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Appendix 1. Alternatives Screening Report

1. Introduction

1.1 Purpose of Alternatives Screening Report

San Diego Gas & Electric (SDG&E) submitted Applications on December 14, 2005 (A.05-12-014) and August 4, 2006 (A.06-08-010) seeking authorization by the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity (CPCN) for the Sunrise Powerlink (SRPL) Project (Proposed Project). This project was approved by the California Independent System Operator on August 3, 2006. The Proponent's Environmental Assessment (PEA) was filed with an amended application with the CPUC on August 4, 2006. Because the proposed transmission line would cross approximately 33 miles of federal land managed by the Bureau of Land Management (BLM), the project would also require a Right-of-Way (ROW) Grant from the BLM for the portion of the project across BLM land. The Proposed Project is described in detail in Section B of the EIR/EIS. This document describes the alternatives screening analysis that has been conducted for the Proposed Project, supplementing the information presented in Sections C of the EIR/EIS.

Alternatives to the Proposed Project were suggested by SDG&E as part of the PEA and Routing Study, by the EIR/EIS team (the CPUC and BLM staff and consultants hired by those agencies) based on identification of potentially significant environmental impacts, and by public agencies and the general public during the scoping period (September 11 to October 20, 2006). The alternatives screening analysis was completed in order to determine the range of alternatives that would be carried forward in the EIR/EIS. This report documents: (1) the range of alternatives that have been suggested and evaluated; (2) the approach and methods used by the CPUC and BLM in screening the potential feasibility of these alternatives according to guidelines established under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA); and (3) the results of the alternatives screening process (i.e., which alternatives are analyzed in the EIR/EIS).

The Alternatives Screening Report is incorporated as Appendix 1 to the EIR/EIS, providing the basis and rationale for whether an alternative has been carried forward to full evaluation in the EIR/EIS. For each alternative that was eliminated from further consideration, this document explains in detail the rationale for elimination. Since full consideration of the No Project/Action Alternative is required by CEQA and NEPA, this report does not address this alternative (it is defined in Section C.6 of the EIR/EIS).

1.2 Alternatives Consideration in EIR/EIS Scoping

The process in which alternatives to the Proposed Sunrise Powerlink Project have been identified has involved several steps and two formal opportunities for public comment. The process is described in this section.

September 2006 – EIR/EIS Scoping

In September 2006, a Notice of Preparation (NOP) announcing a 30-day scoping period was sent to interested agencies and members of the public to inform recipients that the CPUC was beginning preparation of the Sunrise Powerlink EIR/EIS and to solicit information that would be helpful in the environ-

mental review process. Also, the BLM published in the Federal Register a Notice of Intent (NOI) to prepare a joint EIR/EIS for Sunrise Powerlink (FR Vol. 71, No. 169, page 51848, August 31, 2006). Following the release of the NOP and NOI, seven public scoping meetings were held during the week of October 2, 2006, and a Scoping Report was prepared to document comments received.

After the fall 2006 scoping period, the EIR/EIS team completed preliminary assessment of nearly 100 alternatives, including 24 identified by SDG&E in its PEA. The rest of the alternatives were suggested by the public and public agencies during scoping (September/October 2006), or were developed by the EIR/EIS team in order to reduce or avoid impacts of the Sunrise Powerlink Project as proposed. In this notice, 29 alternatives are recommended for detailed EIR/EIS analysis and the remaining approximately 70 alternatives are recommended for elimination from detailed analysis. Research on the potential feasibility of a number of alternatives was ongoing during fall 2006, so they were still identified as “retained” pending receipt of additional information.

January/February 2007 – EIR/EIS Alternatives Scoping

A second scoping period was held in January/February of 2007 to allow the public to provide input to the EIR/EIS team on its preliminary assessment of all identified alternatives. Prior to the close of the first scoping period in October 2004, the Sierra Club and the Center for Biological Diversity filed a motion with the CPUC’s Administrative Law Judge (ALJ) Weissman requesting that the scoping period be extended and that additional scoping meetings be held. These additional commenting opportunities were requested in order to give interested members of the public additional time to consider and react to possible southern transmission line routes identified by SDG&E in its October 2, 2006 filing to the CPUC, in response to a request by the Assigned Commissioner.

In an October 19, 2006 Ruling, the ALJ determined that rather than extend the scoping period, it would be more efficient and informative to allow the EIR/EIS team the time to develop alternatives and to allow the public an additional scoping period to provide comments to the team. Therefore, the ALJ ruled that there would be a second 30-day scoping period at the earliest practical time to solicit comments from the public on the alternatives proposed to be fully analyzed in the EIR/EIS, as well as those recommended to be eliminated from detailed analysis.

March 2007 – Notice on Alternatives Conclusions

After receiving this input, on March 16, 2007 the CPUC and BLM, utilizing their independent judgment, issued a Notice that described the agency conclusions regarding alternatives to be analyzed in the EIR/EIS. Conclusions presented in the March 2007 Notice were based on consideration of the Draft EIR/EIS.

May 2007 – Notice of Modified Alternatives

Following the publication of the March Notice, additional input was received from the Cleveland National Forest (Forest) in April 2007, including the Forest’s request that an alternative be fully analyzed in the EIR/EIS that would not require an amendment to the Forest’s 2005 Land Management Plan. The Forest suggested consideration of a “Modified Route D Alternative” that would not only be consistent with the Forest’s Land Management Plan, but would also avoid collocating with the existing Southwest Powerlink in the area of highest fire risk. As a result, portions of the Route D Alternative that were previously considered and eliminated were combined with new route segments, and have been analyzed in the EIR/EIS (see Section 4 for a description of the route).

On May 8, 2007, the CPUC and BLM mailed another Notice to inform the public of the inclusion of this additional EIR/EIS alternative and to solicit comments on the Modified Route D Alternative, the original Route D Alternative, and on alternative segments south of Interstate 8. This comment period ended on June 14, 2007.

1.3 Summary of Proposed Project

Proposed Project Description

The Proposed Project, known as “Sunrise Powerlink” or “SRPL,” is described in detail in Section B of this EIR/EIS and the entire project would span a total of 150 miles (676 new towers), including a new 91-mile 500 kilovolt (kV) transmission line (in Imperial County and eastern San Diego County) and a new 59-mile 230 kV line (in central and western San Diego County) that includes both overhead and underground segments. It would also include a new substation in central San Diego County and upgrades at four existing substations. The proposed route and ROW requirements are described below in five segments, starting at the southeastern end of the project.

