 4 Units/Net Acre Maximum 10 Units/Net Acre Maximum 10 Units/Net Acre/Comprehensive Plan Area Maximum 16 Units/Net Acre Maximum 29 Units/Net Acre Mineral 2.5 Gross Acres/Unit Mineral and Petroleum (Min. 5 Acre Parcel Size) Other Facilities Resource Agriculture (Min. 20 Acre Parcel Size) Resource Management (Min. 20 Acre Parcel Size) Specific Plan Required |
| Kern County | Kern County General Plan | Non-Urban Residential (.4 – 2.0 DU/AC) Urban Residential (2.1 – 6.5 DU/AC) |
| Lancaster | Lancaster General Plan | Non-Urban 1 (0.5 du/ac) |
| Los Angeles County | Antelope Valley Area Plan | Commercial Hillside Management Non Urban 1 (0.5 du/ac) Non-Urban 2 (0.5 to 1.0 du/ac) Open Space (Bureau of Land Management) National Forest Public Service Facilities Floodway/Floodplain |
Existing and planned residential and non-residential development projects would be traversed by the Alternative 3 transmission line. It would traverse four specific plan areas (Mojave, Soledad Mountain-Elephant Butte Specific Plan, Willow Springs, Ritter, and City Ranch). Development of the 10,625 acre Ritter Ranch has been through phases. Phase I construction includes approximately 800 housing units, two proposed commercial centers, three parks, open space, and one elementary school. The northern boundary of the Ritter Ranch Specific Plan is delineated by the Amargosa Creek drainage and Elizabeth Lake Road. Anaverde is a large residential development located east of and adjacent to Ritter Ranch. The master planned community has approximately 5,200 housing units and occupies 1,985 acres. Fifty percent of the area is designated residential.

Existing and planned residential and non-residential development projects traversed by the Alternative 3 transmission line are presented below (Table 3.2.3-10) and listed by milepost in Appendix F, Table F-8 of this Final EIS/EIR.

**Table 3.2.3-10. Existing and Planned Development Projects Traversed by the Alternative 3 230 kV Transmission Line**

<table>
<thead>
<tr>
<th>Land Jurisdiction</th>
<th>Land Use Plan</th>
<th>Designation within Impact Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmdale</td>
<td>Palmdale General Plan, City Ranch Specific Plan, Ritter Ranch Specific Plan</td>
<td>Aqueduct Low Density Residential Single Family Residential Mineral Resource Extraction Public Facility</td>
</tr>
<tr>
<td>USFS</td>
<td>Angeles National Forest Land Management Plan</td>
<td>Back Country</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alta-Oak Creek Mojave Wind Energy Project</td>
<td>public facilities and utilities</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Avalon Wind Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Mojave Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Mojave Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Mojave Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Ridge Rider Solar Park Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Rosamond Solar Array Project</td>
<td>public facilities and utilities</td>
<td>pending/under review</td>
</tr>
<tr>
<td>Soledad Mountain-Elephant Butte Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Willow Springs Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 11055</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 198</td>
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<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2385</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2957</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 2958</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 6145</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 7901</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>PM 8941</td>
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<td>approved/recorded</td>
</tr>
<tr>
<td>PM 9213</td>
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<td>approved/recorded</td>
</tr>
<tr>
<td>PM 9755</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR 3263</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR 3474</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>Project</td>
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<td>Status</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>TR Aqueduct 1</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 2</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR Aqueduct 3</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>TR T3253</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>City of Lancaster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VTTM 066062 (includes school site property (Westside Union School District))</td>
<td>residential, institutional</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>City of Palmdale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ritter Ranch Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
<tr>
<td>City Ranch Specific Plan</td>
<td>residential</td>
<td>approved/recorded</td>
</tr>
</tbody>
</table>

Approximately 242 residences would be located within 1,000 feet of the Alternative 3 transmission line centerline.

3.2.4 AGRICULTURE

Introduction

This section describes the agricultural resources that would be affected by the Proposed Project and Alternatives. Specifically, agricultural resources are defined to include: (1) applicable Important Farmland categories (Prime, Unique, and Farmland of Statewide Importance) designated by the California Department of Conservation (DOC); (2) Williamson Act lands under contract or designated as Agricultural Preserves; and (3) Active Agricultural Operations.

Active Agricultural Operations may or may not be designated DOC Farmland or Williamson Act lands. A conservative approach was used wherein areas identified as including active or potentially active agriculture during aerial photography/field review were assumed to encompass Active Agricultural Operations. Lands not in active cultivation but exhibiting signs of recent agricultural-related activities (i.e., plowing, weed removal, and/or agricultural infrastructure maintenance) were mapped as Active Agricultural Operations. Areas that seemingly supported previous agricultural uses but appeared to be inactive and unmaintained, as evidenced by substantial weed growth and/or infrastructure and facility disrepair, were not designated or mapped as Active Agricultural Operations. Active Agricultural Operations included cropland, vineyards, apiaries, and orchards.

The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Land Use Technical Report, and contained in Volume III of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Land Use Technical Report, please refer to that report for more detailed information on Proposed Action and Alternatives effects on agricultural resources.

The following discussion addresses the existing environmental conditions in the affected area. In addition, existing laws and regulations relevant to agricultural resources are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid
certain impacts that might otherwise occur with the implementation of the Proposed Action and Alternatives.

Forestry Resources affected by the Proposed Action and Alternatives are addressed in Section 3.3.1, Biological Resources.

**Overview of Methodology and Analysis Area**

In order to identify resources and lands designated for agriculture, data were obtained from the DOC and applicable local sources. Specifically, these data include mapped locations of DOC Important Farmland as well as Williamson Act contract lands and Agricultural Preserves. In addition, information regarding active agriculture was obtained from aerial photographs, local landowners, and field reconnaissance (September 2007 and September 2008 through May 2009). For purposes of this analysis, lands within a one-mile study corridor (i.e., 0.5 mile on each side of the assumed centerline) for the Proposed Action and Alternatives were mapped in order to identify the types of agricultural resources affected (disturbed or made unavailable for agriculture). Finally, data regarding agricultural-related operations (e.g., crop types and irrigation methods) were obtained from local farm bureaus, published literature, and previous environmental studies. Data was compiled and mapped utilizing a geographic information system (GIS). Please see Figures 3.2.4-1 and 3.2.4-2.
FIGURE 3.2.4-1. AGRICULTURAL RESOURCES IN THE NORTHERN PORTION OF THE PROJECT AREA
Figure 3.2.4-2. Agricultural Resources in the Southern Portion of the Project Area
In order to identify California’s agricultural land resources, the California DOC established the Farmland Mapping and Monitoring Program (FMMP) which applies the Natural Resources Conservation Service’s (NRCS) soil classifications. Agricultural data collected by the NRCS and DOC is compiled by county. Consequently, for the purposes of this analysis, agricultural resources are analyzed by county.

The regional setting for the Proposed Action and Alternatives include parts of Kern County, the ANF, and Los Angeles County (incorporated and unincorporated). The FMMP important farmland data for Los Angeles and Kern Counties includes a 10-acre minimum mapping unit, which indicates that units of land smaller than 10 acres are incorporated into the surrounding map classifications (DOC 2004a). Important farmland is classified as the following: Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, Grazing Land, and agricultural land under Williamson Act Contract. See the Regulatory Setting Section for a description of these important farmland classifications. Additionally, while the ANF was not mapped under the FMMP, portions of the ANF are used for tree plantations. Plantations in Bouquet Canyon, Leona Divide, Lake Elizabeth, Canyon (along Lake Hughes Road), and Sawmill Mountain were established starting in the 1950s through to the late 1970s.

Kern and Los Angeles counties have a combined total of 3,017,772 acres of agricultural land within their jurisdictions, with the majority of this total in Kern County. Table 3.2.4-1 indicates the total acreage of agricultural land in Los Angeles and Kern Counties along with the acreage of important farmland in each jurisdiction. As shown in Table 3.2.4-1, Kern County contains 939,221 acres of Farmland, while Los Angeles County contains 42,007 acres of Farmland (DOC 2008).

<table>
<thead>
<tr>
<th>County</th>
<th>Prime Farmland</th>
<th>Unique Farmland</th>
<th>Farmland of Statewide Importance</th>
<th>Farmland of Local Importance</th>
<th>Grazing Land</th>
<th>Total Agricultural Land</th>
<th>Williamson Act Contract Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kern</td>
<td>626,217</td>
<td>96,656</td>
<td>216,348</td>
<td>0</td>
<td>1,807,069</td>
<td>2,746,290</td>
<td>1,548,079</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>32,408</td>
<td>1,178</td>
<td>1,228</td>
<td>7,193</td>
<td>229,475</td>
<td>271,482</td>
<td>0</td>
</tr>
</tbody>
</table>

Alfalfa and grain hay, as well as onions, carrots, potatoes, radishes, and other root vegetables, are predominantly grown commercially in the region. Irrigation of croplands utilizes flood, pivot, wheel and hand line methods. Dryland farming is minimal. Horse ranches and improved pasture lands are also located along San Francisquito Canyon and Bouquet Canyon Road. Active orchards (fruit and nut) can be found along Bouquet Canyon Road and in other areas.

Livestock grazing occurs on BLM public lands (Hansen Common Grazing Allotment) managed by the Ridgecrest Field Office as well as on certain private lands. The 230 kV transmission line in the Proposed Action and Alternatives all traverse the grazing allotment between mileposts 0.2-2.2, 2.4-3.5, 4.0-4.7, 5.3-6.0, and 6.9-7.3. Table 3.2.4-2 presents information for this grazing allotment. Cattle were observed grazing east of Quail Lake along Alternative 1 transmission line (south of California State Route 138).
**Table 3.2.4-2. Grazing Allotment Information**

<table>
<thead>
<tr>
<th>Name</th>
<th>Acres</th>
<th>Active AUMs</th>
<th>Range Type¹</th>
<th>Livestock</th>
<th>Season of Use²</th>
<th>Multiple Use Class (M, I &amp; C)³</th>
<th>AMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hansen Common</td>
<td>34,848</td>
<td>72,102</td>
<td>E/P</td>
<td>Cattle &amp; Sheep</td>
<td>12/1-9/30</td>
<td>M</td>
<td>Yes</td>
</tr>
</tbody>
</table>

¹Acres of public land in the grazing allotment.
²The acres of private, State, BLM, and other ownerships that comprise the area of the grazing allotment.
³Allotments with ephemeral and perennial (E/P) forage have a mixture of both range (forage) types.
⁴The period livestock typically graze forage on the allotment. Grazing use on some allotments is authorized to occur all year long. The grazing period of use does not apply (NA) to ephemeral allotments because grazing use occurs when forage is available.
⁵Multiple Use Classes as designated by BLM. M = Moderate, I = Intensive, C = Controlled.

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

**Summary of Inventory Results**

**Project Components Common to All Action Alternatives**

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

**New 230 kV Circuit**

The addition of a 230 kV circuit between the Haskell Canyon Switching Station and Castaic Power Plant would not affect agricultural resources.

**Reconductoring of BR-RIN Transmission Line**

Reconductoring of the BR-RIN transmission line would cross or run adjacent to agricultural resources similar to Alternative 2 as described below.

**New Haskell Canyon Switching Station**

Construction of the proposed Haskell Canyon Switching Station would not affect agricultural resources.

**Expansion of Barren Ridge Switching Station**

Expansion of the Barren Ridge Switching Station would not affect agricultural resources.

**New 230 kV Double-Circuit Transmission Line**

**Alternative 1**

Table 3.2.4-3 shows the categories of agricultural resources crossed by the Alternative 1 transmission line along with the total distance each category is traversed. Agricultural resources traversed by milepost are presented in Appendix F, Table F-9 of this Final EIS/EIR. The Alternative 1 transmission line would not cross an ANF plantation.
TABLE 3.2.4-3. AGRICULTURAL RESOURCES TRAVERSED BY THE ALTERNATIVE 1 230 KV TRANSMISSION LINE

<table>
<thead>
<tr>
<th>Agricultural Resource</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Farmland of Local Importance</td>
<td>2.8 miles</td>
</tr>
<tr>
<td>Total Grazing Lands</td>
<td>31.2 miles</td>
</tr>
<tr>
<td>Total Cropland</td>
<td>2.8 miles</td>
</tr>
</tbody>
</table>

Alternative 2: LADWP’s Proposed Action and Federal Agency Preferred Alternative

Table 3.2.4-4 shows the categories of agricultural resources crossed by the Alternative 2 transmission line along with the total distance each category is traversed. Agricultural resources traversed by milepost are presented in Appendix F, Table F-10 of this Final EIS/EIR. The Alternative 2 transmission line would not cross an ANF plantation.

TABLE 3.2.4-4. AGRICULTURAL RESOURCES TRAVERSED BY THE ALTERNATIVE 2 230 KV TRANSMISSION LINE

<table>
<thead>
<tr>
<th>Agricultural Resource</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Prime Farmland</td>
<td>1.2 miles</td>
</tr>
<tr>
<td>Total Unique Farmland</td>
<td>0.7 mile</td>
</tr>
<tr>
<td>Total Farmland of Statewide Importance</td>
<td>2.6 miles</td>
</tr>
<tr>
<td>Total Farmland of Local Importance</td>
<td>2.2 miles</td>
</tr>
<tr>
<td>Total Grazing Lands</td>
<td>11.1 miles</td>
</tr>
<tr>
<td>Total Cropland</td>
<td>4.7 miles</td>
</tr>
</tbody>
</table>

Alternative 2a

Agricultural resources crossed by the Alternative 2a transmission line are the same as Alternative 2 (see Appendix F of this Final EIS/EIR). The Alternative 2a transmission line would not cross an ANF plantation.

Alternative 3

Table 3.2.4-5 shows the categories of agricultural resources crossed by the Alternative 3 transmission line along with the total distance each category is traversed. Agricultural resources traversed by milepost are presented in Appendix F, Table F-11 of this Final EIS/EIR. The Alternative 3 transmission line would not cross an ANF plantation.

TABLE 3.2.4-5. AGRICULTURAL RESOURCES TRAVERSED BY THE ALTERNATIVE 3 230 KV TRANSMISSION LINE

<table>
<thead>
<tr>
<th>Agricultural Resource</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Prime Farmland</td>
<td>1.9 miles</td>
</tr>
<tr>
<td>Total Unique Farmland</td>
<td>0.7 mile</td>
</tr>
<tr>
<td>Total Farmland of Statewide Importance</td>
<td>3.2 miles</td>
</tr>
<tr>
<td>Total Farmland of Local Importance</td>
<td>0.0 miles</td>
</tr>
<tr>
<td>Total Grazing Lands</td>
<td>16.7 miles</td>
</tr>
<tr>
<td>Total Cropland</td>
<td>4.3 miles</td>
</tr>
</tbody>
</table>
3.2.5 RECREATION

Introduction

This section describes the recreational resources which may be affected by the Proposed Action and Alternatives. A recreation area is any site or facility that is used for recreational activities, including but not limited to a national, state, county or city park or trail; preserve; open space; campground; or a private recreational site such as a golf course. This section provides an overview of the technical methodology used in establishing baseline conditions, examines the affected environment within a defined study area and vicinity context, and presents the regulatory framework (relevant existing laws and regulations). In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Proposed Action and Alternatives. Information related to Significant Ecological Areas (SEAs), Habitat Conservation Plans (HCPs) and Natural Community Conservation Plans (NCCPs) is presented separately in Section 3.3.1 (Biological Resources).

The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Land Use Technical Report, contained in Volume III of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Land Use Technical Report, please refer to that report for more detailed information on Proposed Action and Alternatives effects on recreation.

Overview of Methodology and Analysis Area

The objective of the recreation inventory was to identify, map, describe, and document the recreation areas within the Proposed Action and Alternatives study area. This was accomplished by collecting data for recreation within a one mile wide study corridor (0.5 mile on each side of the centerline of the transmission line) and region, if susceptible to disturbances (e.g., noise, traffic, dust).

Existing and planned data and maps from a variety of sources were collected and included in the inventory, as appropriate. Agency land and resource management and planning documents were also reviewed for applicable data.

Following this initial step in the inventory, key federal, State, and local land and resource management agencies were contacted to update information and to solicit further input. Contacts were established by telephone, letter, e-mail, or personal interview. Current data was compiled and mapped utilizing a geographic information system (GIS). National Agriculture Imagery Program 2005 color aerial photography, Google Earth, and federal, State, and local agency GIS data layers were utilized to identify and more accurately assess recreation resources. Field investigations were conducted to verify and supplement these existing resources during September 2007 and between September 2008 and May 2009.

The study area and region contain a number of recreational resources owned and/or managed by federal, State, local, and/or private entities (refer to Figures 3.2.5-1 and 3.2.5-2).
Figure 3.2.5-1. Recreation—Northern Portion of the Project Area
CHAPTER 3: ENVIRONMENTAL SETTING

FIGURE 3.2.5-2. RECREATION—SOUTHERN PORTION OF THE PROJECT AREA

Legend
- Project Component
- Pacific Crest National Scenic Trail (PCT)
- Other Trails
- California State Park
- Inventoried Roadless Area ( Angeles National Forest)
- MRCA - Park/Property
- Existing, Proposed, or Planned City Park
- Wild and Scenic River (Eligible)

Recreation - South

- Alt. 2 & 2a and Reconductoring
- Alt. 3
- Alt. 2 and Reconductoring
- Alt. 1 and New 230kV Circuit
- Proposed Haskell Canyon Switching Station
- Reconductoring

Forest Service Recreation Opportunity Spectrum Zones
- Only shown within corridor
  - Roaded Natural
  - Semi-Primitive/ Motorized
  - Semi Primitive / Non-Motorized
  - Aqueduct
  - Lake or Pond
  - City Boundary
  - USDA Forest Service
  - USDI Forest Service
  - Bureau of Land Management

BARREN RIDGE RENEWABLE TRANSMISSION PROJECT
Federal

BLM

The BLM (Ridgecrest Field Office) administers public land in the northern portion of the study area. The majority of this land is found in a checkerboard pattern and surrounded by private land holdings.

Recreation Management Areas (RMAs) are BLM’s primary means of managing recreational use of the public lands. Public land falls within either a Special RMA (SRMA) or Extensive RMA (ERMA). The study area includes portions of two SRMAs (Southern Sierra and Mojave SRMA) which consist of 212,000 and 64,500 acres, respectively. SRMAs are areas that require a recreation investment, where more intensive recreation management is needed, and where recreation is a principal management objective. Recreational activities in the study area and vicinity typically consist of casual and dispersed uses including off-highway vehicle (OHV) use, driving for pleasure, photography, rock hounding, limited hunting, (subject to California Department of Fish and Game regulations), and primitive camping. The BLM does not have visitation statistics specific to the study area. Total estimated visitation (visits and visitor days) between October 1, 2007 and September 30, 2008 for the Southern Sierra SRMA, however, was 211,286 and 448,119, respectively. The Mojave SRMA had total estimated visits of 37,389 and visitor days of 56,550 during the same time period.

Virtually all recreational activities on BLM lands depend on availability of access to recreational areas. Motorized vehicle access, or at least the degree of access, into an area affects the desirability of that area depending upon the nature of the recreational activity. Presently, motorized-vehicle access on BLM lands within the study area occurs on “designated routes of travel” in accordance with the Multiple-Use Class L. In Multiple-Use Class L, only those routes of travel that are specifically “approved” may be used by motor vehicles.

According to the West Mojave Route Designation Program, existing BLM routes within the study area are designated as “open” and are identified as follows: MK0022, MK0025, MK0029, MK0040, MK0045, MK0048, MK0049, MK0050, MK0051, MK0052, MK0054, MK0081, MK0082, MK0105, MK0106, and MK0108. These routes currently provide for motorized-vehicle access to recreation activities (including OHV use) and other uses such as utility corridors, livestock operations, mineral extraction sites, and private lands.

No BLM ACECs (Area of Environmental Concern) or Herd Areas/Herd Management Areas were identified in the study area.

USFS (Angeles National Forest)

The Angeles National Forest (ANF) is located adjacent to the Los Angeles metropolitan area and is within a two-hour drive for more than ten million people. The ANF comprises more than 70% of the open space available for outdoor recreation in Los Angeles County. Visitor use from the early- to mid-1980s on the ANF was reported at 5.5 million recreation visitor days (RVDs), where a single RVD equals twelve visit hours, which may be aggregated continuously, intermittently, or simultaneously by one or more persons. In 1992, the USFS reported that the ANF was the second-highest ranked national forest (out of 141) in the nation for intensity of use at 0.071 acre per RVD.
The largest single use of the ANF is characterized as day use. That is persons entering the ANF for a recreation visit that does not include an overnight stay. Recreation activity groups include anglers, boaters, equestrians, hikers, OHV users, picnickers, sightseers, water players and persons participating in special events. The ANF is a year-round destination.

The ANF is divided into three separate ranger districts based upon natural watershed boundaries: the Santa Clara/Mojave Rivers Ranger District, the Los Angeles River Ranger District, and the San Gabriel River Ranger District. The Proposed Action and Alternatives are located within the Santa Clara/Mojave Rivers Ranger District with recreational uses primarily accessed from Bouquet Canyon Road, Spunky Canyon Road, and San Francisquito Canyon Road.

Recreational resources and opportunities on NFS lands in the ANF are managed by the USFS as either Developed Recreation or Dispersed Recreation. Developed Recreation includes resources that are regularly maintained by the USFS such as OHV routes, trails (hiking, biking, and equestrian use), campgrounds, picnic areas, information centers, and other, similar facilities. Dispersed Recreation generally includes undeveloped open space areas that are used for recreational purposes but are not regularly maintained by the USFS.

Recreation Opportunity Spectrum
In addition to the Forest Land Use Zones and Places described above in Section 3.2.3, USFS management direction for recreational opportunities in the ANF is further specified by Recreation Opportunity Spectrum (ROS) classes. The 2005 ANF Land Management Plan (LMP) uses ROS classes to plan for future management of recreation areas and resources in the ANF. The ROS is a framework for defining classes of outdoor recreation environments, activities and experience opportunities within the Forest. The opportunities are arranged along a continuum or spectrum divided into five classes which define recreation opportunities within various areas of the forest. Table 3.2.5-1 provides a description of these ROS classes.

<table>
<thead>
<tr>
<th>ROS Objective Setting</th>
<th>Characterization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primitive</td>
<td>Characterized by an essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free of evidence of human-induced restrictions and controls. Motorized use within the area is not permitted. There are no developed facilities.</td>
</tr>
<tr>
<td>Semi-Primitive</td>
<td>Characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction among users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized recreation is not permitted, but local roads used for other resource management activities may be present on a limited basis. Use of such roads is restricted to minimize impacts on recreation experience opportunities. A minimum of developed facilities (if any) are provided.</td>
</tr>
<tr>
<td>Non-Motorized</td>
<td>Characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present but would be subtle. Motorized use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted. Developed facilities are present but are more rustic in nature.</td>
</tr>
<tr>
<td>Semi-Primitive Motorized</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 3.2.5-1. USDA FOREST SERVICE RECREATION OPPORTUNITY SPECTRUM (2005)
### ROS Objective Setting

<table>
<thead>
<tr>
<th>Characterization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Roaded Natural</td>
<td>Characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction among users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities, which are present and well-defined.</td>
</tr>
<tr>
<td>Rural</td>
<td>Characterized by a substantially developed environment and a background with natural-appearing elements. Moderate to high social encounters and interaction between users is typical. Renewable resource modification and utilization practices are used to enhance specific recreation activities. Sights and sounds of humans are predominant on the site and roads and motorized use is extensive. Facilities are more highly developed for user comfort with ample parking.</td>
</tr>
</tbody>
</table>

Source: USFS 2005

Different types of recreational resources, activities, and opportunities are made available or restricted by USFS management practices, depending upon the applicable ROS class. Accordingly, any activity on NFS lands that conflicts with the applicable ROS class for that area may affect corresponding recreational opportunities that are intended to be available under the applicable ROS designation. With the exception of the “Primitive” ROS Class, the Proposed Action and Alternatives would traverse all of the ROS classes described above.

### High-Impact Recreation Areas

In accordance with the Federal Lands Recreation Enhancement Act (REA) of 2004, the USFS has designated areas on NFS lands that experience concentrated use or higher rates of visitation as High Impact Recreation Areas (HIRAs). The chosen boundaries for each HIRA are based upon public usage of the area for recreational purposes and available amenities maintained by the USFS within each area. The HIRA’s intent is to represent the areas of highest recreational usage and Developed Recreation opportunities in the Forest. Recreational users are required to purchase a National Forest Adventure Pass or an America the Beautiful Interagency Pass in order to use recreational resources within a HIRA. The purpose of this fee-based program, as authorized under the Federal REA, is to generate necessary funding to pay for backlogged maintenance of recreational resources throughout the Forest. Backlogged maintenance includes maintaining trails, cleaning restrooms, picking up trash, removing litter and graffiti, providing visitor information, and fulfilling other services as needed. Portions of Alternative 2 and Alternative 2a would be situated in the Rowher/Drinkwater HIRA.

Developed and Dispersed Recreation resources within the study area are described in further detail below.

### Developed Recreation

#### Off-Highway Vehicle Trails and Open Riding Areas

The USFS has designated an interconnected system of OHV trails, forest roads designated for OHV use, and Open Riding Areas throughout the ANF. These trails, roads and riding areas provide a range of recreational opportunities to OHV recreationists of all skill levels. For the safety of OHV recreationists, OHV use is not permitted on the same roadways as passenger vehicle travel. The types of vehicles that are permitted on Forest Service roads are defined by one of five Operational Maintenance Levels (OMLs) that are assigned to each USFS roadway.
OMLs are guidelines for the degree of maintenance that the USFS invests in a road, towards the purpose of managing each road and the surrounding NFS lands for their intended uses. The USFS’s OMLs applicable to the ANF are presented in Table 3.2.5-2.
**Table 3.2.5-2. Angeles National Forest Roadway Operational Maintenance Level Guidelines**

<table>
<thead>
<tr>
<th>Maintenance Guidelines</th>
<th>OML 1</th>
<th>OML 2</th>
<th>OML 3</th>
<th>OML 4</th>
<th>OML 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shoulder</strong></td>
<td>n/a*</td>
<td>Maintain only as necessary for planned traffic.</td>
<td>Maintain existing shoulders commensurate with the traveled way.</td>
<td>Same as OML 3.</td>
<td>Maintain to the same standard as the traveled way.</td>
</tr>
<tr>
<td><strong>Drainage</strong></td>
<td>Keep drainage facilities functional and prevent unacceptable environmental damage.</td>
<td>Same as OML 1.</td>
<td>Same as OML 1.</td>
<td>Same as OML 1.</td>
<td>Same as OML 1.</td>
</tr>
<tr>
<td><strong>Roadway</strong></td>
<td>Closed to vehicular traffic. Perform work to alleviate erosion or sedimentation on or from the road. Defer removal of brush and trees from the roadway.</td>
<td>Manage vegetative cover as needed for planned traffic. Remove and/or repair slides and/or slumps as needed for access with high clearance vehicles to control resource damage.</td>
<td>Maintain existing vegetative cover. Control vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in standard passenger cars.</td>
<td>Same as OML 3.</td>
<td>Same as OML 3.</td>
</tr>
<tr>
<td><strong>Roadside</strong></td>
<td>n/a*</td>
<td>n/a*</td>
<td>Remove hazard trees and clean up litter.</td>
<td>Clean up litter in accordance with road management objectives. Remove hazard trees and perform landscape treatments as required.</td>
<td>Same as OML 4.</td>
</tr>
<tr>
<td><strong>Structure</strong></td>
<td>Inspect and repair only those items that cannot be deferred, and that are necessary to protect investment, and preserve structural integrity.</td>
<td>Maintain all structures to provide for the passage of planned traffic.</td>
<td>Maintain structures to provide for passage of planned traffic. Defer noncritical items and combine to provide for more economical project. For example, defective bridge rails, running planks, and bridge guideposts on a current basis.</td>
<td>Same as OML 3.</td>
<td>Same as OML 3.</td>
</tr>
<tr>
<td><strong>Traffic Service</strong></td>
<td>Ensure that physical closure devices and/or appropriate signing are in place and functional at the road entrance. Defer the maintenance of signs within the closure until the road is opened. Correct deferred items prior to opening the road to traffic.</td>
<td>Install and maintain route markers; warning, regulatory, and guide signs; and other traffic control devices to provide for planned traffic and an appropriate traffic management strategy.</td>
<td>Install and maintain route markers; warning, regulatory, and guide signs; and other traffic devices to provide for planned traffic.</td>
<td>Same as OML 3.</td>
<td>Install and maintain route markers; warning, regulatory, and guide signs; and other traffic devices to provide for planned traffic. Renew centerlines, edge stripes. And other pavement and curb markings as needed to provide for planned traffic.</td>
</tr>
</tbody>
</table>

* n/a: Generally no work required.
Under special circumstances, OHV use may be permitted on an OML 3 roadway, providing that a Mixed Use Traffic Study has been completed to assess the safety risks involved with OHVs and passenger vehicles utilizing the same road. However, under normal circumstances, OHVs are restricted to OML 2 roads, thus avoiding hazards to OHV users that are created by the presence of larger vehicles on OML 3, 4, and 5 roads.

In comparison with designated OHV roads (OML 2 roads) and trails, which interconnect throughout the Forest, Open Riding Areas are designated areas where OHV recreationists are permitted to drive off trails. The 10,000 acre Rowher Flats OHV Area includes three OHV Staging Areas, which are where OHVs may be dropped off by their transport vehicles, which can also park in the Staging Area if a valid National Forest Adventure Pass is displayed. Rowher Flats is open to motorcycles, ATVs, and four-wheel drive vehicles and also consists of an entrance road, restrooms, trails, and signs. Overnight camping is allowed, although there are no developed camping facilities and no available water. Alternatives 2 and 2a are the only alternatives that would impact this area, or any currently open, significant authorized OHV areas.

**Multi-Use Recreational Trails**
There are more than 557 miles of hiking and equestrian trails, including a number of trailheads, within the ANF. The Pacific Crest Trail (PCT) makes up 176 miles of these trails. With the exception of the PCT and trails located within designated wilderness areas, trails in the ANF are open for mountain biking and equestrian use (terrain permitting). Throughout the ANF, trails provide access to recreational and wilderness resources such as campgrounds and backcountry camping areas, day use areas and picnic areas, scenic vistas, fishing and hunting areas, and designated wilderness areas. There is a wide variety of hiking, mountain biking, and equestrian trails located throughout the ANF and within the study area. The specific names and locations of trails that would be crossed by the Proposed Action or Alternatives are presented in Appendix F, Table F-13 of this Final EIS/EIR. The PCT is also discussed in further detail below.

**Pacific Crest National Scenic Trail**
The PCT is 2,650 miles long, extending from Mexico to Canada and running generally along the north-south oriented mountain ridges of California (Sierra Nevada), Oregon, and Washington (Cascade Range). The PCT traverses both public and private lands along its multi-state alignment. In 1968, the United States Congress designated the PCT as one of the first scenic trails in the National Trails System. Use of the PCT is limited to non-mechanized means of travel.

The Pacific Crest Trail Association (PCTA) is a non-profit membership group dedicated to the preservation and protection of the trail. In 1993, the PCTA signed a Memorandum of Understanding (MOU) with the USFS and other land management agencies including the U.S. Department of the Interior’s (DOI) National Park Service (NPS) and the Bureau of Land Management (BLM). This MOU identifies the PCTA as the federal government’s “major partner” in the management of the PCT. Overall management of the PCT is provided by the USFS within the ANF, and by the BLM on public lands under its jurisdiction.

The PCT crosses through the northern portion of the ANF (Santa Clara/Mojave River Ranger District) in a south-to-north direction. Although the trail is usually situated on ridgelines, it is routed off ridges in several places due to a lack of necessary easements through private property.
The PCT crosses through the central portion of the ANF (Santa Clara/Mojave Rivers Ranger District) in a west-east direction, following a natural topographic divide between the Soledad Front Country Place and the Angeles High Country Place.

**Campgrounds, Picnic Areas, and Trailheads**

Campgrounds and picnic areas are popular with public recreationists. A National Forest Adventure Pass must be purchased for vehicles parked in non-fee campgrounds, and a special permit is required for group camps. The Rowher/Drinkwater HIRA includes the Streamside and Zuni campgrounds, as well as the Los Cantiles picnic area/day use area.

Trailheads that provide access to the recreational trails network described above are also situated throughout HIRAs, often in the same vicinity as campgrounds or picnic areas and day use facilities. Green Valley Station, an administration/interpretive site and trailhead, is located within the Alternative 2 study corridor. Two other trailheads (Drinkwater OHV Staging Area and Rowher Flats OHV Area) are located outside of a study corridor, but within proximity to an Alternative. The Drinkwater OHV Staging Area, a parking/staging trailhead for the Drinkwater OHV system, is located near Alternatives 2 and 2a. The Rowher Flats OHV Area, a staging/trailhead for the Rowher Flats OHV system, is situated near Alternative 3.

**Recreation Residences**

Recreation residences on the ANF include privately owned cabins authorized under Special Use Authorizations for up to 20 years. Recreation residences in the study area are concentrated in two areas (Bouquet Canyon and San Francisquito Canyon). Cabins are intended for weekend, vacation, or seasonal use only.

**Concessionaires**

Concessionaires (private businesses that operate and maintain government recreation facilities) operate under Special Use Authorization to the USFS within the ANF. A Place to Shoot, a permitted commercial target shooting range open to the public, is situated in proximity to Alternatives 2 and 2a. Private facilities under permit within the ANF are located in proximity to Alternatives 1, 2, and 2a.

**Dispersed Recreation**

Dispersed Recreation is inclusive of recreational activities that occur outside of concentrated use areas such as campgrounds, picnic areas, and maintained trails.

**Hunting:** Hunting is permitted throughout the ANF during seasons that are designated and managed by the California Department of Fish and Game (CDFG). Hunters must hold a valid California hunting license to participate in recreational hunting. The CDFG manages recreational deer hunting throughout the State in separate zones; the Project area is within Zone D-11.

**Fishing:** Recreational fishing is also a popular day-use activity in the ANF. A variety of designated fishing areas are available to the public, which are accessible using NFS roads, designated OHV routes, and multi-use hiking trails. Some fishing areas are restricted to shore fishing only, while others allow for fishing from boats. Permits are required for all fishing activities. The CDFG stocks some waterways within the ANF with fish. Bouquet
Canyon Creek is stocked (as long as there is enough water flow) with rainbow trout by the CDFG from late spring though summer. Access to the creek is from Bouquet Canyon Road. The creek is overseen by the CDFG and requires an Adventure Pass.

**Camping:** Dispersed (also known as remote or primitive) camping occurs outside of developed campgrounds. It occurs in both wilderness and non-wilderness areas, with or without a vehicle; however, most dispersed camping use occurs by vehicle. Dispersed camping is generally allowed forest-wide in the ANF.

**Driving for Pleasure:** Driving for pleasure often is the first or only recreation experience visitors have on the national forests. The ANF contains one scenic highway and byway (Angeles Crest). In addition to this designated roadway, other rural routes offer opportunities for viewing scenery and other activities over less-traveled roads. These rural routes are roads that are not managed specifically for driving pleasure but offer loops and connections to other outstanding scenery. Rest stops, turnouts, scenic vistas, interpretive panels and roadside picnic areas enhance the driving for pleasure recreation opportunity.

**Wildlife and Nature Viewing:** Wildlife and nature viewing are often among the top five activities in which visitors participate. Wildlife and nature viewing is widespread and mostly unrestricted. Some of the most popular opportunities focus around bird watching (migratory birds at several riparian locations) and spring wildflower viewing. Sightings of large mammals are rare but valued by the public. The national forests participate in the State of California Watchable Wildlife Program and the Forest Service Naturewatch programs (Eyes on Wildlife, Fishwatch and Celebrating Wildflowers).

**Snowplay:** Winter views of snow-covered mountains from the Los Angeles basin draw visitors to numerous popular dispersed snowplay areas across the ANF, often just places where motorists can pull their vehicles over to the side of the road.

**Waterplay:** It usually involves sitting by, wading through, or swimming in water. There may be associated activities near waterplay in riparian areas, including picnicking, large family gatherings, and cooking. Waterplay use is very high in the lower elevation canyons of the ANF.

**Rock Climbing:** Some rock climbing and rappelling occurs in the Santa Clara/Mojave Rivers Ranger District of the ANF.

**Designated Wilderness Areas**
There are several wilderness areas designated on NFS lands in the ANF; however, no wilderness areas are located within 0.5 mile of the Proposed Action and Alternatives.

**Wild and Scenic Rivers**
Congress enacted the Wild and Scenic Rivers Act (WSRA) in 1968 to preserve select rivers’ free-flowing condition, water quality, and outstandingly remarkable values. It allows existing uses of a river to continue and future uses to be considered, so long as existing or proposed use does not conflict with protecting river values.
Rivers may be identified for study by an act of Congress under Section 5(a), or through federal agency-initiated study under Section 5(d)(1). Section 5(d)(1) directs federal agencies to consider the potential of Wild and Scenic Rivers in their planning processes, and its application has resulted in numerous individual river designations and state- and area-specific legislation. A river corridor is defined as a river and the adjacent area within the boundaries of a designated river, or a river and the adjacent area within one-quarter mile of the banks of a congressionally authorized study river (one-half mile for designated/study rivers authorized under the Alaska National Interest Lands Conservation Act).

Both Sections 5(a) and 5(d)(1) studies require determinations to be made regarding a river’s eligibility, classification and suitability. Eligibility and classification represent an inventory of existing conditions. Eligibility is an evaluation of whether a river is free-flowing and possesses one or more outstandingly remarkable values including scenery, recreation, geology, fish and wildlife, history, cultural (prehistoric), or similar values. If found eligible, a river is analyzed as to its current level of development (water resources projects, shoreline development, and accessibility) and a recommendation is made that it be placed into one or more of three classes—wild, scenic or recreational. The final procedural step, suitability, provides the basis for determining whether to recommend a river as part of the National System. Suitable uses are those compatible with protecting and enhancing the outstandingly remarkable values for which the river was designated or found eligible.

New proposals include facilities, management actions, or uses on NFS land and are not allowed if they have the potential to affect the eligibility or potential classification of the river segment. A portion of the San Francisquito Canyon, determined eligible for Wild and Scenic River designation in the ANF LMP, is located within the study area.

**Inventoried Roadless Areas**

Inventoried Roadless Areas (IRAs) are undeveloped areas on NFS lands that are inventoried as lacking authorized roadways as determined through the Forest Service’s Roadless Area Review and Evaluation process. IRAs may include trails suitable for hiking and equestrian use, but do not include NFS authorized roads that would accommodate either full-sized vehicles (including high-clearance and passenger vehicles) or OHVs. IRAs are intended to protect areas for their natural or wilderness qualities; self-contained ecosystems; and undeveloped areas adjacent to existing Wilderness Areas (USFS 2005).

Three IRAs—Red Mountain, Salt Creek, and Tule—were identified within the study area. Current USFS regulations regarding IRA conservation do not allow roads to be built or reconstructed in these areas. The regulations do not prohibit issuance of a Special Use Authorization in IRAs, but a project would have to be constructed by helicopter or some means other than road building.

**State**

**State Water Project**

The California Aqueduct, which is part of the California State Water Project, provides year-round recreational fishing opportunities (at certain locations), primarily for striped bass and catfish. Other recreational uses, such as boating and swimming, are not permitted.
Pyramid Lake is an artificial lake formed by Pyramid Dam on Piru Creek. The earth and rock dam was built by the California Department of Water Resources. Pyramid Lake is part of the California Aqueduct. Downstream is Castaic Lake, which is the terminus of the west branch of the aqueduct. Pyramid and Castaic Lakes act as the upper and lower reservoirs for a 1,495 megawatt pumped storage hydroelectric plant. Pyramid Lake offers boating, fishing, jet skiing and picnic areas (including five unique sites that are accessible only by boat), and courtesy docks.

**California Department of Parks and Recreation**

The California Department of Parks and Recreation manages 280 units throughout the State. Units are classified by statute and can include, but are not limited to, State Parks, State Recreation Areas, State Vehicular Recreation Areas, State Reserves, and State Historic Parks. Units of the State Parks system can also include sub-units, such as State Wilderness, Cultural Preserves, and Natural Preserves. These parks protect and preserve culturally and environmentally sensitive structures and habitats, threatened plant and animal species, ancient Native American sites, and historic structures and artifacts.

The California State Parks’ Planning Division develops the California Outdoor Recreation Plan: the statewide master plan for parks, outdoor recreation, and open space for all recreation providers. The California Outdoor Recreation Plan provides policy guidance to all public agencies (federal, State, local, and special districts) engaged in providing outdoor recreational lands, facilities and services throughout California.

**Castaic Lake State Recreation Area**

Castaic Lake State Recreation Area, located at the northern end of the Santa Clarita Valley, is home to one of the largest State Water Project reservoirs in Southern California. Castaic Lake’s recreational facilities were built by the Department of Water Resources and the State Department of Parks and Recreation, but the 8,000-acre park is operated and maintained by the Los Angeles County Department of Parks and Recreation. The facility consists of two separate lakes—the main reservoir and lagoon/afterbay. The main reservoir forms a V-shaped body of water with approximately 29 miles of shoreline. The east arm of the lake is open to boating, fishing and sailing, and a portion is open to water-skiing and wakeboarding. The west arm is reserved for water-skiing and wakeboarding, with a special use area for all personal watercraft. Fishing in the west arm is allowed only in the coves. Ramps are provided on the east and west sides of the dam, and picnic facilities are located in both areas. The recreation area offers self-contained overnight camping on the lagoon/afterbay. Campgrounds containing 60 campsites are located on the east side and can accommodate travel trailers, campers, and RVs. Tent camping is also available on a limited basis. The campgrounds also include a picnic area and provide access to areas designated for boating, swimming (seasonal), and fishing.

According to the California State Parks, Office of Grants and Local Services (August 2008), Castaic Lake Recreation Area is listed as a Land and Water Conservation Fund Program funded project. Specific information related to the funding is provided below.
Castaic Afterbay Development 1971/72

- Picnic tables, barbecues, boating, restrooms, parking, roads, landscaping, shade structure, lighting, utilities, comfort stations, dressing rooms.

Castaic Lake SRA Development 1980/81

- Parking lots, roads, walkways.

The Castaic Sports Complex is located just south of Castaic Lake and provides a number of sports opportunities to the public.

Antelope Valley California Poppy Reserve

The Antelope Valley California Poppy Reserve is located 15 miles west of Highway 14, approximately three miles northwest of the existing Antelope Substation. The land is owned by the State of California and is managed by the California Department of Parks and Recreation. The reserve includes 1,745 acres of protected land in the Antelope Buttes where the California State Flower, the California poppy, flourishes every spring. There is a Visitor’s Center and a parking area at the reserve, as well as seven miles of trails, which include a paved section for wheelchair access. OHV use is popular immediately to the north of the reserve. Peak visitation at the Antelope Valley California Poppy Reserve occurs from March to May of each year (CA State Parks 2005).

The Antelope Valley California Poppy Reserve Resource Management Plan/General Development Plan/Environmental Report guides the future development and management of the Antelope Valley California Poppy Reserve. The Plan also identifies lands outside existing reserve boundaries that are of prime concern to present and future environmental values, and to visitor use of the reserve.

California Department of Fish and Game

The Department of Fish and Game maintains native fish, wildlife, plant species and natural communities for their intrinsic and ecological value and their benefits to people. This includes habitat protection and maintenance in a sufficient amount and quality to ensure the survival of all species and natural communities. The department is also responsible for the diversified use of fish and wildlife, including recreational, commercial, scientific and educational uses. Department of Fish and Game owned and operated lands (undesignated) are located in the study area.

California Back Country Discovery Trails

The goal of the California Back Country Discovery Trail system is to provide long-distance OHV opportunities from Mexico to Oregon (CA State Parks 2005).

State Conservancies

The California Resources Agency is responsible for conserving, enhancing, and managing the State’s natural resources, including the land, water, wildlife, parks, minerals, and historic sites. State Conservancies are independent agencies under the California Resources Agency. Each has a different mission in specific geographic areas around the State. While their missions vary,
their primary objectives include protecting the natural environment, increasing public access and recreation opportunities and preserving and enhancing wildlife habitat.

Santa Monica Mountains Conservancy
The Santa Monica Mountains Conservancy mission is to strategically buy, preserve, protect, and restore land in Southern California, forming an interlinking system of urban, rural, and river parks, open space, trails, and wildlife habitats easily accessible to the general public. Santa Monica Mountains Conservancy Parkland/Property is located in the study area.

San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy
Legislation created the Conservancy in 1999 and a year later it created a Parkways and Open Space Plan to preserve urban open space and habitat for the enjoyment and appreciation of present and future generations. The Conservancy sponsors projects providing low-impact recreation, education, wildlife habitat restoration, and watershed improvements that prioritize river-related recreation, re-vegetating, aesthetic improvements, and wildlife habitat. San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy property is located in the study area.

Local
Los Angeles County Riding and Hiking Trails
The County of Los Angeles Department of Parks and Recreation manages and maintains a network of multi-use trails that runs throughout Los Angeles County, including parts of the study area. All trails are open for hiking, mountain biking, and equestrian use, unless otherwise noted. The system has been developed in conjunction with trails provided by other federal and State agencies.

Antelope Valley Area Trails
The Antelope Valley Area Trails Plan is a Master Trails Plan developed and administered by the Antelope Valley Conservancy in conjunction with the City of Lancaster, the City of Palmdale, and the County of Los Angeles. The purpose of this Master Trails Plan is to interlink regional and local trails, including USFS trails and the PCT, for recreational opportunities such as hiking and horseback riding.

Planned Development of Recreational Areas
Ritter Ranch Specific Plan and City Ranch Specific Plan
Park sites are depicted in the Ritter Ranch and City Ranch Specific Plans, which have been adopted by the Palmdale City Council. Development of these parks would occur during build-out of the specific plan areas, based on the park phasing and improvement plans contained within each document. A recreation center is included in the Ritter Ranch development and is planned to occupy 4.7 acres of land at the northeast corner of City Ranch Road and Ranch Center Drive.

Community
In addition, some communities offer parks, baseball fields, walking/hiking/bicycle trails, outdoor sports activities at schools, and other opportunities.
According to the Rosamond Community Services District (RCSD) Parks System Master Plan, a strong desire for a multi-use trail system in the community exists. Specific mention was made of equestrian, hiking, and biking trails that provide for backcountry exploration, adults commuting to work, children commuting to school, and travel to adjacent communities. The master plan contains a conceptual layout of 38.5 miles of trails within the RCSD service area and an additional 85.4 miles in the District’s Sphere Of Influence (SOI). Recommendations for trails within the study area are organized into two categories (Major and Local).

- Major trails would primarily make connections beyond the unincorporated community of Rosamond itself, and provide opportunities for long-distance commuting and recreational activities. Major trails within the study area include the following: M2 - Rosamond Trail; M3 - Powerline Trail; and M4 - Aqueduct Trail.

- Local Trails are intended to facilitate recreation opportunities and connections within the RCSD service area and SOI. Local trails within the study area include the following segments: L9; L10; L11; L12; and L13.

The RCSD does not currently own any developed park and recreation facilities.

Private
Recreational opportunities also exist on privately owned lands, including private campgrounds, golf courses, RV parks, and motor raceways. Activities such as hunting may be permitted on privately owned land with landowner consent.

Regulatory Framework
The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

Summary of Inventory Results
Project Components Common to All Action Alternatives
The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

New 230 kV Circuit
The addition of the new 230 kV circuit within the ROW would include only stringing activities from the proposed Haskell Canyon Switching Station to the existing Castaic Power Plant. Since the existing ROW traverses the Castaic Lake State Recreation Area, recreational uses are primarily associated with this area. The new 230 kV circuit would traverse USFS Road 5N29.

Reconductoring of BR-RIN Transmission Line
The existing transmission line would be removed and used to pull the new conductor. Some of the transmission line structures would need to be modified or replaced, and/or foundations
reinforced, to carry the additional weight of the new heavier conductor. All work would remain within the existing ROW.

This Project component and construction access routes would cross or run adjacent to a range of land use types, including recreational lands (CLWA Conservatory Garden and Learning Center, Whitney Canyon Park, and Mountains Recreation and Conservation Authority Property).

**New Haskell Canyon Switching Station**

The proposed new Haskell Canyon Switching Station site does not include recreational facilities, nor would it require the construction of new, or the expansion of existing, recreational facilities.

**Expansion of Barren Ridge Switching Station**

The expansion area of the Barren Ridge Switching Station would not include recreational resources.

**New 230 kV Double-Circuit Transmission Line**

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

**Alternative 1**

The Alternative 1 transmission line is characterized by both developed and dispersed recreational opportunities including areas for OHV use, camping, swimming, boating, riding and hiking trails, hunting, and wildlife observation. Existing and proposed recreational resources that would be located near or traversed by the Alternative 1 transmission line include:

- **Rosamond Community Services District Parks System Master Plan Trails.** The master plan provides the first step in planning a comprehensive trail system and contains a conceptual layout of 38.5 miles of trails within the RCSD service area and an additional 85.4 miles in the District’s Sphere Of Influence. Alternative 1 would traverse and/or be adjacent to several of these trails.

- **Los Angeles County Riding and Hiking Trails.** Los Angeles County trails include a network of multiuse trails which are managed by the Los Angeles County Department of Parks and Recreation. Alternative 1 would traverse and/or be adjacent to several of these trails.