Imperial Valley Link

The first segment of the project would consist of 60.9 miles of the route, including the entire Imperial County portion and a few miles in San Diego County. The SRPL would start at SDG&E’s Imperial Valley Substation located about five miles southwest of the center of the City of El Centro. It would be on BLM land and private land, following about four miles of the existing 500 kV Southwest Powerlink (SWPL) transmission line to the northwest, then turning north, following the eastern edge of BLM land adjacent to agricultural lands. From Milepost 20 to 41, the route would follow an existing Imperial Irrigation District (IID) transmission line. It would turn west to follow SR78 for 9.6 miles, then south along another existing IID 92 kV transmission line for 2.8 miles. The route would approach Anza-Borrego Desert State Park westward along Old Kane Springs Road for 10.8 miles. The Imperial Valley Link also includes upgrades to the existing SDG&E Imperial Valley Substation to accommodate the termination of the new 500 kV transmission line.

Anza-Borrego Link

The Proposed Project would include 22.6 miles through the Anza-Borrego Desert State Park (ABDSP). It would continue through ABDSP adjacent first to Old Kane Spring Road for 7.3 miles, then to State Route (SR) 78 for about 10 miles, passing the Tamarisk Grove Campground and County Route (CR) 3 to Borrego Springs, and finally to Grapevine Canyon Road, turning northwest. The route would pass through approximately 5.6 miles of the Park within Grapevine Canyon Road.

SDG&E has an existing 100-foot-wide easement through the Park that was granted by BLM, but the 500 kV line would require a 150-foot-wide right-of-way, so an expanded easement is required. Because of the wider easement and a route modification that would avoid a cultural resource site, the project as proposed in the Park would be located on 43 acres of land designated as State Wilderness. The entire Anza-Borrego Link would require relocation of both an existing IID 92 kV line and an SDG&E 69 kV transmission line.

Central Link

The project within the Central Link is 27.3 miles long and would include 7.4 miles of 500 kV line and 19.9 miles of 230 kV line. The 500 kV line would continue northwest from the western boundary of the Park within Grapevine Canyon for about four miles, then turning west and staying south of S22 for about 2.5 miles. At this point, the 500 kV line would cross S2 and turn south for one mile, into the new Central East Substation.

The 230 kV line would exit the substation to the north, staying west and south of S2 for about seven miles. Then it would turn south for two miles, paralleling SR79 on its east side. It would cross to the west side of SR79 at the intersection of SR79 and SR76 (southeast of Lake Henshaw). Heading south, it would parallel SR79 at a distance of between one-half mile and three miles west of the highway. The line would parallel a portion of Mesa Grande Road running southeast, then turn south to cross SR78 about 3/4-mile west of Santa Ysabel (at the intersection of SR79 and SR78), then continue south-southwest for 2.5 miles on the east side of SR78.

The existing 69 kV line that is currently located along SR79 would be relocated to run parallel to the SRPL 230 kV within a shared 300-foot ROW. The relocated 69 kV circuit would be supported by new tubular steel poles. The existing 69 kV structures would be removed from the intersection of SR76 and SR79 south to the Santa Ysabel Substation on SR78. Due to this removal, new 69 kV structures would be constructed from MP 100.2 to MP 109.4.

Central East Substation. The proposed 500/230 kV Central East Substation, requiring approximately 106 acres of disturbance, would be located on a privately owned parcel that SDG&E is purchasing. It is located in an undeveloped rural area, about a mile west of S2 and about 1.2 miles south of the S2/S22 intersection in northern San Diego County.

Inland Valley Link

The 25.5-mile project route in this area would extend from southwest of Santa Ysabel, south of central Ramona, and end at the existing Sycamore Canyon Substation on the north edge of Marine Corps Air Station Miramar. The first segment in this link would generally parallel the existing SDG&E 69 kV transmission line that connects Santa Ysabel and Creelman Substations, except for a mile-long segment would diverge west of the 69 kV line to avoid United States Forest Service property. Entering Mount Gower County Preserve from the northwest, the lines would be installed underground, first along a dirt road within the Preserve, then continuing underground in Gunn Stage Road and San Vicente Road. The lines would transition to overhead on San Vicente Road just west of Wildcat Canyon Road, then cross San Vicente Road to the north side for about one mile. At this point, the route would follow an existing SDG&E 69 kV transmission line to the southwest to the Sycamore Canyon Substation.

Coastal Link

A new, 13.6-mile single-circuit 230 kV transmission line would begin at the existing Sycamore Canyon Substation in Rancho Peñasquitos and terminate at the existing Peñasquitos Substation in the Torrey Hills area of the City of San Diego. A 5.9-mile segment from the Sycamore Canyon Substation to the Chicarita Substation would turn northwest and would be installed within existing SDG&E ROW. Immediately west of Chicarita Substation a 4.3-mile underground segment would start. The first 1.9 miles would be in a 50-year-old dedicated SDG&E utility right-of-way that is currently vacant. The 230 kV line would be constructed within Park Village Drive and the Los Peñasquitos Canyon Preserve for

2.4 miles (underground), then transition to overhead in another SDG&E corridor at the western end of Park Village Drive. For the last 3.3 miles, the new 230 kV circuit would be overhead within existing SDG&E ROW into the Peñasquitos Substation.

Substation Upgrades. The Sycamore Canyon Substation would be modified to accommodate termination of three new 230 kV transmission circuits (the new double circuit entering the substation from the new Central East Substation and the new single circuit exiting the substation towards the Peñasquitos Substation). The Peñasquitos Substation would be modified to accommodate the new 230 kV circuit; all improvements at this site would be within the existing substation fencing.

Other System Upgrades

The SRPL Project would require upgrades to three existing substations described above (Imperial Valley, Sycamore Canyon, and Peñasquitos), as well as construction of a new substation (Central East Substation), also described above. In addition, the Sunrise Powerlink Project would require that SDG&E upgrade other portions of its electric system that are physically separate from the corridor described in the five links above:

- A reconductor¹ of the existing Sycamore Canyon to Elliot 69 kV transmission line would be required. Along this 8.5-mile segment, new conductors would be installed primarily on existing towers, but several towers would have to be replaced with new towers in order to support the weight of the new lines.
- The San Luis Rey Substation would be modified with the addition of a third 230/69 kV transformer and a 230 kV, 69 MVAR shunt capacitor.
- The South Bay Substation would be modified with the addition of a 69 kV, 50 MVAR shunt capacitor.