- **National Forest System Roads.** National Forest System roads that would be traversed by or located adjacent to Alternative 1 include Dry Canyon Road (5N29), City Highline Motorway FR Road (6N21, OHV), Old Ridge Road (8N04) (OHV) (currently under a temporary closure), Reservoir Summit Road (7N26.1), Liebre Gulch Road (8N01, OHV), and Forest Inn Road (6N43).

- **Pacific Crest National Scenic Trail.** The PCT enters the ANF from the eastern boundary of the Santa Clara/Mojave Rivers Ranger District, and exits the ANF from the northwestern boundary of this district. Alternative 1 would cross and/or be located adjacent to the PCT.
California Department of Fish and Game Property. California Department of Fish and Game property classified as “undesignated” would be traversed between mileposts 57.8 and 58.3 and mileposts 58.6 and 58.8.

Inventoried Roadless Areas. Alternative 1 would traverse and/or be located adjacent to the Salt Creek IRA.

Castaic Lake State Recreation Area. Alternative 1 would traverse and/or be located adjacent to the Castaic Lake State Recreation Area.

Recreational resources crossed by milepost are presented in Appendix F, Table F-12 of this Final EIS/EIR.

Alternative 2: LADWP’s Proposed Action and Federal Agency Preferred Alternative

The Alternative 2 transmission line is characterized by both developed and dispersed recreational opportunities including areas for OHV use, backpacking, camping, riding and hiking trails, hunting, and wildlife observation. Existing and proposed recreational resources that would be located near or traversed by the Alternative 2 transmission line include:

Rosamond Community Services District Parks System Master Plan Trails. The master plan provides the first step in planning a comprehensive trail system and contains a conceptual layout of 38.5 miles of trails within the RCSD service area and an additional 85.4 miles in the District’s Sphere Of Influence. The Alternative 2 transmission line would traverse and/or be adjacent to several of these trails.

Los Angeles County Riding and Hiking Trails. Los Angeles County trails include a network of multiuse trails which are managed by the Los Angeles County Department of Parks and Recreation. The Alternative 2 transmission line would traverse and/or be adjacent to several of these trails.

National Forest System Roads. National Forest System roads that would be traversed or located adjacent to the Alternative 2 transmission line include Pettinger Canyon Road (5N28), City Highline Motorway FR Road (6N21) (OHV), Burns Road (7N01) (OHV), Leona Divide (6N04.2) (OHV), and South Portal (7N02) (OHV).

Pacific Crest National Scenic Trail. The PCT enters the ANF from the eastern boundary of the Santa Clara/Mojave Rivers Ranger District, and exits the ANF from the northwestern boundary of this district. The Alternative 2 transmission line would cross and/or be located adjacent to the PCT between milepost 46.9 and milepost 47.3.

San Francisquito Canyon Eligible Wild and Scenic River. San Francisquito Canyon, an eligible Wild and Scenic River, would be traversed and/or adjacent to the Alternative 2 transmission line.

Rowher-Drinkwater Flats High Impact Recreation Area. Designated recreation areas near the Alternative 2 transmission line include A Place to Shoot (target shooting range), picnicking, camping, and recreation facilities. OHV use (motorcycles, ATVs, and four-wheel driving) is
also a popular recreation activity. Off-highway travel is restricted to designated motor vehicle routes including roads, trails, and Open Areas.

**Red Mountain Inventoried Roadless Area.** The Red Mountain IRA would be located 1,500 feet west of the Alternative 2 transmission line. This IRA includes 56,320 acres of remote undeveloped backcountry.

**California Back Country Discovery Trail.** Within the ANF, California Back Country Discovery Trails would be traversed and/or adjacent to Alternative 2. These OHV systems provide a range of recreation opportunities for OHV enthusiasts through the development of an integrated system of trails and low-maintenance standard roads (USFS 2005).

Recreational resources crossed by milepost are presented in Appendix F, Table F-13 of this Final EIS/EIR.

**Alternative 2a**

As described in the Land Use Section, the Alternative 2a transmission line is 63 miles long and would be located to the north and around the unincorporated community of Green Valley (Green Valley Re-route). The Green Valley Re-route would occur within the boundary of the ANF (Santa Clara/Mojave Rivers Ranger District) and Los Angeles County.

Recreational resources crossed by milepost are presented in Appendix F, Table F-14 of this Final EIS/EIR.

**Alternative 3**

The Alternative 3 transmission line is characterized by both developed and dispersed recreational opportunities. Much of the land along the Alternative 3 transmission line is privately owned. Recreational activities include areas for OHV use, riding and hiking trails, and open space purposes. Existing and proposed recreational resources that would be located near or traversed by the transmission line include:

**Rosamond Community Services District Parks System Master Plan Trails.** The master plan provides the first step in planning a comprehensive trail system and contains a conceptual layout of 38.5 miles of trails within the RCSD service area and an additional 85.4 miles in the District’s Sphere Of Influence.

**Los Angeles County Riding and Hiking Trails.** Los Angeles County trails include a network of multiuse trails which are managed by the Los Angeles County Department of Parks and Recreation.

**Pacific Crest National Scenic Trail.** The PCT enters the ANF from the eastern boundary of the Santa Clara/Mojave Rivers Ranger District, and exits the ANF from the northwestern boundary of this district. Alternative 3 would cross the PCT between milepost 62.0 and milepost 62.1.

Recreational resources crossed by milepost are presented in Appendix F, Table F-15 of this Final EIS/EIR.
### 3.2.6 PUBLIC SERVICES AND UTILITIES

#### Introduction

This section identifies and describes the public services and utilities systems affected by the Proposed Action and Alternatives. This section examines the affected environment and presents the regulatory framework that is relevant to existing services and systems in the BRRTP area.

#### Overview of Methodology and Analysis Area

Public services (i.e., fire protection, police protection, schools) and utilities (i.e., electricity, natural gas, water, wastewater, and landfill facilities) in the region are typically provided by the applicable jurisdiction. Transmission elements of the Proposed Action and Alternatives would traverse USFS land in the Angeles National Forest (ANF), BLM land, unincorporated communities in Kern and Los Angeles Counties, and the cities of Lancaster, Palmdale, Santa Clarita, and Los Angeles. The proposed Haskell Canyon Switching Station would be located on LADWP-owned land near the southern boundary of the ANF. Current data regarding providers and their service capacities was compiled through a review of land use plans, online resources, existing environmental documents, and personnel communications. Entities providing public services and utilities in the BRRTP area are described in detail in the sections below.

#### Fire Protection and Emergency Medical Response Services

**Kern County Fire Department**

The Kern County Fire Department (KCFD) is an organization comprising over 625 permanent employees protecting an area which spans over 8,000 square miles. The department provides fire protection services for over 500,000 citizens living in the unincorporated areas of Kern County and the cities of Arvin, Delano, Maricopa, McFarland, Ridgecrest, Shafter, Taft, Tehachapi and Wasco. Over 546 uniformed firefighters are stationed in 46 fire stations throughout Kern County. Added to this, the Kern County Fire Department has 14 Mutual Aid Agreements with neighboring fire suppression organizations to further strengthen the emergency services available to customers. Specifically, services provided by the department include fire prevention and suppression, search, rescue, and air operations, arson investigation, emergency medical services, and hazardous materials mitigation (KCFD 2010).

Three KCFD fire stations are found within 10 miles of the BRRTP and are the most likely to serve the Project area: Tehachapi Station, Mojave Station, and the Rosamond Station. Table F-17 in Appendix F of this Final EIS/EIR provides the location and operational detail of these stations.

**Los Angeles County Fire Department**

The Los Angeles County Fire Department (LACoFD) provides fire protection, emergency response, disaster response, and related services to unincorporated areas of Los Angeles County as well as the cities of Lancaster, Palmdale, and Santa Clarita. A Mutual Aid agreement is in place between the USFS and LACoFD for fire protection services, and the California Department of Forestry contracts with the LACoFD for the protection of State Responsibility Areas (SRAs) which include privately owned forestlands, rangelands, and watersheds.
The LACoFD is divided into three Regional Emergency Operations Bureaus (North, Central, and East), which serve a total 2,296 square mile service area. The BRRTTP area is served by Battalions 6, 11, and 17 within the North Operations Bureau area of the LACoFD; however, in the incidence of fire, all stations within the County would respond as necessary, per the California Master Mutual Aid Agreement. Tables F-18 and F-19 in Appendix F of this Final EIS/EIR identify fire stations and equipment resources within the BRRTTP Fireshed (LACoFD 2010).

**Los Angeles Fire Department**

The Los Angeles Fire Department (LAFD) is the largest metropolitan Fire Department in the Western United States, with 106 Fire Stations and over 3,600 personnel providing fire protection, firefighting, emergency medical care, rescue, hazardous materials mitigation, and disaster response services to over four million people within a 470 square mile service area. The LAFD provides fire protection services within the city limits for the City of Los Angeles.

**USFS (ANF)**

In the ANF, the responsibility of fire protection falls upon the USFS through their implementation of the USFS Fire Management Program. The Fire Management Program is executed by the USFS in cooperation with the LACoFD, and includes elements of fire prevention, fire suppression, and fire use. As a wildland-urban interface, communities on the fringe of the Forest boundary are susceptible to fire under conditions of wind. Aggressive fire suppression and prevention strategies are implemented to protect life and property damage in the adjacent communities.

The Southern California Geographic Coordination Center is charged with the mobilization of federal resources within a geographic area that extends from the Stanislaus National Forest to the Cleveland National Forest. Fire response resources may be mobilized from across the nation in support of wildland fire incidences; however, for the purposes of evaluating local capabilities to respond to a local wildfire, Tables F-20 and F-21 in Appendix F of this Final EIS/EIR identify ANF fire stations and equipment resources available in the BRRTTP fireshed.

**Traffic and Law Enforcement Services**

**Kern County Sherriff’s Department**

The Kern County Sheriff’s Department (KCSD) is responsible for administering the countywide jail system and providing police protection services throughout the county of Kern. Services provided include crime prevention, search and rescue, special operations (e.g., bomb squad, S.W.A.T.), civil process duties (e.g., paperwork processing for lawsuits filed), transportation to the courts, and coroner services.

The KCSD headquarters facility is located in Bakersfield, and 15 substations provide patrol services within a 400 square mile area. Eight unincorporated communities are located within the KCSD service area: Grapevine, Fort Tejon, Lebec, Frazier Park, Lake of the Woods, Los Padres Estates, Piñon Pines, and Pine Mountain Club. The Rosamond, Mojave, and Frazier Park Substations would serve as the primary responders for police protection services for the BRRTTP area and vicinity. The Off-Highway Vehicle Enforcement Team, based out of the KCSD
Ridgecrest Field Office, also provides law enforcement and patrol services to the remote and less accessible areas of Kern County (i.e., Rosamond/Mojave desert areas, and Tehachapi Mountains), particularly during the off-highway vehicle season (KCSD 2010).

Los Angeles County Sheriff’s Department
The Los Angeles County Sheriff’s Department (LASD) is the second largest municipal law enforcement agency in the nation, providing police protection services to roughly one million residents in the unincorporated communities of Los Angeles County as well as forty contracted cities (e.g., Lancaster, Palmdale, Santa Clarita) (LASD 2010a). LASD Region 1 patrol stations serving the BRRTP area include the Lancaster, Palmdale, and Santa Clarita Valley Stations.

California Highway Patrol
Traffic regulation enforcement, emergency response coordination, and other assistance along major roadways such I-5 and State Routes 14 and 138 are provided by the California Highway Patrol (CHP). The statewide law enforcement agency is also responsible for assisting other public agencies with law enforcement activities (e.g., accident investigations, vehicle theft investigations) and the oversight of emergency incidence management (e.g., assistance to disabled or abandoned vehicles) on the State’s highway transportation system.

Law Enforcement in the Angeles National Forest
The BRRTP would traverse lands under the management of the Santa Clara District Office of the ANF. Law enforcement in the ANF is provided by Law Enforcement Officers and Forest Protection Officers. In addition, the Los Angeles County Sheriff’s Department (Palmdale office) patrols the ANF in OHVs. The team deploys between two and eight members to problem areas, on varying days and times. This unit also has a volunteer unit consisting of 82 members (Los Angeles County Sheriff’s Department 2009a).

Law Enforcement on Public Lands Administered by the Bureau of Land Management
The BRRTP would traverse lands under the management of the Ridgecrest Field Office of the BLM. Law enforcement on these public lands is provided by BLM Rangers, local Kern County Sheriffs and the California Highway Patrol. The BLM force includes nine Rangers and one Chief Ranger (BLM 2010).

School Districts
The BRRTP area overlaps with the following school districts; Southern Kern USD, Tehachapi USD, Antelope Valley HSD, Eastside Union SD, Lancaster ESD, Westside Union ESD, Palmdale ESD, and Acton Agua-Dulce USD. Table F-22 in Appendix F of this Final EIS/EIR identifies schools located within one-quarter mile of the BRRTP area.

Utilities Systems
Table 3.2.6-1 identifies utility service providers in the BRRTP area.
### Table 3.2.6-1. Utility Service Providers by Jurisdiction

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<th>Jurisdiction</th>
<th>Natural Gas</th>
<th>Electric Service</th>
<th>Water Service</th>
<th>Wastewater Service</th>
<th>Solid Waste Management Service</th>
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<td>Pacific Gas and Electric, Southern California Gas Company</td>
<td>Kern County Water Agency, Mojave Water Agency</td>
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<td>Los Angeles County</td>
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<td>City of Los Angeles, Department of Water and Power; Southern California Edison</td>
<td>Los Angeles County Department of Public Works; City of Los Angeles Department of Water and Power; Antelope Valley-East Kern Water Agency; Central/West Basin Municipal Water District; Calleguas Municipal Water District, Camrosa Water District, Casitas Municipal Water District - Castaic Lake Water Agency, Central Basin Municipal Water District; Las Virgenes Municipal Water District, Metropolitan Water District of Southern California</td>
<td>Los Angeles County Sanitation District, Santa Clarita Valley Sanitation District</td>
<td>Chiquita Canyon Landfill/Consolidated Disposal Service; Antelope Valley Recycling and Disposal Facility/Waste Management, Inc.; Sunshine Canyon Landfill/BFI Waste Systems of North America, Inc.; Lancaster Landfill/Waste Management, Inc.</td>
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<td>Los Angeles County Water Works; Antelope Valley-East Kern Water Agency</td>
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<td>Los Angeles County Sewer Maintenance, Santa Clarita Valley Sanitation District</td>
<td>Chiquita Canyon Landfill/Consolidated Disposal Service; Antelope Valley Recycling and Disposal Facility/Waste Management, Inc.</td>
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</table>
### Solid Waste Landfills and Recycling Services

The waste management services identified in Table 3.2.6-1 provide solid waste disposal services through the use of landfills and permitted treatment facilities located throughout the region. Table 3.2.6-2 identifies the solid waste landfills that may serve the Project area, as well as the type of waste accepted and the remaining capacities at these facilities.

#### Table 3.2.6-2. Solid Waste Landfills Serving the BRRT2 Project Area

<table>
<thead>
<tr>
<th>County Facilities</th>
<th>Solid Waste Landfill Used in 2008</th>
<th>Waste Type Accepted by Facility</th>
<th>Permitted Max Disposal/Day</th>
<th>Total Estimated Permitted Capacity</th>
<th>Total Estimated Permitted Capacity Used</th>
<th>Remaining Estimated Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kern County</td>
<td>Boron Sanitary Landfill</td>
<td>Ash, construction/demolition, industrial, dead animals, mixed municipal</td>
<td>200 tons/day</td>
<td>1,002,819 cy</td>
<td>794,187 cy</td>
<td>208,632 cy</td>
</tr>
<tr>
<td></td>
<td>Mojave-Rosamond Sanitary Landfill</td>
<td>Agricultural, construction/demolition, industrial, dead animals, mixed municipal</td>
<td>42 tons/day</td>
<td>330,000 cy</td>
<td>-436,157 cy</td>
<td>Capacity is currently exceeded.</td>
</tr>
<tr>
<td></td>
<td>Tehachapi Sanitary Landfill</td>
<td>Construction/demolition, industrial, dead animals, mixed municipal</td>
<td>1,000 tons/day</td>
<td>3,388,723 cy</td>
<td>2,513,849 cy</td>
<td>874,874 cy</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>Lancaster Landfill and Recycling Center</td>
<td>Agricultural, asbestos, construction/demolition, green materials, inert, industrial, mixed municipal tires, contaminated soil, BioSolids</td>
<td>1,700 tons/day</td>
<td>26,665,000 cy</td>
<td>7,576,261 cy</td>
<td>19,088,739 cy</td>
</tr>
<tr>
<td></td>
<td>Antelope Valley Public Landfill I</td>
<td>Construction/demolition, inert, industrial, mixed municipal</td>
<td>1,400 tons/day</td>
<td>6,480,000 cy</td>
<td>3,501,857 cy</td>
<td>2,978,143 cy</td>
</tr>
<tr>
<td></td>
<td>Antelope Valley Public Landfill II</td>
<td>Agricultural, construction/demolition, green materials, inert, industrial, mixed municipal</td>
<td>1,800 tons/day</td>
<td>8,206,000 cy</td>
<td>N/R</td>
<td>8,206,000 cy</td>
</tr>
<tr>
<td></td>
<td>Chiquita Canyon Sanitary Landfill</td>
<td>Construction/demolition, green materials, inert, industrial, mixed municipal</td>
<td>6,000 tons/day</td>
<td>63,900,000 cy</td>
<td>34,600,000 cy</td>
<td>29,300,000 cy</td>
</tr>
<tr>
<td></td>
<td>Sunshine Canyon Sanitary Landfill</td>
<td>Construction/demolition, green materials, inert, industrial, mixed municipal</td>
<td>6,600 tons/day</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>County Facilities</td>
<td>Solid Waste Landfill Used in 2008</td>
<td>Waste Type Accepted by Facility</td>
<td>Permitted Max Disposal/Day</td>
<td>Total Estimated Permitted Capacity</td>
<td>Total Estimated Capacity Used</td>
<td>Remaining Estimated Capacity</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------</td>
<td>--------------------------------</td>
<td>---------------------------</td>
<td>-----------------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Sunshine Canyon Landfill Unit 2</td>
<td>mixed municipal</td>
<td>5,500 tons/day</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td></td>
</tr>
</tbody>
</table>

Source: CIWMB 2010.

**Electricity**

As indicated in Table 3.2.6-1, electricity in the BRRTP area is provided by the City of Los Angeles Department of Water and Power (LADWP), Pacific Gas and Electric (PG&E), Southern California Gas Company, and Southern California Edison (SCE).

**Water Supply**

Roughly two-thirds of southern California’s water supply is imported from sources in northern California through the California Department of Water Resource’s State Water Project (SWP). The SWP delivers water to primary water purveyors in the region including the Antelope Valley-East Kern Water Agency, Palmdale Water District, Metropolitan Water District of Southern California, and the Castaic Lake Water Agency. These agencies supply water to local providers serving the jurisdictions potentially affected by the Proposed Action and Alternatives.

Table 3.2.6-1 lists purveyors that supplement water from the SWP with groundwater and aquifer storage and recharge. Additional water supplies serving communities in the region include over 385 miles of streams and 6,765 acres of reservoirs in the ANF.

Table 3.2.6-3 identifies primary SWP contractors serving the BRRTP area, as well as their average annual water entitlement and usage under the SWP, and projected groundwater supply.

**Table 3.2.6-3. State Water Project Contractors Serving the BRRTP Area (Annual Water Supply)**

<table>
<thead>
<tr>
<th>State Water Project Contractor</th>
<th>Initial Request (acres/feet)</th>
<th>Approved Allocation (acres/feet)</th>
<th>Percent Initial Request Approved (acres/feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antelope Valley-East Kern Water Agency</td>
<td>141,400</td>
<td>70,700</td>
<td>50%</td>
</tr>
<tr>
<td>Castaic Lake Water Agency</td>
<td>95,200</td>
<td>47,600</td>
<td>50%</td>
</tr>
<tr>
<td>Littlerock Creek Irrigation District</td>
<td>2,300</td>
<td>1,150</td>
<td>50%</td>
</tr>
<tr>
<td>Mojave Water Agency</td>
<td>82,800</td>
<td>41,400</td>
<td>50%</td>
</tr>
<tr>
<td>Metropolitan Water District of Southern California</td>
<td>1,911,500</td>
<td>955,750</td>
<td>50%</td>
</tr>
<tr>
<td>Palmdale Water District</td>
<td>21,300</td>
<td>10,650</td>
<td>50%</td>
</tr>
<tr>
<td>San Bernardino Valley Municipal Water District</td>
<td>102,600</td>
<td>51,300</td>
<td>50%</td>
</tr>
<tr>
<td>San Gabriel Valley Municipal Water District</td>
<td>28,800</td>
<td>14,400</td>
<td>50%</td>
</tr>
</tbody>
</table>

Source: Department of Water Resources, June 2010 State Water Project Allocation Increase.

The First and Second Los Angeles Aqueducts traverse much of the BRRTP area, conveying water by gravity across 338 miles from Mono Basin and 233 miles from the Owens Valley to LADWP customers in the City of Los Angeles. Aqueduct deliveries from these aqueducts have, on average, supplied about half of the City’s water needs over the last ten years (LADWP, 2010).
Regulatory Framework

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

Summary of Inventory Results

As described in detail above, a number of entities provide public and utilities services in the BRRTP area and vicinity.

Project Components Common to All Action Alternatives

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives. Table 3.2.6-4 identifies affected jurisdictions providing public and utilities services in the area of the BRRTP components that are common to all action Alternatives.

Table 3.2.6-4. Affected Jurisdiction(s) Providing Services in BRRTP Area (Components Common to All Action Alternatives)

<table>
<thead>
<tr>
<th>Affected Jurisdiction(s)</th>
<th>New 230 kV Circuit</th>
<th>Reconductoring of the BR-RIN Transmission Line</th>
<th>New Haskell Canyon Switching Station</th>
<th>Expansion of the Barren Ridge Switching Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM-administered land</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USFS Land (ANF)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kern County</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>X*</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City of Santa Clarita</td>
<td></td>
<td>X</td>
<td>X*</td>
<td></td>
</tr>
<tr>
<td>City of Los Angeles</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*LASD patrols the ANF in OHVs, and the Fire Management Program is executed by the USFS in cooperation with the LACoFD to provide fire prevention, fire suppression, and fire use services in the ANF.

New 230 kV Double-Circuit Transmission Line

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. Table 3.2.6-5 identifies affected jurisdictions providing public and utilities services in the area of the transmission line for each action Alternative.

Table 3.2.6-5. Affected Jurisdiction(s) Providing Services in the BRRTP Area (230 kV Transmission Line for Each Alternative)

<table>
<thead>
<tr>
<th>Affected Jurisdiction(s)</th>
<th>Alternative 1 Transmission Line</th>
<th>Alternative 2 Transmission Line</th>
<th>Alternative 2a Transmission Line</th>
<th>Alternative 3 Transmission Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLM-administered land</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>USFS Land (ANF)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Kern County</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Los Angeles County</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>City of Lancaster</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>City of Palmdale</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
3.2.7 HAZARDOUS WASTE AND MATERIALS

Introduction

This section describes hazardous materials in the area of the Proposed Action and Alternatives. Specifically, this section presents the conditions of the affected environment, and describes regulations, plans, and standards that pertain to environmental contamination in the BRRTP area.

Additional public health and safety hazards associated with the BRRTP are addressed in this document to satisfy requirements of the CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Please refer to Sections 3.2.12 (Electrical Effects), 3.2.13 (Wildfire and Fuels), and 3.2.3 (Land Use) for hazards related to wildfire, electric and magnetic fields (EMF), and aviation safety.

Overview of Methodology and Analysis Area

Hazardous materials generally include substances that are toxic, flammable, corrosive, or chemically reactive, or produce vapors when combined with water. Proposed Action and Alternatives-related contamination impacts could result from the unintentional release or mobilization of hazardous materials that, because of quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment. Soils possessing contaminant levels in excess of established regulatory thresholds for particular substances (e.g., petroleum products, lead) must be treated as hazardous waste during their excavation, transport, and disposal. For this reason, the locations of known hazardous sites must be defined in the planned Proposed Action and Alternatives excavation areas prior to construction. Current and historical land uses must also be considered to evaluate the potential for encountering unidentified hazardous substances during Proposed Action or Alternatives excavation activities. If contaminants are encountered, applicable safety standards and current law must be followed to minimize risks associated with human and environmental exposure.

The BRRTP area includes USFS land in the Angeles National Forest (ANF), BLM-administered public land, unincorporated communities in Kern and Los Angeles Counties, and the cities of Lancaster, Palmdale, Santa Clarita, and Los Angeles. The Proposed Action and Alternative rights-of-way (ROWs) traverse lands containing a variety of uses including agricultural, commercial, rural residential, and industrial uses. Activities associated with these land uses often involve the storage and/or use of hazardous materials which could be inadvertently released into the surrounding area, resulting in contamination.

Hazardous Materials Database Records Search

TrackInfo Services, LLC (TIS) conducted a review of regulatory databases on September 20, 2010 for this analysis. Such database searches by third-party specialized contractors are often used as a limited investigation to reveal the location of current and former hazardous material storage sites, use locations, and/or illicit release sites in a specific geographic area. When used in conjunction with aerial photography, field reconnaissance, and other investigative methods, these searches can be relied upon by agencies and other individuals to identify sources of known and potential contamination.
The records search radii used to query published governmental records for the Project area met or exceeded the criteria specified in the American Society for Testing and Materials (ASTM) standards. A list of the regulatory agency databases searched by TIS is provided in Table 3.2.7-1. A summary of identified contamination sites is provided below. Detailed information can be found in the TIS Reports included within Appendix K.

### Table 3.2.7-1. **Regulatory Agency Databases Searched**

<table>
<thead>
<tr>
<th>Regulatory Database Searched</th>
<th>Type of Record</th>
<th>Regulatory Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPL</td>
<td>National Priority List</td>
<td>United States Environmental Protection Agency (EPA)</td>
</tr>
<tr>
<td>NPL Delisted</td>
<td>National Priority List Subset</td>
<td>EPA</td>
</tr>
<tr>
<td>CERCLIS</td>
<td>Comprehensive Environmental Response, Compensation, and Liability Information System</td>
<td>EPA</td>
</tr>
<tr>
<td>NFRAP</td>
<td>No Further Remedial Action Plan (archive of CERCLIS sites)</td>
<td>EPA</td>
</tr>
<tr>
<td>RCRA COR ACT</td>
<td>Resource Conservation and Recovery Act Information System Sites</td>
<td>EPA</td>
</tr>
<tr>
<td>RCRA TSD</td>
<td>Resource Conservation and Recovery Act Treatment, Storage, and Disposal Facilities</td>
<td>EPA</td>
</tr>
<tr>
<td>RCRA GEN</td>
<td>Resource Conservation and Recovery Information System Generators</td>
<td>EPA</td>
</tr>
<tr>
<td>RCRA NLR</td>
<td>Resource Conservation and Recovery Act Information System Sites that no longer require reporting</td>
<td>EPA</td>
</tr>
<tr>
<td>Federal IC / EC</td>
<td>Brownfield Management System</td>
<td>EPA/Environmental Protection Agency (EPA)</td>
</tr>
<tr>
<td>ERNS</td>
<td>Emergency Response Notification System</td>
<td>EPA/National Response Center</td>
</tr>
<tr>
<td>Tribal Lands</td>
<td>Indian Lands of the United States</td>
<td>U.S. Department of the Interior / Bureau of Indian Affairs</td>
</tr>
<tr>
<td>State Spills 90</td>
<td>Regional Water Quality Control Board’s (RWQCB’s) spills, leaks, investigations, and cleanups</td>
<td>California Environmental Protection Agency (Cal EPA)</td>
</tr>
<tr>
<td>State/Tribal SWL</td>
<td>Solid Waste Information System</td>
<td>California Integrated Waste Management Board / State Water Resources Control Board (SWRCB) / County</td>
</tr>
<tr>
<td>State/Tribal LUST</td>
<td>Leaking Underground Storage Tank Listing</td>
<td>CA SWRCB / County</td>
</tr>
<tr>
<td>State/Tribal UST/AST</td>
<td>Underground and Aboveground Storage Tank Listing</td>
<td>CA SWRCB / County /City</td>
</tr>
<tr>
<td>State/Tribal IC</td>
<td>Deed Restricted Sites Listing</td>
<td>Cal EPA / Department of Toxic Substances Control (DTSC)</td>
</tr>
<tr>
<td>State/Tribal VCP</td>
<td>Voluntary Cleanup Program Sites</td>
<td>Cal EPA / DTSC</td>
</tr>
<tr>
<td>State/Tribal Brownfields</td>
<td>See Mitigation and Brownfields Reuse Program Database</td>
<td>DTSC</td>
</tr>
<tr>
<td>State Permits</td>
<td>Tracks establishments and the status of their permits in relation to compliance with federal, State and local regulations.</td>
<td>CA EPA / County</td>
</tr>
<tr>
<td>State Other</td>
<td>Database of sites that are known to be contaminated as well as sites with uncharacterized properties where further studies may reveal problems</td>
<td>Cal EPA / DTSC</td>
</tr>
<tr>
<td>Floodplains</td>
<td>100 year and 500 year floodplain boundaries</td>
<td>Federal Emergency Management Agency</td>
</tr>
<tr>
<td>Oil &amp; Gas Wells</td>
<td>Completions, pluggings, and permits</td>
<td>California Department of Conservation</td>
</tr>
</tbody>
</table>

Source: TrackInfo Services, LLC (Environmental FirstSearch Report) 2010.

\[\text{2} \text{ The ASTM radii for specific governmental databases vary and are identified in the TIS reports.}\]
Regulatory Framework

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

Summary of Inventory Results

For inventory purposes and impact analysis, the TIS search information was reviewed for sites within one quarter mile of the Proposed Action and Alternatives. A one quarter-mile distance was used as only large contaminant spills would typically migrate that distance, potentially impacting the Proposed Action and Alternatives areas. Overall, the TIS reports concluded that there are no known significant hazardous materials concerns within 0.25 mile of the Proposed Action or Alternative routes. Sites identified in the TIS preliminary record search include solid waste landfill (SWL), State sites, Resource Conservation and Recovery Act (RCRA) generators, underground storage tank (UST), and leaking underground storage tank (LUST) sites associated with local businesses (e.g., auto repair shops, markets). No National Priority List or Superfund sites were identified within proximity to the Proposed Action or Alternatives.

Land uses can serve as good indicators of potential unknown contamination. The sections that follow describe existing land uses that would be crossed by or within the vicinity of the Proposed Action and Alternatives. The TIS Report regulatory database search results are also summarized by Alternative below.

Project Components Common to All Action Alternatives

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

New 230 kV Circuit

Excavation activities would not be required for stringing of the new 230 kV circuit; therefore, preexisting soil and/or groundwater contaminants would not be exposed and mobilized by construction of this Project component.

Reconductoring of the BR-RIN Transmission Line

Between the Barren Ridge and Haskell Canyon Switching Stations, land uses and known hazardous materials sites within 0.25 mile of the BR-RIN route are the same as the Alternative 2 230 kV transmission line route (see Table 3.2.7-2). Where the ROW would traverse the cities of Santa Clarita and Los Angeles, a number of industrial and commercial land uses that would be located adjacent to the ROW are likely to use and/or store materials which would be considered hazardous; however, the likelihood of encountering and mobilizing these substances would be low since no Proposed Action or Alternatives excavation (i.e., tower replacement) would occur on lands south of Haskell Canyon.

New Haskell Canyon Switching Station Area

No known hazardous materials sites were identified within 0.25 mile of this Project component (TIS FirstSearch Reports 2010).
Barren Ridge Switching Station Expansion Area

The expansion area is currently vacant and no known hazardous materials sites were identified within 0.25 mile of this Project component (TIS FirstSearch Reports 2010).

**New 230 kV Double-Circuit Transmission Line**

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

Alternative 1

No known hazardous materials sites that pose a potential contamination threat were identified within 0.25 mile of 230 kV transmission line in Alternative 1 (TIS FirstSearch reports 2010).

Alternative 2: LADWP’s Proposed Action and Federal Agency Preferred Alternative

As summarized below in Table 3.2.7-2, two known hazardous materials sites were identified within 0.25 mile of the proposed route, including a tire waste dumpsite operated by an auto dismantler in Kern County (Dollahite Auto Wrecking), and an underground storage tank used by the Green Valley Market for gasoline storage with no history of contamination (TIS FirstSearch Reports 2010).

**Table 3.2.7-2. Hazardous Materials Sites Identified Within 0.25 Mile of the Alternative 2 230 kV Transmission Line**

<table>
<thead>
<tr>
<th>Site Name and Address</th>
<th>Database Type(s)</th>
<th>Approximate Distance to BRRTP Component</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollahite Auto Wrecking 6770 Backus Road Mojave, CA 93501</td>
<td>SWL</td>
<td>0.22 mile SE of proposed route</td>
<td>Auto dismantler, accepting tire waste.</td>
</tr>
<tr>
<td>Green Valley Market 16166 W Spunky Canyon Road Green Valley, CA 91390</td>
<td>UST</td>
<td>0.19 mile SE of proposed route</td>
<td>UST used for gasoline storage. No spill history reported.</td>
</tr>
</tbody>
</table>

Source: TrackInfo Services, LLC (Environmental FirstSearch Report) 2010.

Alternative 2a

Outside of the ANF, known hazardous materials sites within 0.25 mile of the Alternative 2a transmission line route would be the same as Alternative 2 and include a tire waste dumpsite in Kern County (see Table 3.2.7-3). Within the ANF, no known hazardous materials sites were identified within 0.25 mile of the ROW (TIS FirstSearch Reports 2010).

**Table 3.2.7-3. Hazardous Materials Sites Identified Within 0.25 Mile of the Alternative 2a 230 kV Transmission Line**

<table>
<thead>
<tr>
<th>Site Name and Address</th>
<th>Database Type(s)</th>
<th>Approximate Distance to BRRTP Component</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollahite Auto Wrecking 6770 Backus Road Mojave, CA 93501</td>
<td>SWL</td>
<td>0.22 mile SE of Alternative 2a route</td>
<td>Auto dismantler, accepting tire waste.</td>
</tr>
</tbody>
</table>

Source: TrackInfo Services, LLC (Environmental FirstSearch Report) 2010.
Alternative 3

Table 3.2.7-4 summarizes the four known hazardous materials sites that were identified within 0.25 mile of the Alternative 3 transmission line. The closest known contamination site to the Alternative 3 transmission line ROW is the DTSC-monitored Mint Canyon Space Ordnance Systems Facility, located approximately 0.08 to 0.22 mile northwest and down-gradient of the ROW. Other known sites include a tire waste dumpsite, a former LUST clean-up site, and an underground storage tank used by the Pepper Tree Market with no known spill history.

### Table 3.2.7-4. Hazardous Materials Sites Identified Within 0.25 Mile Of The Alternative 3 230 kV Transmission Line

<table>
<thead>
<tr>
<th>Site Name and Address</th>
<th>Database Type(s)</th>
<th>Approximate Distance to BRRTP Component</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollahite Auto Wrecking 6770 Backus Road Mojave, CA 93501</td>
<td>SWL</td>
<td>0.22 mile SE of Alternative 3</td>
<td>Auto dismantler, accepting tire waste.</td>
</tr>
<tr>
<td>Airsearch MFG Co of CA / Space Ordnance Systems / Mint Canyon Facility 34854 Peterson Road Santa Clarita, CA 91350</td>
<td>RCRA GEN, UST, LUST, NFRAP, STATE</td>
<td>0.08-0.22 mile NW of Alternative 3 route</td>
<td>Final remedial action taken in 1993 consisted of the excavation of soils and sumps. Excavated materials were transported and disposed of at Class I landfill. Reactive waste excavated from the small burn pit was stabilized on-site and then transported out of state for incineration.</td>
</tr>
<tr>
<td>Pepper Tree Market 9661 W Sierra HWY South Antelope Valley, CA 91350</td>
<td>UST</td>
<td>0.20 mile SE of Alternative 3 route</td>
<td>No spill history reported.</td>
</tr>
<tr>
<td>29880 Bouquet Canyon Road N Saugus, CA 91350</td>
<td>LUST</td>
<td>0.24 mile NE of Alternative 3 route</td>
<td>Former LUST cleanup site. Remediation completed- Case Closed.</td>
</tr>
</tbody>
</table>

Source: TrackInfo Services, LLC (Environmental FirstSearch Report) 2010.

### 3.2.8 TRAFFIC & TRANSPORTATION

**Introduction**

Construction, operation and maintenance of the Proposed Action and Alternatives have the potential to impact transportation infrastructure. This section describes the transportation facilities in the study area including roads, transit facilities and airports. A Traffic Technical Study, located in Volume III, was prepared for the Proposed Action and Alternatives and contains detailed information on transportation modes, roadway traffic volumes and functionality within the affected environment.

**Overview of Methodology and Analysis Area**

A field survey was conducted to collect data on the characteristics (e.g., number of lanes, posted speed limit) of major area roadways that would be crossed by the Proposed Action and Alternatives (defined as study roadway segments points). Daily roadway segment count volumes were compiled from databases maintained by the City of Los Angeles and the County of Kern, and from volume summaries maintained by staff at the County of Los Angeles Department of Public Works. Daily roadway volumes at select roadways were compiled by conducting new daily roadway volume counts during the month of September 2008 over two
contiguous weekdays using automatic machine counters. Information on the characteristics of Forest Service Roads in the study area, including traffic service level and objective maintenance levels (the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns), was provided by the ANF.

Planned roadway projects in the study area were identified from Transportation Improvement Plans (TIPs) from the County of Kern and the County of Los Angeles as well as the California Department of Transportation’s State Transportation Improvement Plan (STIP). These projects were included in the overall impact analysis, as they have the potential to overlap with the Proposed Action and Alternatives construction period and the post-construction operations period.

Regulatory Framework
The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

Summary of Inventory Results
The Project study area includes several major regional transportation facilities (roadway, transit, rail, aviation) and Forest Service Roads. These facilities are described briefly below with more detailed information provided about the transportation infrastructure in the study area in the Traffic Technical Study report in Volume III.

Roadways
In order to construct and maintain the Proposed Action and Alternatives utility towers and overhead lines, use of a ground access road network would be necessary. Existing paved and unpaved highways and roads would be used where possible. The Project study area includes several public roads and highways that traverse Kern County and Los Angeles County. Major freeways in the study area include Interstates 5, 210 and 405, State Routes 14 and 58, and the Sierra Highway. Roads in cities and counties that function as arterials, collectors and local streets would also be important to provide access for construction and maintenance workers of the proposed Project.

The Project study area also includes several Forest Service roads that are generally restricted access/fire roads and designated OHV routes. The ANF has assigned an objective maintenance level and a traffic service level based on use and the improved state of the roads within the Forest. Table 3.2.8-1 describes the characteristics of Forest Service roads and other public roads that traverse ANF in the study area. Figure 3.2.8-1 shows the location of roads traversing and in proximity to the section of ANF where the proposed Alternatives are located.
TABLE 3.2.8-1.  ANGELES NATIONAL FOREST ROADWAYS

<table>
<thead>
<tr>
<th>Road Name</th>
<th>Forest Service Road</th>
<th>Objective Maintenance Level</th>
<th>Traffic Service Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir Summit Road</td>
<td>7N26</td>
<td>2 - High clearance vehicles</td>
<td>D - Slow flow or may be blocked</td>
</tr>
<tr>
<td>Pyramid Lake Entrance/Parking</td>
<td>7N27</td>
<td>5 - High degree of user comfort</td>
<td>A - Free flowing mixed traffic</td>
</tr>
<tr>
<td>City Highline Road</td>
<td>6N21</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>Dry Canyon Road</td>
<td>5N29</td>
<td>3 - Suitable for passenger cars</td>
<td>D - Slow flow or may be blocked</td>
</tr>
<tr>
<td>Lake Hughes Road</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Liebre Gulch-Davis Ranch Road</td>
<td>8N01</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>Old Ridge Route Road</td>
<td>8N04</td>
<td>3 - Suitable for passenger cars</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>San Francisquito Motorway</td>
<td>5N17</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>South Portal Road</td>
<td>7N02</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>Tule Divide Fire Road</td>
<td>7N01</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>Temblin Highway</td>
<td>6N32</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>Leona Divide Fire Road</td>
<td>6N04</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>Drinkwater Canyon Road</td>
<td>5N27</td>
<td>2 - High clearance vehicles</td>
<td>D - Slow flow or may be blocked</td>
</tr>
<tr>
<td>San Francisquito Canyon Road</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Tumble Inn Road</td>
<td>8N05</td>
<td>2 - High clearance vehicles</td>
<td>B - Congested during heavy traffic</td>
</tr>
<tr>
<td>Forest Inn Road</td>
<td>6N43</td>
<td>2 - High clearance vehicles</td>
<td>D - Slow flow or may be blocked</td>
</tr>
<tr>
<td>Vasquez Canyon Road</td>
<td>5N15</td>
<td>2 - High clearance vehicles</td>
<td>D - Slow flow or may be blocked</td>
</tr>
</tbody>
</table>

Source: Angeles National Forest 2009

NOTE:
* These roadways are public and are not maintained by ANF. They are listed here to document their presence within the Forest.

Objective Maintenance Level
1-2 = Four-wheel drive/Truck/Fire Vehicles
3-5 = Passenger Cars/Trucks/Fire Vehicles

As previously noted in Section 3.2.5 (Recreation), there are sixteen existing BLM routes in the study area. The routes are unpaved and provide motorized-vehicle access to recreation activities (including OHV use) and other uses, such as utility corridors, livestock operations, mineral extraction sites and private lands. According to the BLM West Mojave Route Designation Program, the routes in the study area are: MK0022, MK0025, MK0029, MK0040, MK0045, MK0048, MK0049, MK0050, MK0051, MK0052, MK0054, MK0081, MK0082, MK0105, MK0106, and MK0108. These routes are in Kern County generally north of the junction of SH-58 and the existing 230 kV line.

Transit and Rail Services

Transit service is limited to the more populous regions of the Project study area. Bus services are provided by Los Angeles County Metropolitan Transportation Authority (Metro) and the City of Santa Clarita Transit. Metrolink is a regional transit system that provides commuter and passenger rail service within the Southern California region. Metrolink’s Antelope Valley Line operates between the city of Lancaster and Downtown Los Angeles with stops in the city of Santa Clarita and the unincorporated communities of Newhall and Sylmar. The line operates at various frequencies throughout the day, with the most service being provided during peak commuting periods (Metrolink 2009).

Union Pacific Railroad (UPRR) operates railroad tracks adjacent to Sierra Highway and then veers left just south of Oak Creek Road in unincorporated community of Mojave. The UPRR line carries freight to and from Southern California.
Bicycle Facilities
Designated bicycle facilities are located within the city of Santa Clarita. These include Class I (off-street) paths along Golden Valley Road and Soledad Canyon Road, and Class II (on-street) bike lanes along Bouquet Canyon Road, Copper Hill Drive, and Haskell Canyon Road.

Airport Facilities
Twenty FAA-registered air facilities within 20,000 feet of the Proposed Action and Alternatives were identified. These include both private and open-to-public facilities. Edwards Air Force Base, a major testing and evaluation center for the Department of Defense, is located to the northwest of the proposed Alternatives and spans sections of Kern and Los Angeles Counties.
FIGURE 3.2.8-1. ANGELES NATIONAL FOREST ROADWAYS
3.2.9 VISUAL RESOURCES

Introduction

Visual resources were inventoried and are described in this section for the Proposed Action and Alternatives. The visual resources inventory describes the regional setting and landscape character, the aesthetic value of the natural and developed landscape, the public value of viewing the natural landscape, the visibility of the landscape from sensitive viewpoints (e.g., residences, recreation and preservation areas, trails, and sensitive roadways), and the agency management objectives.

The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Visual Resources Technical Report, contained in Volume III of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Visual Resources Technical Report, please refer to that report for more detailed information on Proposed Action and Alternatives effects on visual resources and the methods used to determine those effects.

Overview

Visual resources were inventoried within the study corridor centered along the route of the new 230 kV double circuit transmission line for each action Alternative. A six-mile wide study corridor (three miles on each side of the centerline of each route) was studied for visual resources. Within the Angeles National Forest (ANF), the visual resources study corridor was expanded to a 10-mile wide study corridor (five miles on each side of the centerline for each route) to account for viewer sensitivity analysis and visibility analysis.

The study has been conducted in compliance with the USFS Scenery Management System (SMS) (USFS 1995) and the BLM Visual Resource Management (VRM) Inventory and Contrast Rating System (BLM 1986a and b). The methodology used for the visual resource analysis utilizes the components of the SMS that the ANF has cataloged to develop their Scenic Integrity Objectives (SIOs), and also uses an alternative methodology consistent with the BLM VRM on other public and private lands in order to compare end-to-end routes. The SMS inventory components of scenic attractiveness, sensitive viewpoints (Travelways and Use Areas and Concern Levels), seen areas, and distance zones have been inventoried for all lands within the study area. The visual effects of the Project on the ANF only considers compliance with the established SIOs. The inventory elements of the SMS are used in an analysis process to identify visual impact levels in 0.1 mile increments for all Alternatives.

Because transmission projects are linear in nature, they typically cross multiple jurisdictions and land uses, and that is the case with the BRRTP. There are no formal guidelines for managing visual resources for private, State or county-owned lands found within the study area. Therefore, the methodology used in this study for these lands integrates the BLM VRM system on private lands, but is modified to better address culturally dominated landscapes outside of public lands administered by the USFS or BLM.
The visual resources inventory consisted of the following steps:

- A review of the regional physiography, landscape setting, landscape character, and an inventory of existing regional landform, vegetation and water features
- Mapping of BLM Scenic Quality and VRM classes, high sensitivity viewpoints, and visibility and distance zones
- Mapping of ANF SIOs, Places, and viewpoints of high concern, and visibility and distance zones
- Scenic attractiveness classifications were developed for private lands and other lands not managed by BLM or ANF

Visual resource data was obtained from a regional study conducted by POWER in 2007. Additionally, visual resource data was collected from agency publications, agency websites, GIS data sets, aerial photography, field reconnaissance and agency contacts. This data included ANF information relative to SMS components, such as Places mapping, SIO mapping, viewpoints of high concern, seen areas and scenic attractiveness mapping. The data collected from the BLM Ridgecrest Field Office included VRM Classes, BLM-identified sensitive viewpoints, and other potentially sensitive viewpoint locations. Additional visual resource support was received from the agencies through conversations, meetings, and other correspondence.

Existing scenic attractiveness mapping for the Proposed Action and Alternatives was obtained from the USFS and used in the scenic attractiveness inventory, although scenic attractiveness impacts were not assessed because the effect on scenic attractiveness is captured with the SIO compatibility analysis. Scenic quality class mapping was not available from the BLM Ridgecrest Field Office, but was developed using VRM scenic quality criteria and rating. Scenic attractiveness was also developed for private lands and other lands not managed by the BLM or USFS by rating homogeneous landscape rating units using similar criteria to the BLM’s VRM.

Sensitive viewpoints or Key Observation Points were identified through an analysis of viewer sensitivity and consultation with agency resource managers, land use mapping, and field investigation. Concern levels for viewpoints on the ANF were identified by the ANF. Visibility from sensitive viewpoints was mapped using GIS and digital terrain data from the United States Geological Service (USGS) and the sensitive viewpoints mapped for this analysis. Visibility of the Proposed Action and action Alternatives from viewpoints of high concern and other sensitive viewpoints is referred to as Seen Areas in the USFS SMS and as mapping distance zones in the BLM VRM methodology.
Figure 3.2.9-1. Angeles National Forest Scenic Integrity Objectives
ANF Scenic Integrity Objectives

The ANF SIOs are formed by combining scenic attractiveness mapping with the visibility and distance from viewpoints of high concern. Although not adopted for all National Forest System lands nationwide, visual resources on ANF lands are managed under the SMS. The SMS establishes a framework for managing the aesthetics of National Forest System landscapes. SIOs are established on ANF lands, and are described in the Visual Resources Technical Report Appendix A.

Scenic Integrity Objectives are designated and mapped for the ANF. These objectives define the goals for managing the aesthetics of the ANF, define acceptable degrees of landscape change, and form the basis for assessing visual impacts on the ANF. The Project’s resulting Scenic Integrity was estimated to determine conformance with the ANF Land Management Plan and level of SIO compliance (or “underachievement”).

BLM Visual Resource Management

Visual resources on BLM lands are managed under the VRM system. The BLM has four VRM Classes to manage visual resources on public lands. As with the USFS SMS system, the BLM utilizes the VRM system to establish standards on managed lands that allow for various levels of change as typically detailed in the agency Resource Management Plans or Management Framework Plans.

BLM VRM Classes are designated for most of the public lands managed by the BLM in the study corridors. These objectives define the acceptable degree of visual change allowed in the natural landscape. The BLM derive visual resource management (VRM) classes for their lands by combining scenic quality, visual sensitivity, and visibility and distance zones from sensitive viewpoints. For a description of VRM class designations refer to the Visual Resources Technical Report Appendix A.

Regional Setting and Landscape Character

The scenic value analysis of the landscape began by examining the physiography and cultural modifications of the region. Physiography, also referred to as geomorphology, is the classification of major landforms according to their geologic structures and histories into three tiers: divisions, provinces and sections. Patterns of cultural modification (i.e., land uses) were identified and categorized from field observation and aerial photography. The regional setting of the study area was analyzed to classify, describe, and illustrate the regional landform, vegetation and water features, and to break the landscape outside of the ANF into units for evaluation of scenic attractiveness.

Dominant landforms, topography, and vegetation cover were identified and categorized from field observation, topographic maps, and aerial photography, and compared to physiographic regions detailed by Physiography of the Western United States (Fenneman 1931) and ecological subsections in Ecological Subregions of California (USFS Pacific Southwest Region n.d.).

General landform feature types (e.g., mountains, canyons), referred to as landform types, were identified and categorized for areas crossed by the Alternative routes. Each landform type was
further divided into smaller units of similar physiographic, visual, and cultural characteristics. These homogeneous landscape units, or scenic attractiveness rating units, were evaluated for scenic attractiveness using BLM criteria. This was done for all lands not inventoried for visual resources, including the private lands and some of the public lands managed by the BLM. The ANF provided all visual inventory data and mapping.

The ANF Land Management Plan divides the forest into a series of geographical units called “Places” (see Section 3.2.3, Land Use), which each have their own landscape character. The ANF defines “landscape character” as an overall visual and cultural impression of landscape attributes, the physical appearance and cultural context of a landscape that gives it an identity and “sense of place.” Each of these Places has a theme, which refers to images of the landscape that can be defined with a brief set of physical, visual or cultural attributes that encapsulate the sense of place; a setting, which provides a description of the landscape character of the place; a desired condition, which describes what the Place could be as the national forest implements activities to move toward the overall forest-wide desired conditions; and a Program Emphasis, which identifies priority activities the national forest would emphasize in the next three to five years.

**Scenic Attractiveness**

USFS SMS and BLM VRM use slightly different procedures to establish scenic quality or scenic attractiveness levels. The SMS used on the ANF describes scenic attractiveness in terms of landform, vegetation, and water to determine scenic attractiveness classes, while the BLM uses a numerical rating system to determine scenic quality classes and ratings. Both systems classify the landscape into three levels of scenic attractiveness/scenic quality: Class A, Class B, and Class C. Appendix A of the Visual Resources Technical Report documents the definitions of the USFS SMS’s scenic attractiveness with the BLM’s scenic quality classes.

Landform, water, color, influence of adjacent scenery, scarcity of features, and cultural modifications are key elements used in the BLM system for rating scenic quality, and were observed and documented based on the criteria outlined Appendix A of the Visual Resources Technical Report. Vegetation cover, exposed soil color, and any atypical features, such as an abundance of rock outcroppings or unique water features, were also observed and noted. These features were evaluated in terms of contributing to or minimizing the scenic attractiveness of the landscape. The sum of the numeric values for these elements determines the scenic attractiveness class.

With the exception of developed landscapes, the evaluation of scenic attractiveness performed for private land for the BRRTP visual resource study utilizes an approach consistent with agency visual resource inventory procedures. Because agricultural, urban, and developed lands are not addressed by the USFS or BLM systems, these areas were evaluated using scenic attractiveness criteria developed for the Proposed Action and Alternatives. The visual quality criteria are most similar to the BLM criteria, but modified to address culturally dominated landscapes (e.g., communities, agricultural lands, development). The visual quality system was only applied to private lands and lands not managed by the BLM or the ANF. Further details on this methodology and the VRM system can be found in the Visual Resources Technical Report Appendix A.
There are three classes of scenic attractiveness that resulted from field rating landscape areas for
diversity and intactness. These classes are the following:

Class A – Distinctive: Areas where characteristic features of landform, rock, water and
vegetation are distinctive or unique in the context of the surrounding areas. These features
exhibit considerable variety in form, line, color and texture and have strong positive
attributes of unity and intactness.

Class B – Above Average: Areas in which features provide variety in form, line, color and
texture. Although the combinations are not rare in the surrounding region, they provide
sufficient visual diversity to be considered moderately distinctive. These features exhibit
more common variety in form, line, color and texture and have positive, but more common,
attributes of unity and intactness.

Class C – Common: Areas where characteristic features have moderate to little variety in
form, line, color and texture in relation to the surrounding region.

After rating the private lands and other lands not previously inventoried, the following
summarizes scenic quality / scenic attractiveness for the Project corridors:

Class A scenery is located in the Sierra Pelona Mountains; Castaic Lake, Elizabeth Lake, and
Bouquet Reservoir; at Elizabeth Lake Canyon, San Francisquito Canyon, and Bouquet
Canyon; and at Vasquez Rocks.

Class B scenery is the dominant classification within the ANF. The majority of the Sierra
Pelona Mountains within the visual resources study corridor is composed of Class B scenery.
Class B scenery also included Portal Ridge, the Antelope Valley California Poppy Reserve
area, portions of the Santa Susana Mountains, and the Placerita Canyon area.

Class C scenery is the dominant classification within the study corridor, with the exception of
ANF lands. Included are developed areas, valleys, foothills, and indistinct mountainous
areas. These landscapes lack unique or distinctive features and are common within the
context of the physiographic region (as previously described).

Refer to the Visual Resources Technical Report Appendix F for scenic attractiveness / scenic
quality mapping for the Alternative route corridors.

Sensitive Viewers

Specific criteria were used to identify potentially sensitive viewpoints that could be impacted by
the Proposed Action and Alternatives. Sensitive viewpoints, referred to viewpoints of high
concern in the SMS and as Key Observation Points in the BLM VRM methodology, were
identified through consultation with agency contacts, agency websites, land use data, and field
investigation.

Viewpoints on private lands and public lands managed by the BLM include:
• Residences.
• Parks, recreation, and preservation areas – existing and proposed developed recreation sites, parks, or areas used for camping, picnicking or other recreational activities.
• Sensitive Travel routes – Proposed or designated scenic or historic highways or byways and recreation destination routes.
• Sites listed on the National Register of Historic Places.

For viewpoints on the ANF, visual sensitivity was evaluated and rated as high, moderate, or low, following BLM criteria. The viewpoints of high concern were obtained from the ANF, and are listed below:

• Scenic Highways including I-15, Ridge Route Road, Lake Hughes Road, Elizabeth Lake Road, San Francisquito Canyon Road, Bouquet Canyon Road, Spunky Canyon Road
• Pacific Crest National Scenic Trail
• Wild and Scenic River Study Areas including Piru Creek Wild River segment and Piru Creek Recreation River segment; the San Francisquito Creek Recreation River is considered a Moderate Concern
• Placerita Canyon State Park/Nature Center Trails that extend into the ANF
• Sespe Wilderness
• Non-OHV Forest Service Trailheads identified in the ANF Atlas, including San Francisquito Canyon Trailhead and a Pacific Crest National Scenic Trail Trailhead
• Forest Service Points of Interest and Vista Locations identified in the ANF Atlas, including two unnamed Points of Interest located at Warm Springs Canyon and Soledad Canyon, and Templin Vista Point
• Forest Service Campgrounds identified in the ANF Atlas, including Bear Campground, Blue Point Campground (Los Padres National Forest [LPNF]), Cottonwood Campground, Green Valley Camp Site, Hardluck Camp Ground (LPNF), Los Alamos Campground, Oak Flat Campground, Spunky Campground, Streamside Campground, Upper Shake Campground, Zuni Campground, Los Alamos Group Campground, Ellis Apiary Camp Site (LPNF), Horse Trail Camp Site, Log Cabin Camp Site (LPNF), and Maxwell Camp Site
• Forest Service Picnic Areas identified in the ANF Atlas, including Elizabeth Lake Picnic Area, Emigrant Landing Picnic Area, Los Cantiles Picnic Area, Live Oak Picnic Area (LPNF), Serrano Picnic Area, Tin Cup Picnic Area, Vaquero Picnic Area, Vista del Lago Picnic Area, and Yellow Bar Picnic Area
• Forest Service Occupied Facilities, including Green Valley Facility, Los Alamos Fire Station, Oak Flat Fire Station, San Francisquito Fire Station, Texas Canyon Fire Station, and Santa Clara/Mojave Rivers Ranger District Office
• Pyramid Lake Visitor’s Center
Additional information about viewpoints is listed in the Visual Resources Technical Report Appendix A, Table 8. Potential visual impacts to National Historic Landmarks, National Register historic districts and sites, and sites nominated to or designated by the State Historic Preservation Office (SHPO) are addressed in the Cultural Resources Technical Report and summarized in Section 3.2.10 of this Chapter.

**Visual Sensitivity**

Visual sensitivity is defined for this project analysis as a measure of viewer concern for the scenic resource and potential changes to the resource. The USFS SMS refers to this measurement as “concern levels” and defines it as a measure of the degree of public importance placed on landscapes viewed from travelways and use areas (USFS 1995). Viewpoints of high concern on the ANF were determined by the ANF landscape architect. Concern levels are a measure of degree of public importance placed on landscapes viewed from travelways and use areas. Concern levels are divided into three levels: 1 (high), 2 (moderate), and 3 (low). Concern levels are a component of Landscape Visibility as defined by the SMS. Landscape visibility is a function of many interconnected considerations, but consist of three main elements:

1) Travelways and Use Areas,
2) Concern Levels, and
3) Distance Zones.

The criteria used for the analysis for private lands and public lands managed by the BLM were user type/attitude, duration of view, and use volume:

**User type/attitude** considers the local, regional or national significance or importance of a viewpoint or viewed area. As an example, national park or wilderness area viewpoints are typically considered more sensitive than interstate highway viewpoints.

**Duration of view** is defined as the length of time that a sensitive viewer would typically encounter a particular view. For example, a view from a residence is considered to be a high duration view because the landscape could be viewed at any time of day and for any length of time. Alternatively, the amount of time a commuter would see an area of landscape from a highway as they drive through the area would be very short, and thus would be considered a short duration view.

**Use volume** considers the number of users. As an example, a busy arterial road would have a higher volume of users than a small local street.

The combination of user type / attitude, use volume, and duration of view produced an overall sensitivity level of high, moderate, or low that was subsequently used in the visual analysis and initial impact level determination. See Table A-8 in Appendix A of the Visual Resources Technical Report for a complete list of viewpoints and sensitivity levels, including those levels.
already established by the ANF. In this study, potential visual impacts were assessed for high sensitivity viewpoints for private lands and public lands managed by the BLM, and compliance was determined for the established SIOs from viewpoints of high concern on the ANF.

Residences make up the majority of the high sensitivity viewpoints in the study corridors. Residences are concentrated in the communities within the study area, including the cities of Los Angeles, California City, San Fernando, Santa Clarita, Palmdale, and Lancaster, and the unincorporated communities of Mojave, Agua Dulce, Antelope Acres, Castaic, Green Valley, Elizabeth Lake, and Quartz Hill. Additional residences are dispersed throughout the corridors.

High sensitivity recreation viewpoints or recreation and preservation viewpoints of high concern (ANF) in the study corridors include the Antelope Valley California Poppy Reserve; Mountains, Recreation and Conservation Authority (MRCA) areas, including Ritter Ranch, Whitney Canyon Park and Santa Clarita Woodlands Park; the Pacific Crest National Scenic Trail; the Sespe Wilderness; Placerita Canyon State Park/Nature Center; non-OHV forest service trailheads; and ANF points of interest/vista locations, campgrounds, and picnic areas. Cultural viewpoints that were included in the analysis as high sensitivity viewpoints included the St. Francis dam site, Old Ridge Road, and the Vasquez Rocks Natural Area and Nature Center. Veluzat (Melody) Motion Picture Ranch was also included as a high sensitivity viewpoint because its use as a filming location is based on a natural-appearing environment.

Highly sensitive travel routes (or travelways of high concern on the ANF) included State-identified eligible scenic highways, Los Angeles County-identified First Priority Scenic Highways (not adopted), Los Angeles County-identified Second Priority Scenic Highways (not adopted), City of Palmdale General Plan-identified “Antelope Valley Scenic Highways,” City of Los Angeles General Plan-identified Scenic Highways, Old Ridge Road (National Register Site), and other roadways identified by ANF personnel as viewpoints of high concern.

Visibility and Distance Zones

Visibility from sensitive viewpoints was generated by POWER’s GIS analysts using digital terrain data from the USGS and the sensitive viewpoints mapped for this study. Viewsheds from high concern viewpoints were obtained from the ANF to determine Project visibility and resulting SI. Visibility is referred to as Seen Areas in the USFS SMS and as mapping Distance Zones in the BLM VRM methodology.

Landscape visibility was mapped from the centerline of each Alternative corridor using a 195-foot uniform height. The 195-foot height represents the maximum tower height that may be used, and the resulting visible area is somewhat exaggerated from the visibility conditions that would result from construction of the Proposed Action or Alternatives, but is done in an effort to capture the worst-case scenario. Typical tower height for the Project is expected to be approximately 140 feet.

Distance zones for both the VRM and SMS establish visual perception thresholds of detail in the landscape. The perception of form, line, color, texture, and other visual elements in the landscape changes with increasing distance from a viewpoint. Landscape elements tend to
become less obvious and detailed. Elements of form and line become more dominant than color or texture at longer viewing distances.

For this Project, a review of previous studies and environmental review documents for transmission projects in similar geographical, topographical, and environmental settings was performed, and relevant visibility thresholds were established. Distance zones identified for the Proposed Action and Alternatives for private lands and public lands managed by the BLM are as follows:

- **Immediate Foreground**: 0 feet to 500 feet
- **Foreground**: 500 feet to 0.5 mile
- **Middleground**: 0.5 mile to 3 miles
- **Background**: Beyond 3 miles

The distance zones used for the visual analysis of the alternatives on the ANF were slightly different:

- **Immediate Foreground**: 0 feet to 300 feet
- **Foreground**: 300 feet to 0.5 mile
- **Middleground**: 0.5 mile to 4 miles
- **Background**: Beyond 4 miles
- **Seldom-Seen Areas**: Not seen from travelways or use areas

Immediate foreground, foreground, and middleground visibility was mapped for all identified sensitive viewpoints (on private and BLM lands) located within the six-mile-wide visual resources corridor. Visibility was also mapped based on data obtained from the USFS for identified sensitive viewpoints within the ANF that are located up to eight miles from the centerline of each Alternative route, where background views may occur.

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

**Summary of Inventory Results**

**Project Components Common to All Action Alternatives**

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

**New 230 kV Circuit**

The addition of the new 230 kV circuit within the ROW would include only stringing activities from the proposed Haskell Canyon Switching Station to the existing Castaic Power Plant. High or moderate SIOs are established for all ANF-managed lands crossed.
The majority of the areas that would be crossed are composed of Class B scenery. Class A scenery would be crossed in the Castaic Lake area.

One residence would have immediate foreground views of the Alternative.

San Francisquito Canyon Road, identified by the ANF as sensitive, would be crossed. Ridge Route Road, a First Priority County Scenic Highway, would be located in the foreground distance zone. Lake Hughes Road, a Second Priority County Scenic Highway, would be located in the foreground distance zone. I-5, a Second Priority County Scenic Highway, would be located within the middleground distance zone.

Reconductoring of BR-RIN Transmission Line

The existing transmission conductor would be removed and a new conductor would be installed. Some of the transmission line structures would need to be modified or replaced, and/or foundations reinforced, to carry the additional weight of the new heavier conductor. High SIOs are established for all ANF-managed lands crossed.

The majority of the areas crossed are composed of Class C scenery. Class A scenery would be crossed just southeast of the Pacific Crest National Scenic Trail crossing. All other areas from the California Aqueduct south to the proposed Haskell Canyon Switching Station site, with the exception of an area of private land around the Johnson Road crossing, are composed of Class B scenery.

A total of 870 residences would have immediate foreground views of the reconductoring.

The Pacific Crest National Scenic Trail would be crossed in a mountainous, natural area near San Francisquito Canyon Road. The trail would have immediate foreground, foreground and middleground views of the reconductoring. The San Francisquito Creek (Wild and Scenic River) would have immediate foreground, foreground, and middleground views of the Alternative. Trails within the MRCA Whitney Canyon Park would be crossed by the Alternative. The ANF Green Valley Camp Site would also be located within the immediate foreground distance zone. Veluzat Motion Picture Ranch would be located in the foreground distance zone. The Antelope Valley California Poppy Reserve and the ANF Elizabeth Lake Picnic Area would be located within the corridor in the middleground distance zone. Trails within the Placerita Canyon State Park would be located in the middleground distance zone. Trails within the MRCA Santa Clarita Woodlands Park would be located in the middleground distance zone.

Elizabeth Lake Road, a First Priority County Scenic Highway and a Palmdale Scenic Highway; and San Francisquito Canyon Road, identified by the ANF as a sensitive road, would be crossed and would have immediate foreground, foreground, and middleground views. I-210, a City of Los Angeles Scenic Road, would also be crossed. Fairmont-Neenach Road and Johnson Road, both Second Priority County Scenic Highways, would also be crossed and would have immediate foreground, foreground, and middleground views. Lancaster Road, Munz Ranch Road, and 120th Street West, all Second Priority County Scenic Highways, would be located within the foreground distance zone. State Hwy 14, an Eligible State Scenic Highway; West Avenue I; 110th Street West; and West Avenue K, all Second Priority County Scenic Highways,
would be located within the middleground distance zone. Lake Hughes Road, a Second Priority County Scenic Highway, would be located within the middleground distance zone and also within the background distance zone on ANF lands. Rinaldi Street, a City of Los Angeles Scenic Road, would be located in the foreground distance zone. South Brand Boulevard and Sepulveda Boulevard, both City of Los Angeles Scenic Roads, would be located in the middleground distance zone.

New Haskell Canyon Switching Station

The proposed new Haskell Canyon Switching Station would be located in an area of Class B Scenery. Residences located southwest of the switching station site would have middleground views. The Veluzat Motion Picture Ranch would also have middleground views.

Expansion of Barren Ridge Switching Station

The expansion area of the Barren Ridge Switching Station would be located in an area of Class C Scenery. State Highway 14, an Eligible State Scenic Highway, would be located in the foreground distance zone.

New 230 kV Double-Circuit Transmission Line

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below. The inventory results for the new transmission line for each action Alternative are summarized in Table 3.2.9-1 and the text below.

<table>
<thead>
<tr>
<th>TABLE 3.2.9-1. VISUAL RESOURCES INVENTORY SUMMARY</th>
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<td>Alternative 1 Transmission Line</td>
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<tr>
<td>Total Length of Transmission Line</td>
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<td>Number of Residences within Immediate Foreground (500 feet)</td>
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<td>ANF SIO (Miles Crossed)</td>
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<td>Miles of Visibility</td>
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Alternative 1

The new 230 kV double-circuit transmission line in Alternative 1 is the longest transmission line of the action Alternatives (83.1 miles). This transmission line would cross 18.3 miles of ANF High and Moderate SIO areas, would cross a total of 10.8 miles of Class A and Class B landscapes, and would have the greatest distances of immediate foreground and foreground visibility for sensitive recreation, preservation, and transportation viewpoints (non-ANF lands). The Alternative 1 transmission line would be within 500 feet of 29 residences (i.e., immediate foreground of residences for 5.6 miles). Refer to Table 3.2.9-1 for a summary of the visual resource inventory for new transmission line component for each action Alternative.

SIO Classes

High or moderate SIOs are established for all ANF-managed lands crossed by the Alternative 1 transmission line. It would cross the greatest distance of High and Moderate SIOs among the Alternatives (16.3 miles of High SIO).

VRM Classes

No VRM classes are established on the public lands managed by the BLM (4.9 miles).

Regional Setting and Landscape Character

From north to south, the Alternative 1 transmission line would pass through the Sierra Nevada Section of the Cascade-Sierra Mountains Province, the Great Basin Section of the Basin and Range Province, and the Los Angeles Ranges Section of the Pacific Border Province.
Within the ANF, the transmission line would pass through the I-5 Corridor Place and the Santa Clara Canyons Place. The I-5 Corridor Place setting is a designated utility corridor for electricity, fiber optics, natural gas, and crude oil. The Desired Condition of the I-5 Corridor Place is to maintain the landscape as natural appearing and one that functions as a scenic transportation gateway for visitors to Southern California and a corridor for utilities and water. The valued landscape attributes to be preserved over time are dramatic natural appearing canyon and rugged mountain views from the interstate, the presence of coast live oaks along shaded slopes and canyons, and a well-defined age class mosaic in chaparral.

Cultural modifications found throughout the study corridor for the Alternative 1 transmission line include the cities of California City, and Santa Clarita; the unincorporated communities of Mojave, Holiday Valley Estates and Castaic; dispersed rural residences and agricultural uses; and numerous highways and other roads.

**Scenic Attractiveness**

On private and BLM lands, the majority of the areas that would be crossed by the Alternative 1 transmission line are composed of Class C scenery, although it would cross the greatest distance of Class A and Class B scenery among the Alternatives. The Class A scenery that would be crossed by the Alternative 1 transmission line occurs in the Castaic Lake area. All other areas from Lancaster Road south to the proposed Haskell Canyon Switching Station site, with the exception of an area of private land outside the ANF in the San Francisquito Canyon Road Area, are composed of Class B scenery.

**Sensitive Viewpoints and Visibility**

**Residences**

A total of 29 residences would have immediate foreground views of the Alternative 1 transmission line. It would have a total of 22.2 miles within foreground views of residences.

**Recreation and Preservation Viewpoints**

The Alternative 1 transmission line would be the most visible transmission line among the Alternatives in all distance zones for recreation and preservation viewpoints. The total distance of immediate foreground visibility would be 6.8 miles, substantially more than for the transmission lines of the other Alternatives.

The new transmission line for all action Alternatives would cross the Pacific Crest National Scenic Trail. The Alternative 1 transmission line would cross it in a residential area near roadways, and would parallel and remain in close vicinity to the trail for several miles. The trail would have immediate foreground, foreground and middleground views of the Alternative. On the ANF, the Serrano, Vaquero, and Emigrant Landing picnic areas, Oak Flat Camp Ground, Templin Vista, Sespe Wilderness Area, and Creek Recreation River would all be located within the middleground distance zone. Although still being covered in the analysis, a sensitive viewpoint for San Francisquito Creek, eligible as a Wild and Scenic River, was not established by the ANF because the Outstandingly Remarkable Values are neither for Scenery nor Recreation, and public access to the Creek is very limited.
Transportation Viewpoints
The Alternative 1 transmission line would have the greatest distance of immediate foreground and foreground visibility (13.2 miles), and would be substantially more visible than the new transmission line of the other Alternatives.

The Ridge Route Road, a First Priority County Scenic Highway, would be crossed multiple times by the Alternative 1 transmission line. San Francisquito Canyon Road, identified by the ANF as a viewpoint of high concern, would also be crossed by the Alternative 1 transmission line. Lancaster Road, a Second Priority County Scenic Highway, would be in the immediate foreground distance zone. Lake Hughes Road, a Second Priority County Scenic Highway, would be located in the foreground distance zone. State Hwy 14, an Eligible State Scenic Highway; Pine Canyon Road, a First Priority County Scenic Highway; and I-5 and Three Points Road, both Second Priority County Scenic Highways, would all be located within the middleground distance zone.

Alternative 2
The Alternative 2 transmission line, would be the shortest (60.7 miles) transmission line of the four action Alternatives. The greatest number of residences within the immediate foreground distance zone would occur along this Alternative. Refer to Table 3.2.9-1 for a summary of the visual resource inventory for new transmission line component for each action Alternative.

SIO Classes
High SIOs are established for all ANF-managed lands crossed by the Alternative 2 transmission line (14.8 miles). The Alternative 2 transmission line would cross a shorter distance of High SIOs than the Alternative 1 transmission line but a substantially greater distance than the Alternative 3 transmission line.

VRM Classes
No VRM classes are established on the public lands managed by the BLM (4.9 miles).

Regional Setting and Landscape Character
From north to south, the Alternative 2 transmission line would pass through the Sierra Nevada Section of the Cascade-Sierra Mountains Province, the Sonoran Desert Section of the Basin and Range Province, and the Los Angeles Ranges Section of the Pacific Border Province.

Within the ANF, the Alternative 2 transmission line would pass through the Liebre-Sawmill Place and the Santa Clara Canyons Place. The Liebre-Sawmill Place setting rises up from the Mojave Desert at elevations from approximately 3,500 feet up to 5,500 feet, reflecting a transition from the desert floor to the forest. This area is generally accessed from major entries along California State Highway 138 and County Road N2. The paths through this landscape lead visitors to dramatic desert panoramas and rugged fault-zone background views. The Desired Condition focuses on its value as a desert-interface landscape, and it is identified as a “key place” for the attractiveness of its landscape and is maintained as a natural appearing landscape that functions as year-round open space for Los Angeles and Antelope Valley residents. The valued landscape attributes to be preserved over time are the dramatic desert panoramas and
rugged fault-zone background views, the marked transition of plant communities from desert to mixed sage, black oak, pine and juniper at higher elevations, visitor access to free-flowing water in drainages, and the undeveloped appearance of the landscape showing little visible human influence on the natural setting.

The Santa Clara Canyons Place setting rises up from the Santa Clara River Basin at elevations starting at about 1,200 feet and reaching up to 5,000 feet. This area is generally accessed from major portals along the Interstate 5, Interstate 14, and California State Highway 138 travel corridors. The paths through this landscape lead visitors to dramatic canyon panoramas and rugged mountain background views. The Desired Condition relates to the natural appearing and pastoral landscape that functions as a remote Back Country open space. The valued landscape attributes to be preserved over time are the dramatic canyon panoramas and rugged mountain background views, oak woodlands, a well-defined age class mosaic in chaparral, and the pastoral qualities of grazing activities, which is important to the interpretation to the examples of important Native American history and historic mining.

Cultural modifications (i.e., communities and other land uses) are found throughout the study corridor and include the cities of California City, and Santa Clarita; the unincorporated communities of Mojave, Antelope Acres, Elizabeth Lake, and Green Valley; dispersed rural residences, agricultural facilities and cultivated croplands; and numerous highways and other roads.

**Scenic Attractiveness**

On private and BLM lands, the majority of the areas that would be crossed by the Alternative 2 transmission line are composed of Class C scenery. The Alternative 2 transmission line would cross a shorter distance of Class A and Class B scenery than the Alternative 1 transmission line but a greater distance than the Alternative 3 transmission line. The Class A scenery that would be crossed by the transmission line in other Alternatives would occur just southeast of the Pacific Crest National Scenic Trail crossing on the ANF. All other areas from the California Aqueduct south to the proposed Haskell Canyon Switching Station site, with the exception of an area of private land around the Johnson Road crossing, would be Class B scenery.

**Sensitive Viewpoints and Visibility**

A total of 63 residences would be within 500 feet of the Alternative 2 transmission line. The majority of these residences are located in the unincorporated community of Green Valley and in an area north of Johnson Road. The Alternative 2 transmission line would have a total of 20.4 miles within foreground views of residences.

The distance of immediate foreground visibility outside of the ANF for the Alternative 2 transmission line from all high sensitivity viewpoints would be 0.4 mile, and an additional 0.5 mile of foreground visibility. The Pacific Crest National Scenic Trail on the ANF would be crossed in a mountainous, natural area near San Francisquito Canyon Road, and would have immediate foreground, foreground and middleground views of the Alternative 2 transmission line. The ANF Green Valley Camp Site would also be located within the immediate foreground distance zone. The Antelope Valley California Poppy Reserve and the ANF Elizabeth Lake Picnic Area would be located along the alignment in the middleground distance zone.
The Alternative 2 transmission line would be visible for 2.1 miles within the immediate foreground and an additional 2.8 miles within the foreground distance zone for high sensitivity transportation viewpoints off of the ANF.

Elizabeth Lake Road, a First Priority County Scenic Highway and a Palmdale Scenic Highway, and San Francisquito Canyon Road, identified by the ANF as a road of high concern, would be crossed by the Alternative 2 transmission line and would have immediate foreground, foreground, and middleground views of the transmission line. Fairmont-Neenach Road and Johnson Road, both Second Priority County Scenic Highways, would also be crossed and would have immediate foreground, foreground, and middleground views of the transmission line. Lancaster Road, Munz Ranch Road, and 120th Street West, all Second Priority County Scenic Highways, would be located within the foreground distance zone. State Hwy 14, an Eligible State Scenic Highway; West Avenue I, 110th Street West, and West Avenue K, all Second Priority County Scenic Highways, would be located within the middleground distance zone. Lake Hughes Road, a Second Priority County Scenic Highway, would be located within the middleground and background distance zones on the ANF.

Alternative 2a

The Alternative 2a transmission line would be 62.5 miles in length, and would have 32 residences within 500 feet. It would additionally have 16.3 miles within the foreground and immediate foreground distance zones from residences. Refer to Table 3.2.9-1 for a summary of the visual resource inventory for new transmission line component for each action Alternative.

SIO Classes

High SIOs are established for all ANF-managed lands crossed by the Alternative 2a transmission line. It would cross the second greatest distance of High SIOs of the Alternatives.

VRM Classes

No VRM classes are established on the public lands managed by the BLM (4.9 miles).

Regional Setting and Landscape Character

The localized Green Valley Re-route portion of the Alternative 2a transmission line would pass through a mountainous, undeveloped area of the ANF. This portion of the transmission line would pass through the Sonoran Desert Section of the Basin and Range Province and the Los Angeles Ranges Section of the Pacific Border Province. Within the ANF, the Alternative 2a transmission line would pass through the Liebre-Sawmill Place and the Santa Clara Canyons Place. The Liebre-Sawmill Place is valued as a desert-interface landscape and is identified as a “Key Place” for the attractiveness of its landscape, and is maintained as a natural appearing landscape that functions as year-round open space for Los Angeles and Antelope Valley residents. The Santa Clara Canyons Place is identified as a “Key Place” for its natural appearing and pastoral landscape that functions as a remote Back Country open space (see Key Place setting and Desired Condition description above in Alternative 2).
Cultural modifications (e.g., communities) would generally be avoided along the localized Green Valley Re-route portion of the Alternative 2a transmission line. Other cultural modifications (i.e., communities and other land uses) found throughout the study corridor include the cities of California City, and Santa Clarita; the unincorporated communities of Mojave, Antelope Acres and Elizabeth Lake; dispersed rural residences, agricultural facilities and cultivated croplands; and numerous highways and other roads.

Scenic Attractiveness

The majority of the areas that would be crossed by the Alternative 2a transmission line on private and ANF lands are Class C scenery (45.0 miles). No Class A scenery would be crossed by the Alternative 2a transmission line. It would cross 21.0 miles of Class B scenery. All areas from the California Aqueduct south to the proposed Haskell Canyon Switching Station site, with the exception of an area of private land outside around the Johnson Road crossing, are Class B scenery.

Sensitive Viewpoints and Visibility

A total of 32 residences would have immediate foreground views of the Alternative 2a transmission line and would have 3.3 miles in the immediate foreground of residences and an additional 13.0 miles within the foreground distance zone.

The distance of foreground views from high sensitivity recreation viewpoints of the Alternative 2a transmission line would be 0.5 mile, and none within the immediate foreground distance zone. The Alternative 2a transmission line would roughly parallel the general alignment of the Pacific Crest National Scenic Trail on the ANF for approximately two miles and would cross the trail in a mountainous, natural area. This Alternative would have the most immediate foreground, foreground and middleground views of the transmission line from the Trail. The ANF Green Valley Camp Site would also be located within the foreground distance zone. The Antelope Valley California Poppy Reserve and the Elizabeth Lake Picnic Area on the ANF would be located along the alignment in the middleground distance zone.

The Alternative 2a transmission line would have 2.6 miles within the immediate foreground and an additional 5.3 miles of foreground views from high sensitivity transportation viewpoints on private and BLM lands. Elizabeth Lake Road, a First Priority County Scenic Highway and a Palmdale Scenic Highway, and San Francisquito Canyon Road, identified by the ANF as a viewpoint of high concern, would be crossed by the Alternative 2a transmission line and would have immediate foreground, foreground, and middleground views of the Alternative. Fairmont-Neenach Road and Johnson Road, both Second Priority County Scenic Highways, would also be crossed and would have immediate foreground, foreground, and middleground views of the transmission line. Lancaster Road, Munz Ranch Road, and 120th Street West, all Second Priority County Scenic Highways, would be located within the foreground distance zone. State Hwy 14, an Eligible State Scenic Highway; West Avenue I; 110th Street West; and West Avenue K, all Second Priority County Scenic Highways, would be located within the middleground distance zone. Lake Hughes Road, a Second Priority County Scenic Highway, would be located within the middleground distance zone and also within the background distance zone on ANF lands.
Alternative 3

The Alternative 3 transmission line would be 75.5 miles in length and would have 23 residences within the immediate foreground distance zone, 4.8 miles of ANF High and Moderate SIO landscapes crossed, and no crossing of Class A landscapes on private or BLM lands. Refer to Table 3.2.9-1 for a summary of the visual resource inventory for new transmission line component for each action Alternative.

SIO Classes

High SIOs on the ANF are established for 3.8 miles and 1.0 miles are Moderate SIO, fewer miles than the transmission line of the other Alternatives.

VRM Classes

The Alternative 3 transmission line would be the only transmission line among the Alternative to cross BLM-managed lands with established VRM Classes (0.1 mile VRM Class III). The Alternative 3 transmission line would cross 4.9 miles of unclassified landscapes.

Regional Setting and Landscape Character

From north to south, the Alternative 3 transmission line would pass through the Sierra Nevada Section of the Cascade-Sierra Mountains Province, the Great Basin Section of the Basin and Range Province, and the Los Angeles Ranges Section of the Pacific Border Province.

Within the ANF, the transmission line would pass through the Soledad Front Country Place, which is a “Key Place” in the ANF for its natural appearing area that functions as a scenic backdrop and transitional landscape. The setting of the Soledad Front Country Place is one that runs northeast to southwest along both sides of California State Highway 14 along the Santa Clara and Soledad Rivers. This landscape is commonly defined as the area between California Interstate 5 at the southern end and the intersection of California State Highway 138 at the northern end. The northwest and southeast boundaries are, in general, defined by the area visible from California Highway 14. There is a Special Interest Area that highlights the heritage resource values of the area. The Desired Condition is tied to its natural appearance that functions as a scenic backdrop and transitional landscape. The valued landscape attributes to be preserved over time are the dramatic canyon and rugged mountain views, the presence of pine and juniper stands, and a well-defined age class mosaic with patches in chaparral. Private land between the two mountain ranges is acquired and the Pacific Crest National Scenic Trail is connected.

Cultural modifications (e.g., communities and other land uses) are found throughout the study corridor and include the cities of California City, Santa Clarita, Palmdale, and Lancaster; the unincorporated communities of Mojave, Antelope Acres, Quartz Hill, and Agua Dulce; dispersed rural residences, agricultural facilities and cultivated croplands; and numerous highways and other roads.

Scenic Attractiveness

The majority of the areas that would be crossed by the Alternative 3 transmission line are composed of Class C scenery (60.7 miles). The Alternative 3 transmission line would cross no
Class A scenery and 10.5 miles of Class B scenery on private and BLM lands. Class B scenery would be crossed west of Rancho Vista, at the Elizabeth Lake Road crossing, in the Ritter Ranch MRCA area, and in undeveloped areas from the east edge of ANF to the Bouquet Canyon area.

**Sensitive Viewpoints and Visibility**

A total of 23 residences would be within 500 feet of the Alternative 3 transmission line, and it would have the greatest distances of immediate foreground and foreground visibility of the transmission lines among the Alternatives (34.4 miles).

The Alternative 3 transmission line would have 6.3 miles within the immediate foreground and an additional 266.1 miles within foreground and middleground views of the transmission line. The Alternative 3 transmission line would cross the Pacific Crest National Scenic Trail in a residential area near the Sierra Highway. It would parallel and remain in close vicinity to the trail for approximately a half mile. The MRCA Ritter Ranch would also be crossed by the Alternative 3 transmission line and would have immediate foreground, foreground and middleground views of the transmission line. Veluzat Motion Picture Ranch would be located in the foreground distance zone. Trails within the Vasquez Rocks Natural Area and the Antelope Valley California Poppy Reserve would be located within the corridor in the middleground distance zone.

The Alternative 3 transmission line would have 1.4 miles of immediate foreground views and an additional 6.7 miles within foreground distance zone from high sensitivity transportation viewpoints on private and BLM lands. Elizabeth Lake Road, a First Priority County Highway and Palmdale Scenic Highway; Godde Hill Road, a Second Priority County and Palmdale Scenic Highway; and West Avenue K and Vasquez Canyon Road, Second Priority County Scenic Highways, would be crossed by the Alternative 3 transmission line and would have immediate foreground, foreground, and middleground views of the transmission line. The Sierra Highway, West Avenue I and 110th Street West, all Second Priority County Scenic Highways, would be located in the foreground distance zone. State Hwy 14, an Eligible State Scenic Highway, and Lancaster Road, Munz Ranch Road, Fairmont-Neenach Road, 120th Street West, West Avenue K, Johnson Road, 80th Street West and 60th Street West, all Second Priority County Scenic Highways, would be located in the middleground distance zone.

**3.2.10 CULTURAL RESOURCES**

**Introduction**

For this Final EIS/EIR, cultural resources are defined as any prehistoric or historic site, district, building, structure, or object considered to be important to a culture, subculture, or community for scientific, traditional, religious or any other reason. In this document, cultural resources are divided into two broad categories – archaeological resources (i.e., sites and isolated finds) and architectural resources (i.e., buildings and structures). Another class of cultural resource, cultural landscapes, has not been identified previously in the study area (D. Vance, personal communication 2011; D. Storm, personal communication 2011). Also, cultural resources of special importance to Native Americans, such as traditional cultural properties (TCPs) and sacred sites, have not been identified by the Angeles National Forest (ANF) or Bureau of Land Management (BLM) within the BRRTP study area or during consultation efforts conducted
specifically for BRRTP (D. Vance, personal communication 2011; D. Storm, personal communication 2011).

The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Cultural Resources Technical Report, a confidential document prepared for the Draft EIS/EIR. This report is hereby incorporated by reference in its entirety.

**Overview of Methodology and Analysis Area**

The BRRTP would extend from the Mojave Desert to the San Fernando Valley. The BRRTP analysis area for cultural resources covers areas in which cultural resources could be directly or indirectly impacted by one or more Alternatives.

The BRRTP analysis area includes land within the following areas:

- 250 feet on either side of the proposed centerline of the new 230 kV transmission circuit between the new Haskell Canyon Switching Station and the Castaic Power Plant;
- 250 feet on either side of the proposed centerline of the reconductoring of the existing BR-RIN 230 kV transmission line from the Barren Ridge Switching Station to the Rinaldi Substation;
- 250 feet from the new Haskell Substation;
- 250 feet from the expansion of the existing Barren Ridge Switching Station; and
- 250 feet on either side of the proposed centerline of the new 230 kV transmission line for each Alternative.

The locations of other Project components (e.g., new access roads, staging areas) would be expected to occur within the same analysis area although specific design has not been completed.

A Class I inventory was conducted to identify previously recorded cultural resources within the study area and their level of significance (i.e., their eligibility to be listed to the National Register of Historic Places [National Register] or California Register of Historical Resources [California Register]). Information was also compiled on which portions of the study area had been previously surveyed for cultural resources and the quality of these surveys. The survey data were used to identify locations within the study area that have been demonstrated to contain no surface evidence of cultural resources. In some cases, buried cultural resources may not be visible on the ground surface and would not be identified using standard survey methods.

Record searches to compile site and survey data for the Class I analysis were performed at:

- The South Central Coastal Information Center (SCCIC) at California State University – Fullerton (September 16 and 24, 2008; October 8, 9, and 10, 2008; May 21, 2009);
- The San Joaquin Valley Information Center (SJVIC) at California State University – Bakersfield (September 19 and 25, 2008; June 2 and 5, 2009);
- The Ridgecrest Field Office of the BLM in Ridgecrest (September 17, 2008); and
- The Angeles National Forest Supervisor’s office in Arcadia (September 18, 2008).
In addition, the National Park Service (NPS) Focus database of National Register-listed properties, the National Historic Landmarks (NHL) program of the NPS, and lists of California Historical Landmarks (CHLs) and California Points of Historical Interest maintained by the State Office of Historic Preservation (OHP) were examined. Finally, lists of cultural resources determined eligible to be listed to or listed in the California Register were obtained from the Information Centers.

Using the Class I data, a cultural resource sensitivity analysis was performed of 0.1-mile-long and 500-foot-wide units along each transmission line Alternative under consideration. The sensitivity analysis was conducted to determine if particular portions of the Project area had greater potential for containing cultural resources than others. The assessment of resource sensitivity relied on existing cultural resource data where appropriate, but environmental criteria were also used to assess the potential cultural resource sensitivity of each 0.1-mile unit, even if it had not been surveyed for cultural resources. For this analysis, isolated finds were assumed to be not eligible to be listed to the National Register or California Register. However, the ultimate treatment of isolated finds and unevaluated properties in the BRRTP area would be addressed in a Construction Phase Management Plan (CPMP) as required by a Programmatic Agreement being prepared for BRRTP by the ANF, BLM, and State Historic Preservation Officer (SHPO).

A summary of the criteria and process for assigning each 0.1-mile unit high, moderate, or low cultural resource sensitivity is presented below. The criteria were based on existing data from the SJVIC and SCCIC and recommendations by the ANF and BLM.

In determining sensitivity criteria, the following questions were used:

1. Has the 0.1-mile unit within the Alternative been surveyed intensively for cultural resources?

   Based on conversations with ANF and BLM staff, intensive surveys were defined as: 1) systematic surveys that used transect intervals of 15 meters or less; and 2) surveys performed after 1984, the year when OHP requirements for surveys changed significantly.

2. Does the 0.1-mile unit contain a cultural resource?

   Some resources were recorded during intensive surveys, some were recorded during non-intensive surveys, and some were discovered in other ways.

3. What is the cultural resource’s significance?

   Resources were separated into three categories: those that have received an official federal or State designation (e.g., listed in the National Register or California Register) (High Sensitivity); those that have been determined or recommended eligible to be listed to the National Register or California Register or that have not been evaluated for listing eligibility (Moderate Sensitivity); and those that have been determined not eligible to be listed to the National Register or California Register or that are identified as isolated finds (Low Sensitivity).
4. What is the probability of an unsurveyed 0.1-mile unit containing a cultural resource?

Areas that have been intensively surveyed are known to contain or not contain surface evidence of cultural resources. Cultural resources have also been recorded in unsurveyed areas. For most land that has not been surveyed, environmental variables were used to assess the probability of containing sites.

BLM staff (D. Storm, personal communication 2008) suggested that in the eastern Mojave Desert and Antelope Valley portions of the study area, unsurveyed lands most likely to contain cultural resources (Moderate Sensitivity) would be less than 0.25 mile from a spring or in locations where drainages enter the desert lands from adjacent hills. Areas least likely to contain sites (Low Sensitivity) would be more than 0.25 mile from springs and cultivated lands. Cultivation would have destroyed most cultural resources even if they had once existed in the area.

ANF staff (J. Walker, personal communication 2008) suggested that in the mountains, sites would most typically be found in locations less than two miles from a spring, seasonal drainage, or permanent water source that are also on slopes of less than 30 percent (Moderate Sensitivity). Also, sites would be expected on ridge tops, flats, and terraces (Moderate Sensitivity). Low sensitivity areas on the ANF would include terrain with slopes greater than 30 percent and locations more than two miles from a spring, seasonal drainage, or permanent water source.

Because of the limited amount of previous cultural resource survey along portions of some of the Alternatives, an effort was made in 2010 to survey moderate sensitivity areas within ANF boundaries along Alternatives 1, 2 and 2a. The proposed survey area included fifty-nine 0.1-mile-long, 500-foot-wide units, for a total of 358 acres, that were defined as moderately sensitive for cultural resources according to the criteria described above. However, the majority of the units selected for this Class II survey proved to be either too steep or too heavily vegetated for adequate field inspection. Only eight of the fifty-nine 0.1-mile units, a total of 48 acres, were practical to survey systematically using 15-meter intervals. No previously unrecorded cultural resources were discovered within these surveyed units.

Native American History

The study area traverses two distinctly different environments: the Mojave Desert/Antelope Valley and the Sawmill-Liebre Range, and prehistoric adaptations in the two areas differed accordingly. The periods of prehistoric occupation in the two regions are summarized in Table 3.2.10-1 and are briefly described below.

In the Mojave Desert/Antelope Valley and the Sawmill-Liebre Range, the earliest well-documented cultures—Paleoindians—are 10,000 to 13,000 years old. Native American groups of this period were nomadic hunter-gatherers living in small groups who hunted now-extinct species of large game animals and exploited other plant and animal species as well. Archaeological sites in the Mojave Desert dating to the Paleoindian Period are best recognized by the presence of Clovis projectile points. These points have been found along the former shorelines of dry Pleistocene lakes and in the Antelope Valley (Warren 1980, 1984; Warren and
In the California deserts, the number of archaeological sites increased substantially after 8000 B.C., following the Paleoindian Period. In the Mojave Desert, sites are characterized by large, stemmed or concave-based projectile points. Subsistence was still based on hunting and gathering, and archaeological sites are often found along the former shorelines of dry Pleistocene lakes (Warren 1980, 1984; Warren and Crabtree 1986). This time period is unique to the Mojave Desert, and the Sawmill-Liebre Range does not have a corresponding time period.

By around 5000 B.C., the climate became drier and hotter. Sites of this time period are relatively rare in both the Mojave Desert and the Sawmill-Liebre Range. Native American subsistence
shifted away from the shores of lakes, toward upland areas where food resources were more readily available. Tool types also changed during this period, with smaller projectile points becoming more common than previously. Milling stones such as metates and manos, which were used for grinding plant foods, are present but rare at these sites (Warren 1980, 1984; Warren and Crabtree 1986).

About 2000 B.C., climatic conditions shifted again, to cooler and moister. This change led to more favorable environmental conditions, which in turn contributed to an increase in human population in the Mojave Desert and the Sawmill-Liebre Range, the development of trade between different groups, and greater social complexity beyond a simple band structure. In the Sawmill-Liebre Range there was an increase in the variety of site types, included large villages, small permanent camps, rock shelters, workshops, seasonal-use camps, and mortuaries (Vance 2002a, 2002b). In both areas hunters exploited a wide range of game animals, including mountain sheep, and they probably used the atlatl. A wider variety of stone tools were used during this time; milling stones for grinding and processing seeds and plants were used as well (Warren 1980, 1984; Warren and Crabtree 1986).

About A.D. 500, smaller projectile point types and the bow and arrow were introduced. In the Antelope Valley, artifacts from some Rose Spring Period sites suggest that trade or other ties to coastal Native American groups may have been associated with local changes in subsistence and the development of larger villages (Warren 1980, 1984; Warren and Crabtree 1986). In the Sawmill-Liebre Range a similar pattern emerged. There was an increased use of fused shale rather than obsidian for making stone tools. Fused shale is found in the Fillmore area, which possibly suggests that the focus of trade shifted toward the coast and away from the desert. However, it could also suggest a disruption in earlier trade patterns and a shift toward more locally available resources (D. Vance, personal communication 2010).

During this period, the small Desert Side-notched projectile point became a distinctive temporal marker, and pottery appeared for the first time. Trade between different Native American groups increased along the Mojave River and over the Sawmill-Liebre Range, although there is evidence at the very end of the period that the trade network along the Mojave River had broken down. With this decline in trade in the 18th century, the abundance and size of villages in the Antelope Valley declined (Warren 1980, 1984; Warren and Crabtree 1986).

Ethnography
Understanding which 18th and 19th century Native American groups lived in the BRRTP study area is complicated because these groups typically had fluid linguistic and sociopolitical boundaries, or no boundaries at all. After the Spanish began colonizing coastal California in 1769, Native American groups were subject to dramatic social and cultural changes, including the establishment of the Spanish mission system and the introduction of new diseases that decimated native populations. Population declined even further during smallpox epidemics in 1863 and 1870.

Seven Native American groups were common to the BRRTP area: the Tataviam, Kitanemuk, Gabrieliño, Fernandeño, Chumash, Kawaiisu, and Serrano.
The territory of the Tataviam surrounded the upper reaches of the Santa Clara River drainage east of Piru Creek, and included the southwest portions of Antelope Valley. To the south, the territory extended into the San Gabriel Mountains just north of the Los Angeles Basin and San Fernando Valley (King and Blackburn 1978). Much of the southern portion of the BRRTP study area is included in Tataviam territory. Very little is known about the Tataviam because they virtually disappeared as a distinct sociopolitical group by 1900. By 1810 most Tataviam had been baptized at San Fernando Mission, and in 1916, the last speaker of the Tataviam language died.

Like their neighbors, the Tataviam probably followed an annual cycle of trapping, hunting and harvesting plants and animals. Settlements ranged from large villages of 200 people to small communities of fewer than 10 people. Groups consisting of several related families or larger kin groups lived in permanent villages (King and Blackburn 1978).

The Kitanemuk were a small tribe that lived on the southern and western flanks of the Tehachapi Mountains (Blackburn and Bean 1978). They may have been in contact with the Spanish as early as the 1770s, but there is little information available on this tribe because they were assimilated into the mission system very early. Some Kitanemuk lived at the Tejon Reservation in the 1850s.

The Kitanemuk likely followed a similar annual cycle to that of the Tataviam. It has been estimated that the entire group had 500 to 1,000 people, However, there is no data to directly support this claim, as it is primarily based on the size of territory the Kitanemuk occupied and their similarity to neighboring groups (Blackburn and Bean 1978).

The Gabrieliño (or Tongva) were one of the largest, wealthiest and most powerful aboriginal groups in southern California. Their tribal territory was centered in the Los Angeles Basin, but their influence extended as far north as the San Joaquin Valley. The territory included the watersheds of the Los Angeles, San Gabriel, and Santa Ana rivers; several smaller tributary streams in the Santa Monica and Santa Ana mountains; all of the Los Angeles Basin; and adjacent coastal areas. Throughout Gabrieliño territory, there may have been 50 to 100 villages occupied at any one time, with the villages containing 50 to 200 people. Different groups of Gabrieliño adopted different lifestyles depending on local environmental conditions, although all were based on gathering plant foods, hunting or fishing. Villages were politically autonomous, each with its own leader. It was not until 1769 that the Spanish attempted to colonize Gabrieliño territory. As a result of disease and forced re-settlement, the population had declined dramatically by 1900.