Future Transmission System Expansion

- **230 kV Future Phases.** At least four additional 230 kV future circuits may be required after the two 230 kV circuits proposed as part of the SRPL. This expansion may not be needed for decades, but two additional 230 kV circuits are possible within the first decade following completion of the Sunrise Powerlink. The most likely substation end points for the additional 230 kV circuits are Sycamore Canyon, Peñasquitos, Escondido, Mission, and Los Coches Substations.
- **500 kV Future Phases.** While not currently planned by SDG&E, a 500 kV circuit may be constructed from the proposed Central East Substation to connect with the Southern California Edison transmission system. This would involve construction of a new 500 kV transmission line, likely following an existing 69 kV transmission corridor and also possibly the route of the Lake Elsinore Advanced Pumped Storage (LEAPS) project's 500 kV line.

Connected Actions and Indirect Effects

The CPUC and BLM have determined that four projects are so closely related to the Proposed Project as to be considered “connected actions” under NEPA. These four projects are the Stirling Energy Systems solar facility, two components of the IID 230 kV transmission system upgrades, the Esmeralda-

¹ Reconductoring is the installation of new, higher capacity conductors, generally on existing towers (some new towers would be required when existing towers cannot support the greater weight of the new conductors).

San Felipe Geothermal Project, and the Jacumba 230/500 kV Substation. One additional project, a wind project in northern Mexico's La Rumorosa area, under contract to meet Southern California Edison's renewable requirements, is considered as an "indirect effect" of the Proposed Project.

1.4 Overview of Alternatives

In total, the alternatives screening process has culminated in the identification and preliminary screening of over 100 potential alternatives or combinations of alternatives. These alternatives range from minor routing adjustments to SDG&E's proposed 500 kV and 230 kV project routes, to entirely different transmission line routes, to alternate system voltages, and system designs. Each category is presented below, but not all options described below are analyzed in detail in this EIR/EIS.

Proposed alternatives identified by the Applicant (SDG&E), the NEPA Lead Agency (BLM), the CEQA Lead Agency (CPUC), the agencies' consultants, and the public are listed below according to the determination made for EIR/EIS analysis (i.e., whether or not each is analyzed in the EIR/EIS or eliminated from further analysis). Section 4 presents detailed descriptions of each alternative and detailed explanations of why each was selected or eliminated.

1.4.1 Alternatives Analyzed in the EIR/EIS

Following are the 27 alternatives that have been chosen for detailed analysis in this EIR/EIS through the alternative screening process. Table C-1 (in Section C) presents a summary of the conclusions for each alternative listed below. These alternatives are described in more detail in Section 4 of this Appendix.

Imperial Valley Link Route Segment Alternatives

- FTHL Eastern Alternative
- SDG&E West of Dunaway Alternative
- SDG&E West Main Canal–Huff Road Modification Alternative

Anza-Borrego Link Route Segment Alternatives

- Partial Underground 230 kV ABDSP SR78 to S2 Alternative
- Overhead 500 kV ABDSP within Existing ROW

Central Link Route Segment Alternatives

- Santa Ysabel Existing ROW Alternative
- Santa Ysabel Partial Underground Alternative
- Santa Ysabel All Underground Alternative
- SDG&E Mesa Grande Alternative

Inland Valley Link Route Segment Alternatives

- CNF Existing 69 kV Route Alternative
- Oak Hollow Road Underground Alternative
- San Vicente Transition Alternative
- Chuck Wagon Road Alternative

Coastal Link Route Segment Alternatives

- Pomerado Road to Miramar Area North Alternative
- Los Peñasquitos Canyon Preserve–Mercy Road Alternative
- Black Mountain to Park Village Road Underground Alternative
- Coastal Link System Upgrade Alternative

Substation Alternatives to Central East Substation

- Top of the World Substation Alternative

Southwest Powerlink (SWPL) Alternatives

- Interstate 8 Alternative
- BCD Alternative
- Route D Alternative (North of I-8)
- Modified Route D Alternative (South of I-8)

Full Project Route and System Alternatives

- LEAPS Generation and Transmission Alternative
- LEAPS Transmission Only Alternative

Non Wires Alternatives

- New In-Area Renewable Generation
- New In-Area All-Source Generation

1.4.2 Alternatives Eliminated from EIR/EIS Consideration

This EIR/EIS presents two categories of alternatives eliminated from detailed EIR/EIS consideration. Certain alternatives were eliminated because they clearly did not meet project objectives or were infeasible; these alternatives are described briefly in Section 1.4.2.1. Other alternatives required more detailed consideration in order to determine whether they should be eliminated; these are listed in Section 1.4.2.2 and described in more detail in Section 4 of this Appendix.

1.4.2.1 Alternatives Eliminated After Preliminary Screening

This section describes two alternatives that were eliminated after a preliminary alternatives screening process. Alternatives evaluated in the detailed screening process are presented in Section 4 (Alternatives Descriptions and Determinations).

SR86 into Riverside County Alternative

Alternative Description. This alternative was suggested during scoping and would diverge from the Proposed Project near the intersection of SR78 and SR86. The route would continue north-northwest along SR86, west of the Salton Sea, into Riverside County to avoid ABDSP.

Rationale for Elimination. The Imperial Valley Substation to Rainbow and North of Escondido Alternatives (see Sections 4.9.21 and 4.9.22, respectively) and the LEAPS Project (see Section 4.9.1) are all alternatives that would be located in Riverside County, would avoid ABDSP, and would, therefore, fulfill similar routing objectives as a SR86 into Riverside County Alternative suggested during scoping.

In addition, the Santa Rosa and Mount San Jacinto Wilderness Areas and San Bernardino National Forest extend north from ABDSP nearly to I-10, and thus there would be no new routes (aside from those mentioned above) that would allow an alternative to travel east through this part of Riverside County without creating similar impacts to federal and State Wilderness as the Proposed Project, and additional temporary and permanent impacts to all issue areas associated with a much longer transmission line.

Desert Range Underground Alternative

Alternative Description. This alternative was suggested during scoping by Jeff Martin. This alternative would consist of undergrounding the transmission line (either a 500 kV line or multiple smaller lines) on a direct route through the Desert Link area within the Desert Range Military Facility area where there is Department of Defense (DoD) restricted airspace and height restrictions. The route would travel along the western edge of the agricultural lands in Imperial County and would be adjacent to federal and State land boundaries. See also the discussion of the All Underground 230 kV or 500 kV Alternative in Section 4.9.27.

Rationale for Elimination. All underground construction of transmission lines requires a continuous trench in which to install duct banks that would carry the electrical cables. This amount of trenching would create significant impacts to soils/erosion, cultural resources, biological resources as well as a longer construction time and the need for transition structures. Operational impacts would also be greater associated with maintenance and access to the lines. Repair times would be much longer as well. With the exception of permanent visual resource and height restriction impacts that would be eliminated, underground construction would cause much greater impacts to most issue areas than the Proposed Project or an underground alternative that would follow an existing roadway. Therefore, given the potential for increased significant environmental impacts associated with the construction, operation and maintenance of an underground 230 kV or 500 kV transmission line, the unproven reliability for long-distance underground 500 kV transmission lines, and the high cost of these technologies, undergrounding the transmission line through the open space in the Desert Range Military Facility area has been eliminated from further analysis.

1.4.2.2 Alternatives Eliminated After Detailed Screening

Following are the 70 alternatives that were evaluated through the complete screening process, which is described in Section 3 below, but were still eliminated from detailed consideration. Table C-2 (in Section C) presents a summary of the conclusions for each alternative listed below. The rationale for elimination of each of these alternatives is presented in detail in Section 4 of this Appendix.

Imperial Valley Link Route Segment Alternatives

- SDG&E Desert Western Route Alternative
- SDG&E Segment 1/Imperial Valley via 92 kV Alternative
- Imperial Valley FTHL Alternative
- SDG&E Imperial Valley FTHL Modification Alternative
- SDG&E Bullfrog Farms Alternative
- Huff Road Bullfrog Farms Alternative
- New River Alternative

Anza-Borrego Link Route Segment Alternatives

- SDG&E ROW Shorter Structure Alternative
- SDG&E Segment A/Northern Borrego Springs via S22 Alternative
- SDG&E Segment 4/ABDSP via S2 Alternative
- SDG&E SR78 West of Anza Alternative
- SDG&E ABDSP North Side of SR78 Alternative
- SDG&E Borrego Valley Alternative
- SDG&E Borrego Valley Underground Alternative
- SDG&E SR78 Julian Alternative

- SDG&E ABDSP SR78 to S2 Central Alternative
- Overhead 230 kV ABDSP Alternative
- HVDC Light Underground Alternative

Central Link Route Segment Alternatives

- SDG&E Central East Substation to SR79 Alternative
- SDG&E Warner S2 to SR79 Alternative
- SDG&E San Dieguito Park Alternative
- Volcan Mountain Alternative

Inland Valley Link Route Segment Alternatives

- SDG&E Segment 10/Inland Valley SR78 Alternative
- SDG&E Creelman Alternative
- West of San Vicente Road Underground Alternative

Coastal Link Route Segment Alternatives

- Northwest Corner Alternative
- Mannix-Dormouse Road Alternative
- SDG&E Segment 12 Poway Substation to Peñasquitos Substation Alternative
- SDG&E Segment 13 Scripps Ranch Alternative
- SDG&E Segment 14 Poway Alternative
- SDG&E Segment 15 Warren Canyon Alternative
- SDG&E Segment 16 North of Peñasquitos Alternative
- Pomerado Road to Miramar Area North–Combination Underground/Overhead Alternative
- MCAS Miramar–All Underground and Underground/Overhead Alternative
- MCAS Miramar–Combination Underground/Overhead Alternative
- Rancho Peñasquitos Boulevard Bike Path Alternative
- Carmel Valley Road Alternative
- State Route 56 Alternative
- MP 146.5 to Peñasquitos Substation Underground and Consolidation Alternative
- Scripps-Poway Parkway to State Route 56 Alternative
- Scripps-Poway Parkway–Pomerado Road Underground Alternative

Substation Alternatives to Central East Substation

- SDG&E Central South Substation Alternative
- Mataguay Substation Alternative
- SDG&E Warner West Substation Alternative
- Warner Substation Alternative

Southwest Powerlink (SWPL) Alternatives

- West of Forest Alternative
- SDG&E Route B Alternative
- SDG&E Route Segment C Alternative
- SDG&E Route Segment BC Alternative
- West of Forest/Otay Segment Alternative

Full Project Route and System Alternatives

- Path 44 Upgrade Alternative
- Mexico Light 230 kV Alternative
- SDG&E Southwest Powerlink (SWPL) No. 2 Alternative

- Convert SWPL to DC Alternative
- Upgrade Series Capacitors along SWPL
- SDG&E 230 kV CFE Alternative
- Serrano/Valley-Central 500 kV Alternative
- Valley-Rainbow 500 kV Alternatives [Include Devers-Pala, Devers-Ramona, Coachella-Ramona-Miguel, Devers-Miguel via Northern San Diego County, and Devers-Miguel via Imperial County]
- Valley-Rainbow (V-R) Serrano-Talega Alternative
- Valley-Central 500 kV Alternative
- SDG&E 500 kV Full Loop or Full Loop North Alternatives [Includes Imperial Valley–Ramona 500 kV; Imperial Valley–Rainbow 500 kV; and Imperial Valley–East of Escondido 500 kV]
- Northern Service Territory Upgrades Alternatives [Includes SONGS Light and SONGS Heavy 230 kV Alternatives]
- SDG&E Imperial Valley–Central 230 kV (“Four 230 kV Circuits”) Alternative
- HTLS Composite Conductor Alternative
- All Underground 230 kV or 500 kV Alternative
- Green Path Coordinated Projects Alternative

Non-Wires Alternatives

- Non-Renewable Distributed Generation Alternative
- Energy Efficiency Alternative
- Demand Response Alternative
- All-Solar Alternative

1.5 Organization of the Alternatives Screening Report

The remainder of this Alternatives Screening Report provides a summary of the project background and previous documents (Section 2), an overview of the alternative evaluation process (Section 3), and then the detailed determinations on individual alternatives (Section 4).