The Fernandeño were the historic tribe within the San Fernando Valley. Before 1797 and prior to the establishment of the Spanish Missions, the Fernandeño were formed into villages, each composed of a single lineage. The lineages held territory, engaged in collective economic and ceremonial activity, and intermarried with other lineage groups to establish a complicated regional network of kinship, economic, and ceremonial ties (www.tataviam-nsn.us/heritage/tribal-history). Subsistence consisted of hunting small game and gathering acorns, yucca, juniper berries, sage seeds, and islay. The social and cultural ties and organization of the lineages established in the pre-mission period continued through the mission period from 1797 to 1846. Between 1847 and 1885, the Fernandeño were dispossessed of Mexican land.
grants at Encino, Cahuenga, Tujunga, Rocha’s grant, and Sikwanga, all located near Mission San Fernando on land formerly held in trust for the Indians by the Catholic Church. Between 1886 and 1951, the community lived in the old section of the city of San Fernando (Fernandeño Tataviam Band of Mission Indians 2011).

The Chumash were a large wealthy tribe found along the coast from San Luis Obispo south and east to Malibu Canyon, and inland to the western edge of the San Joaquin valley (Grant 1978a, b). One interior Chumash group was found within or near the BRRTP study area, the Emigdiano Chumash (Grant 1978a, b; King and Blackburn 1978). The Emigdiano Chumash lived in extreme southwestern Kern County east of Castaic Lake. Some Chumash also lived in the Fort Tejon area. Grant (1978b) estimates that the total population was only several hundred, far smaller than Chumash populations along the coast. There is no ethnographic information available for the Emigdiano Chumash (Grant 1978b).

The Kawaiisu were a semi-nomadic hunting-gathering group located primarily in the southern Tehachapi Valley and in mountains to the north. Their subsistence activities took them as far south as Antelope Valley (Smith 1978). Occupying a definable territory, living and working in small family units, and spending their winters in a villages, the Kawaiisu were an autonomous political and ritual group. They were bound together by family, language, trade and ceremonial practices. Beyond the family groups, social structure was minimal. Related families usually lived close to each other and worked together in hunting and gathering food (Digital Desert n.d.1). For a time they lived on the Tejon Reservation north of the study area.

The Serrano, a hunting-gathering group, lived primarily east of the Mojave River and north of San Bernardino, but some maps indicate that the Serrano, at least as a linguistic group, extended possibly as far west as the BRRTP study area (Bean and Smith 1978b). The Serrano were organized into local groups claiming relatively small territories. There was no larger political organization and there was no formal territory defined for the entire tribe. Spanish influence on the Serrano was negligible until around 1819, but by 1834 most Serrano had been forced to relocate to missions and had lost much of their traditional culture. Today, many Serrano live on the Morongo and San Manuel Reservations.

**Euro-American History**

The transition from the prehistoric period to the historic era occurred during the mid-1700s when Spanish expeditions began arriving in the region to establish missions. Although most early missions were along the coast between San Diego and Sonoma, a few expeditions went inland. One of the first was led by Gaspar de Portola in 1769 into the upper reaches of the Santa Clara Valley near present-day Newhall. Following expeditions included those led by Pedro Pages in 1772 and by Fr. Garcés in 1776. Missions established in the general vicinity of the southern part of the BRRTP study area included Mission San Gabriel in 1776, Mission San Buenaventura in 1782, and Mission San Fernando Rey de España in 1797 (Garretson 2010). A mission outpost, or *estancia*, which became the headquarters for the San Fernando mission cattle ranch, was established at the confluence of the Santa Clara River and Castaic Creek in 1804 (Worden 1996). The decline of the missions as religious institutions began in 1821, when Mexico gained independence from Spain and ended in 1830 when the Mexican government removed the missions from church control (Castillo 1978).
During the early historic period, the Mojave Desert and Antelope Valley served as an important transportation corridor between the California coast and the Colorado River to the east. One of these early routes was the Mojave Road, which ran to the east of the BRRTP area (Digital Desert n.d.2). Another important travel corridor is the Spanish Trail, which crossed the desert south of the BRRTP area. The route was part of a network of trails used in the trading of horses and woolen products.

During the 1850s, the northern part of the study area experienced the first real surge of Anglo-American settlement in the desert. Gold was discovered in 1853 in Greenhorn Gulch northeast of the study area (Clark 1999). In locations that would eventually become the cities of Ridgecrest, Tehachapi, and Barstow, and the unincorporated communities of Rosamond and Mojave, small settlements developed to supply the mining operations. By 1854 the first of many stage lines was established in Kern County, one of which ran through San Francisquito Canyon.

Mining in the western Mojave Desert began in 1862 with the discovery of borax (SCVhistory.com 2009). Other non-metals mined in the Mojave region included clay, limestone, red clay and bentonite clay. Silver mining experienced a boom of about five years due to the high transportation costs and the declining value of silver. The mining boom rebounded with the discovery of gold in the hills just south of the town of Mojave (Ryan 2001). In the Sawmill-Liebre Range, gold was discovered in Placerita Canyon in 1842 leading to extensive mining operations throughout the mountains. Many of the early claims were located in Soledad Canyon, Texas Canyon, and near Acton, areas that continued to be mined well into the 20th Century (Vance 2001).

Between the mid-1850s and early 1860s, new residents of Kern County developed a moderate agricultural economy (Macko et al. 1993). A devastating drought caused the local farmers and cattle ranchers to shift to sheep-raising. The Tehachapi area served as a major center for moving sheep between summer and winter ranges (Macko et al. 1993). The arrival of the Southern Pacific Railroad increased settlement and small towns sprang up along the line including Rosamond, Lancaster, and Palmdale. The onset of another severe drought brought this land boom to an end. Antelope Valley recovered from the drought when irrigation projects made cultivation of fruit and nut trees and feed crops possible (Love 1997). Irrigation allowed for diversity in crop growth such as alfalfa, cotton, potatoes, onions, carrots, and corn.

From its founding in 1769, the city of Los Angeles relied on the Los Angeles River to provide irrigation water. In 1904 William Mulholland, superintendent of the City Water Department, suggested that the city should obtain water rights to the Owens Valley (LADWP 2009). Work began on the Los Angeles Aqueduct in 1907 and water first flowed into the San Fernando Valley in November 1913 and to the city of Los Angeles in June 1914 (LADWP 2009). The onset of World War II saw a boom in agriculture in Antelope Valley, the Sawmill-Liebre Range, and the Tehachapis (Dillon 2007). Real estate emerged as the top economic stimulus following World War II. The construction of the aqueduct spurred the greatest population growth (McKenna et al. 2007).

In the southern portion of the study area in the mid-1700s, Spanish expeditions began arriving in the region to establish missions to convert the native population to Catholicism. A mission...
outpost, or *estancia*, which became the headquarters for the San Fernando mission cattle ranch, was established at the confluence of the Santa Clara River and Castaic Creek in 1804 (Worden 1996).

In 1849, the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States, and the region that would become the State of California came under the jurisdiction of the United States. California was admitted to the union in 1850.

The cattle industry continued to dominate the local economy until droughts decimated grazing areas and herds. Land speculators acted quickly to secure title to foreclosed land, ushering the period of Anglo-American dominance in the southern part of the study area (Castillo 1978). In 1875, Henry Newhall purchased a foreclosed rancho. Newhall sold some of the land to the railroad, and the Southern Pacific Railroad line was completed connecting the cities of Los Angeles and San Francisco. The town of Newhall was established around the railroad station (SCVHS n.d.).

In 1876, Charles Mentry of the Star Oil Works constructed the first oil pipeline in California from Pico Canyon to the refinery in Newhall. Eventually the pipeline was extended to the ocean in the city of Ventura (Harnish 1996).

Serving as a major contribution to overland transportation, the Butterfield Stage Route was once the primary overland mail route from Missouri to the west coast. It was started in 1858 by John Butterfield and ran approximately 2,800 miles from Tipton, Missouri to San Francisco, California. The stage route was in operation until 1861 (Alison 2009). In the study area, the Butterfield Stage Route traveled up San Francisquito Canyon through Green Valley.

A major transportation project that helped direct the path of settlement and development in the region was the building of the Old Ridge Road. Survey was completed in early 1914. The Old Ridge Road wasn’t paved until 1919. In 1933, the route was replaced by Highway 99. The route was nominated to the National Register in 1991 by the ANF and listed in 1997 as a historic structure. Construction began on I-5 during the 1960s to accommodate the greater traffic loads then using Highway 99 and was completed in 1970 (Pool 1997; California Department of Water Resources 2000).

Where Ridgecrest is now located, a small scattering of settlers managed agricultural supplies for the miners in the 1850s. In the early 1900s, the Crum brothers moved to the area, and the town of Crumville developed around their dairy and farming operation. In 1941, the town of Crumville was officially named Ridgecrest by a unanimous vote and by 1963 the community became incorporated as the City of Ridgecrest (City of Ridgecrest n.d.).

**Native American Concerns**

For BRRTP, the ANF is responsible for Section 106 consultation with Native American Tribes that could potentially have interest in or who have traditional ties to the study area. Tribes were also contacted as part of the NEPA Scoping Process for the BRRTP. Several tribes responded to initial consultation letters sent by the ANF describing the Proposed Action and Alternatives and requesting tribal participation in the development of the Programmatic Agreement (PA).
Chairperson James Ramos of the San Manuel Band of Mission Indians was contacted on September 24, 2009 with a request for tribal participation in the development of the PA. On September 30, 2009 Andrew Salas of the Gabrieliño Group sent an e-mail expressing interest in the Project as it moves forward. On May 12, 2008 John Valenzuela of the Seven Feathers Corp/San Fernando Band of Mission Indians sent a letter providing information in regard to the availability of monitors during the construction phase of the Project. On June 9, 2008 the Morongo Band of Mission Indians sent a letter to the ANF commenting on aspects of the Project. On June 3, 2009 The Santa Ynez Band of Mission Indians/Tribal Elders Council sent a letter requesting that the Chumash, who are located in or near the study area, be informed of the undertaking and to also suggest that a Native American monitor be present during ground disturbing activities. Once it was confirmed that local tribes had been contacted regarding BRRTP, the Santa Ynez Band asked to be removed from further consultation. On June 30, 2009 the Owl Clan Consultants sent an e-mail expressing concern over the Proposed Action and Alternatives.

In addition to the consultation letters sent by the ANF, the agency’s Tribal Liaison also held a meeting for all members of local Native American tribes to discuss a variety of issues, including the BRRTP. Letters were sent to tribal representatives announcing the time and location of the forum, which was held on April 18, 2009 at the Forest Supervisor’s Office in Arcadia.

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

**Summary of Inventory Results**

This Final EIS/EIR presents the results of a background search of cultural resource data and limited cultural resource survey within Alternatives 1, 2, 2a, and 3. Most land along the Alternatives has not been systematically or intensively surveyed for cultural resources by professional archaeologists. For this reason, each Alternative may contain many cultural resources that have not yet been identified. Class III (intensive) cultural resource field inventories would be completed as required by Section 106 of the NHPA and CEQA for the selected route before construction begins.

**Designated Resources**

National- or State-designated properties in the BRRTP vicinity are listed in Table 3.2.10-2.

National Historic Landmarks (NHLs) are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. According to the NPS online list of NHLs (accessed September 2, 2008), there are 20 NHLs in Los Angeles County and only one NHL in Kern County. None are close to the BRRTP.

The NPS Focus database was reviewed on September 10, 2008 to determine whether any National Register-listed properties are located in the Project area. While a few exist in the
general vicinity, only one, the Old Ridge Route, falls within the boundaries of any Alternative. The road parallels portions of the Alternative 1 230 kV transmission line.

The list of California Historical Landmarks (CHLs) maintained by the OHP was reviewed on September 11, 2008 and again on June 1, 2009. The ANF is the only CHL crossed by a BRRTP Alternative. However, at the suggestion of ANF cultural resource staff, and for the purposes of this analysis, this particular CHL is not analyzed as a cultural resource because the CHL includes all National Forest lands in the BRRTP area.

Information on sites listed in the California Register was obtained from the Information Centers in Fullerton and Bakersfield. The State Historical Resources Commission has designed the California Register program for use by State and local agencies, private groups, and citizens to identify, evaluate, register and protect California’s historical resources. The Register is the authoritative guide to the State’s significant historical and archaeological resources. Two California Register-listed properties are within the boundaries of BRRTP Alternatives: the Olive Power Plant Transmission Line and the Old Ridge Route (see Table 3.2.10-2).

California Points of Historical Interest are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points of Historical Interest designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register. Information on California Points of Historical Interest was obtained from the OHP. No Points of Historical Interest occur within the BRRTP area.

In its General Plan, the City of Santa Clarita has identified a number of local resources of historic interest.
### Table 3.2.10-2. National- and State-Designated Cultural Resources within One Mile of BRRTP Alternatives

<table>
<thead>
<tr>
<th>RESOURCE PRIMARY NUMBER</th>
<th>RESOURCE</th>
<th>BRRTTP ALTERNATIVE</th>
<th>DISTANCE/DIRECTION FROM COMPONENT</th>
<th>LISTED IN NATIONAL REGISTER</th>
<th>CALIFORNIA HISTORIC LANDMARK&lt;sup&gt;1&lt;/sup&gt;</th>
<th>LISTED IN CALIFORNIA REGISTER&lt;sup&gt;1&lt;/sup&gt;</th>
<th>CALIFORNIA POINT OF HISTORICAL INTEREST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kern County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-001213</td>
<td>Willow Springs</td>
<td>Alternatives 2, 2a, 3</td>
<td>0.4 mile SW</td>
<td></td>
<td>X</td>
<td>(No. 130)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Los Angeles County</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-000990 19-188474</td>
<td>Old Ridge Route, Halfway Inn, Reservoir Summit Service Center National Forest Inn</td>
<td>All Alternatives</td>
<td>0.0 mile</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>19-167231</td>
<td>Mission San Fernando Rey de España</td>
<td>All Alternatives</td>
<td>0.8 Mile SE</td>
<td></td>
<td>X</td>
<td>(No. 157)</td>
<td></td>
</tr>
<tr>
<td>19-186560</td>
<td>The Cascades</td>
<td>All Alternatives</td>
<td>0.3 mile SW</td>
<td></td>
<td>X</td>
<td>(No. 653)</td>
<td></td>
</tr>
<tr>
<td>19-186536</td>
<td>Lyons Station Stagecoach Stop</td>
<td>All Alternatives</td>
<td>0.7 mile W</td>
<td></td>
<td>X</td>
<td>(No. 688)</td>
<td></td>
</tr>
<tr>
<td>19-186535</td>
<td>Angeles National Forest</td>
<td>All Alternatives</td>
<td>0.0 mile</td>
<td></td>
<td>X</td>
<td>(No. 717)</td>
<td></td>
</tr>
<tr>
<td>19-186553</td>
<td>St. Francis Dam Disaster Site</td>
<td>Alternatives 2, 2a</td>
<td>0.9 mile NW</td>
<td></td>
<td>X</td>
<td>(No. 919)</td>
<td>X</td>
</tr>
<tr>
<td>19-186552</td>
<td>Beale’s Cut Stagecoach Pass</td>
<td>All Alternatives</td>
<td>0.8 mile W</td>
<td></td>
<td>X</td>
<td>(No. 1006)</td>
<td>X</td>
</tr>
<tr>
<td>19-180722 19-003474</td>
<td>Lopez Adobe/La Casa de Geronimo Lopez</td>
<td>All Alternatives</td>
<td>0.9 mile SE</td>
<td></td>
<td>X</td>
<td>X (No.105)</td>
<td></td>
</tr>
<tr>
<td>19-002132</td>
<td>Olive Power Plant 1 Transmission Line</td>
<td>All Alternatives</td>
<td>0.0 mile</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>CHLs No. 770 and above are automatically listed in the California Register. CHLs below No. 770 are listed in the California Register only upon action by the State Historical Resource Commission.
Other Cultural Resources

Most of the cultural resources previously recorded in the BRRTP area have not been formerly designated by any federal, State, or local entity. Data on these resources was obtained from the SCCIC, SJVIC, USFS, and BLM.

The listing eligibility status of known cultural resources within each Alternative transmission line corridor is summarized in Table 3.2.10-3. Isolated finds are assumed for this analysis to be not eligible to be listed to the National Register or California Register, but each isolated find identified within the selected Alternative would be evaluated for listing eligibility on a case-by-case basis.

<table>
<thead>
<tr>
<th>Table 3.2.10-3. Listing Eligibility Status of Previously Recorded Cultural Resources Within 250 Feet of the Centerlines of the 230 kV Transmission Line for Each Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Resources</td>
</tr>
<tr>
<td>Alternative 1: 41</td>
</tr>
<tr>
<td>Alternative 2: 22</td>
</tr>
<tr>
<td>Alternative 2a: 22</td>
</tr>
<tr>
<td>Alternative 3: 33</td>
</tr>
<tr>
<td>Listed in National Register, Listed in California Register</td>
</tr>
<tr>
<td>Alternative 1: 1</td>
</tr>
<tr>
<td>Alternative 2:</td>
</tr>
<tr>
<td>Alternative 2a:</td>
</tr>
<tr>
<td>Alternative 3:</td>
</tr>
<tr>
<td>Determined Eligible to be listed to National Register,</td>
</tr>
<tr>
<td>Listed in California Register</td>
</tr>
<tr>
<td>Alternative 1: 1</td>
</tr>
<tr>
<td>Alternative 2: 1</td>
</tr>
<tr>
<td>Alternative 2a: 1</td>
</tr>
<tr>
<td>Alternative 3: 1</td>
</tr>
<tr>
<td>Determined Not Eligible to be listed to National Register,</td>
</tr>
<tr>
<td>or Assumed Not Eligible as Isolated Find</td>
</tr>
<tr>
<td>Alternative 1: 6</td>
</tr>
<tr>
<td>Alternative 2: 7</td>
</tr>
<tr>
<td>Alternative 2a: 7</td>
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<tr>
<td>Alternative 3: 7</td>
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<td>Unevaluated</td>
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<td>Alternative 1: 31</td>
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<td>Alternative 2: 13</td>
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<tr>
<td>Alternative 2a: 13</td>
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<tr>
<td>Alternative 3: 23</td>
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<tr>
<td>Alternative 1: 2</td>
</tr>
<tr>
<td>Alternative 2: 1</td>
</tr>
<tr>
<td>Alternative 2a: 1</td>
</tr>
<tr>
<td>Alternative 3: 2</td>
</tr>
</tbody>
</table>

*Old Ridge Route, including Reservoir Summit Service Center, HalfWay Inn, and National Forest Inn as contributing elements

Project Components Common to All Action Alternatives

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

New 230 kV Circuit

Six cultural resources have been previously recorded within 250 feet of the new circuit from Haskell Canyon Switching Station to Castaic Power Plant. All of the sites are historic and include: the West Pettinger Canyon mines, two transmission lines, two road segments including the Old Ridge Route, and the Los Angeles Aqueduct. The Old Ridge Route is listed in the National Register and the California Register and the Olive Power Plant 1 Transmission Line is eligible to be listed to the National Register and is listed in the California Register. The remaining sites have not been evaluated.

Reconductoring of BR-RIN Transmission Line

Thirty-eight cultural resources have been previously recorded within 250 feet of the BR-RIN Transmission Line. Of these, 26 are historic, two are prehistoric, 8 are prehistoric isolated finds, and two have an unknown cultural affiliation (i.e., inventory forms were missing from files). The 26 historic sites include: historic Forest Service roads, the Randsburg Cutoff Road, mining sites, to include the West Pettinger Canyon mines, two transmission lines, a recreational residence tract, historic trash scatters, the Los Angeles Aqueduct, and structural remains. One of
the transmission lines, the Olive Power Plant 1 Transmission Line, is eligible to be listed to the National Register and is listed in the California Register. The prehistoric sites and isolates consist of lithic scatters, storage sites, and a rock ring. The remaining historic sites and the prehistoric sites and isolates have not been evaluated for listing eligibility.

New Haskell Canyon Switching Station

There are three historic sites within 250 feet of the new Haskell Canyon Switching Station grading area: the West Pettinger Mines, the Olive Power Plant 1 Transmission Line, and the Southern California Edison Antelope Transmission Line. The Olive Transmission Line is eligible to be listed to the National Register and the other two sites have not been evaluated for listing eligibility. There are no recorded sites within 250 feet of the planned expansion area for the Barren Ridge Switching Station.

Expansion of Barren Ridge Switching Station

There are no recorded sites within 250 feet of the planned expansion area for the Barren Ridge Switching Station.

New 230 kV Double-Circuit Transmission Line

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

Alternative 1

A total of 41 resources have been previously recorded within 250 feet of the Alternative 1 230 kV transmission line centerline. Historic cultural resources include trash scatters, a homestead site, foundations, a labor camp associated with the Los Angeles Aqueduct, the Los Angeles Aqueduct itself, transmission lines, roads (including the Old Ridge Route), and a mining complex. Prehistoric sites consist of two lithic scatters and an earth oven.

Most resources along the Alternative 1 transmission line have not been evaluated for listing eligibility. The Old Ridge Route is listed in both the National Register and the California Register. Contributing elements to the Old Ridge Route include the Reservoir Summit Service Center, remains of the HalfWay Inn, and remains of the National Forest Inn. The Olive Power Plant 1 Transmission Line has been determined eligible to be listed to the National Register and is listed in the California Register. The Randsburg Cut Off road has been determined not eligible to be listed to the National Register. For this analysis it is assumed that isolated finds are not eligible to be listed; however, when the survey of the selected route is undertaken, each isolated find would be evaluated for National Register listing eligibility.

Alternative 2

A total of 22 resources have been previously recorded within 250 feet of the centerline of the Alternative 2 230 kV transmission line. Recorded historic sites include roads, trash scatters, the San Francisquito Summer Home Tract, transmission lines, mining sites, and an old adobe. Prehistoric sites consist of a storage site and a habitation site.
The Olive Power Plant I Transmission Line has been determined eligible to be listed to the National Register and is listed in the California Register. For this analysis it is assumed that isolated finds are not eligible to be listed; however, when the survey of the selected route is undertaken, they would be evaluated for their National Register and California Register listing eligibility. Most sites were unevaluated.

Alternative 2a

The number and types of cultural resources in Alternative 2a transmission line corridor are identical to those for the Alternative 2 transmission line.

Alternative 3

Thirty-three cultural resources have been previously documented within 250 feet of the Alternative 3 transmission line centerline. Identified resources include historic roads, trash scatters, mining sites, ranching complexes, remains of a hog farm, and two transmission lines. Prehistoric sites include a quarry, lithic scatters, four sites with either cupules on boulders or grinding slabs, a shallow rock-lined pit, and a bedrock mortar.

Out of all of the sites recorded along the Alternative 3 transmission line corridor, only one is eligible to be listed to the National Register and has been listed on the California Register: the Olive Power Plant 1 Transmission Line. For this analysis it is assumed that isolated finds are not eligible to be listed; however, when the survey of the selected route is undertaken, they would be evaluated for their National Register and California Register listing eligibility. Most sites have not been evaluated.

3.2.11 WILDFIRE AND FUELS

Introduction

Construction, operation and maintenance of the proposed Project have the potential to create wildfires and wildfire-related impacts. This section describes the wildfire ecology in the study area and the regulations governing wildfire prevention. A Wildlife and Fuels Technical Report, located in Volume III, was prepared for the Proposed Action and Alternatives and contains detailed information on wildfire behavior conditions and potential power transmission line fire hazards within the affected environment.

Overview of Methodology and Analysis Area

The BRRTP Proposed Action and Alternatives were field-verified for existing wildfire and fuels attributes and conditions. Each Alternative was surveyed within the borderzone, an area extending a quarter-mile outward on either side of the centerline associated with the Alternative. The borderzone, which represents the wildfire and fuels study corridor and the area identified where potential wildfire risk exists, was divided into half-mile square segments. Each half-mile segment was visually inspected. In those circumstances where access was limited, segments were observed using binoculars from nearby ridges or high access points.

Six wildfire and fuel attributes were identified and analyzed within the study corridor and are described in more detail in the Technical Report. Attributes and conditions of topography, fuels
and vegetation, roads, wildfire containment conflicts, assets at risk, and new line/existing segments along the study corridor were GPS recorded and documented. In addition to the field inventory, additional data was received from local agencies and programs, and satellite imagery was utilized for verification of existing attributes in areas where field verification was not possible.

For the purposes of this Final EIS/EIR, a fireshed assessment area of approximately 496,000 acres was identified. Firesheds are regional landscapes that are conceptually analogous to watersheds and are referred to as the limits of an area in which an ignition that escapes containment could spread under extreme weather conditions. Areas of the Proposed Action and Alternatives outside the BRRTP fireshed were assessed and determined insignificant for existing wildfire and fuel risks.

Regulatory Framework

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

Summary of Inventory Results

Wildfire Behavior Conditions

The presence of dense, dry fuels and a warm, arid climate characterizes Southern California as having one of the most fire-prone landscapes in the world. Factors influencing wildfire behavior and magnitude include forest structure, fuel conditions, climate, and the source of ignition.

Weather is one of the most significant biophysical factors of wildfire behavior. The summer months of Southern California are arid and warm, with very little precipitation. Drought and Santa Ana Occurrences (SAO) are native weather conditions to Southern California that drive catastrophic wildfires. SAO are seasonal weather events that generally occur during autumn months (September to December) when cool air rises from the ocean, creating high off-shore winds that mix with the hot, arid desert air. High pressure builds in the desert and forms a strong pressure gradient with low pressure in the coastal ranges, creating winds exceeding 60 miles per hour that blow into the valleys.

Fuels are organic material (living or dead) in and/or on the ground or in the air that would ignite and burn. Fuel conditions are considered a bipartite element of wildfire behavior having anthropogenic and biophysical components. Anthropogenic influences on fuel conditions are a result of active vegetation management (i.e., mastication, prescribed burning, brush removal, or eradication of non-native species) which alters its composition and structure. Moisture content, above-ground biomass, and fuel structure and composition are biophysical components of fuel conditions.

The topography of a given area integrates slope, aspect, and elevation. Large upland ridges burn more frequently when compared to valleys, swamps, or riparian areas. Steep slopes promote the preheating of fuels, which leads to a rapid upslope fire spread. Difficult terrain reduces the effect of fire suppression efforts and often creates barriers for firefighters, aerial attacks, and fire engines. High elevations may contain reduced fuel loads, while mid-elevations may allow for
the growth of dense forests and chaparral communities. Slope, aspect, and elevation comprise the topography of a geographical area and are highly influential on wildfire behavior.

Human intervention (arson, negligence) would most likely occur around or in highly recreated areas and rights-of-way. Arson is deliberate and has caused most of the catastrophic wildfires. Human negligence could be shooting guns, improperly extinguishing a campfire, cigarettes, or exhaust sparks from off-highway vehicles.

**BRRTP Fireshed**

The BRRTP fireshed is approximately 496,000 acres, covering multiple land ownerships over portions of Los Angeles, Kern, and Ventura Counties (see Figure 3 in the Wildfire and Fuels Technical Report in Volume III of this Final EIS/EIR). SAO originating from the Great Basin create extreme fire weather conditions that are characterized by low humidity, sustained high-speed winds, and strong gusts. The fireshed is also influenced by the variation in elevation. The elevation in the BRRTP fireshed ranges from 926 vertical feet in the valleys and basins to 5,790 vertical feet at peak mountain ranges.

The fireshed assessment defined seven distinct eco-regions. These are briefly described in the following narrative and shown on Figure 3.1 in the Wildfire and Fuels Technical Report.

**High Desert plains and hills (87,887 fireshed acres):** This eco-region consists of the western Mojave Desert and exhibits a desert climate. This region experiences a high pressure gradient that primes the Santa Ana wind events. The soils are predominantly comprised of alluvial plain and pediment with small hills. Within the eco-region boundary the vegetation composition is predominantly shrubs, comprising approximately 53,000 acres.

**San Gabriel Mountains (9,204 fireshed acres):** The eco-region boundary includes the western edge of the San Gabriel Mountains, situated to the north of the unincorporated community of Sylmar. It is adjacent to the east side of the Simi Valley-Santa Susana Mountains eco-region and to the south side of the Sierra Pelona-Mint Canyon eco-region. The underlying geology contains mostly granitic rock on steep to very steep slopes. Due to lower elevations, the soils are somewhat mesic.

**Simi Valley-Santa Susana Mountains (5,222 fireshed acres):** This region comprises a small portion west of the city of San Fernando and north of the city of Granada Hills. The eco-region is characterized by steep mountains transcending into the gently sloping floodplains of the wildland-urban interface. The soils are well drained and the soil moisture regime is mostly xeric.

**Los Angeles plain (15,602 fireshed acres):** This eco-region is located within a small portion of the fireshed and is bordered by the eco-regions of the Simi Valley-Santa Susana Mountains and San Gabriel Mountains in the San Fernando Valley. The climate is hot and moderately humid and is influenced by the Pacific Ocean’s marine layer. Precipitation ranges over the eco-region from 12-20 inches annually. The region is similar to the San Gabriel Mountains in geology. The region is characterized by floodplains levels/terraces and very gently sloping to sloping alluvial fans. The soils are well drained and soil moisture regimes are xeric.
Sierra Pelona-Mint Canyon (152,762 fireshed acres): This eco-region is defined by its location east of I-5 and bordering the wildland-urban interace of the Santa Clarita Valley, the Los Angeles Basin, and the city of Palmdale suburbs. The eco-region is characterized by mid-elevation foothills and urban development. The soils are well drained and have xeric characteristics. Underlying rock is sedimentary with portions of granite. Significantly, Santa Ana winds formed in the desert advance toward the low pressure of the Coastal Ranges, and sweep through the Santa Clarita Valleys and Los Angeles Basin of this eco-region. Within the eco-region boundary, the vegetation composition is predominantly occupied by shrub.

Northern Transverse Ranges (202,512 fireshed acres): Extending horizontally across the fireshed, this eco-region, the largest area within the fireshed, is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands. The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern end of the eco-region, the high-elevation mountain range transcends into the foothills of the Santa Clarita Valley.

The fire season for the Northern Transverse Ranges is highly dependent on the winter snowpack and spring weather conditions. The eco-region is dominated by southern mixed chaparral series with a sparse mixture of deciduous and pine forests, decreasing in density as the elevation drops into the Santa Clarita Valley and Los Angeles Basin.

San Rafael-Topatopa Mountains (22,460 fireshed acres): This eco-region spans west of I-5, adjacent to the southwestern portion of the Northern Transverse Ranges and northwestern section of the Sierra Pelona Mint Canyon eco-regions. This eco-region does not contain the Proposed Action or Alternatives, but is adjacent to other eco-regions where the Alternatives are located. The region is characterized by the mid-low elevation foothills transcending into the West Central Valley. The slopes of the mountains are steep with narrow canyons and the soils are well drained with the soil moisture regime being xeric.

Angeles National Forest Fire Management Units

A Fire Management Unit (FMU) is any land management area definable by objectives, land features, access, values to be protected, political boundaries, fuel types, major fire regimes, or special management areas designated by agency policy or congressional action. Four FMUs have been established for the ANF, each representing unique fire management challenges. Only three of the four FMUs are discussed in relation to the BRRTP fireshed (see Figure 3 in the Wildfire and Fuels Technical Report). The units were established to allow analysis of specific fire management needs and issues.

FMU-1 – Wildland-Urban Interface (WUI)

This FMU is characterized by lower elevation shrub- and grass-dominated fuels systems and includes the majority of the urban wildland interface areas. This FMU has the highest number of ignitions on an annual basis when compared to other FMUs. A major source of the ignitions comes from the transportation routes included in the FMU. I-5 and State Highway 14 are located within the FMU and the BRRTP fireshed.
Fuels within the FMU have been under constant change due to the high frequency of fires. The steep slopes can act to limit the capabilities of mechanized equipment during the firefighting efforts. The density of the urbanization in the FMU dictates that dire prevention activities would be centered on maintaining defensible space around improvements. While protection of private property would remain a key suppression objective, the ability to take aggressive perimeter control actions is as important to mitigating the threat to property as defensive structure protection actions are.

**FMU-2 – Non-Wilderness**

The FMU fuels are characterized by the density of the fuels and the canopy closure in this mid-elevation range. With increasing elevation, the lower grasslands transition into denser and larger chaparral vegetation types. The FMU consists of an urban intermix consisting of private property, structures, and federal facilities. Within the unit there also exist established suppression control features, such as the Santa Clara and Sierra Pelona fuelbreaks. These features need to be maintained through the use of prescribed fire, mechanical, or biological means.

Steep slopes and heavily bisected topography limit control opportunities within the FMU. Mechanized equipment is restricted in many areas to the primary ridge systems. Fires under typical weather patterns run to the ridge tops, where changes in the alignment of the fire spread allow for successful suppression operations to be conducted. Lateral spread is a function of winds and fuel moistures. As live fuel moisture decreases, lateral spread increases in the chaparral fuel type; this lateral spread often allows a fire to reposition for rapid upslope fire runs.

**FMU-4 – Wilderness**

Only 750 acres of land is designated Sespe wilderness within the BRRTP fireshed. The FMU is best characterized by tactical limitations to fire suppression and LMP direction for Wilderness Management. Limited access to the area requires that the Forest rely on aerial firefighting and detection methods to operate within this Unit.

**Alternatives within the Fireshed**

**Project Components Common to All Action Alternatives**

As described in Chapter 2 of this Final EIS/EIR, the following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Switching Station, and expansion of the Barren Ridge Switching Station) would be the same for each action Alternative.

The new circuit between Haskell Canyon and the Castaic Power Plant would be entirely within the BRRTP fireshed. Forty-three miles of the reconductoring would occur within the BRRTP fireshed assessment area. The new switching station in Haskell Canyon would be located south of the ANF on LADWP-owned property at the convergence of several existing and proposed 230 kV transmission lines. The Proposed Haskell Canyon Switching Station is within State Fire Suppression Responsibility Area. Expansion of the existing Barren Ridge Switching Station, located in Kern County, is outside of the BRRTP fireshed and the study area for wildfire hazards.
New 230 kV Double-Circuit Transmission Line

**Alternative 1**
The Alternative 1 230 kV transmission line would run from the Barren Ridge Switching Station to the unincorporated community of Mojave, California, while paralleling LADWP’s existing 230 kV BR-RIN and 500 kV PDCI transmission lines. It would continue south-southeast to parallel the Los Angeles Aqueduct to Lancaster Road, where it would travel west to the Interstate 5 freeway utility corridor. It would then run southeast along LADWP’s existing Castaic – Rinaldi corridor to the proposed Haskell Canyon Switching Station. The Alternative 1 transmission line would run 32.5 miles through the BRRTP fireshed. The firefighting responsibility areas would be composed of 16.1 miles of federal and 16.4 miles of State. Land ownership for the Alternative 1 transmission line within the fireshed would be split between 15.9 miles of Angeles National Forest, 0.3 mile of California Department of Fish and Game, and 16.3 miles of other (private, county, and city properties). This proposed alignment would transect three USFS Land Use Zones, including 7.6 miles of Developed Areas Interface, 8.2 miles of Back Country, and 0.8 mile of Back Country Motorized-Use Restricted; the remaining 14.7 miles of transmission line would be located outside the Land Use Zones under non-federal jurisdiction. The FMUs of the Alternative 1 transmission line would consist of 17.7 miles of Forest Non-Wilderness and 14.3 miles of Wildland Urban Interface.

**Alternative 2 (Proposed Action)**
Beginning at the Barren Ridge Switching Station, the Alternative 2 transmission line would run south, paralleling LADWP’s existing 230 kV BR-RIN and 500 kV PDCI transmission lines. It would travel south from the unincorporated community of Mojave, California to the Antelope Valley California Poppy Reserve. It would continue south into National Forest System lands, remaining within designated utility corridors, and terminating at the proposed Haskell Canyon Switching Station. The Alternative 2 transmission line would run 27.4 miles through the BRRTP fireshed. The firefighting responsibility areas would be composed of 13.3 miles of federal, 7.4 miles of State, and 6.7 miles of local. Land ownership for the Alternative 2 transmission line within the fireshed would be split between 13.9 miles of Angeles National Forest and 13.4 miles of other (private, county, and city properties). This proposed alignment would transect two USFS Land Use Zones including 6.2 miles of Developed Areas Interface and 8.6 miles of Back Country; the remaining 12.6 miles would be located outside Land Use Zones under non-federal jurisdiction. The FMUs of the Alternative 2 transmission line would consist of 14.8 miles of Forest Non-Wilderness and 2.5 miles of Wildland Urban Interface, with the remaining 10.1 miles outside FMUs.

**Alternative 2a**
The Alternative 2a transmission line would begin at the Barren Ridge Switching Station and run south, paralleling LADWP’s existing 230 kV BR-RIN and 500 kV PDCI transmission lines. It would travel south from Mojave towards the Antelope Valley California Poppy Reserve. It would continue south into National Forest System lands, bypass the unincorporated community of Green Valley, and travel over the ridge along an existing fire road. The route would be within ANF lands, but outside the USFS 1,000-foot designated utility corridor. The alignment would connect back to the Alternative 2 (Proposed Action) alignment south of Green Valley, and end at the proposed Haskell Canyon Switching Station. Alternative 2a would run 28.8 miles through the BRRTP fireshed. The firefighting responsibility areas would be composed of 15.4 miles of federal, 6.0 miles of State, and 7.4 miles of local. Land ownership for the Alternative 2a
transmission line within the fireshed would be split between 15.4 miles of the Angeles National Forest and 13.4 miles of other (private, county, and city properties). This proposed alignment would transect two USFS Land Use Zones including 13.2 miles of Back Country and 1.9 miles of Developed Areas Interface; the remaining 13.8 miles would be located outside Land Use Zones under non-federal jurisdiction. The FMUs of the Alternative 2a transmission line would consist of 15.5 miles of Forest Non-Wilderness and 3.3 miles of Wildland Urban Interface, with the remaining 10.1 miles outside FMUs.

**Alternative 3**
The Alternative 3 transmission line would begin at the Barren Ridge Switching Station and run south, paralleling LADWP’s existing 230 kV BR-RIN and 500 kV PDCI lines. It would travel south from the unincorporated community of Mojave, California to the Antelope Valley California Poppy Reserve. It then would travel southeast past SCE’s Antelope Substation to Palmdale, paralleling SCE’s existing high-voltage transmission lines. It would make a sharp turn to the south-southwest to Haskell Canyon while paralleling LADWP’s existing Victorville-Rinaldi 500 kV and Adelanto-Rinaldi 230 kV transmission lines. The Alternative 3 transmission line would run 40.3 miles through the BRRTP fireshed. The firefighting responsibility areas would be composed of 0.3 mile of federal, 20.7 miles of State, and 16.8 miles of local. Land ownership for the Alternative 3 transmission line within the fireshed would be split between 2 miles of the Angeles National Forest and 39.6 miles of other (private, county, and city properties). This proposed alignment would transect one USFS Land Use Zone consisting of 2.1 miles of Back Country; the remaining 38.8 miles would be located outside the Land Use Zones under non-federal jurisdiction. The FMUs of Alternative 3 would consist of 14.4 miles of non-federal units, 2.8 miles of Forest Non-Wilderness, and 24.4 miles of Wildland Urban Interface.

### 3.2.12 ELECTRICAL EFFECTS

**Introduction**
This section describes electric and magnetic fields in the area of the Proposed Action and Alternatives Identified in Chapter 2. Specifically, this section presents the conditions of the affected environment, and describes regulations, plans, and guidelines that pertain to electrical effects from the transmission facilities in the BRRTP area.

The assessment of electric and magnetic fields shall: 1) provide an overview of the technical methodology used in collecting baseline conditions; 2) examine the affected environment with respect to electrical effects; and 3) present the regulatory framework.

**Overview of Methodology and Analysis Area**

**Electric and Magnetic Fields**
Electric and magnetic fields (EMF) are present wherever electricity flows: around appliances and power lines, in offices, schools, and homes. Electric fields are invisible lines of force, created by voltage, and are shielded by most materials. Units of measure are volts per meter (V/m). Magnetic fields are invisible lines of force, created by electric current and are not shielded by most materials, such as lead, soil and concrete. In the United States, magnetic field strength units of measure are Gauss (G) or milliGauss, where 1 G = 1,000 mG. Much of the world’s scientific community measures magnetic field strength in units of Tesla (T) and microTesla (µT)
where 10,000 G = 1 T, 1G = 100 µT, and 1mG = 0.1 µT. Electric and magnetic field strengths diminish with distance. These fields are low energy, extremely low frequency fields, and should not be confused with high energy or ionizing radiation such as X-rays and gamma rays.

Some studies have reported a weak association between estimates of residential magnetic field exposure and certain types of childhood cancer. These studies have not shown that the magnetic fields from power lines actually cause cancer. Some worker studies have also found associations between estimates of EMF exposure and some forms of cancer, but these results have been very inconsistent. Laboratory experiments have shown that exposure levels typically well above those normally found in residences can produce changes in cells, but there is little or no evidence that these changes constitute a health risk.

Electrical transmission and distribution line systems are not the only sources of magnetic fields. Within homes and work places, local sources of magnetic fields include building wiring and plumbing, electric blankets, electric stoves, computer terminals, bedside clocks, ceiling fans, and other appliances that people may use for prolonged periods. It is noteworthy that some of the common sources of higher magnetic fields are appliances and electrical devices found within the home. The magnetic field levels from such sources in typical use can range up to thousands of mG or higher; however, the duration of exposure from many appliances is typically much shorter than that from other sources. Thus, exposure to both electric and magnetic fields occurs continuously, and is not simply a function of living or working near a power line or facility. Exposure depends upon the many sources and field strengths that are present where a person lives, works, and otherwise spends time.

A majority of people in the United States are exposed to magnetic fields that average less than 2.0 mG. Table 3.2.12-1 depicts estimated average magnetic field exposure of the U.S. population from residential sources, according to a study commissioned by the U.S. government as part of the EMF Research and Public Information Dissemination (EMF RAPID) Program. This study measured magnetic field exposure of a sample of people of all ages randomly selected among the U.S. population. Participants wore or carried with them a small personal exposure meter and kept a diary of their activities both at home and away from home. Magnetic field strength values were automatically recorded twice a second for 24 hours. The study reported that exposure to magnetic fields is similar in different regions of the country and similar for both men and women.

Possible Health Effects of Electric and Magnetic Fields

This section reviews the results of selected reports pertaining to possible links between electric and magnetic fields and health effects. Results are presented in chronological order and demonstrate how scientific knowledge in this area is still unfolding.

A number of studies in the late 1980s and 1990s investigated a possible association between power lines and EMF and the incidence of childhood leukemia. The studies included:

- Four studies which used wire codes to assess exposure to EMF were considered to be of sufficient quality to evaluate an association between the incidence of childhood leukemia and exposure to magnetic fields (Wertheimer & Leeper 1979; Savitz et al. 1988; London 1989; London 1993).
et al. 1991; Linet et al. 1997). The wire code method includes a number of factors, such as the wiring in the home, and the distance of home from the power line.

- Four studies were considered to be of sufficient quality by the National Institute of Environmental Health Sciences (NIEHS) to be used in an evaluation of the association between the incidence of childhood brain tumors and classification of exposure based on wire codes (Savitz et al. 1988; Wertheimer & Leeper 1979; Gurney et al. 1996; Preston-Martin et al. 1996b).

- Three studies of appliance use evaluated the association between the incidence of childhood leukemia and exposure to magnetic fields (Hatch et al. 1998; London et al. 1991; Savitz et al. 1990).

### Table 3.2.12-1. **Residential Sources of Magnetic Fields**

<table>
<thead>
<tr>
<th>Source</th>
<th>Magnetic Field Strength (mG)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kitchen</strong></td>
<td></td>
</tr>
<tr>
<td>Blenders</td>
<td>20</td>
</tr>
<tr>
<td>Coffee Makers</td>
<td>1</td>
</tr>
<tr>
<td>Dishwashers</td>
<td>30</td>
</tr>
<tr>
<td>Electric Ranges</td>
<td>30</td>
</tr>
<tr>
<td>Refrigerators</td>
<td>20</td>
</tr>
<tr>
<td><strong>Bedroom</strong></td>
<td></td>
</tr>
<tr>
<td>Digital Clock</td>
<td>8</td>
</tr>
<tr>
<td>Analog Clock</td>
<td>30</td>
</tr>
<tr>
<td><strong>Living/Family Room</strong></td>
<td></td>
</tr>
<tr>
<td>Color Televisions</td>
<td>20</td>
</tr>
<tr>
<td>Window Air Conditioners</td>
<td>20</td>
</tr>
<tr>
<td>Ceiling Fans</td>
<td>50</td>
</tr>
<tr>
<td><strong>Laundry/Utility</strong></td>
<td></td>
</tr>
<tr>
<td>Electric Clothes Dryer</td>
<td>3</td>
</tr>
<tr>
<td>Washing Machines</td>
<td>30</td>
</tr>
<tr>
<td>Vacuum Cleaners</td>
<td>200</td>
</tr>
<tr>
<td>Portable Heaters</td>
<td>40</td>
</tr>
<tr>
<td><strong>Workshop</strong></td>
<td></td>
</tr>
<tr>
<td>Drills</td>
<td>40</td>
</tr>
<tr>
<td>Power Saws</td>
<td>300</td>
</tr>
</tbody>
</table>

In 1996, a National Research Council committee of the National Academy of Sciences (NAS) released its evaluation of research on potential associations between EMF exposure and cancer, reproduction, development, learning, and behavior. The report concluded:

“Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects.”

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3 “EMF Questions & Answers”, U.S. National Institute of Environmental Health Services, EMF RAPID Program, 2002
4 The magnetic field strengths are measured at a distance of one foot from the source.
The NAS focused primarily on the association of childhood leukemia with the proximity of the child’s home to power lines. The NAS panel found that although a link between EMF exposure and increased risk for childhood leukemia was observed in studies that had estimated EMF exposure using the wire code method; this link was not found in studies that had included actual measurements of magnetic fields at the time of the study.

In 1992, the U.S. Congress authorized the EMF-RAPID Program in the Energy Policy Act (PL 102-486, Section 2118). The Congress instructed the NIEHS, National Institutes of Health, and the Department of Energy to direct and manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risks from exposure to extremely low frequency (ELF) EMF.

More recently, childhood leukemia has been associated with exposure to magnetic fields in the highest exposure groups, in recent reviews and pooled studies (International Agency for Research on Cancer [IARC] 2001, Ahlbom et al. 2000, and Greenland et al. 2000). The basis for these relationships remains unexplained (Brain et al. 2003). Kavet and Zaffanella (2002) suggested that contact currents could explain the association between high residential magnetic fields and childhood leukemia. Contact currents flow through the body whenever a person touches two conductive surfaces that are at different voltages. Leukemia in childhood is rare. In the U.S., about 2 to 3 cases per 100,000 person years for children 0 to 20 years old have been reported, but the rate peaks at two to three times this rate in 0- to 4-year olds (Brain et al. 2003).

In the first of the analyses of pooled data, Ahlbom et al. (2000) reported that if nine studies that included long-term measurements of magnetic fields were pooled, a statistically significant association could be found for childhood leukemia in the children with average exposures of 4 mG (0.4 microTesla) or greater. For children with lower average exposures, no significant elevation of childhood leukemia was found in the pooled studies. Magnetic field strength would exceed 4 mG from the center of the proposed transmission line to a point on either side of the line roughly 45 feet from the center of the transmission line. In the second of the analyses of pooled data, Greenland et al. (2000) reported that if the 15 studies for which magnetic fields were measured (or could be estimated) were pooled, a statistically significant association (relative risk = 1.7) could be found for childhood leukemia in the children with average exposures of 3 mG (0.3 microTesla). For children with lower average exposures, no significant elevation of childhood leukemia was found in the pooled studies. According to the authors, this data indicates that exposure to power-frequency magnetic fields could account for 0-8% of childhood leukemia deaths in the United States.

The World Health Organization’s IARC met in June 2001 to review the scientific evidence regarding the potential carcinogenicity of static and ELF EMF. An international scientific panel was created consisting of 21 experts from 10 countries. The panel categorized its conclusions for carcinogenicity based on the IARC classification system that evaluates the strength of evidence from epidemiological, laboratory (human and cellular), and mechanistic studies (classifications are “carcinogenic to humans,” “probably carcinogenic to humans,” and “possibly carcinogenic to humans”). The IARC concluded that:
“ELF magnetic fields are possibly carcinogenic to humans, based on consistent statistical associations of high level residential magnetic fields with a doubling of risk of childhood leukemia and power-frequency (50 or 60 Hz) residential ELF magnetic field strengths above 0.4 microTesla. In contrast, no consistent evidence was found that childhood exposures to ELF electric or magnetic fields are associated with brain tumors or any other kinds of solid tumors. No consistent evidence was found that residential or occupational exposures of adults to ELF magnetic fields increase risk for any kind of cancer.”