2. Background and Previous Documents

SDG&E has been investigating building a new 500 kV line into San Diego County for a number of years. Numerous options have been outlined and analyzed in previous studies or proceedings sponsored by the CPUC, the California Energy Commission (CEC), and/or the California Independent System Operator (CAISO). The studies and proceedings that identified possible alternatives to the Sunrise Powerlink Project are outlined below. This screening process reconsiders alternatives that were previously identified to determine their current viability. System and non-wires alternatives that arose from previous agency and utility work are discussed in Sections 4.8 and 4.9, respectively. The description for each individual alternative in Section 4 also describes from where the alternative originated.

2.1 SDG&E Valley-Rainbow 500 kV Interconnect Project

On March 23, 2001, SDG&E submitted Application (A.) 01-03-036 seeking authorization by the CPUC for a CPCN for the Valley to Rainbow 500 kV Interconnect Project. The Valley-Rainbow Project was proposed to provide an interconnection between SDG&E's existing 230 kV transmission system at the proposed Rainbow Substation on Rainbow Heights Road near the unincorporated community of Rainbow in San Diego County and Southern California Edison's (SCE) existing 500 kV transmission system at the Valley Substation on Menifee Road in the unincorporated community of Romoland in Riverside County.

The Valley-Rainbow project was proposed to provide the transmission capacity necessary to reliably meet regional loads (San Diego and southern Orange Counties) should regional internal generating capacity be insufficient to meet regional demand. At the time, the CAISO indicated a potential need for development of additional transmission capacity into the San Diego region from the greater Southwestern U.S. The CAISO went on to say that in order for this new capacity to be useful in meeting the overall needs of the State, it would be necessary to increase current transmission transfer capability from the San Diego region to the remainder of the State.

Concurrently with consideration of SDG&E's need for Valley-Rainbow, the Administrative Law Judge (ALJ) Cooke also guided the CEQA/NEPA process, as part of the CPCN proceedings. In a ruling dated October 21, 2002, ALJ Cooke directed the CPUC Energy Division to prepare and file a document that provided a preliminary alternatives feasibility analysis based on the environmental information developed between March 2001 and the document's publication date of November 2002.

Numerous alternatives to Valley-Rainbow were raised by the general public, elected officials and federal, state, and local agencies. Therefore, the interim preliminary report on the alternatives screening analysis summarized the work completed by late 2002 on alternatives.

In total, the alternatives screening process for Valley-Rainbow culminated in the identification and screening of approximately 45 alternatives. These alternatives ranged from minor routing adjustments to SDG&E's proposed 500 kV location, to alternative system voltages, system designs and routing options that have been under consideration in other parts of San Diego, Riverside, Orange, and Imperial Counties, as well as non-wires alternatives. Valley-Rainbow would have established a new utility corridor, which resulted in substantial controversy and public concern.

Due to this controversy and public concern, opponents to the project argued that the project was not needed. The CPUC performed an independent evaluation of project need for reliability purposes and economic benefit to ratepayers and California. In Decision (D.) 02-12-066, the CPUC denied SDG&E's request for a CPCN for the project stating that based on the evidence, SDG&E would not experience a capacity deficiency within the adopted five-year planning horizon for the project. Based on the record, the CPUC concluded that "SDG&E will continue to meet established reliability criteria under conservative supply and demand forecasts within the adopted five-year planning horizon." The CPUC also evaluated whether Valley-Rainbow would provide positive economic benefits and the decision stated that the evidence showed that the project would not be cost-effective to ratepayers except under the extreme assumptions. Decision 02-12-066 was the first decision by the CPUC since the creation of the CAISO in 1998 in which the CPUC denied a CPCN for a project which the CAISO Governing Board determined to be needed.

As a result, the EIR/EIS was never completed and Valley-Rainbow was not constructed. However, the alternatives developed as part of the alternatives screening process and published in the interim preliminary report on the Valley-Rainbow alternatives are considered here as possible alternatives for the Sunrise Powerlink Project. They are included in this Alternatives Screening Report in Section 4.

2.2 Southwest Transmission Expansion Plan

An informal, voluntary sub-regional transmission planning group was formed in 2002 to address transmission concerns across the southwest and develop the Southwest Transmission Expansion Plan (STEP). The STEP group included transmission and generation stakeholders in Arizona, Nevada, and southern California and was sponsored by CAISO and Arizona Public Service (APS). STEP provided a forum for interested parties to participate in the planning, coordination, and implementation of the transmission system between Arizona, Nevada, Mexico, and southern California.

The STEP group finalized its studies with a report in March 2004. The broad scope of the STEP group provided a forum for discussing expansion of the transfer capability across the Colorado River between Arizona, southern Nevada, and California. The STEP report identified numerous options for upgrading these transmission paths. Part of this work included the corridor that extends from the Palo Verde hub of generators in western Arizona to the urban load center of San Diego. The STEP report gave an outline for improvements around the Miguel Substation area and for a new line into San Diego. Among the options for a new line into San Diego were adding a second circuit to the existing Southwest Powerlink (i.e., Imperial Valley-Miguel 500 kV #2), expanding the transmission grid in Mexico, interconnecting SDG&E with SCE in Riverside County (e.g., via Valley-Rainbow), and creating a new corridor from the Imperial Valley Substation to a point in central or northern San Diego County.

2.3 Imperial Valley Study Group

The Imperial Valley Study Group (IVSG), formerly known as the Salton Sea Study Group (SSSG), was a voluntary planning collaborative group for the Imperial Valley area that was created under a policy directive from the CPUC (as a result of D.04-06-010 under Proceeding I.00-11-001). It was also supported by initiatives at the California Energy Commission related to the 2005 Integrated Energy Policy Report proceeding. The IVSG was formed to recommend a phased plan for developing the transmission necessary to export 2,200 MW of renewable geothermal and solar generation from the Imperial Valley to urban coastal load centers. Alternative solutions were created from IID's proposed Green Path initiative and SDG&E's concurrent Transmission Comparison Study for a new 500 kV connection to

San Diego. Independent of the IVSG, Los Angeles Department of Water & Power (LADWP) was also conducting transmission planning activities to access Imperial Valley geothermal resources (known as Green Path North), and the IVSG report notes LADWP's plans. The IVSG development plan was released in September 2005, and it aimed to represent the consensus recommendation of the stakeholder participants in the study group, which included the regional transmission owners, CAISO, CPUC, CEC, generation developers, local, state and federal agencies, environmental and consumer groups and other interested parties.

The IVSG transmission plan consists of three development phases, designed to provide market access for 2,200 MW of renewable resources, primarily geothermal and solar, in the Imperial Valley region:

- **Phase 1** of the IVSG development plan was to accommodate three new geothermal plants producing 645 MW by the end of 2010. Upgrades of the IID transmission system would be required from its Highline Substation to El Centro Substation (approximately 20 miles), and from El Centro to the Imperial Valley Substation (approximately 18 miles), where the power would be delivered to the CAISO grid. The upgrades within IID territory are now known as part of the Green Path Coordinated Projects. The other major component of the IVSG's Phase 1 was a new 500 kV line from the Imperial Valley Substation to San Diego County, with 230 kV connections to SDG&E's load center.² IVSG studies established that a line from the Imperial Valley Substation to San Diego County would make Imperial Valley generation deliverable to load centers in San Diego and to other load centers in Southern California and to the north.
- **Phase 2** of the IVSG development plan was to accommodate an additional three geothermal plants producing an additional 645 MW of incremental generation, bringing the cumulative new export capacity total to 1,290 MW by approximately the end of 2016. The Phase 2 upgrades were also to provide market access for Concentrating Solar Power (CSP) generation projects, and/or other renewable generation projects developed in that timeframe. Phase 2 would upgrade IID's existing El Centro–Avenue 58 transmission line, from its El Centro Substation to its planned Bannister Substation west of the Salton Sea geothermal field. IID would also construct a new 230 kV line from the Bannister Substation to a new San Felipe 500/230 kV Substation to interconnect to the proposed Imperial Valley to San Diego 500 kV line. This San Felipe Substation could potentially provide an additional interconnection between the IID and CAISO systems, and thus another point for the delivery of renewable resources to Southern California loads. IID would construct, own and operate these upgrades.
- **Phase 3** of the IVSG development plan was to make an additional 910 MW of Imperial Valley generation deliverable to the CAISO grid, bringing cumulative incremental export capacity to 2,200 MW in 2020. As with Phases 1 and 2, the plan expects that most of the new Imperial Valley generation would be scheduled to SDG&E, to minimize congestion at the existing Devers Substation. Additional upgrades of the IID transmission system would support delivery of renewable resources to the SCE 230 kV system at the Mirage Substation.

2.4 SDG&E Transmission Comparison Study

SDG&E prepared a Transmission Comparison Study (TCS) concurrent with the IVSG work to refine the findings of the STEP group report. This study evaluated a variety of transmission alternatives for the new line into San Diego. SDG&E performed the background research, and STEP's Technical Work-

² This project is the proposed Sunrise Powerlink Project. Alternatively, portions of that line or another 500 kV line in Imperial County could be built and owned by IID.

ing Group then reviewed the work, provided input, and helped in the process of developing and selecting alternatives. This evaluation was completed in October 2005. The conclusion of the TCS led SDG&E to favoring a 500 kV “full loop” concept, which would connect the existing Imperial Valley Substation, a new Central Substation, and the existing SCE Serrano-Valley 500 kV line. This “full loop” concept and the shorter option of simply a new 500 kV line between the existing Imperial Valley and a new Central Substation were selected above other concepts such as new transmission lines to the northern interconnections with SCE, parallel to the existing Southwest Powerlink, or further east to the North Gila area in Arizona. In late 2005, the option of a new 500 kV line between the existing Imperial Valley and a new Central Substation became the Sunrise Powerlink Project.

2.5 SDG&E Routing Study

SDG&E filed an initial application for the Proposed Project in late 2005 and conducted routing studies in 2006, in advance of filing the PEA. After selecting the Imperial Valley–Central Substation concept for connection points, SDG&E’s May 2006 Routing Study summarized the constraints and opportunities for routing a 500 kV line between these two points.

The Routing Study was the result of a public process led by SDG&E that had three distinct phases. Phase I focused on the purpose and need of the project and its benefits. It presented supplemental information regarding studies completed to-date and conclusions related to the necessity of the project with associated timelines. Phase II included preliminary route selection and focused on the criteria utilized for qualitatively analyzing all opportunities and constraints in the study area. Preliminary routes and substation sites were evaluated and refined to general macro-analysis study corridors. Phase III identified the preferred alignment, which is the Proposed Project, and alternatives based on further studies and public input.

The final Routing Study, which is included in Appendix B of SDG&E’s PEA, includes the methodology, components, and figures that show the development of the Proposed Project, from the delineation of a regional area of interest to the proposed routes and alternatives presented to the public. Routes that were presented to the public in the final phase of the SDG&E’s public involvement process, as well as any changes to the routes that are analyzed as part of the PEA are included. All of these routes that were considered within the Routing Study have been incorporated for consideration in Section 4 of this Alternatives Screening Report.

2.6 CAISO SRTP-2006 aka Southern Renewables Transmission Planning

The CAISO conducted an independent review of the “Sun Path Project” in 2006. The Sun Path Project was a combination of the SDG&E Sunrise Powerlink with facilities in the IID territory that make up part of the Green Path Coordinated Projects. With these upgrades combined into “Sun Path,” CAISO made the following findings:³

- Sun Path facilitates compliance by SDG&E and other California utilities with the state renewable portfolio standard (RPS) by providing access to the CAISO control area for planned renewable resources in the Salton Sea and other areas in Imperial Valley area without curbing economic imports to California

³ CAISO South Regional Transmission Plan for 2006 (CSRTP-2006) Report: The Sun Path Project Study. <http://www.aiso.com/1841/1841b1925a320.pdf>. July 28, 2006.

- Sun Path Project provides positive net economic value for the CAISO ratepayers as its benefit outweighs its cost
- Sun Path Project solves San Diego's known import limit reliability problem for 2010 and beyond without introducing any new reliability concerns.

The CAISO Board of Governors approved the Sun Path Project on August 3, 2006⁴ as a necessary and cost-effective upgrade to the CAISO Controlled Grid. Staff of CAISO has participated throughout early 2007 in the CPUC proceeding for the SRPL to provide updated testimony on economic and reliability assessment.