Short and Long Term Health Effects

**Pacemakers.** The potential for pacemaker interference from power line fields depends on the manufacturer, model, and implantation method, among other factors. Studies have determined thresholds for interference of the most sensitive units to be about 2,000 to 12,000 mG for magnetic fields and about 1.5 to 2.0 kV/m for electric fields (University of Rochester 1985). Guidelines for occupational exposure suggest that electric field exposure should not exceed 1 kV/m or 1,000 mG for workers with cardiac pacemakers (ACGIH 2001). It is unclear that reversion to a fixed pacing mode is harmful since pacemakers are routinely put into reversion with a magnet to test operation and battery life. Some new pacemaker models are dual chamber devices that can be more sensitive to external interference. Some of these dual chamber units may experience inappropriate pacing behavior (prior to reversion to fixed pacing mode) in electric fields as low as 1.2 to 2 kV/m, while other models appear unaffected in fields up to 20 kV/m. The biological consequences of brief, reversible pacemaker malfunction are mostly benign. An exception would be an individual who has a sensitive pacer and is completely dependent on it for maintaining all cardiac rhythms. For such an individual, a malfunction that compromised pacemaker output or prevented the unit from reverting to the fixed pacing mode, even brief periods of interference, could be life-threatening (Sastre 1997). The precise coincidence of events (i.e. pacer model, field characteristics, biological need for full function pacing) would generally appear to be a rare event.

**Brain and Breast Cancer.** Numerous occupational studies of adults have also been performed to examine the relationship between magnetic or electric fields and adult cancers including leukemia and brain and breast cancers. These studies have concentrated on occupations presumed to have high exposure to EMF and have varied greatly in study design and exposure assessment methods. These studies published through 2002 are described in the International Agency for Research on Cancer (IARC) monographs (IARC 2002). A consistent relationship between adult cancer and exposure to electric or magnetic fields has not been found (Gammon et al. 1988; Kheifets et al. 1999; Wrensch et al. 1999; Laden et al. 2000; Zheng et al. 2000; Davis et al. 2002; London et al. 2003; Schoenfeld et al. 2003; and Forssen et al. 2005).

**Miscarriage.** Studies such as Li et al. 2002 have examined the association between magnetic field exposure and miscarriage in San Francisco, California. No association was found between TWA magnetic field exposure and miscarriages. However, miscarriage risk increased with an increasing level of magnetic field exposure above 16 mG.

**Conclusion**

The association between measured fields and childhood leukemia is weak, and it is not clear whether it represents a cause-and-effect relationship. At present, the available series of studies
indicates no association between EMF exposure and childhood cancers other than leukemia. Far fewer of these studies have been conducted than studies of childhood leukemia. There have been more than 30 detailed reports on both long-term and short-term studies of EMF exposures in laboratory animals (bioassays) conducted by researchers. Long-term animal bioassays constitute an important group of studies in EMF research. Such studies have a proven record for predicting the carcinogenicity of chemicals, physical agents, and other suspected cancer-causing agents. Researchers compared groups of animals treated with cancer initiators to groups treated with cancer initiators and then exposed to EMF, to see if EMF exposure promoted the cancer growth (initiation-promotion model). Other studies tested the cancer promotion potential of EMF using mice that were predisposed to cancer because they had defects in the genes that control cancer. Most of the studies conducted for animals (primarily rodents such as rats) suggest a lack of carcinogenicity, and the few with borderline positive results are inadequate to conclude that exposure to magnetic fields at the magnitude and field configurations at which they were investigated increases the incidence of cancer in rodents.

Electric and Magnetic Induction

The primary issue is how the induced or coupled voltages and currents on powered objects can compromise safety to a person who comes in contact with the object. Researchers have done extensive work in the area of perception of 60 hertz (Hz) power system currents. The electrical effects on humans start with perception and as current levels increase, let-go levels are next in importance. Higher current levels can lead to ventricular fibrillation and respiratory inhibition, which can cause death. Generally, for safety purposes, it is desirable to reduce the induced voltage and currents to levels that result in current flow through the body below the let-go threshold. Ultimately sufficient safeguards should be provided to reduce body currents below the perception limit. The reported perception of electrical current is a median level of approximately 1.0 mA. The let-go threshold is defined as the highest current (RMS) flow in a hand to hand or hand to foot path for which a conductor held in a hand may be released. This threshold is extremely important since it defines a minimum dangerous current for the onset of an uncontrollable situation. The average let-go current for women and men was found to be 10.5 milliamperes (1/1000 of an ampere referred to in a condensed unit of “mA”) and 16.0 mA, respectively. In the smallest percentile for let-go currents measured, the currents have been reported to be as low as 6.0 mA for women and 9.0 mA for men. It has been estimated that 4.5 mA would be a reasonably safe let-go threshold for children. The National Electrical Safety Code (NESC) requires that power lines be designed to keep the induced current from nearby objects below 5.0 mA when short-circuited to ground. The short circuit current can be calculated for any object in or near the corridor to determine if the magnitude of the current is below the 5.0 mA rule for safety purposes.

The other situation in terms of electrical currents is a fault current. This would be a current that flows to ground as a result of an abnormal situation on the power line such as a broken conductor. The fault current is primarily a function of the time it takes for the utility to clear the fault. As the time of exposure decreases, the body tolerance to current levels increases.

Regulatory Framework

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.
Summary of Inventory Results
The methodology and analysis presented above is relevant for each of the Project Alternatives.

3.2.13 SOCIOECONOMICS

Introduction
This section describes the potential socioeconomic setting within the area of the Proposed Action and Alternatives. The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Socioeconomic Resources Assessment Report, contained in Volume III of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Socioeconomic Resources Assessment Report, please refer to that report for more detailed information on Proposed Action and Alternatives setting and effects on socioeconomic resources.

Overview of Methodology and Analysis Area
The socioeconomic study area broadly considered Kern, Ventura, and Los Angeles Counties. Detailed results of the study related to Ventura County can be found in the Socioeconomic Resources Assessment Report located in Volume III of this Final EIS/EIR. For purposes of this Final EIS/EIR, effects to Ventura County in regards to socioeconomics from the Project would be minimal and therefore are not included within the discussion. The northern one-third of the Proposed Action and Alternatives is located near the Tehachapi Mountain range and the Mojave Desert areas of Southern California in Kern County, while the southern two-thirds is generally located within the Angeles National Forest (ANF) and more urbanized communities such as the cities of Los Angeles, Lancaster, Palmdale, and Santa Clarita in Los Angeles County.

The population of the two-county area ranges from high-density urban in the northern part of the city of Los Angeles, to suburban/urban in the cities of Palmdale, Lancaster, and Santa Clarita in northern Los Angeles County, to rural in unincorporated north Los Angeles County and southern Kern County. The unincorporated communities of Rosamond and Mojave, act as rural centers closest to Proposed Action and Alternative routes in southern Kern County, with the Tehachapi area being somewhat more distant, but offering more housing and urban services. Employment bases in the region varies from urban service-oriented in the more densely settled cities of Los Angeles and Santa Clarita, to resource-oriented (oil and gas, and outdoor recreation) in Kern County.

To identify the most important, noticeable socioeconomic impacts, the local study area was defined. Communities within the area were examined, focusing on communities closest to Project Alternatives (those communities in southern Kern and northern Los Angeles Counties). In general, workers needed to construct and operate Project facilities—not including specialized workers, who tend to be somewhat itinerant, temporarily relocating near their work sites for the duration of their work—would be drawn from areas within commuting distance of Project facilities. In addition, the itinerant workers who migrate to the area for work would be most likely to select residences that would be within ready commuting distance, with somewhat of an additional preference for residences in communities offering urban services. Communities
nearest the Alternative routes could be most affected, as in-migrating workers would tend to seek accommodations, and spend money on accommodations, retail goods, restaurants, and miscellaneous needs in those communities.

While these areas include all areas that could potentially be locations for workers, in general the worker locations, would be mostly concentrated in the areas closest to Project Alternatives – i.e., within a 45-minute commute of any Project facility. Since the city of Lancaster and the city of Palmdale are located about midway, from north to south, in the local area, offer reasonable commutes, and have urban services including ample hotel/RV supplies, of all the local communities, these two communities would most likely be the source of the most substantial numbers of locally hired workers, as well as the preferred location for the largest numbers of in-migrating Project workers. When construction occurs south of the ANF, the city of Santa Clarita would likely be a primary location for workers moving to the area to be near their work sites.

Finally, all areas within six miles of any Alternative corridor were also addressed in the Environmental Justice Analysis.

Population

Table 3.2.13-1 lists the historical population estimates, population densities, and average annual growth for the cities and two counties within the Project area, and California from 1980 to 2008.


<table>
<thead>
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<th></th>
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<tbody>
<tr>
<td>California</td>
<td>29,758,213</td>
<td>33,873,086</td>
<td>36,675,346</td>
<td>38,049,462</td>
<td>1.37%</td>
<td>1.26%</td>
<td>155,959.34</td>
<td>217.19</td>
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<tr>
<td>Kern County total</td>
<td>544,981</td>
<td>661,653</td>
<td>753,395</td>
<td>817,517</td>
<td>2.28%</td>
<td>2.46%</td>
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<td></td>
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<tr>
<td>California City</td>
<td>5,955</td>
<td>8,385</td>
<td>11,505</td>
<td>14,365</td>
<td>5.01%</td>
<td>5.74%</td>
<td>203.55</td>
<td>41.19</td>
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<td>Tehachapi</td>
<td>6,182</td>
<td>11,125</td>
<td>11,909</td>
<td>13,089</td>
<td>4.26%</td>
<td>1.73%</td>
<td>9.58</td>
<td>1,161.27</td>
</tr>
<tr>
<td>Los Angeles County total</td>
<td>4,209,724</td>
<td>4,554,368</td>
<td>4,871,793</td>
<td>5,025,876</td>
<td>0.99%</td>
<td>1.06%</td>
<td>4,060.87</td>
<td>1,121.53</td>
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<tr>
<td>Los Angeles (County seat)</td>
<td>3,485,557</td>
<td>3,694,742</td>
<td>3,932,740</td>
<td>4,045,873</td>
<td>0.83%</td>
<td>0.97%</td>
<td>469.07</td>
<td>7,876.74</td>
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<tr>
<td>Glendale</td>
<td>180,038</td>
<td>194,973</td>
<td>205,746</td>
<td>207,157</td>
<td>0.78%</td>
<td>0.61%</td>
<td>30.65</td>
<td>6,361.27</td>
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<tr>
<td>Santa Clarita</td>
<td>110,690</td>
<td>151,131</td>
<td>166,926</td>
<td>177,045</td>
<td>2.64%</td>
<td>1.77%</td>
<td>47.83</td>
<td>3,159.75</td>
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<tr>
<td>Palmdale</td>
<td>68,946</td>
<td>116,670</td>
<td>135,808</td>
<td>147,897</td>
<td>4.33%</td>
<td>2.67%</td>
<td>104.96</td>
<td>1,111.56311</td>
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<tr>
<td>Lancaster</td>
<td>97,300</td>
<td>118,718</td>
<td>132,925</td>
<td>145,243</td>
<td>2.25%</td>
<td>2.33%</td>
<td>94</td>
<td>1262.957447</td>
</tr>
<tr>
<td>Burbank</td>
<td>93,649</td>
<td>100,316</td>
<td>106,084</td>
<td>108,029</td>
<td>0.80%</td>
<td>0.79%</td>
<td>17.35</td>
<td>5,781.90</td>
</tr>
<tr>
<td>San Fernando</td>
<td>22,580</td>
<td>23,564</td>
<td>24,804</td>
<td>25,230</td>
<td>0.62%</td>
<td>0.68%</td>
<td>2.38</td>
<td>9900.840336</td>
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<tr>
<td>La Canada Flintridge</td>
<td>19,378</td>
<td>20,318</td>
<td>21,475</td>
<td>21,276</td>
<td>0.52%</td>
<td>0.40%</td>
<td>8.65</td>
<td>2,348.90</td>
</tr>
</tbody>
</table>

**Sources:**
For Communities within the City of Los Angeles:
Kern County

Kern County is the third largest county (in acreage) in California, with a population of 817,517 on January 1, 2008 (California Department of Finance 2008). Its population density is very low, at 81 persons per square mile, compared to a statewide average of 217.

County population growth has been rapid since 2000, at 2.5% per year. Bakersfield, the county seat, has been the primary focus of this growth, having grown by 3.5% annually after 2000, to 328,692 persons on July 1, 2008 (California Department of Finance 2008).

Incorporated cities are not located within the immediate vicinity of the Project in Kern County. Just north, however, is the city of Tehachapi, which could be a residence for both local hires for Project construction, and for in-migrating workers. The city of Tehachapi’s population was 13,089 on July 1, 2008. In 2000, however, the combined surrounding unincorporated, but urbanized, communities of Golden Hills, Bear Valley Springs, and Stallion Springs exceeded that of the city of Tehachapi (U.S. Bureau of the Census 2000).

Unincorporated Kern County communities near the vicinity of the Project include Rosamond (year 2000 Census population: 14,349), Mojave (year 2000 Census population: 3,836), and Lebec/Gorman (year 2000 Census population: 1,285), as well as the unincorporated communities near the city of Tehachapi of Golden Hills (year 2000 Census population: 7,434), Bear Valley Springs (year 2000 Census population: 4,232), and Stallion Springs (year 2000 Census population: 1,522). Most of the Kern County land area within the vicinity of the Project is rural farmland, and undeveloped/vacant.

Population projections for Kern County by the Kern County Council of Governments call for a slowing of its historical rapid population growth to 1.9% annually from 2006 to the year 2030. The only available sub-county projections are for the Tehachapi area, which is projected to experience a relatively rapid population growth rate of 2.5% annually.

Los Angeles County

Los Angeles County is the most populous county in California, with 5,799,584 persons on July 1, 2008 (California Department of Finance 2008). The City of Los Angeles accounted for 4,045,873 of the county population. Unincorporated Los Angeles County accounted for an additional 1,092,078 persons within the Project area. Population estimates are shown in Table 3.2.13-1.

Incorporated communities in the vicinity of the Project include the cities of Santa Clarita, Palmdale, and Lancaster; portions of the Alternatives pass through each of these cities. All potential Project routes would pass through the city of Santa Clarita, which is the most urbanized area in the vicinity of the Project. The City of Santa Clarita’s population was 177,045 as of July 1, 2008, an average annual increase of 1.8% since 2000.

Portions of some Alternatives would traverse the city of Palmdale and the city of Lancaster, in northern Los Angeles County. Both cities experienced average annual growth exceeding the county average in 2000-2008, at 2.7% and 2.3%, respectively (the overall county growth rate
was 1.0%). As of July 1, 2008, the City of Palmdale’s population was 147,897, and the City of Lancaster’s population was 145,283.

Other incorporated cities in proximity are to the south of the city of Santa Clarita, in the San Fernando Valley. These include the cities of Glendale (July 1, 2008 population: 207,157), Burbank (July 1, 2008 population: 108,029), Pasadena (July 1, 2008 population: 148,126), San Fernando (July 1, 2008 population: 25,230), and La Canada Flintridge (July 1, 2008 population: 21,276). These cities may be potential sources of Project labor and thus would benefit from Project wage payments to workers who live there, but likely not locations where in-migrating Project workers may choose to live because they are within a reasonable commute of only the southernmost Project Alternative facilities.

In addition, the unincorporated area of North Los Angeles County, while not as densely settled as most of the incorporated areas, is home to significant population. Annual population estimates for the unincorporated area of north Los Angeles County have not been developed by the California Department of Finance, which only estimates county unincorporated areas as a whole, not for unincorporated subareas. The Southern California Association of Governments (SCAG) estimated the 2005 population of “Unincorporated North Los Angeles County” at 132,797 (SCAG 2008).

Population projections for Los Angeles County by the SCAG call for generally slow growth. Strong growth, however, is projected for the cities of north Los Angeles County (Santa Clarita, Lancaster, and Palmdale are all projected to grow over 1.2% annually), and for unincorporated north Los Angeles County (4.0%).

Race and Ethnicity
Kern County populations had predominantly “White Only” race in the year 2000, and had higher proportions of “White Only” persons than the State as a whole, at 69.9% and 61.6%, respectively. Los Angeles County has a more diverse racial composition than did the State. In Los Angeles County, the “White Only” population represented under 50% of the population; the County had no majority racial population.

The major ethnic minority in the three-county Study Area, as it is in the State of California, is “Hispanic or Latino.” Each of the three counties has a higher proportion of this ethnicity than the State as a whole. In Los Angeles County, the proportion was nearly a majority, at 46.9 percent (and increased to 47% by July 1, 2006 [U.S. Bureau of the Census 2008]).

Projections by the California Department of Finance call for a much faster rate of growth for the Hispanic population than for other race or ethnic populations in Kern and Los Angeles Counties. In all three counties, the numbers of Hispanic persons are expected to exceed that of the White-only non-Hispanic population (the historical majority) during the next decades, currently the case in Los Angeles County. By 2010 the Kern County population is expected to have more Hispanic than White-only non-Hispanic persons and the same is projected to occur by 2030.
Housing

Census 2000 data should be understood with caution given significant changes in housing markets since the financial crisis, which began being evident in 2007. However, rental (as opposed to owner-occupied or for-sale) unit data may be broadly indicative of the level of housing available.

For the vicinity of the Project as a whole, measured on a zip code basis, there were about 5,000 vacant units for rent in the year 2000. Rental vacancy rate were mostly above 5%, which is generally considered to be the approximate threshold for “tight” rental markets.

Economy

Kern County has generally (with sectoral exceptions such as construction) been somewhat more insulated from economic slowdowns than has Los Angeles County. The slowdowns of 1991-93 and 2001-03 meant generally larger year-to-year percentage declines for Kern County than for Los Angeles County. The recession of 2007-2009, while “officially” ended, is still playing out in the three-county area, and thus no conclusions can be drawn as yet. Economic data presented below include employment and unemployment and income data.

Employment and Unemployment

Employment growth in the three-county study area has been generally healthy since 1990. Los Angeles County growth, however, has lagged compared to the State and U.S. as a whole over that period, increasing at 0.3% annually (compared to 1.2% Statewide), in part as employers have chosen to locate in its nearby counties. Kern County annual employment growth rates were 2.0% from 1990 to 2006.

Unemployment rates in the three-county study area have historically exhibited substantial seasonal swings in Kern County, but not in Los Angeles County due to its more mature and less resource extraction-based nature. In Los Angeles County, seasonal variation exists, but is not significant in light of total county employment. As Kern County’s economies have grown and diversified, however, this seasonal volatility has tempered. These data also show that in Kern County, unemployment rates have historically been significantly higher than in Los Angeles County.

The number of unemployed persons in the labor force is a more important indicator of how many people might be available to fill new employment opportunities, such as those provided by the Proposed Action and Alternatives. As with the unemployment rate, counties located in the study area show seasonal swings in the rolls of the unemployed, particularly in Kern County due to its heavier reliance on farming.

Kern County unemployment is used as the base because it is the majority source of possible labor pool for projects in the Antelope Valley. Generally, about 30,000 unemployed persons have resided in Kern County.

The number of Los Angeles County unemployed is much larger, at a historical average of about 275,000 persons. However, most of these unemployed Los Angeles County residents likely do not live within ready commuting distance of the vicinity of the Project. A more realistic estimate
of the Los Angeles County unemployed work force that could commute to the Antelope Valley would include those living in the cities of Lancaster, Palmdale, Santa Clarita, Burbank, Glendale, Pasadena, San Fernando, and the unincorporated north Los Angeles County area.

Although comprehensive data on the number of unemployed workers within a reasonable commute of the vicinity of the Project are unavailable, a minimum number can be estimated based on California Employment Development Department data. Using only the cities in the immediate vicinity of Project routes as the base, these data indicate a total unemployed work force of about 12,000 as a historical average. Since these data do not cover all areas (including unincorporated areas) in the vicinity of the Project, they should be understood to be minimums.

**Employment by Industry**

Kern County’s economy has historically been based in mining, agriculture, and forestry and fisheries, and remains so through recent years. However, employment in the farming sector has declined numerically, and the mining and forestry and fisheries industries have experienced minimal change. In addition, the county economy has diversified as it has grown, rendering them smaller as a proportion of total county employment. Construction, transportation, real estate, and administrative services grew somewhat as proportions of total county employment from 2001 to 2006 (U.S. Department of Commerce, Regional Information System 2008a).

As of 2006, the largest sectors (at the REIS two-digit level of aggregation) were State government, retail trade, and forestry and fisheries. However, the raw proportions of employment by industry do not always fully correspond to their true importance to an areas export base. Although the three main resource extraction industries do indeed show high concentrations in Kern County, federal civilian employment is also highly concentrated in the county relative to nationwide averages, indicating it is also important.

Industries in Kern County with the highest concentrations relative to national averages include: farming; mining; military; federal, civilian; finance and insurance; and forestry, fishing, related activities, and other.

Los Angeles County employment patterns reflect those of major central cities, with a broad diversity of service export employment. Retail trade, manufacturing, professional and technical services, local government, and health services were the largest employers in 2006.

Distribution of total employment somewhat obscure the actual export base of Los Angeles County. Los Angeles County industries with the highest concentrations relative to national averages include: wholesale trade; information; and arts, entertainment, and recreation. The motion picture and video industry (part of the broader arts and entertainment industry) while not one of the top industries in terms of share of total employment, however, is by far the leading export industry in the County. Several other industries closely related to this sector are important as well (such as artists and performers).

**Construction Employment**

A final indicator relevant to the Proposed Action and Alternatives’ employment is construction jobs located in the study area. Construction employment is a primary indicator of economic cycles, and the study area reflects that status. Construction employment peaked in early 2006 in
all three counties, before the mortgage crisis began to affect builders’ plans. Currently, construction employment is relatively low from its 2006 peak, but historical data show that it tends to grow over any complete business cycle. Furthermore, regional total construction employment does not tend to be seasonal, except in Kern County. Los Angeles County indicates no remarkable seasonal fluctuations, as there are in Kern County.

The data show that a drop of about 4,000 construction jobs has occurred in Kern County over the past two years. Barring a very rapid increase in construction employment by the start of Project construction, this may indicate some availability of local residents for Project construction jobs, relative to the high construction employment (and therefore low unemployment in the construction trades) of the pre-2007 years.

Income

Personal income in the study area exhibits a common trend, with the more rural satellite county (Kern County) having lower per capita income than the more diversified (Los Angeles County).

Per capita income in Los Angeles County has declined compared to the State as a whole since 1990, particularly since the year 2000. The Los Angeles County income growth rate has been only 0.4% annually, or below the rate of inflation, while State per capita income has grown at 3.9% annually over the same period. Kern County per capita incomes have barely kept up with inflation since 2000, increasing by 2.9% annually, and are significantly below per capita incomes in Los Angeles County and statewide. Some or most of this difference in apparent per capita well-being may be explained by lower costs of living in Kern County, particularly for housing.

Recent published income distribution data are unavailable for the study area. However, the 2000 Census included income distribution data. Of particular importance is the rate of poverty, which is analyzed in greater detail in the Environmental Justice section later in this report for the areas within six miles of Project routes. Overall regional income distribution data are presented herein.

Income distribution for the three counties in the study area reported in the 2000 Census (reporting incomes in 1999) show that Kern County had a higher proportion of households and persons in low-income categories, and a lower proportion in higher income categories. Los Angeles County followed the general distribution as did the State as a whole.

Census County Divisions in the general area of the Proposed Action and Alternatives were also tabulated. This region generally encompasses the cities of Tehachapi and Bakersfield to the north, and the northern part of the city of Los Angeles to the south, and east-central Kern County to the east. Thus, this region is somewhat larger than the zip code-based region used to estimate population in the vicinity of the Project earlier in this chapter. In summary, 6.7% of persons in this somewhat broader region had incomes under the poverty level, compared to a statewide average poverty rate of 6.3 percent. At the upper end of the income distribution, 2.9% of households had incomes over $200,000 in 1999, compared to a statewide average of 3.6 percent. The income distribution of this region looks much like that of the State.
Economic Projections

Statewide economic projections performed by the California Department of Finance (2008a) show a slowing economy. However, since these forecasts were performed in April, 2008, they do not account for the financial markets crisis of late 2008, and hence are highly likely to be overly optimistic.

Employment projections for Kern County by the California Employment Development Department (EDD) (2005) predict an overall increase of 15.3% during 2004-2014, or 1.4% annually. This represents a slightly lower annual average growth rate of 1.9% from 2000-2006.

Corresponding employment projections for Los Angeles County include a much slower total employment increase of 10.3% during 2004-2014, or 0.9% annually. This would be a noticeably higher annual average growth rate than the 0.4% from 2000-06.

The SCAG (2008) also publishes employment projections, but Kern County is not included. Unincorporated North Los Angeles County (3.1% average annual projected growth), and the cities of Lancaster (1.9%), Santa Clarita (1.6%), and Palmdale (1.4%) were predicted to have higher growth rates than overall Los Angeles County from 2005-2035.

Fiscal Conditions

City and county revenues are generally designed to match costs, with occasional year-to-year differences typically accommodated by transfers in and out of contingency funds. The Proposed Action and Alternatives are not expected to result in noticeable increases to local costs of public services, because long-term in-migration to the study area is expected to be minimal relative to population and economic activity levels. Very few new students for schools (and hence class space or teacher employment), or requirements for general government services, police or fire personnel, etc. are expected to result due to the short term of construction and only a handful of new jobs provided by Project operations. Thus, local jurisdiction costs of public services are not addressed in detail. In the sections that follow, these costs are addressed only superficially.

The primary focus is on local government revenues for jurisdictions in which Project Alternatives are located, particularly property taxes. These include unincorporated Los Angeles and Kern counties, and the cities of Palmdale, Lancaster, Santa Clarita, and Los Angeles.

Unlike most development projects, the Proposed Action would not generate any property taxes for jurisdictions because the Project would be exempt under Article 13, Section 11 of the California State Constitution. Thus, the primary tax revenues generated by the Proposed Action and Alternatives would be in the form of retail sales and use taxes from spending of workers’ incomes in the local economy. This could be interpreted as loss of potential property taxes, which are important revenue sources for the regions cities and counties.

Los Angeles and Kern counties, and all cities therein, impose the local (county/city) one percent sales and use tax on taxable sales within their jurisdictions. Total sales tax rates in almost all of Los Angeles County, including the unincorporated north county area, the cities of Lancaster, Palmdale, and Santa Clarita, and the northern part of the city of Los Angeles, are 9.25%. Sales
taxes total 8.25% on taxable sales in almost all of Kern County, including throughout the vicinity of the Project.

Los Angeles County
More than 65% of Los Angeles County—2,649 square miles—is unincorporated. The Los Angeles County Board of Supervisors is the primary decision-making body, and County departments provide the municipal services. The budget to provide these services was $22.5 billion in Fiscal Year (FY) 2007-08.

The most important sources of funds for Los Angeles County are special funds and district revenues (21% of total County revenue), State assistance (20%), federal assistance (18%), and property taxes (16%). The county receives an insignificant share of sales tax revenues (0.2%).

City of Los Angeles
The City of Los Angeles depends to a much greater degree on property and sales taxes (about 41% of total general fund revenues) than does Los Angeles County (16%, virtually all from property taxes). Unlike the County, the City gets very little intergovernmental revenue.

City of Santa Clarita
The City of Santa Clarita relies more heavily on sales and use taxes (54% of its total General Fund revenues), and property taxes (29%), than does Los Angeles County.

City of Palmdale
The City of Palmdale’s leading source of projected General Fund revenues was property taxes at 41% for FY 2008-09. Conversely, sales and use taxes constitute much less than that in the City of Santa Clarita, at 29%.

City of Lancaster
The City of Lancaster’s leading source of projected General Fund sales and use and property taxes were nearly equal for FY 2008-09, at 33% and 32%, respectively.

Kern County
Kern County collects much less of its budgeted revenues from State aid (4% in FY 2007-08) than does Los Angeles County (20%). The County relies most heavily on federal aid for its revenues, at 23% of its total. Property taxes are also very important to the County revenue base, at 22% of the total.

Regulatory Framework
The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

Summary of Inventory Results
The methodology and analysis presented above is relevant for each of the Project Alternatives.
3.3 NATURAL ENVIRONMENT

3.3.1 BIOLOGICAL RESOURCES

Introduction

The existing biological environment, sensitive plant and wildlife species, and vegetation communities supported within and adjacent to the BRRTP study area located in Los Angeles and Kern County, California are described in this section. This section also identifies the regulatory framework including existing laws and regulations relevant to biological resources. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Proposed Action or Alternatives. The purpose of this study and analysis is to review the Proposed Action and Alternatives in sufficient detail to determine to what extent any species currently listed or formally proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA), birds protected under the Migratory Bird Treaty Act (MBTA) or Bald and Golden Eagle Protection Act (BGEPA), or designated as sensitive or of special concern by the Regional Forester, R5-USDA, California Department of Fish and Game (CDFG), and BLM may be affected.

The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Biological Resources Technical Report, contained in Volume IV of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Biological Resources Technical Report, please refer to that report for more detailed information on Proposed Action and Alternatives effects on biological resources.

In compliance with the California Environmental Quality Act (CEQA) and ESA, the LADWP, USFS, and BLM have consulted with the United States Department of the Interior, U.S. Fish and Wildlife Service (USFWS) and CDFG management and staff. The purpose of these consultation meetings and associated correspondences was to help identify biological issues, study potential occurrences and distribution of plants and wildlife and their habitats, and develop survey and mapping protocols to be used to prepare biological studies for the Proposed Action and Alternatives. This coordination is ongoing; refer to the Biological Resources Technical Report for a description of coordination and correspondence with both State and federal agencies.

Overview of Methodology and Analysis Area

The BRRTP would extend from the Mojave Desert to the San Fernando Valley. The northern portion of the Proposed Action and Alternatives crosses the westernmost Mojave Desert and Antelope Valley south and east of the Tehachapi Mountains to the base of the Sawmill-Liebre Range (also known as the Castaic Range or Sierra Pelona Mountains). The southern portion crosses the Sawmill-Liebre Range and the upper Santa Clara River, and extends into the San Fernando Valley where it terminates at Rinaldi Substation.

The physiography of the Project area in the Los Angeles and Kern County regions from north to south is the flat Antelope Valley gradually rising in elevation (northern region) and giving way to the foothills of the Angeles National Forest (central region). Continuing south, the foothills gradually give way to the city of Santa Clarita (southern region). Drainages originating from the
foothills of the ANF have carried rock detritus and water to the Santa Clarita area. This has produced several riparian areas which support a rich, varied, and unique ecosystem. The diversity and distribution of biological resources within the study corridor are a function of the regional climate, soils, and topography. For most of the region, the availability of water or soil moisture is the critical factor that determines the broad distribution of vegetation types and associated wildlife species.

The analysis identified and characterized biological resources, including vegetation community types, riparian habitats, and special-status plant and animal species that are known to occur or have potential to occur in the Project area. Information was collected from existing reports, books and manuals, and field collection of new data specific to the Proposed Action and Alternatives. The Project area was defined as the area either directly or indirectly impacted by the Proposed Action and Alternatives.

To identify the existing and potential biological resources present in the vicinity of the Proposed Action and Alternatives, a Geographic Information System (GIS) search was performed. This consisted of mapping baseline biological resource data (vegetation mapping, California Natural Diversity Database [CNDDB] records, USFS National Resource Information System (NRIS) database, habitat conservation areas, water resources, and potential jurisdictional areas). The following U.S. Geological Survey (USGS) quadrangles were reviewed: Agua Dulce, Black Mountain, Cache Peak, Del Sur, Fairmont Butte, Green Valley, Lake Hughes, La Liebre Ranch, Lebec, Liebre Mountain, Little Buttes, Mint Canyon, Mojave, Mojave NE, Monolith, Neenach School, Newhall, Ritter Ridge, San Fernando, Sleepy Valley, Soledad Mountain, Tylerhorse Canyon, Warm Springs Mountain, Whitaker Peak, and Willow Springs.

The survey corridors for the protocol surveys were 150 meters (500 feet) wide (250 feet on each side of transmission line centerline). Amphibian species and their potential habitat were surveyed up to five miles from the centerline to describe the potential of indirect impacts from construction activities (see Appendix E of the Biological Resources Technical Report).

The field habitat reconnaissance survey evaluated the quality of the habitat for special-status species and/or proximity of the habitat to a known occurrence of a species. Information used to determine known occurrence locations included CNDDB data, USFS data (for Angeles National Forest), California Native Plant Society (CNPS) records, consultation with Wildlife Agencies, and reference to published species accounts. Field survey activities included documenting plant and animal species or sign observed within the study corridor, mapping vegetation communities, and photo-documenting existing biological conditions for all identified potential Project routes. The potential for occurrence of special-status species not observed during field investigations was assessed based upon evaluation of species distribution, including range that may extended outside the Project area, and habitat use and information from previous research studies and biological reports.

Habitats for special-status species of plants and animals were classified for presence of the species as “absent,” “unlikely,” “possible,” “likely,” or “present.” Refer to Appendices A and B of the Biological Resources Technical Report for a list of these classifications. These classifications were derived from an evaluation of the ability of key habitat components to supply the life requisites on selected species of fish and wildlife (USFWS 1980).
involves using the same key habitat components to compare existing habitat conditions and optimum habitat conditions for the species of interest. Optimum conditions are those associated with the highest potential densities of the species within a defined area.

Vegetation mapping of the Proposed Action and Alternatives was conducted by visual examination of the 500-foot-wide survey corridors. The purpose of these surveys was to identify vegetation and land cover within the Project area. Prior to the field review, field maps were developed in GIS using CNDDB records and Gap Analysis Program (USGS) vegetation data. The vegetation layer was overlaid onto aerial photography for easy use in the field. Vegetation communities were then field-verified using a combination of direct observations and aerial photo interpretation for areas that were difficult to access. Dominant plant species and land use were also recorded. Data collected in the field was then used to refine the vegetation layer in GIS and to develop a comprehensive overview of the vegetation communities present within the Project area.

Information gathered from the literature review and reconnaissance-level field surveys were used to identify habitat for all threatened and endangered plant and wildlife species with potential to occur within the Project area. USFWS protocol surveys were conducted in 2008, 2009 and 2010 on portions of all Alternatives to assess the presence of special-status plant and wildlife species.

Prior to conducting field surveys, USFS, USFWS and BLM were consulted to determine survey needs and appropriate survey time frames. USFWS protocol surveys were conducted for the arroyo toad (*Anaxyrus californicus*) and California red-legged frog (*Rana draytonii*), federal- and State-listed plant species, Forest Service Sensitive/Watch plant species, and CNPS List 1 and 2 species. Surveys were also conducted to determine presence of and suitable habitat for California spotted owl (*Strix occidentalis occidentalis*), Joshua trees (*Yucca brevifolia*), special-status bat species, desert tortoise (*Gopherus agassizii*), Mohave ground squirrel (*Spermophilus mohavensis*), and special-status riparian bird species. Additionally, desert habitat and invasive weed surveys were conducted, along with an avian risk assessment and Riparian Conservation Area surveys. (See Appendices E through N of the Biological Resources Technical Report for Survey Reports).

The accuracy of the various surveys conducted for the Proposed Action and Alternatives is limited by the following factors:

- Surveys were performed within a 500-foot-wide corridor in which construction impact areas would most likely be located. The corridor approach allowed surveys to include a majority of the potential impact areas (e.g., tower and pull sites) because in most cases, the specific impact areas were not known at the time of the surveys. However, this 500-foot corridor in most cases only allowed for surveys of portions of potential access/spur roads and staging areas, as these impact areas are expected to extend well outside of the 500-foot buffer.
- Surveys were performed on public lands and private lands where permission to access was obtained. In areas where access was not possible, other information, such as regional habitat assessment models and air photos, was used to identify suitable habitat for each species; species were assumed to be present (where appropriate); and mitigation was developed based on that assumption.
Regulatory Framework

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

Summary of Inventory Results

Provided below is a detailed description, including site-specific data, for vegetation types, common wildlife, special-status plants and wildlife with the potential to occur within the Project area. All the data provided below was collected during survey work conducted from 2008 to 2010 or provided by the various wildlife agencies, including the USFS, CDFG, USFWS, and BLM. The species discussed in the text below are known to occur along each Project component. For lists of species with the potential to occur please refer to Appendix G of this Final EIS/EIR.

Vegetation Community

Seventeen vegetation types were mapped within the Project area for the Proposed Action and Alternatives. Table 3.3.1-1 lists these habitat types including acres and percentage of total acreage within the Project area. Full descriptions of each of these vegetation types are provided in the Biological Resources Technical Report (POWER 2011) and vegetation maps are provided (Appendices A and B of the Biological Resources Technical Report). Because most vegetation community mapping occurred during 2008 and 2009 surveys, prior to the second edition of *A Manual of California Vegetation* (Sawyer, Keeler-Wolf, Evens November 2009), vegetation communities were described and mapped according to Holland (1986) with the Sawyer, Keeler-Wolf (1995) equivalent provided in the Biological Resources Technical Report (POWER 2011) when applicable. Vegetation mapping conducted in 2010 was described according to Holland (1986), with the Sawyer, Keeler-Wolf (1995) equivalent for consistency with earlier surveys.

<table>
<thead>
<tr>
<th>Vegetation Community</th>
<th>Total Acreage</th>
<th>Percentage of Total Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Land</td>
<td>2101.50</td>
<td>11.84%</td>
</tr>
<tr>
<td>Barren/Developed</td>
<td>1139.44</td>
<td>6.42%</td>
</tr>
<tr>
<td>Non-native Grassland</td>
<td>1665.30</td>
<td>9.38%</td>
</tr>
<tr>
<td>Chamise chaparral</td>
<td>1236.51</td>
<td>6.97%</td>
</tr>
<tr>
<td>Interior live oak chaparral</td>
<td>53.90</td>
<td>0.30%</td>
</tr>
<tr>
<td>Joshua tree woodland</td>
<td>1295.10</td>
<td>7.30%</td>
</tr>
<tr>
<td>Mojave creosote bush scrub</td>
<td>6240.40</td>
<td>35.16%</td>
</tr>
<tr>
<td>Mojave wash scrub</td>
<td>310.00</td>
<td>1.75%</td>
</tr>
<tr>
<td>Rabbitbrush scrub</td>
<td>147.50</td>
<td>0.83%</td>
</tr>
<tr>
<td>Riversidian sage scrub</td>
<td>1859.87</td>
<td>10.48%</td>
</tr>
<tr>
<td>Scrub oak chaparral</td>
<td>359.80</td>
<td>2.03%</td>
</tr>
<tr>
<td>Southern mixed chaparral</td>
<td>1124.50</td>
<td>6.34%</td>
</tr>
</tbody>
</table>
### Vegetation Community

<table>
<thead>
<tr>
<th>Vegetation Community</th>
<th>Total Acreage</th>
<th>Percentage of Total Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern coast live oak riparian forest</td>
<td>47.36</td>
<td>0.27%</td>
</tr>
<tr>
<td>Southern cottonwood willow riparian forest</td>
<td>8.05</td>
<td>0.05%</td>
</tr>
<tr>
<td>Southern riparian scrub</td>
<td>83.64</td>
<td>0.47%</td>
</tr>
<tr>
<td>Southern sycamore alder riparian woodland</td>
<td>60.42</td>
<td>0.34%</td>
</tr>
<tr>
<td>Southern willow scrub</td>
<td>12.91</td>
<td>0.07%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17746.20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Special-Status Species

Thirty-five special-status wildlife species and sixty-eight special-status plant species have the potential to occur within the Project area. Special-status species are defined as any species currently listed, formally proposed for listing, or a candidate for listing as endangered or threatened under the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA); any species designated as sensitive, of special concern, fully protected, or as a management indicator species by the Regional Forester, R5-USDA, California Department of Fish and Game (CDFG), or BLM; any species listed by the California Native Plant Society (CNPS) as List 1 or 2; or any species otherwise defined as rare, threatened, or endangered under the California Environmental Quality Act. Of these thirty-five special-status wildlife species and sixty-eight special-status plant species, there are thirteen wildlife and four plant species with potential to occur within the Project area that are listed, or candidates for listing, at the State and/or federal level; and one additional plant species categorized as “state rare” that has potential to occur. Appendix G of this Final EIS/EIR lists these species, their status, and their potential for occurrence. Detailed accounts for these species and locations of these species are provided in the Biological Resources Technical Report.

### Non-Native and Invasive Species

Ninety-eight weed species were known to occur or were identified with the potential to occur within the ANF portion of the Project area.

Nine invasive species were mapped within the Project corridors: tocalote (*Centaurea melitensis*), rockrose (*Cistus creticus/ladanifer*), artichoke thistle (*Cynara cardunculus*), horehound (*Marrubium vulgare*), tree tobacco (*Nicotiana glauca*), smilgrass (*Piptatherum miliaceum*), Russian thistle (*Salsola tragus*), Spanish broom (*Spartium junceum*), and saltcedar (*Tamarix ramosissima*). The presence of these species within the corridor(s) is of particularly high concern because the potential for them to spread is high. Fifteen invasive species were noted to occur within the Project corridors, but were not mapped due to their high frequency and known presence in the area: slender wild oat (*Avena barbata*), wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess brome (*Bromus hordeaceus*), red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), blessed thistle (*Cnicus benedictus*), tansy mustard (*Descurainia sophia*), filaree (*Erodium* sp.), shortpod mustard (*Hirschfeldia incana*), prickly lettuce (*Lactuca serriola*), yellow sweetclover (*Melilotus officinalis*), rabbit foot grass (*Polypogon monspeliensis*), Mediterranean grass (*Schismus barbatus*), tumble mustard (*Sisymbrium altissima/orientale*), sow thistle (*Sonchus* sp.), and rat-tail fescue (*Vulpia myuros*). Six invasive species known from previous studies were also noted or mapped on access roads to
the corridors: tree-of-heaven (*Ailanthus altissima*), giant reed grass (*Arundo donax*), bull thistle (*Cirsium vulgare*), yellow star thistle (*Cirsium solstitialis*), fennel (*Foeniculum vulgare*), perennial pepperweed (*Lepidium latifolium*), and black locust (*Robinia pseudoacacia*). Five invasive species were not observed within the Project area or access roads but are believed to have a high potential of occurring after Project construction due to nearby locations and their ability to spread to disturbed areas: eupatory (*Ageratina adenophora*), perennial sweet pea (*Lathyrus latifolius*), Himalayan blackberry (*Rubus discolor*), and puncture vine (*Tribulus terrestris*). Detailed accounts for these species and locations of these species are provided in the Biological Resources Technical Report.

**Common Wildlife**

Common wildlife species throughout the northern region are indicative of the high desert environments and agricultural centers of Southern California. Wildlife associated with the area includes, but is not limited to, mule deer (*Odocoileus hemionus*), coyotes (*Canis latrans*), round-tailed ground squirrels (*Spermophilus tereticaudus*), kangaroo rats (*Dipodomys* sp.), and muskrats (*Ondatra zibethicus*). Birds include waterfowl, red-tailed hawks (*Buteo jamaicensis*), falcons (*Falco* sp.), common ravens, turkey vultures (*Cathartes aura*), western scrub-jay (*Aphelocoma californica*), quail (*Callipepla* sp.) and mourning dove (*Zenaida macroura*) (CDFG 2010, USFS 2005). Reptile species observed during surveys or expected to occur include the western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), desert spiny lizard (*S. magister*), desert iguana (*Dipsosaurus dorsalis*), and western rattlesnake (*Crotalus viridis*). Chuckwallas (*Sauromalus ater*), red racers (*Coluber constrictor*), common kingsnakes (*Lampropeltis getula*), gopher snakes (*Pituophis catenifer*), and western whiptail lizards (*Aspidoscelis tigris*) are also commonly found in the northern region of the Project area. Species that occur on the ANF include coyote, gray fox (*Urocyon cinereoargenteus*), California ground squirrel (*S. beecheyi*), western gray squirrel (*Sciurus griseus*), and Botta’s pocket gopher (*Thomomys bottae*). The diverse assemblage of vegetation communities on the ANF provides suitable breeding, nesting, and foraging habitat for a relatively exhaustive number of bird species, including Steller’s jay (*Cyanocitta stelleri*), wrentit (*Chamaea fasciata*), mountain chickadee (*Poecile gambeli*), acorn woodpecker (*Melanerpes formicivorus*), and dark-eyed junco (*Junco hyemalis*). Many perennial and intermittent drainages occur on the ANF and provide suitable breeding habitat for several amphibian species, including Pacific tree frog (*Pseudacris hypochondriaca* [regilla]), California tree frog (*Pseudacris cadaverina*), Monterey ensatina (*Ensatina eschscholtzii eschscholtzii*), and coast range newt (*Taricha torosa torosa*).

**Wildlife Movement Corridors**

Wildlife movement corridors can reduce the effects of habitat fragmentation by allowing animals to move between core habitats, replenishing depleted populations, maintaining diversity in the gene pool, and contributing to plant diversity by transporting seed and pollen. Corridors also provide escape routes from fire, predators and human disturbances, and serve as travel pathways for accessing food, water, and mates. Wildlife movement can also have negative effects, such as facilitation of the passage of disease, introduction of invasive species, introduction of “poorly suited” genes, and increased predation on depleted populations. The benefits of increased wildlife movement, however, are generally accepted as outweighing these potential negative impacts.
These linkages among habitat types can extend for miles from primary habitat areas and occur on a large scale throughout California. The northern area of the Project is located within the Mojave Desert. This portion of the desert is surrounded by agricultural land and sporadic areas of residential development. Species can move under the current ROW; however, the access roads used to maintain the transmission line also increase access by humans. Suitable cover from predators is also an important aspect of wildlife movement, such as for kit fox, which require passages that are large enough to accommodate larger body sizes. Smaller wildlife species, such as American badger, can use culverts and other smaller passages. Other aspects of land use, including agricultural activity and proximity to developed areas, can also reduce the amount of movement that occurs through a corridor. Under current conditions, there are a number of barriers that may restrict the movement of terrestrial wildlife species within and through the BRRTP area. These barriers include agricultural activities, major highways and roads, rail lines, and existing development such as industrial, commercial, and residential areas. Existing roads present barriers to terrestrial wildlife, and the removal of natural vegetation by agricultural activities has reduced suitable cover or disrupted the land surface.

Unlike the urbanized and agricultural areas to the north and south, the central end of the Proposed Action and Alternatives crosses the ANF. The ANF provides an extensive area containing a mosaic of relatively undeveloped habitat that can serve as core areas for the wildlife species present. This area of the Proposed Action and Alternatives has minimal human disturbance and, according to the South Coast Linkage Project and California Essential Habitat Connectivity Project, provides a wildlife movement corridor for large mammals and birds moving north to south or vice versa (Penrod et. al 2004, Spencer et. al 2010). Terrestrial movement in the north-south direction, particularly along San Francisquito Creek and Bouquet Creek, is less restricted due to the presence of aquatic and riparian areas along these creeks. As the creeks proceed south, the developed areas greatly inhibit the movement of terrestrial wildlife species between core habitat areas to the south.

There are several existing barriers that affect the east-west movement of terrestrial wildlife across the BRRTP area. Existing barriers include I-5 to the west and California Highway 14 to the east. Highway 14, located immediately outside the BRRTP area, boundary, is the most significant barrier. To cross this barrier, terrestrial wildlife would need to negotiate heavy traffic. On the east side the BRRTP area boundary, I-5 presents another major barrier to terrestrial wildlife movement. Only limited options exist for east-west terrestrial wildlife movement across these barriers and they include culverts, overpasses, and underpasses.

Management Indicator Species

Five Management Indicator Species (MIS) identified in the ANF Land and Resource Management Plan (LRMP) (USDA 2005) occur within the BRRTP study area. Certain species, known as MIS, are identified as indicators of the health and function of the forest ecosystem in response to USFS management activities. Project-level effects on MIS are analyzed and disclosed as part of the environmental analysis under the NEPA.

MIS are selected because their population changes are believed to indicate the effects of management activities (36 CFR 219.19(a) (1), 1982) and to serve as a focus for monitoring (36 CFR 219(a) (6), 1982). The regulation (1982 Planning Rule) required the selection of vertebrate and/or invertebrate species as MIS but did not preclude the selection of other life forms.
Vascular plants are included as MIS because these species are often wide-ranging and responsive to landscape-level stressors.

MIS that occur in the Project area include mule deer, mountain lion (*Puma concolor*), arroyo toad, song sparrow (*Melospiza melodia*), and California spotted owl. A review was conducted to determine whether the Project area was within known or potential habitat for each MIS. Table 3.3.1-2 describes the MIS, their associated Management Indicators, measure, and relevance to the Project within the ANF. See the *Management Indicator Species Analysis for the Barren Ridge Renewable Transmission Project* in Appendix I of this Final EIS/EIR for further details and analysis of impacts to MIS in the Project area.

### Table 3.3.1-2. Management Indicator Species Selected for Project Evaluation

<table>
<thead>
<tr>
<th>MIS Species</th>
<th>Indicators of Management</th>
<th>Measure</th>
<th>Relevance to Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mule deer</td>
<td>Healthy diverse habitats</td>
<td>Trend in abundance and/or habitat condition</td>
<td>Occurs in Project area</td>
</tr>
<tr>
<td>Mountain lion</td>
<td>Habitat fragmentation</td>
<td>Trend in distribution, movement, and/or habitat conditions</td>
<td>Occurs in Project area</td>
</tr>
<tr>
<td>Arroyo toad</td>
<td>Aquatic habitat</td>
<td>Trend in abundance and/or habitat condition</td>
<td>Occurs in Project area</td>
</tr>
<tr>
<td>Song sparrow</td>
<td>Riparian habitat</td>
<td>Trend in abundance and/or habitat condition</td>
<td>Occurs in Project area</td>
</tr>
<tr>
<td>California spotted owl</td>
<td>Montane conifer forest</td>
<td>Occupied territories and/or habitat condition</td>
<td>Occurs in Project area</td>
</tr>
</tbody>
</table>

### Biological Soil Crusts

Biological soil crusts, also known as cryptobiotic crusts, are the community of organisms living at the surface of arid soils. Major components include cyanobacteria, algae, fungi, mosses, liverworts, and lichens. Biological soil crusts increase soil stability; reduce wind and water erosion; increase water infiltration; provide nutrient contributions; increase soil fertility by fixing atmospheric nitrogen and contributing to soil organic matter; enhance seedling germination and plant growth; and function as living mulch by retaining soil moisture and discouraging annual weed growth (Belnap et al. 2001).

Biological soil crusts are found in arid soils around the globe in both hot and cold climates. They occur in haparral and desert vegetation communities throughout Southern California on intact, relatively undisturbed soils. Biological soil crusts occur throughout the BRRTP study area within chamise chaparral, interior live oak chaparral, joshua tree woodland, Mojave creosote bush scrub, Riversidian sage scrub, scrub oak chaparral, and southern mixed chaparral with relatively undisturbed soils.

While no general practices or mitigation measures are in place to specifically address the protection of cryptobiotic crusts, there are several that would reduce short-term or long-term effects to these communities. These include GP-7, GP-24, GP-25, GP-33, GP-34, GP-35, GP-42, GP-43, and GP-44, as well as mitigation measures AIR-2a (Implement construction fugitive dust control plan), VIS-12 (Minimize vegetation clearing), BIO-1 (Provide restoration/compensation for impacted sensitive vegetation communities), BIO-2 (Prevent the spread of invasive weeds), and BIO-13 (Protect special-status plant species and their habitat).
Inventory Results

To provide baseline conditions for each component of the Proposed Action and Alternatives, the dominant soil type, water and habitat characteristics, species present or the potential to occur is described for each. The temporary and permanent ground disturbance is also provided to evaluate potential impacts to the biological resources. For conventional ground construction of the lattice towers, the temporary disturbance estimates take into account structure staging area, and sites for pulling and tensioning, sleeving and stringing, guard structures, material staging, and concrete batch plants. To minimize permanent impacts, after the construction of the BRRTP all the temporary areas and roads greater than 16 feet wide would be re-vegetated. The permanent disturbance estimates take into account the structures, spur and access roads. Each structure would have a disturbance area of 60 by 60 ft (0.08 acre). Each mile would have approximately five towers per mile, for a total disturbance of 0.2 acre per mile. For the ground disturbance summary please refer to Chapter 2.

The following sections describe in detail the biological resources present within each Alternative.

Project Components Common to All Action Alternatives

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

New 230 kV Circuit

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes the addition of approximately 12 miles of a new 230 kV transmission circuit onto existing Castaic – Olive 230 kV transmission line structures (towers 1-1 through 12-1). Approximately 300 feet of BLM-managed public lands and four miles of USFS lands would be traversed; however, the new circuit would not require new or additional ROW.

The dominant plant communities are chamise chaparral, Riversidian sage scrub, southern mixed chaparral, and development (POWER 2011; see Biological Resources Technical Report Appendix F).

Surveys conducted along the new 230 kV circuit corridor by a POWER botanist in the spring of 2010 detected slender mariposa lily (*Calochortus clavatus var. gracilis*) and short-joint beavertail (*Opuntia basilaris var. brachyclada*) along access roads in both burned and unburned chaparral. Peirson’s morning glory was also detected along the access roads. Although it was once listed as Sensitive by the USFS, Peirson’s morning-glory (*Calystegia peirsonii*) has subsequently been found to be common on ANF lands, and the USFS does not typically map or monitor populations (POWER 2011; see Biological Resources Technical Report). However, since only one population was observed along the new 230 kV circuit, USFS botanist Katie VinZant chose to map the population.

- Short-joint beavertail (*Opuntia basilaris var. brachyclada*) (9 individuals)
- Slender mariposa lily (*Calochortus clavatus var. gracilis*) (13 individuals)
Prior to field surveys, 53 special-status plant species were determined to have potential to occur within the proposed new 230 kV circuit corridor, including nine species with moderate potential to occur and 12 species with low to very low potential to occur. Special-status species are defined as any species currently listed, formally proposed for listing, or a candidate for listing as endangered or threatened under the federal Endangered Species Act (ESA) and California Endangered Species Act (CESA); any species designated as sensitive, of special concern, fully protected, or as a management indicator species by the Regional Forester, R5-USDA, California Department of Fish and Game (CDFG), or BLM; any species listed by the California Native Plant Society (CNPS) as List 1 or 2; or any species otherwise defined as rare, threatened, or endangered under the California Environmental Quality Act. Suitable habitat for these species may occur within chaparral and Riversidian sage scrub vegetation. All of these were searched for during 2010 protocol-level surveys at a time of year when they are identifiable in the field. However, surveys along the new 230 kV circuit corridor were constricted to alongside existing roads and towers, as other disturbance area locations are unknown at this time. Therefore, there is a high likelihood that other rare plant species populations may occur within this corridor.

The 13 special-status plants that are likely to occur within the new 230 kV circuit corridor include:

- Chaparral ragwort (*Senecio aphanactis*)
- Great’s aster (*Symphyotrichum greatae*)
- Ojai navarretia (*Navarretia ojaiensis*)
- Parry’s spineflower (*Chorizanthe parryi var. parryi*)
- Plummer’s mariposa lily (*Calochortus plummerae*)
- San Fernando Valley spineflower (*Chorizanthe parryi var. fernandina*)
- Slender-horned spineflower (*Dodecahema leptoceras*)
- Davidson’s bush-mallow (*Malacothamnus davidsonii*)
- Nevin’s barberry (*Berberis nevinii*)
- Palmer’s grapplinghook (*Harpagonella palmeri*)
- Peirson’s morning-glory (*Calystegia peirsonii*)
- Ross’s pitcher sage (*Lepechinia rossii*)
- San Gabriel bedstraw (*Galium grande*)

Weed species located within the new 230 kV circuit corridor include:

- Blessed thistle (*Cnicus benedictus*)
- Common horehound (*Marrubium vulgare*)
- Red brome (*Bromus madritensis* ssp. *rubens*)
- Slender wild oat (*Avena barbata*)
- Wild oat (*Avena fatua*)
- Cheatgrass (*Bromus tectorum*)
- Rat-tail fescue (*Vulpia myuros*)
- Ripgut brome (*Bromus diandrus*)
- Soft chess brome (*Bromus hordeaceus*)

Based on the presence of recorded occurrences, only one special-status species, California condor (*Gymnogyps californianus*), is believed to occur immediately within the impact corridor of the new 230 kV circuit.
Additional special-status wildlife species are believed to be present within one mile of the new 230 kV circuit impact corridor or to have the potential to occur within it, but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- Arroyo chub (*Gila ocultii*)
- Bald eagle (*Haliaeetus leucocephalus*)
- California red-legged Frog (*Rana draytonii*)
- Coast (San Diego) horned lizard (*Phrynosoma coronatum blainvillii*)
- Coastal rosy boa (*Lichanura trivirgata roseofusca*)
- Least Bell’s vireo (*Vireo bellii pusillus*)
- Pallid Bat (*Antrozous pallidus*)
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
- Tricolored blackbird (*Agelaius tricolor*)
- Western mastiff bat (*Eumops perotis californicus*)
- Western red bat (*Lasiurus blossevillii*)
- Arroyo toad (*Anasyrus Californicus*)
- California legless lizard (*Anniella pulchra*)
- California spotted owl (*Strix Occidentalis Occidentalis*)
- Coastal California gnatcatcher (*Polioptila californica californica*)
- Grasshopper sparrow (*Ammodramus savannarum*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Peregrine falcon (*Falco peregrinus*)
- Townsend’s big-eared bat (*Corynorhinus townsendii*)
- Two-striped garter snake (*Thamnophis hammondii*)
- Western spadefoot toad (*Spea hammondii*)
- White-tailed kite (*Elanus leucurus*)

In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative “snapshot” of bird use within the Project area. Two surveys were conducted along this corridor in fall 2010, and three surveys in spring 2011. Between both survey periods, a combined total of 94 avian species was positively detected and identified, with an estimated total of 2,348 individual birds detected. With the nearby Castaic Lagoon and Castaic Lake, the new 230 kV circuit corridor also supports a relatively high number of waterbirds in areas adjacent to it, with 22 waterbird species positively identified. The new 230 kV circuit corridor partially overlaps with Alternative 1 and shares some of the same detection data with it. It is possible that even more avian species were incidentally observed along this Project component during other Project surveys, and because these five survey dates presented only a snapshot of activity, it is likely that, on average, more or less bird species use this area than were detected during the point count survey dates.

Reconductoring of BR-RIN Transmission Line

The upgrade of the existing BR-RIN would involve approximately 13 miles of USFS lands and four miles of BLM-managed public lands.
The proposed route is located within the Sierra Pelona-Mint Canyon eco-region. The eco-region is characterized by mid-elevation foothills and urban development. The soils are well drained and have xeric characteristics; underlying rock is sedimentary with portions of granite (POWER 2011; see Biological Resources Technical Report). Significantly, Santa Ana winds formed in the desert advance toward the low pressure of the Coastal Ranges, and sweep through the Santa Clarita Valleys and Los Angeles Basin of this eco-region. Annual precipitation in the region ranges from 12 to 20 inches.

The dominant plant species are chamise (*Adenostoma fasciculatum*), manzanita (*Arctostaphylos glauca*), ceanothus (*Ceanothus* spp.), toyon (*Heteromeles arbutifolia*), coast live oak (*Quercus agrifolia*), and coastal sage scrub species including California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), and thick-leaf yerba santa (*Eriodictyon crassifolium*) (POWER 2011; see Biological Resources Technical Report Appendix F).

Two special-status plant species were within the reconductoring corridor during surveys conducted in 2008, 2009, and 2010 (POWER 2011):

- Short-joint beavertail (84 individuals)
- Slender mariposa lily (4,081 individuals)

The 59 special-status plant species that are likely to occur within the corridor include:

- Alkali mariposa lily (*Calochortus striatus*)
- Barstow woolly sunflower (*Eriophyllum mohavense*)
- Blochman’s dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)
- Braunton’s milk-vetch (*Astragalus brauntonii*)
- California androsace (*Androsace elongata* ssp. *acuta*)
- California satintail (*Imperata brevifolia*)
- Chaparral ragwort (*Senecio aphanactis*)
- Charlotte’s phacelia (*Phacelia nashiana*)
- Club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*)
- Creamy blazing star (*Mentzelia tridentata*)
- Davidson’s bush-mallow (*Malacothamnus davidsonii*)
- Delicate bluecup (*Githopsis tenella*)
- Desert cymopterus (*Cymopterus deserticola*)
- Gairdner’s yampah (*Perideridia gairdneri* ssp. *gairdneri*)
- Golden violet (*Viola aurea*)
- Greatta’s aster (*Symphyotrichum greatae*)
- Half’s monardella (*Monardella macrantha* ssp. *hallii*)
- Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*)
- Kusche’s sandwort (*Arenaria macradenia* var. *kuschei*)
- Laguna Mountains jewel flower (*Streptanthus bernardinus*)
- Late-flowered mariposa lily (*Calochortus weedii* var. *vestus*)
- Lemmon’s syntrichopappus (*Syntrichopappus lemmonii*)
- Many-stemmed dudleya (*Dudleya multicaulis*)
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)
- Mojave Indian paintbrush (*Castilleja plagiotoma*)
- Mojave tarplant (*Deinandra mohavensis*)
Based on the presence of recorded occurrences, the following wildlife species are believed to occur immediately within the impact corridor of the reconductoring corridor:

- **American badger** (*Taxidea taxus*)
- **Desert tortoise** (*Gopherus agassizii*)

Special-status wildlife species are believed to be present within one mile of the corridor, or to have the potential to occur within it, but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- **Plummer’s mariposa lily** (*Calochortus plummerae*)
- **San Bernardino aster** (*Symphyotrichum defoliatum*)
- **Santa Susana tarplant** (*Deinandra minthornii*)
- **Southern California black walnut** (*Juglans californica*)
- **Southern Mountains skullcap** (*Scutellaria bolanderi ssp. austromontana*)
- **Tehachapi buckwheat** (*Eriogonum callistum*)
- **White pygmy-poppy** (*Canbya candida*)
- **White-bracted spineflower** (*Chorizanthe xanti var. leucotheca*)

- **Ocellated lily** (*Lilium humboldtii ssp. ocellatum*)
- **Salientia gnatcatcher** (*Polioptila californica californica*)
- **Desert tortoise** (*Gopherus agassizii*)

Special-status wildlife species are believed to be present within one mile of the corridor, or to have the potential to occur within it, but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- **American badger** (*Taxidea taxus*)
- **Coastal California gnatcatcher** (*Polioptila californica californica*)

Special-status wildlife species are believed to be present within one mile of the corridor, or to have the potential to occur within it, but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- **American badger** (*Taxidea taxus*)
- **Coastal California gnatcatcher** (*Polioptila californica californica*)
• Arroyo chub (*Gila orcuttii*)
• California condor (*Gymnogyps californianus*)
• California spotted owl (*Strix occidentalis occidentalis*)
• Coastal rosy boa (*Lichanura trivirgata roseofusca*)
• Golden eagle (*Aquila chrysaetos*)
• Le Conte’s thrasher (*Toxostoma lecontei*)
• Loggerhead shrike (*Lanius ludovicianus*)
• Mountain plover (*Charadrius montanus*)
• Peregrine falcon (*Falco peregrinus*)
• San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
• Southwestern pond turtle (*Actinemys marmorata pallida*)
• Swainson’s hawk (*Buteo swainsoni*)
• Townsend’s big-eared bat (*Corynorhinus townsendii*)
• Two-striped Garter Snake (*Thamnophis hammondii*)
• Western red bat (*Lasiurus blossevillii*)
• Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)

• Burrowing owl (*Athene cunicularia*)
• California red-legged frog (*Rana draytonii*)
• Coast (San Diego) horned lizard (*Phrynosoma coronatum blainvillii*)
• Desert kit fox (*Vulpes macrotis arsipus*)
• Grasshopper sparrow (*Ammodramus savannarum*)
• Least Bell’s vireo (*Vireo bellii pusillus*)
• Mohave ground squirrel (*Spermophilus mohavensis*)
• Pallid bat (*Antrozous pallidus*)
• San Bernardino ringneck snake (*Diadophis punctatus modestus*)
• Southern grasshopper mouse (*Onychomys torridus ramona*)
• Southwestern willow flycatcher (*Empidonax traillii extimus*)
• Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*)
• Tricolored blackbird (*Agelaius tricolor*)
• Western Mastiff bat (*Eumops perotis californicus*)
• Western Spadefoot toad (*Spea hammondii*)
• White-tailed kite (*Elanus leucurus*)

USFWS-designated critical habitat for the coastal California gnatcatcher (*Polioptila californica californica*) is located on the southern portion of the reconductoring component of the Proposed Action and Alternatives. Direct and indirect impacts could occur from accessing this transmission line for maintenance and construction activities. Impacts to this species would be considered significant due to its protection under ESA and would require formal consultation with USFWS.

In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative snapshot of bird use within the Project area. Two surveys were conducted along the reconductoring component in fall 2010, and three surveys in spring 2011. Between both survey periods, a combined total of 92 avian species was positively detected and identified, with an estimated total of 3,342 individual birds detected. The reconductoring
component shares the same corridor with all of Alternative 2 and therefore shares the same avian detections with this alternative for the point count data. In addition to this area, it also continues south for another portion that is not shared with any other Project components. Along with the species detected during the avian point count surveys, it is also possible that even more avian species were incidentally observed along this Project component during other Project surveys, and because these five survey dates presented only a snapshot of activity in the survey areas, it is likely that, on average, more or less bird species use this area than were detected during the point count survey dates.

New Haskell Canyon Switching Station

All of the vegetation communities and cover types occurring within the proposed 2.7-acre development footprint at the proposed Haskell Canyon Switching Station site would be impacted by the construction of the proposed switching station. The station would be 500 feet by 600 feet to accommodate the necessary equipment, such as steel support structures, circuit breakers, disconnect switches, and associated equipment, and a relay house and control house containing control and protective relaying equipment. The relay and control houses would each be 30 feet long by 12 feet wide by 10 feet high and constructed of gray concrete block. The station yard would include a paved internal access road 16 feet wide, and would be enclosed by chain-link fencing with barbed-wire extension for security. The station yard would include a paved internal access road 16 feet wide, a 100 foot by 100 foot gravel parking area, and would be enclosed by chain-link fencing with barbed-wire extension for security.

The dominant plant community within the Haskell Canyon Switching Station footprint is Riversidn Sage Scrub. The surrounding communities include chamise chaparral and development (POWER 2011; see Biological Resources Technical Report Appendix F). Surveys conducted by a POWER botanist in the spring of 2009 detected short-joint beavertail cactus approximately 0.25 mile south from the switching station site. In addition, the special-status species listed below for Alternative 2 have the potential to occur in the Haskell Canyon Switching Station area.

There are 58 special-status plant species that have the potential to occur within the Haskell Canyon Switching Station footprint:

- Alkali mariposa lily (*Calochortus striatus*)
- Blochman’s dudleya (*Dudleya blochmaniae ssp. blochmaniae*)
- California androsace (*Androsace elongata ssp. acuta*)
- Chaparral ragwort (*Senecio aphanactis*)
- Club-hair mariposa lily (*Calochortus clavatus var. clavatus*)
- Davidson’s bush-mallow (*Malacothamnus davidsonii*)
- Desert cymopterus (*Cymopterus deserticola*)
- Barstow woolly sunflower (*Eriophyllum mohavense*)
- Braunton’s milk-vetch (*Astragalus brauntonii*)
- California satintail (*Imperata brevifolia*)
- Charlotte’s phacelia (*Phacelia nashiana*)
- Creamy blazing star (*Mentzelia tridentata*)
- Delicate bluecup (*Githopsis tenella*)
- Gairdner’s yampah (*Perideridia gairdneri ssp. gairdneri*)
• Golden violet (*Viola aurea*)
• Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*)
• Laguna Mountains jewel flower (*Streptanthus bernardinus*)
• Lemmon’s sytrichopappus (*Sytrichopappus lemmonii*)
• Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)
• Mojave tarplant (*Deinandra mohavensis*)
• Ocellated lily (*Lilium humboldtii* ssp. *ocellatum*)
• Pale-yellow layia (*Layia heterotricha*)
• Parish’s checkerbloom (*Sidalcea hickmanii* ssp. *parishii*)
• Peirson’s lupine (*Lupinus peirsonii*)
• Piute Mountains jewel-flower (*Streptanthus cordatus* var. *piutensis*)
• Red Rock poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*)
• Rock Creek broomrape (*Orobanche valida* ssp. *valida*)
• Ross’s pitcher sage (*Lepechinia rossii*)
• Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)
• San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)
• San Gabriel Mountains dudleya (*Dudleya densiflora*)
• Slender-horned spineflower (*Dodecahema leptoceras*)
• Southern Mountains skullcap (*Scutellaria bolanderi* ssp. *austromontana*)
• Southern tarplant (*Centromadia parryi* ssp. *australis*)
• Thread-leaved brodiaea (*Brodiaea filifolia*)
• White rabbit-tobacco (*Pseudognaphalium leucocephalum;* SYN=*Gnaphalium leucocephalum*)

• Hall’s monardella (*Monardella macrantha* ssp. *hallii*)
• Kusche’s sandwort (*Arenaria macradenia* var. *kuschei*)
• Late-flowered mariposa lily (*Calochortus weedii* var. *vestus*)
• Many-stemmed dudleya (*Dudleya multicaulis*)
• Mojave Indian paintbrush (*Castilleja plagiotoma*)
• Nevin’s barberry (*Berberis nevinii*)
• Ojai navarretia (*Navarretia ojaiensis*)
• Palmer’s grapplinghook (*Harpagonella palmeri*)
• Parry’s spineflower (*Chorizanthe parryi* var. *parryi*)
• Peirson’s morning-glory (*Calystegia peirsonii*)
• Plummer’s mariposa lily (*Calochortus plummerae*)
• Red Rock tarplant (*Deinandra arida*)
• Rock monardella (*Monardella viridis* ssp. *saxicola*)
• Round-leaved filaree (*California macrophylla*)
• San Bernardino aster (*Symphyotrichum defoliatum*)
• San Gabriel bedstraw (*Galium grande*)
• Santa Susana tarplant (*Deinandra minthornii*)
• Southern California black walnut (*Juglans californica*)
• Southern jewel flower (*Streptanthus campestris*)
• Tehachapi buckwheat (*Eriogonum callistum*)
• White pygmy-poppy (*Canbya candida*)
• White-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*)

Weed species potentially located in the Haskell Canyon Switching Station footprint are:
Cheatgrass (*Bromus tectorum*)
Hoary brome (*Bromus hordeaceus*)
Red brome (*Bromus madritensis*)
Spanish broom (*Spartium junceum*)
Tansy mustard (*Descurainia sophia*)

Filaree (*Erodium cicutarium*)
Indian hedgemustard (*Sisymbrium orientale*)
Ripgut brome (*Bromus diandrus*)
Tall tumblemustard (*Sisymbrium altissimum*)
Tocalote (*Centaurea melitensis*)

The four special-status wildlife species that are potentially located in the Haskell Canyon Switching Station footprint include:

Coast horned lizard (*Phrynosoma coronatum blainvillii*)
Townsend’s big-eared bat (*Corynorhinus townsendii*)

Pallid bat (*Antrozous pallidus*)
White-tailed kite (*Elanus leucurus*)

In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative snapshot of bird use within the Project area. While no surveys were conducted on the specific proposed switching station site, three surveys were conducted in fall 2010 and two surveys in spring 2011 at two sites nearby and in close proximity to the site. Between both survey periods, a combined total of 35 avian species was positively detected and identified at these two points, with an estimated total of 187 individual birds detected. It is possible that more avian species were incidentally observed at or near the proposed switching station site during previous surveys conducted in this area, and because these survey dates presented only a snapshot of activity in the survey area, it is likely that, on average, more or less bird species use this area than were detected during the point count survey dates.

**Expansion of Barren Ridge Switching Station**

LADWP proposes expansion of the existing Barren Ridge Switching Station to the east side by 235 feet for a total station size of 485 feet by 500 feet (5.7 acres). The expansion area of the station would include electrical structures and equipment for the addition of transmission lines, a material staging area, roadway within the station, and drainage area. Expansion of the existing switching station would be very similar to the construction of the Haskell Canyon Switching Station. Expansion would consist of preconstruction surveys, site preparation and grading, installation of reinforced concrete foundations, installation of electrical conduits for equipment power and control, and installation of structures and equipment.

Habitat assessment surveys were conducted in 2008. Surveys were conducted on foot in native plant communities surrounding the existing station ROW, as access allowed. Particular attention was given to any remaining undisturbed habitat pockets, with the assumption that undisturbed areas provide higher quality habitat than those altered by anthropogenic activity. Some highly developed areas were not surveyed, due to the absence of characteristics able to support the
species of interest. To gain a sense of wildlife activity levels in proximity to the proposed expansion of the Barren Ridge Switching Station, biologists documented any observed sensitive wildlife species and evaluated habitat for suitable characteristics to support State or federal protected species. The primary species to be assessed during the survey included desert tortoise, Mohave ground squirrel, desert kit fox (*Vulpes macrots arsipus*), and burrowing owl (*Athene cunicularia*).

Vegetation within the survey area was classified using Holland’s *Preliminary Descriptions of the Terrestrial Natural Communities of California* as a guide and primary reference (Holland 1986). Holland’s system was used because of its habitat-based approach and because it includes all of the general vegetation communities found within the switching station footprint and can be applied when most data used in classification are qualitative, as is the case for this Project. *A Manual of California Vegetation* (Sawyer, Keeler-Wolf 1995) was used as a reference and the equivalent was provided in the Biological Resources Technical Report (POWER 2011) when applicable. *A Manual of California Vegetation*, Second Edition (Sawyer, Keeler-Wolf, Evens 2009) was released after vegetation mapping was conducted for the majority of the BRRTP. Mojave creosote bush scrub (Holland 1986) is the predominant vegetation type at the Barren Ridge Switching Station. It is composed of widely spaced evergreen and drought-deciduous shrubs dominated by creosote bush (*Larrea tridentata*), burro brush (*Ambrosia dumosa*), and cheesebush (*Hymenolea salsola*) as well as various cactus (*Opuntia* spp., *Cylindropuntia* spp.) species.

No special-status plants were located in the Barren Ridge Switching Station area. However, because not all areas of potential impact within the area were surveyed at the protocol level, additional special-status plant species could be present. This is based on known occurrence locations and/or the availability of suitable habitat.

The 10 special-status plants that are likely to occur near or within the Barren Ridge Switching Station footprint include:

- Alkali mariposa lily (*Calochortus striatus*)
- Charlotte’s phacelia (*Phacelia nashiana*)
- Mojave tarplant (*Deinandra mohavensis*)
- Piute Mountains jewel-flower (*Streptanthus cordatus var. piutensis*)
- Red Rock tarplant (*Deinandra arida*)
- Barstow woolly sunflower (*Eriophyllum mohavense*)
- Creamy blazing star (*Mentzelia tridentata*)
- Pale-yellow layia (*Layia heterotricha*)
- Red Rock poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*)
- White pygmy-poppy (*Canbya candida*)

Weed species located in the Barren Ridge Switching Station footprint are:

- Cheatgrass* (*Bromus tectorum*)
- Indian hedgemustard (*Sisymbrium orientale*)
- Red brome* (*Bromus madritensis*)

* Indicates species that were too widespread and numerous to map.

The special-status wildlife species that are potentially located in the Barren Ridge Switching Station footprint include:
• Desert tortoise (*Gopherus agassizii*)

• Le Conte’s thrasher (*Toxostoma lecontei*)

In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative snapshot of bird use within the Project area. Two surveys were conducted at the Barren Ridge Switching Station in spring 2011. Between both surveys, a combined total of 11 avian species was positively detected and identified, with an estimated total of 52 individual birds detected. It is possible that more avian species were incidentally observed at or near the switching station during previous surveys conducted in this area, and because these two survey dates presented only a snapshot of activity in the survey area, it is likely that, on average, more or less bird species use this area than were detected during the point count survey dates.

**New 230 kV Double-Circuit Transmission Line**

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

**Alternative 1**

Alternative 1 230 kV transmission line would cross 83 miles and would require 7.3 miles of new access road. The majority of the Alternative 1 transmission line area within the ANF consists of dense, impenetrable chaparral, with very steep slopes. The Project corridors in the northern region would lie within the Mojave Ecotype characterized by Mojave creosote bush scrub and Mojave wash scrub with scattered and isolated rural residential properties and agricultural fields. The level of precipitation in this ecotype ranges from four to ten inches annually. Dry lakes, or playas, occur in the arid northern portion of the Alternative 1 area. Within the Antelope-Fremont Valleys watershed, streams crossed by the study corridors include Cache Creek, Oak Creek, Cottonwood Creek, Armargosa Creek, Anaverde Creek, Railroad Canyon Creek, Willow Springs, and multiple unnamed perennial and intermittent streams. The Alternative 1 transmission line would parallel the First and Second Los Angeles Aqueducts in the northernmost portion of the Project area, and both aqueducts occur within the study corridor.

In the northern end of the Project area, human occupation of the Antelope Valley has significantly altered these local habitats and wildlife resources, as agricultural, military, and development activities have resulted in an overall reduction of biodiversity and population of wildlife species within the terrestrial habitats.

The southern end of the Alternative 1 transmission line within the ANF would be located in steep, mountainous terrain of the eastern Transverse Range, including the Sierra Pelona Mountains. The ecotype is considered the Northern Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands. The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern
end of the eco-region, the high-elevation mountain range transcends into the foothills of the Santa Clarita Valley. Long periods of hot, dry weather are not uncommon at the high elevations of the Northern Transverse Ranges. Precipitation ranges from 6 to 40 inches annually throughout the eco-region.

Soil
The soils predominantly comprise alluvial plain and pediment with small hills within the northern end of Alternative 1 (POWER 2011; see Biological Resources Technical Report). For the southern end of the Alternative 1 transmission line, the eco-type is considered the Northern Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands.

Vegetation
Eleven different vegetation communities were mapped within the northern end of the Alternative 1 transmission line corridor. Full descriptions of each of these habitats are provided in Section 4.1 of the Biological Resources Technical Report. The most common vegetation communities are Mojave Creosote Bush Scrub and Riversidian Sage Scrub at lower elevations (USFS 2005, Sawyer 1993, Holland 1986). Vegetation communities along the northern portion of the Alternative 1 transmission line within the ANF include Mojavean juniper woodland and scrub and southern mixed haparral with Juniperus californica (California juniper) and Ceanothus spp. (ceanothus) dominating the overstory.

Within the central and southern end of the Alternative 1 transmission line, the vegetation composition is predominantly drought tolerant, evergreen shrubs. The general eco-region is dominated by southern mixed haparral with a sparse mixture of deciduous broadleaf trees and conifers, decreasing in density as the elevation drops into the Santa Clarita Valley and Los Angeles Basin (POWER 2011; see Biological Resources Technical Report). Overstory plant species within the region include California juniper (Juniperus californica), foothill pine (Pinus sabiniana), oak species (Quercus spp.), ceanothus, big berry manzanita, and chamise.

Biological soil crusts are present within openings in coastal sage scrub, chaparral, Mojave desert scrub, and Joshua tree woodland on undisturbed soils throughout Alternative 1.

Special-Status Species
There are two special-status plant species known to occur within the Alternative 1 transmission line impact corridor:

- Short-joint beavertail (Opuntia basilaris var. brachyclada). Total of 49 individuals.
- Slender mariposa lily (Calochortus clavatus var. gracilis). Total of 28 individuals.

As not all areas of potential impact within the Alternative 1 transmission line corridor were surveyed, an additional 52 special-status plant species could be present within the impact corridor. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:
- Alkali mariposa lily (*Calochortus striatus*)
- Barlow woolly sunflower (*Eriophyllum mohavense*)
- Blochman’s dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)
- Braunton’s milk-vetch (*Astragalus brauntonii*)
- California androsace (*Androsace elongata* ssp. *acuta*)
- California satintail (*Imperata brevifolia*)
- Chaparral ragwort (*Senecio aphanactis*)
- Charlotte’s phacelia (*Phacelia nashiana*)
- Club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*)
- Creamy blazing star (*Mentzelia tridentata*)
- Davidson’s bush-mallow (*Malacothamnus davidsonii*)
- Delicate bluecup (*Githopsis tenella*)
- Desert cymopterus (*Cymopterus deserticola*)
- Gairdner’s yampah (*Perideridia gairdneri* ssp. *gairdneri*)
- Golden violet (*Viola aurea*)
- Hall’s monardella (*Monardella macrantha* ssp. *hallii*)
- Late-flowered mariposa lily (*Calochortus weedii* var. *vestus*)
- Lemmon’s syntrichopappus (*Syntrichopappus lemmontii*)
- Many-stemmed dudleya (*Dudleya multicaulis*)
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)
- Mojave Indian paintbrush (*Castilleja platyotoma*)
- Mojave tarplant (*Deinandra mohavensis*)
- Nevin’s barberry (*Berberis nevinii*)
- Ocellated lily (*Lilium humboldtii* ssp. *ocellatum*)
- Ojai navarretia (*Navarretia ojaiensis*)
- Pale-yellow layia (*Layia heterotrucha*)
- Palmer’s grapplinghook (*Harpagonella palmeri*)
- Parry’s spineflower (*Chorizanthe parryi* var. *parryi*)
- Peirson’s lupine (*Lupinus peirsonii*)
- Peirson’s morning-glory (*Calystegia peirsonii*)
- Piute Mountains jewel-flower (*Streptanthus cordatus* var. *piutensis*)
- Plummer’s mariposa lily (*Calochortus plummerae*)
- Red Rock poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*)
- Red Rock tarplant (*Deinandra arida*)
- Rock monardella (*Monardella viridis* ssp. *saxicola*)
- Ross’s pitcher sage (*Lepechinia rossii*)
- Round-leaved filaree (*California macrophylla*)
- Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)
- San Bernardino aster (*Symphyotrichum defoliatum*)
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)
- San Gabriel bedstraw (*Galium grande*)
- San Gabriel Mountains dudleya (*Dudleya densiflora*)
- Slender-horned spineflower (*Dodecahema leptoceras*)
- Santa Susana tarplant (*Deinandra minthornii*)
- Southern California black walnut (*Juglans californica*)
- Southern jewel flower (*Streptanthus campesiris*)
Southern tarplant (*Centromadia parryi* ssp. *australis*)
- Thread-leaved brodiaea (*Brodiaea filifolia*)
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*; SYN=*Gnaphalium leucocephalum*)
- Tehachapi buckwheat (*Eriogonum callistum*)
- White pygmy-poppy (*Canbya candida*)
- White-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*)

**Non-Native and Invasive Plant Species**

In the northwestern corner of the Alternative 1 transmission line corridor on the ANF, along Forest Road 8N01, slender wild oat, wild oat, ripgut brome, soft chess brome, red brome, cheatgrass, tocalote, tansy mustard (*Descurania sophia*), filaree, shortpod mustard, prickly lettuce, smilo grass (*Piptatherum junceum*), Mediterranean grass, tumble mustard, sow thistle, and rat-tail fescue were common, but were not mapped due to their abundance. However, Russian thistle, Spanish broom, saltcedar, giant reed grass, yellow star thistle, fennel, perennial pepperweed, tree tobacco, and black locust were mapped on ANF lands within the Alternative 1 corridor, as they occur in more distinct populations. One small occurrence of Indian hedgemustard (*Sisymbrium orientale*) was mapped along BLM lands on the Alternative 1 transmission line corridor (POWER 2011; see Biological Resources Technical Report Appendix F).

There are three special-status wildlife species that are known to occur within the Alternative 1 transmission line impact corridor:

- **American badger** (*Taxidea taxus*)
- **California condor** (*Gymnogyps californianus*)
- **Desert tortoise** (*Gopherus agassizii*)

Potential coastal California gnatcatcher habitat was observed along the Alternative 1 transmission line within the ANF (POWER 2009a), and several individuals were detected during bird use count surveys conducted by POWER biologists in fall 2010 and spring 2011. While this species is expected to be present in the general Project area, it was not detected within the ROW or what is referred to as the impact corridor, which is 250 feet on either side of the proposed centerline.

Additional special-status wildlife species are believed to be present within one mile of the Alternative 1 transmission line impact corridor but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- **Bald eagle** (*Haliaeetus leucocephalus*)
- **Burrowing owl** (*Athene cunicularia*)
- **Coast (San Diego) horned lizard** (*Phrynosoma coronatum blainvillii*)
- **Coastal California gnatcatcher** (*Polioptila californica californica*)
- **Coastal rosy boa** (*Lichanura trivirgata roseofusca*)
- **Desert kit fox** (*Vulpes macrotis arsipus*)
- **Golden eagle** (*Aquila chrysaetos*)
- **Grasshopper sparrow** (*Ammodramus savannarum*)
Le Conte’s thrasher (Toxostoma lecontei)  
Loggerhead shrike (Lanius ludovicianus)  
Pallid bat (Antrozous pallidus)  
San Diego black-tailed jackrabbit (Lepus californicus bennettii)  
Swainson’s hawk (Buteo swainsoni)  
Townsend’s big-eared bat (Corynorhinus townsendii)  
Western mastiff Bat (Eumops perotis californicus)  
Western spadefoot toad (Spea hammondii)  

Least Bell’s vireo (Vireo bellii pusillus)  
Mountain plover (Charadrius montanus)  
Peregrine falcon (Peregrine falcon)  
Southern grasshopper mouse (Onychomys torridus ramona)  
Tehachapi pocket mouse (Perognathus aliticulus inexpectatus)  
Tricolored blackbird (Agelaius tricolor)  
Western red bat (Lasius blossevillii)  
White-tailed kite (Elanus leucurus)

Migratory Birds
In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative snapshot of bird use within the Project area. Two surveys were conducted along this alternative in fall 2010, and three surveys in spring 2011. Between both survey periods, a combined total of 94 avian species was positively detected and identified, with an estimated total of 2,065 individual birds detected. Alternative 1 partially overlaps with the new 230 kV circuit corridor and shares some of the same detection data with that corridor. In addition, it shares the same corridors through a portion of its northern end with Alternatives 2, 2a, and 3. Because avian point count surveys were only conducted along the Proposed Action, a large portion of Alternative 1 in the Angeles National Forest and Antelope Valley was not surveyed during these efforts. Therefore, there are likely to be additional species that use the Alternative 1 corridor regularly or periodically that were not represented during these surveys. It is also possible that even more avian species were incidentally observed along this alternative corridor during other Project surveys, and because these five survey dates presented only a snapshot of activity in the survey areas, it is likely that, on average, more or less bird species use this area than were detected during the point count survey dates.

Alternative 2 – LADWP’s Proposed Action and Federal Agency Preferred Alternative

The Alternative 2 230 kV transmission line would start in the Mojave Ecotype, characterized by desert salt brush with scattered and isolated rural residential properties and agricultural fields. Dry lakes, or playas, occur in the arid northern portion of the Project area. The level of precipitation in this ecotype ranges from 4 to 10 inches annually. Within the Antelope-Fremont Valleys watershed, streams crossed by the study corridors include Cache Creek, Oak Creek, Cottonwood Creek, Armargosa Creek, Anaverde Creek, Railroad Canyon Creek, Willow Springs, and multiple unnamed perennial and intermittent streams.

As the Alternative 2 transmission line would head south, it would cross through the ANF. The area is characterized by steep, mountainous terrain of the eastern Transverse Ranges, including the northern San Gabriel and Liebre Mountains. The ecotype is considered the Northern
Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is bisected by granitic uplands (POWER 2011; see Biological Resources Technical Report). The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern end of the eco-region, the high-elevation mountain range transcends into the foothills of the Santa Clarita Valley. Long periods of hot, dry weather are not uncommon at the high elevations of the Northern Transverse Ranges. Precipitation ranges from 6 to 40 inches annually throughout the eco-region.

Soils
In the northern portion of the Alternative 2 transmission line corridor, the soils predominantly comprise alluvial plain and pediment with small hills (POWER 2011; see Biological Resources Technical Report). The southern end of the Alternative 2 transmission line corridor is considered the Northern Transverse Range ecotype and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands.

Vegetation
Within the northern eco-region boundary of the Alternative 2 transmission line corridor, the most common vegetation communities include Mojave creosote bush scrub and Riversidian sage scrub at lower elevations, with Mojavean juniper woodland and scrub and southern mixed chaparral as the elevation increases (USFS 2005, Sawyer 1993, Holland 1986, POWER 2011; see Biological Resources Technical Report). Where the transmission line would cross through the ANF, the eco-region is dominated by southern mixed chaparral with a sparse mixture of deciduous broadleaf trees and conifers, decreasing in density as the elevation drops into the Santa Clarita Valley and Los Angeles Basin. Dominant overstory plant species throughout the Alternative 2 transmission line area within Mojave creosote bush scrub and Joshua tree woodland include Creosote bush and Joshua tree. As elevation increases in the foothills California juniper, foothill pine, oak species, ceanothus, big berry manzanita, and chamise dominate the overstory. There are three major drainages and several small drainages that originate from the foothills of the ANF and spread over the northwestern Los Angeles County region. The San Francisquito Canyon Creek, a minor drainage in the area, has several small distributaries. The Santa Clara River also has two minor distributaries, San Francisquito Canyon Creek and Bouquet Canyon Creek. Many reaches of these natural and modified stream channels have the ability to support riparian areas and function as wildlife corridors.

Biological soil crusts are present within openings in coastal sage scrub, chaparral, Mojave desert scrub, and Joshua tree woodland on undisturbed soils throughout Alternative 2.

Special-Status Species
There are two special-status plant species that are known to occur within the Alternative 2 transmission line impact corridor:

- Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*). Total of 84 individuals.
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*). Total of 4,081 individuals.
As not all areas of potential impact within the Alternative 2 transmission line corridor were surveyed, an additional 58 special-status plant species could be present within the impact corridor. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- Alkali mariposa lily (*Calochortus striatus*)
- Barstow woolly sunflower (*Eriophyllum mohavense*)
- Blochman’s dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)
- Braunton’s milk-vetch (*Astragalus brauntonii*)
- California androsace (*Androsace elongata* ssp. *acuta*)
- California satintail (*Imperata brevifolia*)
- Chaparral ragwort (*Senecio aphanactis*)
- Charlotte’s phacelia (*Phacelia nashiana*)
- Club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*)
- Creamy blazing star (*Mentzelia tridentata*)
- Davidson’s bush-mallow (*Malacothamnus davidsonii*)
- Delicate bluecup (*Githopsis tenella*)
- Desert cymopterus (*Cymopterus deserticola*)
- Gairdner’s yampah (*Perideridia gairdneri* ssp. *gairdneri*)
- Golden violet (*Viola aurea*)
- Hall’s monardella (*Monardella macrantha* ssp. *hallii*)
- Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*)
- Kirsch’s sandwort (*Arenaria macradenia* var. *kuschei*)
- Laguna Mountains jewel flower (*Streptanthus bernardinus*)
- Late-flowered mariposa lily (*Calochortus weedii* var. *vestus*)
- Lemmon’s syntrichopappus (*Syntrichopappus leonon*)
- Many-stemmed dudleya (*Dudleya multicaulis*)
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)
- Mojave Indian paintbrush (*Castilleja plagiotoma*)
- Mojave tarplant (*Deinandra mohavensis*)
- Nevin’s barberry (*Berberis nevinii*)
- Ocellated lily (*Lilium humboldtii* ssp. *ocellatum*)
- Ojai navarretia (*Navarretia ojaiensis*)
- Pale-yellow layia (*Layia heterotricha*)
- Palmer’s grapplinghook (*Harpagonella palmeri*)
- Parish’s checkerbloom (*Sidalcea hickmanii* ssp. *parishii*)
- Parry’s spineflower (*Chorizanthe parryi* var. *parryi*)
- Peirson’s lupine (*Lupinus peirsonii*)
- Peirson’s morning-glory (*Calystegia peirsonii*)
- Piute Mountains jewel-flower (*Streptanthus cordatus* var. *piutensis*)
- Plummer’s mariposa lily (*Calochortus plummerae*)
- Red Rock poppy (*Eschscholzia minutiflora* ssp. *tisselmannii*)
- Red Rock tarplant (*Deinandra arida*)
- Rock Creek broomrape (*Orobanche valida* ssp. *valida*)
- Rock monardella (*Monardella viridis* ssp. *saxicola*)
- Ross’s pitcher sage (*Lepechinia rossii*)
- Round-leaved filaree (*California macrophylla*)
Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)
San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)
San Gabriel Mountains dudleya (*Dudleya densiflora*)
Slender-horned spineflower (*Dodecahema leptoceras*)
Southern Mountains skullcap (*Scutellaria bolanderi* ssp. *austromontana*)
Southern tarplant (*Centromadia parryi* ssp. *australis*)
Thread-leaved brodiaea (*Brodiaea filifolia*)
White rabbit-tobacco (*Pseudognaphalium leucocephalum*; SYN=*Gnaphalium leucocephalum*)
San Bernardino aster (*Symphyotrichum defoliatum*)
San Gabriel bedstraw (*Galium grande*)
Santa Susana tarplant (*Deinandra minthornii*)
Southern California black walnut (*Juglans californica*)
Southern jewel flower (*Streptanthus campestris*)
Tehachapi buckwheat (*Eriogonum callistum*)
White pygmy-poppy (*Canbya candida*)
White-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*)

Due to the existing access along the Alternative 2 transmission line, more biological data was collected along this corridor relative to the other Alternatives. Detailed vegetation mapping and special-status plant and wildlife surveys were conducted along this Alternative from 2008 through 2010, including surveys along access roads.

There are two special-status wildlife species that are known to be present within the Alternative 2 transmission line impact corridor:

- **American badger** (*Taxidea taxus*)
- **Desert tortoise** (*Gopherus agassizii*)

Additional special-status wildlife species are believed to be present within one mile of the Alternative 2 transmission line impact corridor but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- **Arroyo chub** (*Gila orcuttii*)
- **California condor** (*Gymnogyps californianus*)
- **California Spotted Owl** (*Strix occidentalis occidentalis*)
- **Coastal Rosy Boa** (*Lichanura trivirgata roseofusca*)
- **Golden Eagle** (*Aquila chrysaetos*)
- **Burrowing owl** (*Athene cunicularia*)
- **California red-legged frog** (*Rana draytonii*)
- **Coast (San Diego) horned lizard** (*Phrynosoma coronatum blainvillii*)
- **Desert kit fox** (*Vulpes macrotis arsipus*)
- **Grasshopper sparrow** (*Ammodramus savannarum*)
- **Le Conte’s Thrasher** (*Toxostoma lecontei*)
- **Loggerhead shrike** (*Lanius ludovicianus*)
- **Least Bell’s vireo** (*Vireo bellii pusillus*)
- **Mohave ground squirrel** (*Spermophilus mohavensis*)
- **Mountain plover** (*Charadrius montanus*)
- **PalUid bat** (*Antrozous pallidus*)
Peregrine falcon (*Falco peregrinus*)
San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
Southwestern pond turtle (*Actinemys marmorata pallida*)
Swainson’s hawk (*Buteo swainsoni*)
Townsend’s big-eared bat (*Corynorhinus townsendii*)
Two-striped garter snake (*Thamnophis hammondii*)
Western red bat (*Lasiurus blossevillii*)
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
San Bernardino ringneck snake (*Diadophis punctatus modestus*)
Southern grasshopper mouse (*Onychomys torridus ramona*)
Southwestern willow flycatcher (*Empidonax traillii extimus*)
Tehachapi pocket mouse (*Perognathus alicolus inexpectatus*)
Tricolored blackbird (*Agelaius tricolor*)
Western mastiff bat (*Eumops perotis californicus*)
Western spadefoot toad (*Spea hammondii*)
White-tailed kite (*Elanus leucurus*)

The Alternative 2 transmission line would parallel San Francisquito Creek for five miles and cross the creek south of the unincorporated community of Green Valley. The point the proposed centerline would cross the creek is from ridgeline to ridgeline. However, it is important to note that all designated USFWS wildlife habitat and USFS-modeled GIS habitat near the Alternative 2 transmission line is located along San Francisquito Creek. For the five miles that the transmission line would parallel San Francisquito Creek, the USFS-modeled habitat is well outside the 500-foot proposed transmission line corridor. During several field surveys, it was determined that amphibian species would not be able to access the Alternative 2 transmission line due to steep ridgeline that would separate the USFS-modeled habitat and transmission line.

**Non-Native and Invasive Plant Species**

Weed species known to occur along the Alternative 2 transmission line corridor within the ANF are:

Blessed milkthistle (*Silybum marianum*)
Cheatgrass (*Bromus tectorum*) *
Hoary brome (*Bromus hordeaceus*) *
Indian hedgemustard (*Sisymbrium orientale*)
Prickly Russian thistle (*Salsola tragus*)
Rat-tail fescue (*Vulpia myuros*) *
Ripgut brome (*Bromus diandrus*) *
Rock rose (*Cistus ladanifer*)
Shortpod mustard (*Hirschfeldia incana*) *
Spanish broom (*Spartium junceum*)
Tall tumblemustard (*Sisymbrium altissimum*) *
Tocalote (*Centaurea melitensis*) *
Wild oats (*Avena sp.*) *
Blessed thistle (*Cnicus benedictus*)
Filaree (*Erodium cicutarium*) *
Horehound (*Marrubium vulgare*)
Mediterranean grass (*Schismus barbatus*) *
Rabbit-foot grass (*Polypogon monspeliensis*)
Red brome (*Bromus madritensis*) *
Rock rose (*Cistus creticus*)
Saltcedar (*Tamarix ramosissima*)
Smilograss (*Piptatherum miliaceum*) *
Sweetclover (*Melilotus officinalis*) *
Tansy mustard (*Descurainia sophia*) *
Tree tobacco (*Nicotiana glauca*)

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Migratory Birds
In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative snapshot of bird use within the Project area. Two surveys were conducted along this alternative in fall 2010, and three surveys in spring 2011. Between both survey periods, a combined total of 82 avian species was positively detected and identified, with an estimated total of 2,369 individual birds detected. Alternative 2 shares the same corridors through a portion of its northern end with Alternatives 1, 2a, and 3. It is possible that even more avian species were incidentally observed along this alternative corridor during other Project surveys, and because these five survey dates presented only a snapshot of activity in the survey areas, it is likely that, on average, more or less bird species do use this area than were detected during the point count survey dates.

A temporary transmission line would be required for construction of Alternative 2 around the unincorporated community of Green Valley to maintain power while the permanent structures are being upgraded. This temporary transmission line would be 7.5 miles long and extend from near LADWP’s Power Plant 1 to just north of Johnson Road in the unincorporated community of Elizabeth Lake, and would constitute 4.18 acres of temporary disturbance. The Alternative corridor is located almost entirely directly adjacent to San Francisquito Canyon Road, and construction would predominantly occur in areas that are already disturbed or developed. Although there are some areas of agricultural and southern mixed chaparral habitat types where the temporary transmission line would leave the road, overall habitat quality is estimated to be low. Potential habitat is present to support southwestern willow flycatcher (Empidonax traillii extimus), arroyo toad, California red-legged frog, least Bell’s vireo (Vireo bellii pusillus), and unarmored threespine stickleback (Gasterosteus aculeatus williamsoni), but there are no known special-status wildlife occurrences or wildlife corridors in this area (POWER 2011; see Biological Resources Technical Report). The special-status plant species that have a potential to be impacted by this temporary line are:

- Alkali mariposa lily (Calochortus striatus)
- California androsace (Androsace elongata ssp. acuta)
- Club-haired mariposa lily (Calochortus clavatus var. clavatus)
- Gairdner’s Yampah (Perideridia gairdneri ssp. gairdneri)
- Hall’s monardella (Monardella macrantha ssp. hallii)
- Laguna Mountains jewel flower (Streptanthus bernardinus)
- Braunton’s milk-vetch (Astragalus brauntonii)
- California satintail (Imperata brevifolia)
- Davidson’s bush-mallow (Malacothamnus davidsonii)
- Golden violet (Viola aurea)
- Kusche’s sandwort (Arenaria macradenia var. kuschei)
- Late-flowered mariposa lily (Calochortus weedii var. vestus)
The non-native plant species that are known or likely to be present are the same as those species listed above for the Alternative 2 transmission line. The temporary line would partially fall within the San Andreas Rift Zone SEA and the Santa Clara River SEA. It is estimated that 81 trees would require trimming or removal along this route within 28 distinct sections of road. These mostly consist of Quercus or Pinus species. Twenty-seven of these trees are within NFS boundaries.