⁴ <http://www.caiso.com/1847/1847b9ab504b0.pdf>.

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3. Overview of Alternatives Evaluation Process

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

- Alternatives identified by SDG&E
- Alternatives identified in other proceedings, studies, and documents (see Section 2)
- Alternatives identified during the public scoping process that was held in accordance with CEQA and NEPA requirements
- Alternatives identified by the EIR/EIS team as a result of the independent review of the Proposed Project impacts and meetings with affected agencies and interested parties.

3.1 Alternatives Screening Methodology

The evaluation of the alternatives used a screening process that consisted of three steps:

- Step 1:** Clearly define each alternative to allow comparative evaluation
- Step 2:** Evaluate each alternative in comparison with the Proposed Project, using CEQA/NEPA criteria (defined below)
- Step 3:** Based on the results of Step 2, determine the suitability of each alternative for full analysis in the EIR/EIS. If the alternative is unsuitable, eliminate it from further consideration.

3.2 CEQA and NEPA Requirements for Alternatives

After completion of the steps defined above, the advantages and disadvantages of the alternatives are carefully weighed with respect to CEQA and NEPA criteria for consideration of alternatives. Both CEQA and NEPA provide guidance on selecting a reasonable range of alternatives for evaluation in an EIR and EIS, and the requirements are similar. This alternatives screening and evaluation process satisfies both State and federal requirements. The CEQA and NEPA requirements for selection of alternatives are described below.

3.2.1 CEQA

An important aspect of EIR preparation is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a Proposed Project. The State CEQA Guidelines require consideration of the No Project Alternative (Section 15126.6(e)) and selection of a range of reasonable alternatives (Section 15126.6(d)). The EIR must adequately assess these alternatives to allow for a comparative analysis for consideration by decisionmakers. The State CEQA Guidelines (Section 15126.6(a)) state that:

An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project,

and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation.

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

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

Each of these bullets is described in more detail in the following sections.

3.2.1.1 Consistency with Project Objectives

As stated by SDG&E (in PEA Section 3.1), the eight objectives for building the SRPL are to:

1. Ensure SDG&E's transmission system satisfies minimum California Independent System Operator (CAISO), North American Electric Reliability Corporation (NERC), and Western Electricity Coordinating Council (WECC) reliability criteria throughout the planning horizon of the Long-Term Resource Plan (LTRP) and beyond, including the requirement that there be no loss of load within the San Diego area under G-1/N-1 contingency conditions.⁵ Avoid siting the Proposed Project parallel to Southwest Power Link (SWPL) for long distances especially avoiding areas with fire history or fire potential.
2. Provide a transmission facilities with a voltage level and transfer capability that (a) allows for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) supports regional expansion of the electric grid.
3. Provide transmission capability for Imperial Valley renewable resources for SDG&E customers to assist in meeting or exceeding California's 20% renewable energy source mandate by 2010 and the Governor's proposed goal of 33% by 2020.
4. Reduce the above-market costs associated with maintaining reliability in the San Diego area while mitigating the potential exercise of local market power, particularly the costs associated with inefficient generators such as the South Bay and Encina Power Plants.
5. Improve regional transmission system infrastructure to provide for the delivery of adequate, reliable and reasonably priced energy supplies and implement the transmission elements of state and local energy plans.

⁵ This "G-1/N-1" standard requires a defined area system to withstand the simultaneous outage of its largest generating unit (G-1) and largest transmission interconnection (N-1), and be able to withstand the *next* most critical transmission outage without dropping load.

6. Obtain electricity generated by diverse fuel sources and decrease the dependence on increasingly scarce and costly natural gas.
7. Avoid, to the extent feasible, the taking and relocation of homes, businesses or industries, in the siting of the transmission line, substation and associated facilities.
8. Minimize the need for new or expanded transmission line ROW in urban or suburban areas of the SDG&E service territory already traversed by multiple high voltage transmission facilities and, to the extent feasible, assist in implementing local land use goals.

CEQA Guidelines Section 15126.6(a) requires consideration of “a range of reasonable alternatives” to the project, or to the location of the project, that could accomplish “most of the basic objectives of the project” and “avoid or substantially lessen one or more of the significant effects.”

In addition, the CPUC uses the following guiding principles when considering the appropriate criteria for selection of alternatives for evaluation in the EIR/EIS:

- **CPUC Requirements.** Public Utilities Code Section 1002.3 requires the CPUC to “. . .consider cost-effective alternatives to transmission facilities that meet the need for an efficient, reliable, and affordable supply of electricity. . .”, and the CPUC’s Information and Criteria List for project applications requires discussion of “. . .alternatives capable of substantially reducing or eliminating any significant environmental effects, even if these alternatives substantially impede the attainment of the project objectives, and are more costly.”
- **Scope of CPUC General Proceeding.** The November 1, 2006 Scoping Memo prepared by the CPUC Assigned Commissioner and Administrative Law Judge emphasizes SDG&E’s three “vital purposes” for the Proposed Project: (1) to maintain reliability in the delivery of power to the San Diego region; (2) to reduce the cost of energy in the region; and (3) to accommodate the delivery of renewable energy from geothermal and solar resources in the Imperial Valley and wind and other sources in San Diego County.

As set forth in Section A.2, there are three basic objectives sought by the Proposed Project, which correspond to SDG&E’s Project Purpose and Need identified in the Proponent’s Environmental Assessment (PEA) (Section 2.2):

- Basic Project Objective 1: to maintain reliability in the delivery of power to the San Diego region
- Basic Project Objective 2: to reduce the cost of energy in the region
- Basic Project Objective 3: to accommodate the delivery of renewable energy to meet State and federal renewable energy goals from geothermal and solar resources in the Imperial Valley and wind and other sources in San Diego County.

The determination of whether to eliminate or retain alternatives in this EIR/EIS was based on the alternative’s ability to meet these three objectives, keeping in mind the CPUC requirement to consider alternatives “capable of substantially reducing or eliminating any significant environmental effects, even if these alternatives substantially impede the attainment of the project objectives, and are more costly.”