Alternative 2a
The Alternative 2a 230 kV transmission line would run along the same alignment as the Alternative 2 transmission line until it reaches the unincorporated community of Green Valley. This localized Alternative would then skirt around the unincorporated community of Green Valley. The Alternative 2a transmission line would start in the Mojave Ecotype, characterized by Mojave creosote bush scrub and Mojave wash scrub with scattered and isolated rural residential properties and agricultural fields. The level of precipitation in this ecotype ranges from 4 to 10 inches annually. The soils predominantly comprise alluvial plain and pediment with small hills (POWER 2011; see Biological Resources Technical Report). Dry lakes, or playas, occur in the arid northern portion of the Project area. Within the Antelope-Fremont Valleys watershed, streams crossed by the study corridors include Cache Creek, Oak Creek, Cottonwood Creek, Armargosa Creek, Anaverde Creek, Railroad Canyon Creek, Willow Springs, and multiple unnamed perennial and intermittent streams.
As the Alternative 2a transmission line would head south, it would cross through the ANF. The area is characterized by steep, mountainous terrain of the eastern Transverse Ranges, including the northern San Gabriel and Liebre Mountains. The ecotype is considered the Northern Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands (POWER 2011; see Biological Resources Technical Report). The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern end of the eco-region, the high-elevation mountain range transcends into the foothills of the Santa Clarita Valley. Long periods of hot, dry weather are not uncommon at the high elevations of the Northern Transverse Ranges. Precipitation ranges from 6 to 40 inches annually throughout the eco-region.

Vegetation
Within the northern eco-region boundary of the Alternative 2a transmission line corridor, the most common vegetation include Mojave creosote bush scrub and Riversidiansage (USFS 2005, Sawyer 1993, Holland 1986, POWER 2011; see Biological Resources Technical Report). Where the Alternative 2a transmission line would cross through the ANF, the eco-region is dominated by various types of chaparral depending upon slope and aspect, including southern mixed chaparral, scrub oak chaparral, chamise chaparral, and interior live oak chaparral, with a sparse deciduous broadleaf trees and conifers. Dominant overstory plant species include foothill pine, oak species, ceanothus, big berry manzanita, and chamise. There are several significant riparian areas that may be impacted by this Alternative, including Burns Canyon, South Portal Canyon, Tule Canyon, and Ruby Clearwater Canyon. Most reaches of these natural stream channels have the ability to support riparian areas and function as wildlife corridors.

Biological soil crusts are present within openings in coastal sage scrub, chaparral, Mojave desert scrub, and Joshua tree woodland on undisturbed soils throughout Alternative 2a.

Special-Status Species
There are two special-status plant species that are known to occur within the Alternative 2a transmission line impact corridor:

- Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*). Total of 84 individuals.
- Slender mariposa lily (*Calochortus clavatus* var. *gracilis*). Total of 4,081 individuals.

As not all areas of potential impact within the Alternative 2a transmission line corridor were surveyed, an additional 61 special-status plant species could be present within the impact corridor. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- Alkali mariposa lily (*Calochortus striatus*)
- Barstow woolly sunflower (*Eriophyllum mohavense*)
- Blochman’s dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)
- Braunton’s milk-vetch (*Astragalus brauntonii*)
- Braunton’s milk-vetch (*Astragalus brauntonii*)
- Calico monkeyflower (*Mimulus pictus*)
- California satintail (*Imperata brevifolia*)
- Charlotte’s phacelia (*Phacelia nashiana*)
- Creamy blazing star (*Mentzelia tridentata*)
- Delicate bluecup (*Githopsis tenella*)
- Gairdner’s Yampah (*Perideridia gairdneri* ssp. *gairdneri*)
- Hall’s monardella (*Monardella macrantha* ssp. *hallii*)
- Kusche’s sandwort (*Arenaria macradenia* var. *kuschei*)
- Late-flowered mariposa lily (*Calochortus weedii* var. *vestus*)
- Madera leptosiphon (*Leptosiphon serrulatus*)
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)
- Mojave tarplant (*Deinandra mohavensis*)
- Ocellated lily (*Lilium humboldtii* ssp. *ocellatum*)
- Pale-yellow layia (*Layia heterotricha*)
- Parish’s checkerbloom (*Sidalcea hickmanii* ssp. *parishii*)
- Peirson’s lupine (*Lupinus peirsonii*)
- Piute Mountains jewel-flower (*Streptanthus cordatus* var. *piutensis*)
- Red Rock poppy (*Eschscholzia minutiflora* ssp. *twisselmannii*)
- Rock Creek broomrape (*Orobanche valida* ssp. *valida*)
- Ross’s pitcher sage (*Lepechini a rossii*)
- Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)
- San Gabriel Mountains dudleya (*Dudleya densiflora*)
- California androsace (*Androsace elongata* ssp. *acuta*)
- Chaparral ragwort (*Senecio aphanactis*)
- Club-haired mariposa lily (*Calochortus clavatus* var. *clavatus*)
- Davidson’s bush-mallow (*Malacothamnus davidsonii*)
- Desert cymopterus (*Cymopterus deserticola*)
- Golden violet (*Viola aurea*)
- Kern buckwheat (*Eriogonum kennedyi* var. *pinicola*)
- Laguna Mountains jewel flower (*Streptanthus bernardinus*)
- Lemmon’s syntrichopappus (*Syntrichopappus lemonii*)
- Many-stemmed dudleya (*Dudleya multicaulis*)
- Mojave Indian paintbrush (*Castilleja plagiotoma*)
- Nevin’s barberry (*Berberis nevinii*)
- Ojai navarretia (*Navarretia ojaiensis*)
- Palmer’s grapplinghook (*Harpagonella palmeri*)
- Parry’s spineflower (*Chorizanthe parryi* var. *parryi*)
- Peirson’s morning-glory (*Calystegia peirsonii*)
- Plummer’s mariposa lily (*Calochortus plummerae*)
- Red Rock tarplant (*Deinandra arida*)
- Rock monardella (*Monardella viridis* ssp. *saxicola*)
- Round-leaved filaree (*California macrophylla*)
- San Bernardino aster (*Symphyotrichum defoliatum*)
- San Gabriel bedstraw (*Galium grande*)
- Santa Susana tarplant (*Deinandra minthornii*)
- Slender-horned spineflower (*Dodecahema leptoceras*)
- Southern Mountains skullcap (*Scutellaria bolanderi* ssp. *austromontana*)
- Southern tarplant (*Centromadia parryi* ssp. *australis*)
- Thread-leaved brodiaea (*Brodiaea filifolia*)
- White pygmy-poppy (*Canbya candida*)
- White-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*)

- Southern California black walnut (*Juglans californica*)
- Southern jewel flower (*Streptanthus campestris*)
- Tehachapi buckwheat (*Eriogonum callistum*)
- Urn-flowered alumroot (*Heuchera elegans*)
- White rabbit-tobacco (*Pseudognaphalium leucocephalum*; SYN=*Gnaphalium leucocephalum*)

There are two special-status wildlife species that are known to be present within the Alternative 2a transmission line impact corridor:

- American badger (*Taxidea taxus*)
- Desert tortoise (*Gopherus agassizii*)

Additional special-status wildlife species are believed to be present within one mile of the Alternative 2a transmission line impact corridor but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- Arroyo chub (*Gila orcuttii*)
- California condor (*Gymnogyps californianus*)
- California spotted owl (*Strix occidentalis occidentalis*)
- Coastal rosy boa (*Lichanura trivirgata roseofusca*)
- Golden eagle (*Aquila chrysaetos*)
- Le Conte’s thrasher (*Toxostoma lecontei*)
- Loggerhead shrike (*Lanius ludovicianus*)
- Mountain plover (*Charadrius montanus*)
- Peregrine falcon (*Falco peregrinus*)
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
- Southwestern pond turtle (*Actinemys marmorata pallida*)
- Swainson’s hawk (*Buteo swainsoni*)
- Townsend’s big-eared bat (*Corynorhinus townsendii*)

- Burrowing owl (*Athene cunicularia*)
- California red-legged frog (*Rana draytonii*)
- Coast (San Diego) horned lizard (*Phrynosoma coronatum blainvillii*)
- Desert kit fox (*Vulpes macrotis arsipus*)
- Grasshopper sparrow (*Ammodramus savannarum*)
- Least Bell’s vireo (*Vireo bellii pusillus*)
- Mohave ground squirrel (*Spermophilus mohavensis*)
- Pallid bat (*Antrozous pallidus*)
- San Bernardino ringneck snake (*Diadophis punctatus modestus*)
- Southern grasshopper mouse (*Onychomys torridus ramona*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- Tehachapi pocket mouse (*Perognathus alticolus inexspectatus*)
- Tricolored blackbird (*Agelaius tricolor*)
Two-striped garter snake (*Thamnophis hammondii*)
- Western red bat (*Lasius blossevillii*)
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
- Western mastiff bat (*Eumops perotis californicus*)
- Western spadefoot toad (*Spea hammondii*)
- White-tailed kite (*Elanus leucurus*)

### Non-Native and Invasive Plant Species

Weed species known to occur along the Alternative 2a transmission line corridor are:

- Cheatgrass (*Bromus tectorum*) *
- Hoary brome (*Bromus hordeaceus*) *
- Indian hedgemustard (*Sisymbrium orientale*)
- Prickly Russian thistle (*Salsola tragus*)
- Rat-tail fescue (*Vulpia myuros*) *
- Ripgut brome (*Bromus diandrus*) *
- Rock rose (*Cistus ladanifer*)
- Shortpod mustard (*Hirschfeldia incana*) *
- Spanish broom (*Spartium junceum*)
- Tall tumblemustard (*Sisymbrium altissimum*) *
- Tocalote (*Centaurea melitensis*) *
- Wild oats (*Avena sp.*) *

* Indicates species that were too widespread and numerous to map.

### Migratory Birds

In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative snapshot of bird use within the Project area. Two surveys were conducted along this alternative in fall 2010, and three surveys in spring 2011. Alternative 2a shares the same corridor with Alternative 2 for almost its entire length, with the exception of a small portion in the ANF around the unincorporated community of Green Valley. Because avian point count surveys were only conducted along the Proposed Action, the portion of Alternative 2a that diverges from Alternative 2 was not surveyed, and therefore the point count data for Alternative 2a is the same as for Alternative 2. Between the fall 2010 and spring 2011 surveys, a combined total of 82 avian species was positively detected and identified, with an estimated total of 2,369 individual birds detected. Because a portion of Alternative 2a was not surveyed, there could be additional species that use the Alternative 2a corridor regularly or periodically that were not represented during these surveys. In addition to Alternative 2, Alternative 2a also shares the same corridor through a portion of its northern end with Alternatives 1 and 3. It is also possible that even more avian species were incidentally observed along this alternative corridor during other Project surveys, and because these five survey dates presented only a snapshot of activity...
in the survey areas, it is likely that, on average, more or less bird species do use this area than were detected during the point count survey dates.

**Alternative 3**

The Alternative 3 230 kV transmission line would start in the Mojave Ecotype, characterized by desert salt brush with scattered and isolated rural residential properties and agricultural fields. The level of precipitation in this ecotype ranges from 4 to 10 inches annually. The soils predominantly comprise alluvial plain and pediment with small hills (POWER 2011; see Biological Resources Technical Report). Dry lakes, or playas, occur in the arid northern portion of the Project area. Within the Antelope-Fremont Valleys watershed, streams crossed by the study corridors include Cache Creek, Oak Creek, Cottonwood Creek, Armargosa Creek, Anaverde Creek, Railroad Canyon Creek, Willow Springs, and multiple unnamed perennial and intermittent streams.

As the Alternative 3 transmission line would head south, it would cross a total of 69 acres of private land and would cross ANF lands for a small distance (two miles). The area is characterized by steep, mountainous terrain of the eastern Transverse Ranges, including the northern San Gabriel and Liebre Mountains. The ecotype is considered the Northern Transverse Range and is characterized by broad fault blocks and alleviated lowlands, and is dissected by granitic uplands (POWER 2011; see Biological Resources Technical Report). The eco-region is characterized by its high elevation setting and the influence from upper level weather patterns in the west, decreasing to mid-elevation ranges along the eastern section. Along the southern end of the eco-region, the high-elevation mountain range transitions into the foothills of the Santa Clarita Valley. Long periods of hot, dry weather are not uncommon at the high elevations of the Northern Transverse Ranges. Precipitation ranges from 6 to 40 inches annually throughout the eco-region.

**Vegetation**

Within the northern eco-region boundary of the Alternative 3 transmission line corridor, the most common vegetation communities are similar to the other Alternatives and consist of Mojave creosote bush scrub, Joshua tree woodland, and Riversidian sage scrub. Creosote bush, Joshua tree, and California sagebrush are the dominant species within those communities at lower elevations (USFS 2005, Sawyer 1993, Holland 1986, POWER 2011; see Biological Resources Technical Report). Where the Alternative 3 transmission line would cross through the central eco-region, vegetation is dominated by southern mixed chaparral series with a sparse mixture of deciduous broadleaf trees and conifers, decreasing in density as the elevation drops into the Santa Clarita Valley and Los Angeles Basin. Dominant overstory plant species include California juniper, oak species, ceanothus, big berry manzanita, and chamise. There are three major drainages and several small drainages that originate from the foothills of the ANF and spread over the northwestern Los Angeles County region. The San Francisquito Canyon Creek, a minor drainage in the area, has several small tributaries. The Santa Clara River also has two minor distributaries, San Francisquito Canyon Creek and Bouquet Canyon Creek. Many reaches of these natural and modified stream channels have the ability to support riparian areas and function as wildlife corridors.

Biological soil crusts are present within openings in coastal sage scrub, chaparral, Mojave desert scrub, and Joshua tree woodland on undisturbed soils throughout Alternative 3.
Special-Status Species

There are two special-status plants known to occur within the Alternative 3 transmission line impact corridor:

- **Short-joint beavertail** (*Opuntia basilaris var. brachyclada*). Total of 5 individuals.
- **Slender mariposa lily** (*Calochortus clavatus var. gracilis*). Total of 420 individuals.

As not all areas of potential impact within the Alternative 3 transmission line corridor were surveyed, an additional 58 special-status plant species could be present within the impact corridor. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

- **Alkali mariposa lily** (*Calochortus striatus*).
- **Barstow woolly sunflower** (*Eriophyllum mohavense*).
- **Blochman’s dudleya** (*Dudleya blochmanniae*).
- **Braunton’s milk-vetch** (*Astragalus brauntonii*).
- **Baja navarretia** (*Navarretia peninsularis*).
- **Calico monkeyflower** (*Mimulus pictus*).
- **California androsace** (*Androsace elongata ssp. acuta*).
- **California satintail** (*Imperata brevifolia*).
- **Chaparral ragwort** (*Senecio aphanactis*).
- **Charlotte’s phacelia** (*Phacelia nashiana*).
- **Club-haired mariposa lily** (*Calochortus clavatus var. clavatus*).
- **Creamy blazing star** (*Mentzelia tridentata*).
- **Davidson’s bush-mallow** (*Malacothamnus davidsonii*).
- **Delicate bluecup** (*Githopsis tenella*).
- **Desert cymopterus** (*Cymopterus deserticola*).
- **Gairdner’s yampah** (*Perideridia gairdneri ssp. gairdneri*).
- **Hall’s monardella** (*Monardella macrantha ssp. hallii*).
- **Kern buckwheat** (*Eriogonum kennedyi var. pinicola*).
- **Kusche’s sandwort** (*Arenaria macradenia var. kuschei*).
- **Laguna Mountains jewel flower** (*Streptanthus bernardinus*).
- **Late-flowered mariposa lily** (*Calochortus weedii var. vestus*).
- **Leptosiphon** (*Leptosiphon serrulatus*).
- **Madera leptosiphon** (*Leptosiphon serrulatus*).
- **Many-stemmed dudleya** (*Dudleya multicaulis*).
- **Mesa horkelia** (*Horkelia cuneata ssp. puberula*).
- **Mojave Indian paintbrush** (*Castilleja plagiotoma*).
- **Mojave tarplant** (*Deinandra mohavensis*).
- **Nevin’s barberry** (*Berberis nevinii*).
- **Ojai navarretia** (*Navarretia ojaiensis*).
- **Palmer’s grapplinghook** (*Harpagonella palmeri*).
- **Pale-yellow layia** (*Layia heterotricha*).
- **Peirson’s lupine** (*Lupinus peirsonii*).
- **Parry’s spineflower** (*Chorizanthe parryi var. parryi*).
- **Parry’s spineflower** (*Chorizanthe parryi var. parryi*).
• Peirson’s morning-glory (*Calystegia peirsonii*)
• Plummer’s mariposa lily (*Calochortus plummerae*)
• Red Rock tarplant (*Deinandra arida*)
• Rock Creek broomrape (*Orobanche valida* ssp. *valida*)
• Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)
• San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*)
• San Gabriel Mountains dudleya (*Dudleya densiflora*)
• Slender-horned spineflower (*Dodecahema leptoceras*)
• Southern jewel flower (*Streptanthus campestris*)
• Southern tarplant (*Centromadia parryi* ssp. *australis*)
• Thread-leaved brodiaea (*Brodiaea filifolia*)
• White rabbit-tobacco (*Pseudognaphalium leucocephalum; SYN=*Gnaphalium leucocephalum*)

There are two special-status wildlife species known to occur within the Alternative 3 transmission line impact corridor:

• American badger (*Taxidea taxus*)
• Desert tortoise (*Gopherus agassizii*)

Additional special-status wildlife species are believed to be present within one mile of the Alternative 3 transmission line impact corridor but were not located during surveys. This is based on known occurrence locations and/or the availability of suitable habitat. These species include:

• Burrowing owl (*Athene cunicularia*)
• California condor (*Gymnogyps californianus*)
• California legless lizard (*Anniella pulchra*)
• Coast (San Diego) horned lizard (*Phrynosoma coronatum blainvillii*)
• Coastal rosy boa (*Lichanura trivirgata roseofusca*)
• Desert kit fox (*Vulpes macrotis arsipus*)
• Golden eagle (*Aquila chrysaetos*)
• Grasshopper sparrow (*Ammodramus savannarum*)
• Le Conte’s thrasher (*Toxostoma lecontei*)
• Loggerhead shrike (*Lanius ludovicianus*)
• Mohave ground squirrel (*Spermophilus leucurus*; SYN=*Spermophilus mohavensis*)
• Mountain plover (*Charadrius montanus*)
- Pallid bat (*Antrozous pallidus*)
- Southern grasshopper mouse (*Onychomys torridus ramona*)
- Southwestern pond turtle (*Actinemyis marmorata pallida*)
- Swainson’s hawk (*Buteo swainsoni*)
- Townsend’s big-eared bat (*Corynorhinus townsendii*)
- Tricolored blackbird (*Agelaius tricolor*)
- Two-striped garter snake (*Thamnophis hammondii*)
- Unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*)
- Western mastiff bat (*Eumops perotis californicus*)
- Western red bat (*Lasiurus blossevillii*)
- Western spadefoot toad (*Spea hammondii*)
- White-tailed kite (*Elanus leucurus*)

Weed species known to occur along the Alternative 3 transmission line corridor are:

- Cheatgrass (*Bromus tectorum*)
- Hoary brome (*Bromus hordeaceus*)
- Indian hedgemustard (*Sisymbrium orientale*)
- Filaree (*Erodium cicutarium*)
- Prickly Russian thistle (*Salsola tragus*)
- Horehound (*Marrubium vulgare*)
- Red brome (*Bromus madritensis*)
- Mediterranean grass (*Schismus barbatus*)
- Shortpod mustard (*Hirschfeldia incana*)
- Rat-tail fescue (*Vulpia myuros*)
- Tall tumblemustard (*Sisymbrium altissimum*)
- Ripgut brome (*Bromus diandrus*)
- Tansy mustard (*Descurainia sophia*)
- Tocalote (*Centaurea melitensis*)
- Smilagrass (*Piptatherum miliaceum*)
- Tree tobacco (*Nicotiana glauca*)
- Wild oats (*Avena sp.*)

**Migratory Birds**

In 2008, an avian risk assessment was conducted along the entire Project area to gain a qualitative analysis of how much risk the existing transmission lines and proposed transmission lines presented to avian species based on factors such as proximity to water bodies, prevailing wind speeds and directions, and proximity to crucial avian habitat. The results of this assessment are provided for each alternative in Chapter 4. In 2010 and 2011, avian point count surveys were conducted to obtain a quantitative snapshot of bird use within the Project area. One survey was conducted along this alternative in fall 2010, and two surveys in spring 2011. Between the fall 2010 and spring 2011 surveys, a combined total of 39 avian species was positively detected and identified, with an estimated total of 524 individual birds detected. Alternative 3 shares the same corridor along its northern portion with Alternatives 1, 2, and 2a. Because avian point count surveys were only conducted along the Proposed Action, the portions of Alternative 3 that diverge from Alternative 2 were not surveyed. Because a portion of Alternative 3 was not surveyed, there are likely additional species that use the Alternative 3 corridor regularly or periodically that were not represented during these surveys. It is also possible that even more avian species were incidentally observed along this alternative corridor during other Project surveys, and because these three survey dates presented only a snapshot of activity in the survey...
areas, it is likely that, on average, more or less bird species use this area than were detected during the point count survey dates.

This transmission line would also parallel the Santa Monica Conservancy’s Mountains Conservation Property. This property provides habitat for a variety of protected species including, but not limited to, the mountain lion, badger, and spotted owl. This land serves as a transition between coastal and desert ranges. The property does not allow access to the public, thereby limiting disturbance to the species and habitat that are present within the property. The Alternative 3 transmission line would bisect through the middle of this property. However, the transmission line would parallel existing lines and roads that also run through this property.

The South Coast Missing Linkages project has also developed a comprehensive plan for maintaining and restoring critical habitat linkages between existing reserves (SCW 2008). The linkage along the proposed Alternative 3 transmission line alignment serves to connect the San Gabriel and Castaic ranges. The Santa Clara River provides breeding sites and traveling routes for a variety of wildlife, and supports other critical natural processes such as natural flood control, recharge of groundwater basin, and nutrient cycling (SCW 2008). State Route 14 and Sierra Highway are major transportation routes and pose the greatest barriers to wildlife movement between the northern and southern sections of the ANF. Therefore, the South Coast Missing Linkages project has identified routes for species to migrate from the ANF north of State Route 14 through the Mountains Conservation Property to the ANF south of State Route 14.

### 3.3.2 EARTH RESOURCES

**Introduction**

The following discussion addresses existing environmental conditions related to geology, seismicity, soils, mineral resources and paleontology (Earth Resources) in the Proposed Action and Alternative areas. In addition, existing laws and regulations relevant to geology, seismicity, soils and paleontology are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Proposed Action or Alternatives.

The information presented in this section has been derived from the Preliminary Geotechnical Evaluation, the Paleontological Resources Assessment Report, and the Land Use Technical Report located in Volumes III and IV of this Final EIS/EIR. Please refer to the reports for more detailed information related to Earth Resources.

The purpose of the technical reports was to provide a detailed inventory of Earth Resources within the study area and to assess the Alternative corridors and other Project components within the Project study area within the context of potential geologic and seismic hazards and impacts to Earth Resources associated with implementation of the Project. The technical reports: 1) present regulatory framework, 2) provide an overview of the technical methodology used in collecting baseline conditions and evaluating impacts, and 3) examine the affected environment within the study corridors and vicinity.
Overview of Methodology and Analysis Area

The Project study area is located within two geomorphic regions, or “provinces.” These provinces, the Transverse Ranges Geomorphic Province and Mojave Desert Geomorphic Province, are divided by the northwest-trending San Andreas fault zone. The Antelope Valley, Mojave Desert and Barren Ridge part of the study area northeast of the San Andreas fault is located in the western corner of the Mojave Desert Province. The part of the study area southwest of the San Andreas fault, including the ANF, the Sierra Pelona area, and the cities of Santa Clarita and San Fernando, is within the Transverse Ranges Province.

The Mojave Desert Geomorphic Province is characterized by mountain ranges and hills of moderate relief that are partially buried and separated by broad elevated basins, like the Antelope Valley (Norris and Webb 1990). This province is bounded in the study area by the San Andreas fault on the southwest and by the Garlock fault on the northwest, forming a triangular-shaped region on its west side. The Mojave Desert Province extends east from the study area. The Transverse Ranges Geomorphic Province is characterized by east-west trending mountain ranges and fault systems (Norris and Webb 1990). The province is bounded on the northeast by the San Andreas fault, and extends west and south from the study area.

Geology, Seismicity and Soils

The mountain ranges and hills of the Project study area comprise primarily Tertiary age (2 to 65 million years old) marine and non-marine sedimentary and volcanic rocks; Mesozoic era (65 to 245 million years old) granitic rocks; and Paleozoic era (245 to 570 million years old) metamorphic and granitic rocks including schist, gneiss and limestone. Younger Quaternary age (last 1.6 million years) alluvium and other sediments underlie low-lying valley and canyon bottoms as well as much of the Mojave Desert and Antelope Valley parts of the study area.

In general, the distribution of geologic units in the Project study area is such that much of the northern half, in the Antelope Valley and Mojave Desert, is underlain by Quaternary alluvial sediments. Much of the southern half of the Project study area, in the mountainous ANF and Sierra Pelona, is underlain by older Tertiary and pre-Tertiary rock formations, with the exception of canyon bottoms and other drainage areas comprising alluvium. The geologic units are described in further detail in Table 1 in the Preliminary Geotechnical Evaluation (August 2010; see Volume IV of this Final EIS/EIR).

Baseline geologic, seismic and soils information were collected from literature, GIS data and online sources for the Proposed Action, Alternatives, and surrounding areas. The literature and data review was supplemented by field reconnaissance. Review and reconnaissance focused on the identification of specific geologic hazards and paleontological resources along and adjacent to the proposed ROWs.

Mineral Resources

Mineral resources include those areas identified for exploration, development and production of energy resources. This component also includes mining claims. The Southern California region, including portions of the Mojave Desert, is one of the most highly mineralized areas in the United States. Regional mineral resources consist of oil and deposits of rock, sand and gravel.
Most of Southern California’s on-shore oil deposits are located in Los Angeles County. In addition, California is the largest producer of sand and gravel in the nation.

Both metallic and non-metallic mineral resources are located in the vicinity of the Project study area. Mineral resources in the study area of Kern County consist primarily of limestone and dolomite deposits, primarily being quarried for production of cement. In Los Angeles County, the principal mineral commodities in the study area are sand, gravel and crushed and broken stone. Metallic mineral deposits are present in both counties in varying amounts and are primarily restricted to bedrock areas in the mountainous regions; gold, copper and tungsten were the predominant metallic minerals (ores) mined in these counties. However, no active metallic mines are currently located in the vicinity of the Proposed Action or Alternatives.

There are producing oil wells located in the Placerita Canyon area, which is in the study area, but is not located within any of the Alternative routes discussed here. Portions of the federal mineral estate and subsurface State trust land within the study area have been leased for oil and gas. The Project area is deemed to have low potential for the occurrence of oil and gas based on a lack of evidence for marine source beds.

Regionally, the Rand Known Geothermal Resource Area (KGRA) northeast of Red Mountain has high potential for the occurrence of geothermal steam resources based on the occurrence of a known steam well. However, the Rand KGRA has a low potential for development.

Known and undiscovered locatable metallic mineral deposits occurring and expected to occur include gold, silver, base metals, tungsten and iron. Gold has been found in many areas on and surrounding the ANF. Zones of moderate and high potential for precious and base metals are scattered throughout the Project study area, with the exception of the military bases, where data is scarce, and alluvial filled valleys to the southwest, where exposures are poor.

Regionally, potential zones for nonmetallic minerals are associated with known outcrops. Limestone is known to occur along the east side of the Sierra Nevada and Tehachapi Mountains. High potential zones for feldspar are located east of Fremont Peak and near the Ord Mountains. Barite resources occur in the Calico Mountains, the Cady Mountains and the Waterman Hills north of the city of Barstow. Borates are known to occur in Searles Lake, near Kramer Junction, the Calico Mountains, Daggett Ridge and near Hector. Zeolites are known to occur in the Mud Hills, Opal Mountain, near Hector, Alvord Mountain and the El Paso Mountains. Hectorite clay occurs near the Hector railroad siding off of Highway 40, and bentonite occurs in the Mud Hills, Kramer Hills and the El Paso Mountains.

Numerous active mining claims are located in the Project area. An active mining claim is a pre-existing, legal right to explore for mineral resources. Mines can be developed from mining claims; however, many claims are never developed.

Saleable minerals consist mostly of construction materials such as crushed and dimension stone and sand and gravel, in addition to clay used for pond sealant. These deposits are known to occur in many locations throughout and adjacent to the Project study area.
Common clays occur in the playas and Tertiary-age sedimentary rocks. Whether these deposits have potential for development depends on the proximity to markets and conflicts with other resources.

Industrial mineral mining (particularly construction material, such as sand and gravel or rip-rap) is very important to the USFS, counties and local municipalities, as well as for commercial purposes. The USFS uses these and other rock products for road construction and maintenance and for stream bank reinforcement/erosion control. ANF saleable minerals resources include sand and gravel as well as flagstone.

Proposed Alternative alignments traverse areas identified as sand and gravel resources by the State Mining and Geology Board in the Santa Clara River valley; however, no active production/quarrying operations are crossed by them.

Mineral Resource Zone 2 (MRZ-2, as classified by the California Division of Mines and Geology) areas are primarily concentrated along waterways, such as the Santa Clara River, as well as SR-126, Castaic Creek and east of Sand Canyon Road. The MRZ-2 contains construction-grade aggregate within the portion of the Santa Clara River that extends approximately 15 miles from Agua Dulce Creek in the east to the Ventura County boundary in the west.

Known mineral resources encompass portions of the Saugus-Newhall Production-Consumption (P-C) Region and the Palmdale P-C Region. These mineral resources are considered as either “permitted resources” (i.e., materials believed to be acceptable for commercial use that exist within property owned or leased by an aggregate producing company for which permission allowing extraction and processing has been granted), or “resources” (includes permitted resources as well as all potentially usable aggregate material that may be mined in the future, but for which no use-permit allowing extraction has been granted).

As of 2003, there are 525 acres used for mineral extraction of sand, gravel and rock. There are 14 permits for surface mining activities filed with the County, where the status ranges from recently filed to approved. Generally, these mining sites are located in the unincorporated communities of Canyon Country, Acton, Agua Dulce and Mint Canyon.

Baseline geologic, seismic and soils information were collected from literature, GIS data and online sources for the Proposed Action and Alternatives area and surrounding areas. The literature and data review was supplemented by field reconnaissance. Reviews and reconnaissance focused on the identification of specific geologic hazards and paleontological resources along and adjacent to the Project ROW.

The goal of the land use inventory (which included mineral resources) was to identify, map, describe and document the existing, planned and designated land uses within the Project area. Data was compiled within a one-mile-wide study corridor, 0.5 mile on each side of the assumed centerline of each Alternative route. The data inventories facilitated the assessment of potential land use impacts from the construction and operation of the BRRTP.
Initially, base maps were prepared at a scale of 1:12,000. Land use data collected from a number of environmental studies in the region were reviewed, refined and updated. Existing maps from a variety of sources were collected and included in the inventory, as appropriate. Agency land and resource management and planning documents were reviewed for applicable data and land management regulation policies. Online database searches of the BLM LR2000 system were also conducted.

Following these initial steps, key federal, State and local land and resource management agencies were contacted to update information and to solicit further input. These data were compiled and mapped utilizing a geographic information system (GIS). National, State and local agency GIS data layers were utilized to identify and more accurately assess surface land uses and land cover types. Field investigations were conducted to verify and supplement selected existing land uses.

**Paleontology**

The affected environment as it pertains to paleontological resources includes not only actual fossil remains collected at specific locations, but also the collecting localities themselves, as well as the geologic formations containing those localities. In this light, a particular geologic rock unit (i.e., formation) can be considered to represent a proxy for all possible paleontological resources (i.e., fossils) entombed and preserved in that formation in a given area, the fact that fossils have been recovered from that same formation in other areas where it crops-out is taken as an indication of the potential of that formation to preserve similar fossils wherever it occurs.

The goal of the paleontological resources inventory was to identify, describe, and map existing paleontological resources within the study area and to evaluate the level of resource significance for each. The inventory relied on a review of relevant published geologic reports (Kew 1924; Dibblee 1967; and Crowell 2003), privately published geologic mapping from the Dibblee Foundation (Dibblee and Ehrenspeck 1991, 1996a, 1996b, 1996c, 1997a, 1997b, 1997c; and Dibblee and Minch 2002); unpublished environmental technical reports (Hulbert 2004), and museum paleontological site records (Natural History Museum of Los Angeles County, Invertebrate Paleontology Section, San Diego Natural History Museum, and University of California, Museum of Paleontology). This approach was followed in recognition of the direct relationship between paleontological resources and the geologic formations within which they occur. Knowing the geology of a particular area and the documented fossil productivity of the formations occurring in that area, it is possible to make reasonable predictions about where fossils would, or would not, be encountered.

The results of the literature, institutional record, and field survey portions of the inventory were incorporated with GIS layers of Project milepost delineations to estimate the linear coverage of individual geologic formations along specific Project alignments. These data were then summarized and included in Table 2 in the Paleontological Resources Assessment Report (August 2010; see Volume IV of this Final EIS/EIR). Following this, paleontological resource sensitivity values were determined for each formation and the relative resource value of each Project alignment quantified based on the linear distribution (i.e., mileage).

Windshield surveys were conducted during September and October 2008 along the southern portion of the study area to verify geologic mapping and results of the literature and previous institutional record surveys. The survey was primarily conducted along LADWP access roads,
but also involved some portions of public roads. During the survey work, selected bedrock outcrops were examined to determine paleontological sensitivity of geologic rock units occurring in the study area.

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

**Summary of Inventory Results**

**Project Components Common to All Action Alternatives**

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

**New 230 kV Circuit**

There are no distinctive geologic features present in this portion of the Project. There are rock formations present; however, the majority of these geologic formations contain more common rock outcrops, exposed road cuts, and soil-covered areas, and are not considered highly distinct.

The new circuit corridor would not cross any earthquake fault zones or active faults. The potential ground shaking level due to seismic activity along this portion of the Project is 0.40 g. This number represents percentage of ground acceleration level. Higher ground acceleration levels are attributable to higher levels of ground shaking during an earthquake. The corridor would cross 1.1 miles of mapped potential liquefaction hazard zones. This portion of the Project would traverse 5.5 miles of mapped landslides and contain 7.0 miles of potential earthquake-induced landslide hazard zones. The proposed corridor is reportedly underlain by shallow groundwater, at 10 feet in depth. According to the Los Angeles County General Plan, 1.5 miles of this portion of the Project would be located within a potential dam failure inundation zone due to the proximity to Bouquet Reservoir and Castaic Lake.

This portion of the Project would cross 0.3 mile of areas with slight erosion potential, 0.4 mile of areas with moderate erosion potential, and 11.3 miles of areas with severe to very severe erosion potential. Based on available data, there are no areas of high expansion potential within the proposed corridor. Data on corrosive soils potential are available for only some of the soils that would be traversed by the Proposed Action. Corrosive soils potential data exist for 8.6 miles of this portion of the Project. Of those 8.6 miles, the corridor would traverse 1.3 miles with low corrosive potential, 0.3 mile with moderate corrosive potential, and 7.0 miles with high corrosive potential.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.
Paleontology

Construction of the new 230 kV circuit would occur in areas underlain by the Saugus Formation, the Castaic Formation and the Mint Canyon Formation.

The Saugus Formation occurs along portions of the proposed corridor between MP 0.4 and 3.1, and contains very fossiliferous marine deposits as well as terrestrial deposits that locally contain fossil vertebrates. Marine fossils from the Saugus Formation include bryozoans, brachiopods, crabs, barnacles, gastropods, bivalves, echinoids, fish, and trace fossils (Eldridge and Arnold 1904; Kew 1924; Grant and Gale 1931; Winterer and Durham 1962, Squires and White 1983; Groves 1991a; Govean 1993). Fossil bony fish include sheehead (Semicossyphus pulcher), barracuda (Sphyraena sp.), and banjo fish (Rhinobatos sp.) (Govean 1993). Terrestrial vertebrate fossils include terrapins, tortoises, and lizards, as well as land mammals, such as extinct rabbit, gopher, pack rat, dog, cat, mastodon, tapir, horse, peccary, camel, deer, and bison in the city of Santa Clarita and the San Fernando Valley areas (Winterer and Durham 1954, 1962). Fossil land mammals have also been found elsewhere in the Saugus Formation; most notably extinct rabbit, gopher, pack rat, mammoths, horse, and llama of Irvingtonian-land-mammal age in Moorpark, California (Wagner et al. 2007).

The Castaic Formation occurs along the majority of the proposed corridor. A diverse collection of fossil marine invertebrates, dominated by gastropods and bivalves, has been found in the Castaic Formation (Skolnick and Arnal 1959; Stanton 1960, 1966, 1982; McDougall 1982; Govean 1993). Invertebrate fossils include foraminifers, sponges, bryozoans, barnacles, crustaceans, brachiopods, mollusks, and echinoids. Fossil marine vertebrates are rare, but include sharks, rays, bony fish, and marine mammals (Stanton 1966; Welton and Link 1982). Other fossils found in the Castaic Formation include fossil wood and leaves (Govean 1993). During the field survey, fossils were observed at several locations within strata of the Castaic Formation and included oxidized plant fragments, carbonized wood, and internal and external molds of marine mollusks.

The Mint Canyon Formation occurs along the proposed corridor between MP 0.2 and 0.6. Large and diverse fossil collections of plants (Axelrod 1940; Mount 1971), freshwater mollusks and ostracods (Kew 1924; Oakeshott 1958; Mount 1971), turtle (Clemmys sp.; Maxson 1930), and land mammals that include rabbit, dog, peccary (Prosthennops sp.), rhinoceros, camel (Alticamulus sp.), pronghorn antelope (Merycoccus necatus), three genera of horse (Merychippus intermontanus, M. sumani, Protomhippus sp., Hipparion mohavense, Pliohippus sp. cf. P. fossulatus), and mastodon have been found in the Mint Canyon Formation (Kew 1924; Maxson 1928, 1930; Stirton 1933, 1939; Savage et al. 1954; Kelly 1998). Thin lacustrine and fluviatile interbeds contain freshwater gastropods (Paludestrina imitator, cf. Helminthoglypta sp.), bivalves (Amnicola sp.), and ostracods (Kew 1924; Oakeshott 1958; Mount 1971). Local tuff beds contain fossil leaves that represent an oak-savanna community whose nearest related modern equivalent species now occur in southern California, southern Arizona, and northern Mexico (Axelrod 1940; Wallace 1940). These fossil leaves were derived from at least four habitats: lake-border and riparian, savanna, woodland, and Chaparral (Axelrod 1940). Although no fossils were observed in Mint Canyon Formation strata during the field survey, the results of the record search indicate several recorded fossil collecting localities (LACM and UCMP) in the Vasquez and Bouquet canyon portions of the study area.
Reconductoring of BR-RIN Transmission Line

There are no distinctive geologic features present in this portion of the Project. There are rock formations present in portions of the proposed reconductoring corridor; however, the majority of these geologic formations contains more common rock outcrops, exposed road cuts, and soil-covered areas, and is not considered highly distinct. A total of 2.4 miles of the reconductoring would cross the San Fernando fault zone located in the San Fernando Valley, and 1.4 miles would cross the Garlock Earthquake Fault Zone. Potential ground shaking along this portion of the Project due to seismic activity would range from 0.25g to 0.80g. The reconductoring would traverse 10 miles of mapped potential liquefaction hazard zones. This portion of the Project would traverse 2.9 miles of mapped landslides and contain 11.9 miles of potential earthquake-induced landslide hazard zones. The proposed reconductoring corridor is reportedly underlain by shallow groundwater in places. Groundwater depths range from less than ten feet to 184 feet, where data is available. According to the Los Angeles County General Plan, 2.4 miles of this portion of the Project would be located within a potential dam failure inundation zone due to the proximity to Bouquet and Van Norman reservoirs.

This portion of the Project would cross 40 miles of areas with slight erosion potential, 2.3 miles of areas with moderate erosion potential, and 24.1 miles of areas with severe to very severe erosion potential. Based on available data, the reconductoring would cross 0.4 mile of soils with high expansion potential. Data on corrosive soils potential are available for only some of the soils traversed by the Proposed Action. Corrosive soils potential data exist for 55.6 miles of this portion of the Project. Of those 55.6 miles, the reconductoring would traverse 10.2 miles with low corrosive potential, 26.2 miles with moderate corrosive potential, and 19.2 miles with high corrosive potential.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.

Paleontology
The reconductoring would occur in areas underlain by the Saugus Formation, the Pico Formation, the Castaic Formation, the Towsley Formation, the Monterey/Modelo Formation, the Mint Canyon Formation, quaternary alluvium, older alluvium, the Anaverde Formation, the Vasquez Formation, the San Francisquito Formation, plutonic igneous rocks, Mendenhall Gneiss, and Pelona Schist. The Saugus Formation occurs along 14.5 miles of the proposed reconductoring corridor. The Castaic Formation occurs along 12 miles of the proposed reconductoring corridor. The Mint Canyon Formation occurs along 1.5 miles of the proposed reconductoring corridor. Descriptions of the paleontological resources located within the Saugus Formation, the Castaic Formation and the Mint Canyon Formation can be found in the discussion of the addition of the new 230 kV circuit above.

The Pico Formation has a very limited distribution in the study area and is confined to this portion of the Project. It would occur along 0.1 mile of the route. It is rich with marine fossils that include abundant encrusting calcareous algae, foraminifera, sponges, marine worms, bryozoans, brachiopods, crabs, barnacles, mollusks, echinoids, sharks, bony fish, pinnipeds, and cetaceans (Eldridge and Arnold 1907; English 1914b; Kew 1924; Kellogg 1929; Grant and Gale
1931; Winterer and Durham 1962; Squires and White 1983; Groves 1991a, 1991b; Squires et al. 2006). Terrestrial fossils have also been found in the Pico Formation, such as pine (*Pinus* sp.), oak (*Quercus* sp.), bird, and small cat (Winterer and Durham 1962; Squires et al. 2006; unpublished UCMP data).

The Towsley Formation would occur along 2.2 miles of the reconductoring. It contains locally diverse assemblages of marine fossils that include foraminfera, bryozoans, brachiopods, marine worms, crabs, mollusks, echinoids, shark (*Isurus hastalus*), cetacean, sirenian (*Dusisiren jordani*), and walrus (*Imagotaria downsi*) (Eldridge and Arnold 1907; English 1914a, 1914b; Kew 1924; Grant and Gale 1931; Winterer and Durham 1954, 1962; Oakeshott 1958; Kern 1973; Repenning and Tedford 1977; Domning 1978; unpublished LACM data; unpublished UCMP data). The marine deposits exposed in the Elsmere Canyon area are particularly rich in marine fossils (Kern 1973). Fossils of marine mammals and land mammals have also been found in the Towsley Formation as exposed in Elsmere Canyon and include walrus (cf. *Pontolis* sp.) camel (cf. *Procamelus*) and tapir (English 1914a; unpublished UCMP data).

The Monterey/Modelo Formation would occur along one mile of the reconductoring. In the eastern part of the Ventura Basin, as well as in the Soledad, and Los Angeles basins, the Monterey/Modelo Formation contains locally abundant marine fossils including foraminifers, bivalve mollusks (e.g., *Delectopecten* sp.), gastropod mollusks, echinoids, fish, and cetaceans (*Mixocetus elysius, Pithanodelphis nasalis*) (Kellogg 1934; Daviess 1942; Winterer and Durham 1962; Bussino and Barnes 1984; Barnes 1985). Land vertebrates, such as birds (*Phalacrocorax femoralis*), have also been recovered from this rock unit in the study area (Miller 1929).

Quaternary alluvium would occur along 43.4 miles of the reconductoring corridor. Any organic remains (e.g., sub-fossils) preserved within the Quaternary alluvium are too young to be considered paleontological resources, because of the recent age of these deposits and their close association with modern drainages.

Older alluvium would occur along 3.4 miles of the reconductoring corridor. Although no fossils are presently known from the older alluvium in the study area, similar deposits have produced significant remains of Pleistocene megafauna (e.g., ground sloth, mammoth, and mastodon) from sites elsewhere in Southern California (Jefferson 1991).

The Anaverde Formation would occur along 0.3 mile of the reconductoring corridor. Fossils are rare in the Anaverde Formation (Dibblee 1967), but include a significant fossil flora collected from the sandstone-conglomerate facies of the formation as exposed in the northwestern end of Anaverde Valley (Wallace 1949; Axelrod 1950). Axelrod (1950) described 21 species of fossil plants from this area (UCMP Locality P4139) including willow (*Salix*), pine (*Pinus*), aspen (*Populus*), oak (*Quercus*), laurel (*Persea*), sumac (*Rhus*), crab apple (*Peraphyllum*), kidneywood (*Eysenhardtia*), soapberry (*Sapindus*), ceanothus (*Ceanothus*), buckthorn (*Rhamnus*), sycamore (*Platanus*), and serviceberry (*Amelanchier*).

The Vasquez Formation would occur along 0.1 mile of the reconductoring corridor. Fossils are extremely rare in the Vasquez Formation; but, according to Hall (2007), at least one fossil of the extinct horse *Merychippus* has been found in the formation. However, no reports were found of this purported discovery in the peer-reviewed literature. No fossils were observed in exposures...
of this rock unit during the windshield survey and there are no recorded fossil collecting localities reported from this rock unit in the institutional record search.

The San Francisquito Formation would occur along 1.4 miles of the reconductoring corridor. The San Francisquito Formation in the San Francisquito Canyon area contains very diverse fossil assemblages of shallow-marine invertebrate fossils, which includes corals, brachiopods, gastropods, bivalves, ammonites (Diplomoceras sp.), and sharks (Dickerson 1914; Kooser 1980, 1982; Saul 1983; Popeneo and Saul 1987; Squires et al. 1989; Kirby 1991; Kirby and Saul 1995; Squires and Saul 2006, 2007). Elsewhere in southern California, near Cajon Pass, a fossil plesiosaur has been found in the San Francisquito Formation (Kooser 1985; Lucas and Reynolds 1993). During the windshield survey trace fossils were observed at several locations within strata of the San Francisquito Formation and included cylindrical burrows made by infaunal marine invertebrates. The institutional record search found numerous recorded fossil collecting localities (LACM) in the Study Area.

Plutonic igneous rocks would occur along 7.6 miles of the reconductoring corridor. Because of the extremely high temperatures and pressures associated with the magmatic origin of the plutonic igneous rocks in the study area, no fossils are expected in these rocks.

Mendenhall Gneiss would occur along 2.0 miles of the reconductoring corridor. No fossils are expected in the gneiss because of the extreme temperatures and pressures associated with the metamorphic origin of these rocks.

Pelona Schist would occur along 4.0 miles of the reconductoring corridor. No fossils are expected in the Pelona Schist because of the extreme temperatures and pressures associated with the metamorphic history of these rocks.

New Haskell Canyon Switching Station

Distinctive geologic features were not observed at the location of the proposed Haskell Canyon Switching Station. The proposed Haskell Canyon Switching Station site is not located in an Earthquake Fault Zone. In order to evaluate the level of ground shaking that might occur at the proposed switching station, site-specific analysis was performed. The 2007 California Building Code (CBC) recommends that the design of structures be based on the horizontal peak ground acceleration (PGA) having two percent probability of exceedance in 50 years, which is defined as the Maximum Considered Earthquake (MCE). Using the USGS ground motion calculator, the design PGA for the switching station site was 0.40g. The requirements of the governing jurisdictions and the 2007 CBC should be considered in Project design. The proposed switching station site is not located in a liquefaction hazard zone. Although landslides are mapped and were observed in the vicinity of the proposed Haskell Canyon Switching Station site, it is not located in an earthquake-induced landslide hazard zone. Data regarding groundwater levels at the proposed switching station site are not available. The proposed switching station site is not located in a dam failure inundation zone.

The soil erosion potential at the proposed Haskell Canyon Switching Station site has been categorized as severe. NRCS data regarding the expansive potential of surface soils at the proposed switching station site have not been reported. However, based on the nature of the earth units mapped at the site and observed during the reconnaissance (clay shale and sandstone
units), moderately to highly expansive soils may be present at this site. USDA data regarding the corrosive potential of surface soils at the proposed switching station site have not been reported. Detailed assessment of the potential for corrosive soils in the switching station area would be evaluated during the design phase of the Project.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.

**Paleontology**

Construction of the new Haskell Canyon Switching Station would occur in an area underlain by sedimentary deposits of the Saugus Formation (fluvial and alluvial fan deposits of late Pliocene to early Pleistocene age; ~3 to 1.5 Ma), the Castaic Formation (marine sandstones of late Miocene to early Pliocene age; ~6 to 5 Ma), and the Mint Canyon Formation (deltaic, fluvial, and lacustrine deposits of middle to late Miocene age; ~14 to 11 Ma). These rock units are known to produce significant paleontological resources. Detailed descriptions of the paleontological resources located within these formations can be found in the discussion of the addition of the new 230 kV circuit above.

**Expansion of Barren Ridge Switching Station**

Distinctive geologic features were not observed in the proposed Barren Ridge Switching Station expansion area. The switching station is not located in an Earthquake Fault Zone. In order to evaluate the level of ground shaking that might occur at the switching station site, site-specific analysis was performed. Using the USGS ground motion calculator, the design PGA for the switching station site was 0.52g. The requirements of the governing jurisdictions and the 2007 CBC should be considered in Project design. The Barren Ridge Switching Station is located on relatively level ground on the Mojave Desert floor, and landslides are not present. The switching station is not located in an earthquake-induced landslide hazard zone. Data regarding groundwater levels at the switching station are not available. The switching station is not located in a dam failure inundation zone.

The soil erosion potential in the proposed Barren Ridge Switching Station expansion area has been categorized as slight. USDA data regarding the expansive potential of surface soils at the switching station have not been reported. However, based on the sandy nature of the surface soils mapped at the site and observed during the reconnaissance, the expansive potential of the soils at this site is considered low. The corrosive soil potential at the switching station has been categorized as low for concrete and moderate for steel.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.

**Paleontology**

The proposed expansion of the existing Barren Ridge Switching Station would occur in an area underlain by sedimentary deposits of Quaternary alluvium. Any organic remains (e.g., sub-
fossils) preserved within the Quaternary alluvium are too young to be considered paleontological resources, because of the recent age of these deposits and their close association with modern drainages.

**New 230 kV Double-Circuit Transmission Line**

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line. The transmission line for each action Alternative is discussed below.

**Alternative 1**

The proposed Alternative 1 transmission line route would begin at the Barren Ridge Switching Station in the Mojave Desert and travel southwest along the northwestern edge of the Mojave Desert and Antelope Valley, crossing areas underlain by Quaternary alluvial deposits. It would cross the San Andreas Fault Rift Zone (a rift zone is generally defined as a system of depressions in the ground between the parallel faults that make up a fault zone) near the western boundary of the Project study area and then run southeast over steep mountainous areas in the ANF underlain by areas of Mesozoic granitic rock, and by Plio-Pleistocene non-marine and Tertiary marine sedimentary formations. Quaternary alluvial deposits are present in canyons and drainage areas along the proposed Alternative 1 transmission line alignment. The transmission line would cross San Francisquito Canyon near the southern end and end at the proposed Haskell Canyon Switching Station site, which is underlain by Tertiary sedimentary formations.

The Alternative 1 transmission line would cross two active faults with the potential for surface rupture, including the active Garlock fault zone at the beginning of the route near the Barren Ridge Switching Station, and the active San Andreas fault zone. The San Andreas fault zone has long been recognized as the dominant seismotectonic feature in California. This active, right-lateral, strike-slip fault is over 700 miles long and strikes northwest through the state from the Gulf of California to north of San Francisco. Two of California’s three largest historic earthquakes, the 1906 San Francisco earthquake and the 1857 Forth Tejon earthquake, occurred along the San Andreas fault (SCEC 2004). The slip rate of the fault is estimated to be 30 millimeters (mm) per year (Cao 2003). The fault is considered capable of producing earthquakes in excess of 7.4 on the Richter scale, and the average frequency of earthquakes along this segment of the San Andreas fault is 140 years (SCEC 2004).

The Garlock fault zone is a prominent fault feature in Southern California and strikes northeast across the northern part of the Mojave Desert province. Although this fault has not produced large earthquakes historically, geomorphic and stratigraphic evidence indicates that it has done so in the past. The Garlock fault is considered capable of generating about earthquakes in excess of 7.3 on the Richter scale. A portion of the Garlock fault zone near the Project study area ruptured due to the 1952 Kern County Earthquake that occurred on the White Wolf Fault (SCEC 2004). The slip rate of this fault is estimated to be 6 mm per year.

Potential ground shaking along the Alternative 1 transmission line due to seismic activity would range from 0.30g to 0.60g. Liquefaction hazard zones are located near the southern end of the proposed alignment near the proposed Haskell Canyon Switching Station site. Mapped landslides and Earthquake-Induced Landslide Hazard Zones are located in the steep ANF in the southern portion of the proposed alignment. Reported groundwater depths along this proposed
Alternative 1 transmission line alignment are on the order of 138 to 336 feet deep in the Antelope Valley area; an 0.2-mile portion of the proposed Alternative 1 transmission line alignment has an area of reported shallow groundwater 10 feet deep along the existing Castaic – Rinaldi corridor. A total of 1.5 miles of the Alternative 1 transmission line would be located within a potential dam failure inundation zone due to the proximity to Castaic Lake and Bouquet Reservoir.

The Alternative 1 transmission line would traverse soils with low to moderate sensitivity ratings. Variable areas of slight to very severe erosion potential exist along the proposed alignment. An area of high expansion potential is located along the existing Castaic – Rinaldi corridor. Areas of low to high corrosive soil potential exist along the proposed alignment. In general, the Alternative 1 transmission line would encounter more areas of severe to very severe erosion potential than the transmission line for Alternatives 2, 2a and 3.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.

Paleontology
The Alternative 1 transmission line would traverse 56.2 miles of sedimentary deposits of Quaternary alluvium, which accumulated relatively recently and are defined as having only minor sensitivity. This Alternative would also cross 43 miles of sedimentary deposits defined as having minor, major/undetermined and maximum sensitivity and 0.9 mile of areas underlain by plutonic igneous rocks with zero resource sensitivity. Roughly 1.1 miles of this Alternative would cross sedimentary deposits of the Oso Canyon Formation. This rock unit was deposited during the late Miocene (~10 Ma) and, although not proven to contain fossils, its sedimentary origin and fluvial paleoenvironments indicate a strong but unproven potential for producing fossil remains. Nearly 21 miles of Alternative 1 would traverse sedimentary deposits of the Saugus Formation (fluvial and alluvial fan deposits of late Pliocene to early Pleistocene age; ~3 to 1.5 Ma), the Hungry Valley Formation (fluvial, deltaic and lacustrine deposits of early Pliocene age; ~5 Ma), the Castaic Formation (marine sandstones of late Miocene to early Pliocene age; ~6 to 5 Ma), the Ridge Route Formation (alluvial fan, fluvial and deltaic deposits of late Miocene to early Pliocene age; ~8.4 to 5 Ma), the Peace Valley Formation (deltaic and lacustrine deposits of late Miocene to early Pliocene age; ~8.4 to 5 Ma), the Quail Lake Formation (marine sandstones of late Miocene age; ~10 Ma) and the Mint Canyon Formation (deltaic, fluvial and lacustrine deposits of middle to late Miocene age; ~14 to 11).

Alternative 2
The proposed Alternative 2 transmission line route begins at the Barren Ridge Switching Station in the Mojave Desert and travels southwest along the northwestern edge of the Mojave Desert and then runs south across the Antelope Valley, traversing areas underlain by Quaternary alluvial deposits. Alternative 2 transmission line would cross the steep Ritter Ridge/Portal Ridge area and San Andreas Fault Rift Zone in the Leona Valley where Mesozoic granitic rocks, Pelona Schist and Pliocene sedimentary formations would underlie the proposed alignment. It would run south/southeast over the steep, mountainous ANF and through San Francisquito Canyon, Dry Canyon and Haskell Canyon. The ANF portion of the Alternative 2 transmission line south of
the San Andreas Fault Rift Zone would be underlain by areas of Mesozoic granitic rock, Precambrian metamorphic rock, Pelona Schist, Tertiary marine and non-marine sedimentary formations, and Quaternary alluvium.

The Alternative 2 transmission line would cross two active faults with the potential for surface rupture, including the active Garlock fault zone at the beginning of the route near the Barren Ridge Switching Station, and the active San Andreas fault zone. Potential ground shaking along this Alternative due to seismic activity would range from 0.25g to 0.80g. Liquefaction hazard zones are located in the southern Antelope Valley and San Andreas Rift Zone areas. Mapped landslides and Earthquake-Induced Landslide Hazard Zones are located in the steep ANF in the southern portion of the proposed alignment. Reported groundwater depths along the proposed Alternative alignment are on the order of 172 to 295 feet deep in the Antelope Valley area, and 10 to 184 feet deep in the ANF. A total of 1.4 miles of the Alternative 2 transmission line would be located within a potential dam failure inundation zone due to the proximity to Fairmont Reservoir and Bouquet Reservoir.

Variable areas of slight to very severe erosion potential exist along the proposed Alternative 2 transmission line alignment, along with areas of low to high corrosive soil potential.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.

Paleontology
The Alternative 2 transmission line would traverse 43.5 miles of sedimentary deposits of Quaternary alluvium. Because these deposits are accumulated relatively recently, they are defined as having only minor sensitivity. This transmission line would cross 11.5 miles of sedimentary deposits defined as having minor, major/undetermined and maximum sensitivity. Roughly 16 miles of this transmission line would cross areas underlain by plutonic igneous rocks and metamorphic rocks (including the Pelona Schist) with zero resource sensitivity. Nearly five miles of this transmission line would cross sedimentary deposits of Quaternary older alluvium (fluvial and alluvial fan deposits of Pleistocene age; ~1.8 to 0.01 Ma), the Vasquez Formation (alluvial fan, fluvial and deltaic strata of late Oligocene to early Miocene age; ~26 to 22 Ma) and the San Francisquito Formation (marine sedimentary rocks of late Cretaceous to early Paleocene age ~70 to 60 Ma). Although not proven to contain fossils, the sedimentary origin of Quaternary older alluvium and the Vasquez Formation indicates a strong but unproven potential for producing fossil remains. The San Francisquito Formation is defined as having major paleontological resource sensitivity. This transmission line would traverse 2.3 miles of sedimentary deposits of the Saugus Formation (fluvial and alluvial fan deposits of late Pliocene to early Pleistocene age; ~3 to 1.5 Ma), the Anaverde Formation (terrestrial and fluvial deposits of late Miocene to early Pliocene age; ~6 to 5 Ma), and the Mint Canyon Formation (deltaic, fluvial and lacustrine deposits of middle to late Miocene age; ~14 to 11 Ma). All of these rock units are known to produce significant paleontological resources and are defined as having maximum sensitivity.
Alternative 2a

The Alternative 2a transmission line would cross the same terrain as the Alternative 2 transmission line and would deviate only in the localized re-route around the unincorporated community of Green Valley. The proposed Green Valley localized re-route portion of the Alternative 2a transmission line would cross areas of steep terrain along Leona Divide, Grass Mountain, and a ridge area north of Portal Canyon where it would be predominantly underlain by Mesozoic granitic rock and Precambrian metamorphic rock. The Green Valley re-route would not cross a known active fault. Potential ground shaking along this Alternative due to seismic activity would range from 0.60g to 0.80g. No liquefaction hazard zones are mapped along the Green Valley re-route. No landslides are shown on geologic maps reviewed for this evaluation. Earthquake-Induced Landslide Hazard Zones are located on the steep terrain along this proposed Alternative alignment. Groundwater data was not readily available for the portion of this Alternative in the ANF. No potential dam failure inundation zones are mapped along the proposed Green Valley re-route alignment.

The Alternative 2a transmission line would cross the same terrain as the Alternative 2 transmission line and would deviate only in the localized re-route around the unincorporated community of Green Valley. The Green Valley localized re-route portion of the Alternative 2a transmission line would be underlain by areas of severe to very severe erosion potential. Areas of moderate corrosive soil potential exist along the proposed Alternative alignment.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.

Paleontology

The Alternative 2a transmission line would cross 0.3 mile of paleontological resources with major/undetermined sensitivity. A total of 4 miles of this transmission line, all of which is underlain by rock units having zero resource sensitivity, would be slated for helicopter construction of lattice towers.

Alternative 3

The proposed Alternative 3 transmission line route begins at the Barren Ridge Switching Station in the Mojave Desert and travels southwest along the northwestern edge of the Mojave Desert and then runs south across the Antelope Valley, traversing areas underlain by Quaternary alluvial deposits. The Alternative 3 transmission line would cross the steep Portal Ridge area and San Andreas Fault Rift Zone in the Leona Valley where Pelona Schist predominantly would underlie the route. It would run west/southwest over the steep, mountainous Sierra Pelona and through Mint Canyon, Bouquet Canyon and Haskell Canyon. The Sierra Pelona portion of the Alternative 3 transmission line south of the Antelope Valley would be underlain by areas of Pelona Schist, granitic rock, and Tertiary marine and non-marine sedimentary formations. Quaternary alluvial deposits are present in canyons and drainage areas along the proposed Alternative 3 transmission line alignment.
The Alternative 3 transmission line would cross two active faults with the potential for surface rupture including, the active Garlock fault zone at the beginning of the route near the Barren Ridge Switching Station, and the active San Andreas fault zone. Potential ground shaking along this transmission line due to seismic activity would range from 0.25g to 0.80g. Liquefaction hazard zones are located in the San Andreas Rift Zone and in low-lying canyon areas in the southern part of the proposed Alternative alignment. Mapped landslides and Earthquake-Induced Landslide Hazard Zones are located in the steep Sierra Pelona in the southern portion of the proposed transmission line alignment. Reported groundwater depths along this proposed transmission line alignment are on the order of 10 to 295 feet deep in the Antelope Valley area, and 10 to 326 feet deep in the portions of the Sierra Pelona and canyon areas in the southern portion of the transmission line. Nearly two miles of the Alternative 3 transmission line would be located within a potential dam failure inundation zone due to the proximity to Fairmont Reservoir.

Variable areas of slight to severe erosion potential exist along the proposed Alternative 3 transmission line alignment. Areas of low to high corrosive soil potential exist along the proposed transmission line alignment.

There are no active mining operations within the existing transmission line corridor. Likewise, there are no known areas designated or delineated for mineral resource recovery (MRZ-2 or otherwise) along the line. In addition, there are no known mineral resources that have noted value to the region and to the residents of the State.

Paleontology
The Alternative 3 transmission line would traverse 52.3 miles of sedimentary deposits of Quaternary alluvium. Because these deposits accumulated relatively recently, they are defined as having only minor sensitivity. Roughly 18.4 miles of this transmission line would cross areas underlain by plutonic igneous rocks and metamorphic rocks (including the Pelona Schist) with zero resource sensitivity. About 1.3 miles of the Alternative 3 transmission line would cross sedimentary deposits of Quaternary older alluvium (fluvial and alluvial fan deposits of Pleistocene age; ~1.8 to 0.01 Ma). Although not proven to contain fossils, the sedimentary origin of Quaternary older alluvium indicates a strong but unproven potential for producing fossil remains. About six miles of this transmission line would cross sedimentary deposits of the Castaic Formation (marine sandstones of late Miocene to early Pliocene age; ~6 to 5 Ma), the Anaverde Formation (terrestrial and fluvial deposits of late Miocene to early Pliocene age; ~6 to 5 Ma), the Mint Canyon Formation (deltaic, fluvial and lacustrine deposits of middle to late Miocene age; ~14 to 11 Ma), and the Tick Canyon Formation (fluvial and lacustrine deposits of early Miocene age; ~24 to 16 Ma). All of these rock units are known to produce significant paleontological resources and are defined as having maximum sensitivity.

3.3.3 WATER RESOURCES

Introduction
Water resources within the BRRTP study area were inventoried and analyzed to assess potential impacts that would result from construction and operation of the Proposed Action and Alternatives.
The information and analysis that is presented in this section have been derived from the Barren Ridge Renewable Transmission Project Water Resources Technical Report, contained in Volume IV of this Final EIS/EIR. This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the Water Resources Technical Report, please refer to that report for more detailed information on Proposed Action and Alternative effects on water resources.

**Overview of Methodology and Analysis Area**

The goal of the water resource inventory was to identify, map, describe, and document existing water resources within the study corridors of each action Alternative. Detailed data inventories were compiled to facilitate the assessment of potential water resource impacts resulting from construction and operation of the Proposed Action and Alternatives.

Base maps of the Project area were prepared at a scale of 1:12,000. Water resource data collected from federal and State databases were reviewed, refined, and updated. Existing maps from the United States Geological Survey (USGS), National Wetland Inventory (NWI), and Federal Emergency Management Agency (FEMA) were collected and included in the inventory, as appropriate. These data were compiled and mapped utilizing a geographic information system (GIS). The study used National Agriculture Imagery Program 2005 color aerial photography, and national, State, and local agency GIS data layers to identify and more accurately assess surface land uses and land cover types.

Existing water resources were identified within the 0.5-mile wide study corridor to present an overview of the water resources near the transmission line Alternative routes. Water resource inventory data were collected based on the assumption that the transmission line could be placed at any point within a 500-foot corridor, to allow for flexibility in final design utilizing a ROW of 200 feet.

For more information on inventory methodology and analysis area, refer to the Water Resources Technical Report in Volume IV.

**Regulatory Framework**

The Regulatory Framework for the Project area, including applicable federal, State, and local laws, ordinances, regulations, and standards, is included in Appendix D of this Final EIS/EIR.

**Summary of Inventory Results**

Some water resources are common to all action Alternatives; for example, all action Alternatives would cross the Antelope-Fremont Valleys Watershed and the Santa Clara River East Watershed. Those resources common to all action Alternatives are presented below.

**Watersheds**

All proposed Alternative alignments have three watersheds in common: the Antelope-Fremont Valleys Watershed, the Santa Clara River Watershed, and the Los Angeles River Watershed. The Antelope-Fremont Valleys watershed is a large, closed basin that receives surface water...
from tributaries in the San Gabriel Mountains and the Tehachapi Mountains, and from precipitation.

The Santa Clara River Watershed is divided into the Upper Santa Clara River and Lower Santa Clara River. The headwaters of the river are located at Pacifico Mountain in the San Gabriel Mountains. The Santa Clara River flows southwest, draining into the Pacific Ocean.

The Los Angeles River Watershed receives flow from the San Gabriel Mountains, the Santa Monica Mountains, and the Santa Susana Mountains, as well as from groundwater seeps in the Glendale Narrows. South of the San Fernando Valley, flows are dominated by urban runoff, flood flows, and effluent from several municipal wastewater treatment plants. The Los Angeles River empties into the Pacific Ocean in the City of Long Beach.

**Floodplains**

A 100-year floodplain is an area of land that has at least a one percent chance of inundation every year, or at least once every 100 years. FEMA has estimated and mapped 100-year floodplains throughout much of the Antelope-Fremont Valley and Santa Clara River watersheds. In the Antelope Valley, all Alternatives would cross 100-year floodplains associated with Pine Tree Canyon, Cache Creek, Oak Creek, Cottonwood Creek, and numerous unnamed intermittent drainages flowing southeast from the Tehachapi Mountains. In the San Gabriel Mountains, all Alternatives would cross the 100-year floodplain associated with San Francisquito Canyon, Santa Clara River, and Placerita Canyon.

**Surface Water**

Due to the arid nature of the Antelope and Fremont Valleys and the temperate-to-hot climate of the western San Gabriel Mountains, many of the streams are ephemeral in nature and flow only in response to precipitation in the immediate area. Intermittent streams flow only during certain times of year: for example, when they receive water from a spring, seep, melting snowpack from higher elevations, or other periodic sources.

All Alternatives would generally parallel the Tehachapi Mountains, and cross numerous ephemeral and intermittent streams. Streams that would be crossed by all Alternatives include Pine Tree Canyon and Cache Creek, and multiple unnamed ephemeral and intermittent drainages between mile marker 0 and mile marker 13.2. Additionally, all Alternatives would cross the Santa Clara River during reconductoring of the existing 230 kV transmission line, approximately 4.5 miles south of the proposed Haskell Canyon Switching Station.

**Wetlands**

Section 404 CWA jurisdictional wetlands are defined by the EPA and the USACE as “those areas that are inundated or saturated by surface or groundwater at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” The NWI provides approximate locations of wetlands one acre or larger; these wetlands may or may not be jurisdictional based on the USACE 1987 *Wetlands Delineation Manual* and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0).
Riparian Conservation Areas and Significant Ecological Areas

Riparian Conservation Areas (RCAs) have been established within the ANF to protect, maintain, or improve water quality, site productivity, channel stability, riparian vegetation, and riparian-dependent species and habitats. RCAs combine the ecologic concerns of riparian ecosystems with the hydrologic concerns of floodplains and stream banks.

Significant Ecological Areas (SEAs) are designated by the County of Los Angeles, and defined as “ecologically important or fragile land and water areas, valuable as plant and animal communities.” SEAs are classified as one or more of the following: 1) habitats for rare and endangered species of plants and animals; 2) restricted natural communities – ecological areas which are scarce on a regional basis; 3) habitat restricted in distribution in the county; 4) breeding or nesting grounds; 5) unusual biotic communities; 6) sites with critical wildlife and fish value; and 7) relatively undisturbed habitat.

Groundwater and Wells

All Alternatives would cross four groundwater basins: the Fremont Valley Groundwater Basin, the Antelope Valley Groundwater Basin, the Santa Clara River Groundwater Basin, and the San Fernando Valley Groundwater Basin. The Fremont Valley Groundwater Basin drains a surface area of approximately 335,000 acres (523 square miles); the Antelope Valley Groundwater Basin drains an area of approximately 1,010,000 acres (1,580 square miles); the Santa Clara River Valley East Groundwater Sub-basin drains an area of approximately 66,200 acres (103 square miles); and the San Fernando Valley Groundwater Basin drains an area of approximately 145,000 acres (226 square miles).

Well locations were obtained from the California Department of Water Resources (DWR) and the USGS. These wells included privately owned wells registered through the DWR, municipal wells, and wells owned and operated by the USGS to monitor groundwater basin levels, to record trends in groundwater depth, and to monitor groundwater quality.

Water Quality

Water quality is a measure of the suitability of water for its intended uses, with respect to dissolved solids, gases, and suspended material. Surface and groundwater quality objectives for the proposed Alternative 1 alignment area are described in the Los Angeles Region Water Quality Control Plan and the Water Quality Control Plan for the Lahontan Region (Basin Plans). Additional groundwater quality objectives are described in California’s Groundwater Bulletin 118. Water quality objectives were established to protect the existing and potential beneficial uses of surface water and groundwater.

Beneficial uses are goals or desired uses of a water body as specified in the Basin Plans, or as designated by federal, State, or local laws and regulations.

Surface waters that would be crossed by the Alternatives have the common designated existing, potential, or intermittent beneficial uses of Municipal and Domestic Supply, Industrial Service Supply, Industrial Process Supply, Agricultural Supply, Ground Water Recharge, Freshwater Replenishment, Hydropower Generation, Water Contact Recreation, Non-contact Water Recreation, Commercial and Sport Fishing, Warm Freshwater Habitat, Wildlife Habitat, Rare,
Threatened, or Endangered Species, Spawning, Reproduction, and/or Early Development, and Wetland Habitat.

Each Regional Board has developed narrative or numerical water quality objectives for various parameters. These objectives apply to all inland surface waters, enclosed bays, wetlands, and estuaries. Details of the water quality objectives for surface waters crossed by all Alternatives may be found in the Water Resources Technical Report in Volume IV.

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop a List of Water Quality Limited Segments. Waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions develop action plans, called Total Maximum Daily Loads (TMDLs), to improve water quality.

Streams listed on the Section 303(d) List of Water Quality Limited Segments are considered sensitive resources in the routing of transmission lines and are protected from water quality impacts.

Groundwater quality in the basins that would be crossed by all Alternatives varies by area. In the southwest portion of the Fremont Valley Groundwater Basin, groundwater is typically sodium bicarbonate or calcium–sodium sulfate in character, with total dissolved solids (TDS) ranging between 800 milligrams per liter (mg/L) to 1,000 mg/L. Portions of the basin are impaired by high levels of fluoride, sodium, and chloride. Groundwater in the alluvial portion of the Santa Clara River Valley East Sub-basin is characterized by calcium bicarbonate in the east, and calcium sulfate in the west; groundwater in the Saugus Formation portion of the aquifer is of calcium bicarbonate character in the southeast, calcium sulfate in the central portion, and sodium bicarbonate in the western portion. From east to west, TDS ranges from approximately 550 mg/L to 1,000 mg/L in the alluvial aquifer and 500 mg/L to 900 mg/L in the Saugus Formation aquifer. Impairments in the Santa Clara River Valley East Sub-basin include excessive nitrate content in some areas, elevated TDS content, particularly in the western portions, and trichloroethylene and ammonium perchlorate in the eastern portion of the sub-basin. Groundwater in the San Fernando Valley groundwater Basin is characterized by calcium sulfate-bicarbonate in the western portion and by calcium bicarbonate in the eastern portion. Water in this basin is impaired by volatile organic compounds such as trichloroethylene (TCE), perchloroethylene (PCE), petroleum compounds, chloroform, nitrate, sulfate, and heavy metals. Sulfate contamination occurs predominantly in the western portion of the basin, whereas the eastern portion of the basin is contaminated by TCE, PCE, and nitrate.

**Project Components Common to All Alternatives**

The following Project components (new 230 kV circuit, reconductoring of BR-RIN transmission line, new Haskell Canyon Switching Station, and expansion of the Barren Ridge Switching Station) would be identical for each of the action Alternatives.

**Addition of New 230 kV Circuit**

Between the proposed Haskell Canyon Switching Station and the existing Castaic Power Plant, LADWP proposes to add a new 230 kV transmission line onto existing Castaic – Olive 230 kV
Transmission Line structures. Of this 12-mile addition, approximately 8.5 miles would follow the alignment of the Alternative 1 transmission line from mile marker 74.7 to the proposed Haskell Canyon Switching Station, and is discussed below as Alternative 1. The remaining 3.5 miles of this addition would be within the Santa Clara River Watershed. This portion would not cross 100-year floodplains, but would cross one unnamed tributary to Grasshopper Canyon and one unnamed tributary to Castaic Lake, none of which are Section 303(d)-listed. Sections of this addition drain into the Elderberry Forebay, which is within the Castaic Lake reach of the Santa Clara River Valley East Sub-basin. There are no municipal, USGS, or privately-own wells within a 200-foot radius of the 230 kV transmission line addition.

Reconductor Existing 230 kV Transmission Line

Of the 76 miles of existing 230 kV transmission line that would be reconductored, 61 miles would follow the proposed alignment of the Alternative 2 transmission line, and is discussed below as Alternative 2. The remaining 15 miles of the reconductor and upgrade would run from the proposed Haskell Canyon Switching Station south to the Rinaldi Substation. This section of the reconductor would begin in the Santa Clara River Watershed and end in the Los Angeles River Watershed. All action Alternatives would cross the Santa Clara River during the reconductor of the existing 230 kV transmission line. No wells occur within 200 feet of the 230 kV transmission line south of the proposed Haskell Canyon Switching Station. The Santa Clara River is a Section 303(d)-listed river, and is impaired by fecal coliform bacteria due to various nonpoint and (unspecified) point sources.

Construction of the Haskell Canyon Switching Station

The proposed Haskell Canyon Switching Station would be located in the Santa Clara River Watershed. The proposed switching station would not be located within a 100-year floodplain. It would be located on an upland area adjacent to an unnamed intermittent stream tributary to Haskell Canyon. No NWI wetlands occur in the area of the proposed switching station or within the proposed footprint. The proposed switching station would not be located above a groundwater basin, but would be located approximately 0.5 mile upstream of the Haskell Canyon reach of the Santa Clara River Valley East Sub-basin. There are no municipal, USGS, or privately owned wells recorded with a 200-foot radius of the proposed switching station footprint. No Section 303(d)-listed waterbodies are located near the proposed Haskell Canyon Switching Station.

Expansion of the Existing Barren Ridge Switching Station

The Barren Ridge Switching Station is located in the Antelope-Fremont Valleys Watershed. It is not located within any 100-year floodplain, nor is it crossed by any streams; the nearest stream is Pine Tree Canyon, located approximately 0.5 mile south of the switching station. There are no NWI wetlands mapped within the existing or proposed footprint of this switching station. The Barren Ridge Switching Station is located above the Fremont Valley Groundwater Basin. There are no municipal, USGS, or privately owned wells recorded within a 200-foot radius of the proposed switching station footprint. The switching station is not located near a Section 303(d)-listed waterbody.
New 230 kV Double-Circuit Transmission Line

The action Alternatives differ only in the alignment of the proposed 230 kV double-circuit transmission line extending from the Barren Ridge Switching Station to the proposed Haskell Canyon Switching Station.

Alternatives 2 and 2a would require the addition of a temporary transmission line during construction of the proposed 230 kV double-circuit transmission line. This temporary transmission line would begin 0.30 mile north of Johnson Road, near Masonhill Road. The temporary transmission line would generally follow San Francisquito Canyon Road for 7.5 miles. Temporary disturbance for the temporary transmission line would be approximately two acres per mile. There would be no permanent disturbance.

Inventory results presented below are inclusive of all Project components (applicable new 230 kV transmission line route, new 230 kV circuit, reconductoring of BR-RIN transmission line, construction of the temporary transmission line, new Haskell Canyon Switching Station, and expansion of Barren Ridge Switching Station) within each Alternative discussion.

Alternative 1

Watersheds

Watersheds that would be crossed by Alternative 1 are common to all Alternatives, and have been discussed above. No unique watershed would be crossed by this Alternative.

Floodplains

In addition to the 100-year floodplains common to all Alternatives, in the Antelope Valley Alternative 1 would cross multiple 100-year floodplains associated with intermittent drainages flowing southeast from the Tehachapi Mountains. Within the San Gabriel Mountains, Alternative 1 would cross a 100-year floodplain associated with the Castaic Spillway.

Surface Water

The northern section of Alternative 1 would generally parallel the Tehachapi Mountains from Barren Ridge Switching Station to mile marker 58, and cross numerous ephemeral and intermittent streams. In addition to the streams common to all Alternatives, these streams include Oak Creek, Cottonwood Creek, and Little Oak Canyon. As Alternative 1 would near the San Andreas Rift Zone, it would cross intermittent streams draining the foothills, including Cow Spring Canyon, Horse Camp Canyon, and Tentrock Canyon. Where Alternative 1 would pass over the rift zone and enter the mountains and the ANF, it would cross multiple intermittent streams that flow out of the mountains, including West Fork Liebre Gulch and Liebre Gulch, Trough Canyon, Posey Canyon, Grasshopper Canyon, San Francisquito Canyon, and many other streams, both named and unnamed.

The California and the Los Angeles Aqueducts import water from northern and central California to Southern California. The West Branch of the California Aqueduct, operated by the California Department of Water Resources, would be crossed by Alternative 1 approximately two miles southwest of Holiday Lake. Alternative 1 would also cross the Castaic Spillway at mile marker 76.7; Castaic Lake is the terminus of the West Branch of the California Aqueduct.
The First Los Angeles Aqueduct, operated by LADWP, would be generally paralleled by Alternative 1 between mile marker 13.6 and 31.4. In addition, Alternative 1 would cross the First Los Angeles Aqueduct tunnel near mile marker 81.9.

**Hydric Soils**

Hydric soils are soils that are saturated at or near the surface, whether from flooding or high groundwater tables, of a frequency or duration that promotes the development of anaerobic conditions that affect plant growth and promote the establishment of hydrophytic vegetation. Some soils have phases that are not hydric, depending on groundwater table and local flooding and ponding characteristics.

Soils data from the Soils Survey Geographic Database are classified as all hydric soils, partially hydric soils, not hydric soils, and no data available. Hydric soils data were not available for areas within the ANF; however, available data for the remainder of Alternative 1 revealed areas of partially hydric and not hydric soils. Areas of partially hydric soils are found along the proposed Alternative 1 alignment as it parallels the base of the Tehachapi Mountains, and in the area of the San Andreas Rift Zone. Additional areas of partially hydric soils are located between Violin Canyon and San Francisquito Canyon. No hydric soils would be located along Alternative 1.

**Wetlands**

Wetlands along the proposed Alternative 1 alignment are restricted to an area between mile marker 47.5 and 48.7, along the California Aqueduct. These wetlands are associated with the aqueduct itself, and have been classified by the NWI as a lower perennial riverine wetland, with an unconsolidated bottom, that is both artificially and permanently flooded (R2UBKHX). The aqueduct is lined with concrete, above which are buffers of bare soil; neither wetland nor riparian vegetation is associated with these NWI wetlands.

**Riparian Conservation Areas and Significant Ecological Areas**

Many streams that would be crossed by or in proximity to Alternative 1 within the ANF have associated RCAs. Alternative 1 would cross 151 RCAs, of which 102 would be affected. Many RCAs are associated with unnamed streams; however, named streams with associated RCAs include West Fork Liebre Gulch, Liebre Gulch, Trough Canyon, Posey Canyon, Big Oak Flat, Violin Canyon, Charlie Canyon, and San Francisquito Canyon.

Approximately 7.8 miles of Alternative 1 would cross the San Andreas Rift Zone SEA along the southwestern portion of the Antelope Valley. Alternative 1 would also cross a 0.3-mile portion of the Santa Clara River SEA in San Francisquito Canyon.

**Groundwater and Wells**

In the vicinity of the proposed Alternative 1 alignment, the average depth-to-water measurements in monitored wells of the Fremont Valley Groundwater Basin ranged between 117.4 feet and 345.0 feet. Monitored wells in the vicinity of the proposed Alternative 1 alignment within the Antelope Valley Groundwater Basin recorded average depth-to-water
measurements ranged between 152.8 feet and 390.8 feet. In the vicinity of the proposed Alternative 1 alignment, average depth-to-water levels in monitored wells within the Santa Clara River Valley East Sub-basin ranged from 9.6 feet to 67.0 feet.

One well would be located adjacent to Alternative 1 near mile marker 46.1; no other wells would occur along Alternative 1.

Water Quality

Alternative 1 would cross one Section 303(d)-listed stream, Dry Canyon, at mile marker 81.9. Dry Canyon Creek is listed for impairments from fecal coliform bacteria due to natural sources, urban runoff, and storm sewers.

The northern portion of the Antelope Valley Groundwater Basin is typically calcium-bicarbonate in nature, with TDS ranging from 200 mg/L to 800 mg/L. Groundwater throughout this basin is impaired by high levels of boron and nitrate.

Alternative 2

Watersheds

Like Alternative 1, Alternative 2 would pass through the Antelope-Fremont Valleys watershed and the Santa Clara River Watershed. Alternative 2 would pass through the central region of this watershed, and cross through the eastern section of the Upper Santa Clara River Valley Watershed north of the Santa Clara River.

Floodplains

Alternative 2 would cross through 100-year floodplains associated with streams flowing from the Tehachapi Mountains, including Pine Tree Canyon and Oak Creek. Alternative 2 would also cross the broad floodplain in the Antelope Valley associated with the many unnamed drainages that flow from the Tehachapi Mountains. Near mile marker 37, Alternative 2 would cross the floodplain associated with Broad Canyon and several unnamed drainages, and then cross the floodplain associated with Myrick Canyon near mile marker 41. Where this Alternative route would cross the San Andreas Rift Zone and enter the ANF, it would cross smaller floodplains associated with Elizabeth Lake, San Francisquito Canyon, and Bee Canyon. Additional floodplains associated with San Francisquito Creek and Portal Canyon are located southwest of the unincorporated community of Green Valley.

Surface Water

Like Alternative 1, Alternative 2 would cross Pine Tree Canyon, Cache Creek, and many unnamed ephemeral and intermittent drainages that flow from the Tehachapi Mountains into the Antelope Valley. As it passes through the valley, the proposed Alternative 2 alignment crosses multiple unnamed drainages that drain from the edges of the valley toward the valley floor, including Myrick Canyon at mile marker 41.1. Where Alternative 2 would cross the San Andreas Rift Zone and enter the ANF, it would cross numerous named and unnamed streams that drain the Rift Zone and mountains. Among these streams are Myrick Canyon, San Francisquito Canyon, Bee Canyon, Baird Canyon, Dry Canyon, Portal Canyon, and Pettinger Canyon.
The California Aqueduct would be crossed by Alternative 2 at mile marker 43.7, and the Los Angeles Aqueduct Tunnel would be paralleled by Alternative 2 from mile marker 52.2 to mile marker 52.6.

**Hydric Soils**

Hydric soils data were not available for areas within the ANF; however, available data for the remainder of the proposed Alternative 2 alignment revealed areas of partially hydric and not hydric soils. Areas of partially hydric soils are found along the proposed Alternative 2 alignment between mile marker 29, near the unincorporated community of Willow Springs, and mile marker 39, east of the Antelope Valley California Poppy Reserve. Additional areas of partially hydric soils are mapped near mile markers 39.5, 41.2, 43.3, and within the San Andreas Rift Zone from mile marker 44.5 to mile marker 45.8. No hydric soils would be located along Alternative 2.

**Wetlands**

Two NWI wetlands are mapped along the proposed Alternative 2 alignment. The first wetland is located at mile marker 43.7; this wetland is associated with the aqueduct itself, and has been classified by the NWI as a lower perennial riverine wetland, with an unconsolidated bottom, that is both artificially and permanently flooded (R2UBKHx). The sides of the aqueduct are lined with concrete, above which is an access road and buffers of bare soil; neither wetland nor riparian vegetation is associated with this NWI wetland.

The second wetland would be located between mile marker 45.2 and mile marker 45.4. The NWI has classified this as a palustrine emergent wetland with saturated soils for extended periods (PEMB). This wetland is associated with a series of artificial ponds and wetland areas between Elizabeth Lake Road on the west and Kellogg Valley Road on the east.

**Riparian Conservation Areas and Significant Ecological Areas**

Many streams that would be crossed by Alternative 2 within the ANF have associated RCAs. Alternative 2 would cross 66 RCAs, of which 50 would be affected. Many RCAs are associated with unnamed streams; however, named streams with associated RCAs include South Portal Canyon, San Francisquito Canyon, Bee Canyon, Baird Canyon, Dry Canyon, and Pettinger Canyon.

Approximately 1.9 miles of Alternative 2 would cross the San Andreas Rift Zone SEA east of Elizabeth Lake. Alternative 2 would also cross a 0.2-mile portion of the Santa Clara River SEA near Portal Canyon, and a 0.5-mile portion in San Francisquito Canyon.

**Groundwater and Wells**

Within the central Antelope Valley Groundwater Basin, monitored wells in the vicinity of the proposed Alternative 2 alignment recorded average depth-to-water measurements ranged between 152.8 feet and 390.8 feet.

One well is located adjacent to the proposed Alternative 2 alignment near mile marker 41.7; no other wells occur along the proposed Alternative 2 alignment.
Water Quality

Alternative 2 would generally parallel one Section 303(d)-listed stream, Dry Canyon, from mile marker 56.2 to mile marker 58.2. Dry Canyon Creek is listed for impairments from fecal coliform bacteria due to natural sources, urban runoff, and storm sewers.

Groundwater quality in the basins that would be crossed by Alternative 2 varies by area. The central portion of the Antelope Valley Groundwater Basin is typically sodium bicarbonate or sodium sulfate in nature, with TDS ranging from 200 mg/L to 800 mg/L. Groundwater throughout this basin is impaired by high levels of boron and nitrate.

Alternative 2a

Alternative 2a was designed to avoid the unincorporated community of Green Valley, and would be identical to Alternative 2 with the exception of a 6.7-mile re-route designed to avoid the unincorporated community of Green Valley. This deviation in the proposed alignment begins at mile marker 46, south of the unincorporated community of Elizabeth Lake, and rejoins the proposed alignment of Alternative 2 at mile marker 50.7, south of the unincorporated community of Green Valley.

Watersheds

Like Alternative 2, Alternative 2a would pass through the Antelope-Fremont Valleys watershed and the Santa Clara River Watershed. The re-route portion of Alternative 2a would lie within the northeast section of the Upper Santa Clara River Watershed, approximately two miles south of the divide between the Santa Clara River Watershed and the Antelope-Fremont Valleys Watershed.

Floodplains

Alternative 2a would cross through 100-year floodplains associated with streams flowing from the Tehachapi Mountains, including Pine Tree Canyon and Oak Creek. Alternative 2a would also cross the broad floodplain in the Antelope Valley associated with the many unnamed drainages that flow from the Tehachapi Mountains. Near mile marker 37, Alternative 2a would cross the floodplain associated with Broad Canyon and several unnamed drainages, and then cross the floodplain associated with Myrick Canyon near mile marker 41. Where this Alternative would cross the San Andreas Rift Zone and enter the ANF, it would cross smaller floodplains associated with Elizabeth Lake, San Francisquito Canyon, and Bee Canyon. An additional floodplain associated with San Francisquito Creek is located southwest of the unincorporated community of Green Valley.

No 100-year floodplains are mapped within the re-route portion of Alternative 2a.

Surface Water

Alternative 2a would cross Pine Tree Canyon, Cache Creek, and many unnamed ephemeral and intermittent drainages that flow from the Tehachapi Mountains into the Antelope Valley. As it passes through the valley, the proposed Alternative 2a alignment crosses multiple unnamed drainages that drain from the edges of the valley toward the valley floor, including Myrick...
Canyon at mile marker 41.1. Where Alternative 2a would cross the San Andreas Rift Zone and enter the ANF, it would cross numerous named and unnamed streams that drain the Rift Zone and mountains. Among these streams are Myrick Canyon, San Francisquito Canyon, Bee Canyon, Baird Canyon, Dry Canyon, and Pettinger Canyon.

The California Aqueduct would be crossed by Alternative 2a at mile marker 43.7, and the Los Angeles Aqueduct Tunnel would be paralleled by Alternative 2a from mile marker 52.2 to mile marker 52.5.

The Alternative 2a re-route would cross five unnamed streams, including tributaries to South Portal Canyon and San Francisquito Canyon. From mile marker 1.9 to mile marker 2.4, the re-route would parallel Munz Canyon. The re-route would also cross tunnels of the Los Angeles Aqueduct at mile marker 3.8 and mile marker 5.2.

**Hydric Soils**

Available hydric soils data for Alternative 2a revealed areas of partially hydric and not hydric soils. Areas of partially hydric soils are found along the proposed Alternative 2a alignment between mile marker 29, near the unincorporated community of Willow Springs, and mile marker 39, east of the Antelope Valley California Poppy Reserve. Additional areas of partially hydric soils are mapped near mile markers 39.5, 41.2, 43.3, and within the San Andreas Rift Zone from mile marker 44.5 to mile marker 45.8. No hydric soils would be located along Alternative 2a.

**Wetlands**

Two NWI wetlands are mapped along the proposed Alternative 2a alignment. The first wetland is located at mile marker 43.7; this wetland is associated with the aqueduct itself, and has been classified by the NWI as a lower perennial riverine wetland, with an unconsolidated bottom, that is both artificially and permanently flooded (R2UBKHX). The sides of the aqueduct are lined with concrete, above which is an access road and buffers of bare soil; neither wetland nor riparian vegetation is associated with this NWI wetland.

The second wetland would be located between mile marker 45.2 and mile marker 45.4. The NWI has classified this as a palustrine emergent wetland with saturated soils for extended periods (PEMB). This wetland is associated with a series of artificial ponds and wetland areas between Elizabeth Lake Road on the west and Kellogg Valley Road on the east. No additional wetlands are mapped along the Alternative 2a reroute.

**Riparian Conservation Areas and Significant Ecological Areas**

Many streams that would be crossed by Alternative 2a within the ANF have associated RCAs. Alternative 2a would cross 94 RCAs. Sixty-six of these are the same as those in Alternative 2; a separate 28 are distinct to Alternative 2a, all 28 of which would be affected. Many RCAs are associated with unnamed streams; however, named streams with associated RCAs include Portal Canyon, San Francisquito Canyon, Bee Canyon, Baird Canyon, Dry Canyon, and Pettinger Canyon. The Alternative 2a re-route would parallel the Munz Canyon RCA for approximately 1.2 miles from mile marker 1.2 and mile marker 2.4. The re-route would cross RCAs associated
with unnamed tributaries to South Portal Canyon and San Francisquito Canyon, as well as RCAs associated with ephemeral drainages.

Approximately 1.9 miles of Alternative 2a would cross the San Andreas Rift Zone SEA east of Elizabeth Lake. Alternative 2a would also cross a 0.5-mile portion of the Santa Clara River SEA in San Francisquito Canyon. No SEAs would be crossed by the re-route.

**Groundwater and Wells**

Alternative 2a would cross the groundwater basins described in Alternative 2. While the proposed Alternative 2a re-route alignment is not located across any groundwater basin, the first mile is located on a ridge immediately above the boundary of the San Andreas Rift section of the Antelope Valley Groundwater Basin.

One well is located adjacent to Alternative 2a near mile marker 41.7; no other wells occur along Alternative 2a.

**Water Quality**

Surface waters that would be crossed by Alternative 2a have the same designated existing, potential, or intermittent beneficial uses as those described in Alternative 2.

Alternative 2a would generally parallel one Section 303(d)-listed stream, Dry Canyon, from mile marker 56.2 to mile marker 58.2. Dry Canyon Creek is listed for impairments from fecal coliform bacteria due to natural sources, urban runoff, and storm sewers.

Groundwater quality in the basins that would be crossed by Alternative 2a varies by area, as previously described in Alternative 2.

**Alternative 3**

**Watersheds**

Alternative 3 would pass through the central region of the Antelope-Fremont Valleys watershed and cross through the eastern section of the Upper Santa Clara River Valley Watershed north of, and generally paralleling, the Santa Clara River.

**Floodplains**

Alternative 3 would cross through 100-year floodplains associated with streams flowing from the Tehachapi Mountains, including Pine Tree Canyon and Oak Creek. Alternative 3 would also cross the broad floodplain in the Antelope Valley associated with the many unnamed drainages that flow from the Tehachapi Mountains. Additional floodplains would be crossed near mile marker 41, where Alternative 3 would cross a floodplain associated with Myrick Canyon; at Amargosa Creek, near mile marker 51.7; at Mint Canyon, near mile marker 66.9; at Vasquez Canyon, near mile marker 70.1; at Bouquet Canyon, near mile marker 72.2, and at Haskell Canyon, near mile marker 75.
Surface Water

Like the other Alternatives, Alternative 3 would cross Pine Tree Canyon, Cache Creek, and many unnamed ephemeral and intermittent drainages that flow from the Tehachapi Mountains into the Antelope Valley. As it passes through the valley, the proposed Alternative 3 alignment crosses multiple unnamed streams that drain from the edges of the valley toward the valley floor, including Myrick Canyon at mile marker 41.2. As the proposed Alternative 3 alignment turns southeast, it crosses several unnamed streams flowing from upland areas near the California Aqueduct. As Alternative 3 would cross Leona Valley and enters the Sierra Pelona, it would cross multiple named and unnamed streams, including Amargosa Creek, Anaverde Creek, Hauser Canyon, Willow Springs Canyon, Letteau Canyon, Tick Canyon, Mint Canyon, Vasquez Canyon, Bouquet Canyon, and Haskell Canyon.

Alternative 3 would cross the California Aqueduct at mile marker 48.5.

Hydric Soils

For the small section of Alternative 3 that would cross the ANF, hydric soils data were not available; however, available data for the remainder of the proposed Alternative 3 alignment revealed areas of partially hydric and not hydric soils. Areas of partially hydric soils would be found along Alternative 3 between mile marker 40.9, near the floodplain associated with Myrick Canyon Creek, and mile marker 43.2, north of West Avenue J. Larger areas of partially hydric soils are mapped from mile marker 50.8 to mile marker 54.6, from mile marker 55.9 to mile marker 60.5, and from mile marker 68.1 to mile marker 73.2. No hydric soils would be located along Alternative 3.

Wetlands

One NWI wetland is mapped along the proposed Alternative 3 alignment. Located at mile marker 48.5, this wetland is associated with the California Aqueduct, and has been classified by the NWI as a lower perennial riverine wetland, with an unconsolidated bottom, that is both artificially and permanently flooded (R2UBKHX). The sides of the aqueduct are lined with concrete, above which is an access road and buffers of bare soil; neither wetland nor riparian vegetation is associated with this NWI wetland.

Riparian Conservation Areas and Significant Ecological Areas

Alternative 3 would cross six RCAs, of which five would be affected. One RCA is associated with Mint Canyon; the remainder are associated with unnamed drainages, including one tributary to Mint Canyon.

Approximately 4.3 miles of Alternative 3 would cross the San Andreas Rift Zone SEA at the eastern end of Leona Valley. Alternative 3 would also cross a 0.4-mile portion of the Cruzan Mesa SEA between Bouquet Canyon and Cruzan Mesa.

Groundwater and Wells

Alternative 3 would cross the Acton Valley Groundwater Basin. The Acton Valley Groundwater Basin drains a surface area of approximately 8,270 acres (12.9 square miles).
would cross the northern portion of this basin, where average depth-to-water measurements in monitored wells ranged between 1.2 feet to 80.5 feet.

Two wells would be located adjacent to Alternative 3. One well would be located at mile marker 41.9, the second would be located near mile marker 45.5. No other wells would occur along Alternative 3.

Water Quality
Alternative 3 would cross one Section 303(d)-listed stream, Mint Canyon Creek, at mile marker 66.9. Mint Canyon Creek is listed for impairments from nitrate and nitrite due to nonpoint sources.

The central portion of the Antelope Valley Groundwater Basin is typically sodium bicarbonate or sodium sulfate in nature, with TDS ranging from 200 mg/L to 800 mg/L. Groundwater throughout this basin is impaired by high levels of boron and nitrate. In the northern section of the Acton Valley Groundwater Basin, groundwater is impaired by high concentrations of TDS, sulfate, and chloride.