SDG&E’s eight specific objectives (PEA Section 3.1), stated above, are captured by the three basic Project Objectives, as shown in Table Ap.1-1

Table Ap.1-1. Basic Project Objectives and SDG&E's Objectives

Basic Project Objectives	SDG&E's Specific Objectives
1. To maintain reliability in the delivery of power to the San Diego region	<ul style="list-style-type: none"> • <u>SDG&E Objective 1.</u> Ensure SDG&E's transmission system satisfies minimum CAISO, NERC and WECC reliability criteria throughout the planning horizon of SDG&E's Long Term Resource Plan (LTRP) and beyond, including the requirement that there be no loss of load within the San Diego area under G-1/N-1 contingency conditions. Avoid siting the Proposed Project parallel to SWPL for long distances especially avoiding areas with fire history or fire potential. • <u>SDG&E Objective 2.</u> Provide transmission facilities with a voltage level and transfer capability that (a) allows for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3500 MW (under G-1/N-1 contingency conditions) and (b) supports regional expansion of the electric grid. • <u>SDG&E Objective 5.</u> Improve regional transmission system infrastructure to provide for the delivery of adequate, reliable, and reasonably priced energy supplies and to implement the transmission elements of state and local energy plans. • <u>SDG&E Objective 6.</u> Obtain electricity generated by diverse fuel sources and decrease the dependence on increasingly scarce and costly natural gas.
2. To reduce the cost of energy in the region	<ul style="list-style-type: none"> • <u>SDG&E Objective 4.</u> Reduce the above-market costs associated with maintaining reliability in the San Diego area while mitigating the potential exercise of local market power, particularly the costs associated with inefficient generators such as the South Bay and Encina Power Plants. • <u>SDG&E Objectives 5 and 6.</u> See above.
3. To accommodate the delivery of renewable energy from geothermal and solar resources in the Imperial Valley and wind and other sources in San Diego County	<ul style="list-style-type: none"> • <u>SDG&E Objective 3.</u> Provide transmission capability for Imperial Valley renewable resources for SDG&E customers to assist in meeting or exceeding California's 20 percent renewable energy source mandate by 2010 and the Governor's proposed goal of 33 percent by 2020.
Environmental objectives that will be satisfied by CEQA and NEPA process. CEQA and NEPA require consideration of alternatives that avoid or lessen the significant effects of the Proposed Project.	<ul style="list-style-type: none"> • <u>SDG&E Objective 7.</u> Avoid, to the extent feasible, the taking and relocation of homes, businesses or industries, in the siting of the transmission line, substation and associated facilities. • <u>SDG&E Objective 8.</u> Minimize the need for new or expanded transmission line right-of-way (ROW) in urban or suburban areas of the SDG&E service territory already traversed by multiple high voltage transmission facilities and, to the extent feasible, assist in implementing local land use goals.

3.2.1.2 Feasibility

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

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

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

According to the State CEQA Guidelines (Section 15126.6(f)(1)), among the factors that may be taken into account when addressing the potential feasibility of alternatives include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or other regulatory limitations, jurisdictional boundaries, and proponent's control over alternative sites in determining the range of alternatives to be evaluated in the EIR. For the screening analysis, the potential feasibility of potential alternatives was assessed taking the following factors into consideration:

- **Economic Feasibility.** Is the alternative so costly that implementation would be prohibitive? The State CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may “impede to some degree the attainment of project objectives or would be more costly” (Guidelines Section 16126.6(b)). The Court of Appeals added in *Goleta Valley v. Board of Supervisors* (2nd Dist. 1988) 197 Cal.App.3d, p. 1181 (see also *Kings County Farm Bureau v. City of Hanford* (5th Dist. 1990) 221 Cal.App.3d 692, 736 [270 Cal. Rptr. 650]): “[t]he fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are *sufficiently severe* as to render it *impractical* to proceed with project.”
- **Environmental Feasibility.** Would implementation of the alternative cause substantially greater environmental damage than the Proposed Project, thereby making the alternative clearly inferior from an environmental standpoint? This issue is primarily addressed in terms of the alternative’s potential to eliminate significant effects of the Proposed Project.
- **Legal Feasibility.** Does the alternative have the potential to avoid lands that have legal protection that may prohibit or substantially limit the feasibility of permitting a high voltage transmission line?

Lands that are afforded legal protections that would prohibit the construction of the project, or require an act of Congress for permitting, are considered less feasible locations for the project. These land use designations include wilderness areas, wilderness study areas, restricted military bases, airports and Indian reservations. Information on potential legal constraints of each alternative has been compiled from laws, regulations, and local jurisdictions, as well as a review of federal, State, and local agency land management plans and policies.
- **Regulatory Feasibility.** Do regulatory restrictions substantially limit the likelihood of successful permitting of a high-voltage transmission line? Is the alternative consistent with regulatory standards for transmission system design, operation, and maintenance?
- **Social Feasibility.** Would the alternative cause significant damage to the socioeconomic structure of the community and be inconsistent with important community values and needs? Similar to the environmental feasibility addressed above, this subject is primarily considered in consideration of significant environmental effects.
- **Technical Feasibility.** Is the alternative feasible from a technological perspective, considering available technology? Are there any construction, operation, or maintenance constraints that cannot be overcome?

3.2.1.3 Potential to Eliminate Significant Environmental Effects

A key CEQA requirement for an alternative is that it must have the potential to “avoid or substantially lessen any of the significant effects of the project” (State CEQA Guidelines Section 16126.6(a)). If an alternative is identified that clearly does not have the potential to provide an overall environmental advantage as compared to the Proposed Project, it is usually eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

3.2.2 NEPA

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

- (a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
- (b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
- (c) Include reasonable alternatives not within the jurisdiction of the lead agency.
- (d) Include the alternative of no action.
- (e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.
- (f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

The CEQ has stated that "[r]easonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant" (CEQ, 1983).

In addition to the CEQ NEPA regulations, CEQ has issued a variety of general guidance memoranda and reports that concern the implementation of NEPA. One of the most frequently cited resources for NEPA practice is CEQ's *Forty Most Asked Questions Concerning CEQ's NEPA Regulations* (Forty Questions). Although a reviewing federal court does not always give the Forty Questions the same deference as it does the CEQ NEPA Regulations, in some situations the Forty Questions have been persuasive to the judiciary. For example in one decision, a federal court relied heavily on one of the Forty Questions in interpreting the treatment of alternatives under NEPA [*American Rivers et al. v. Federal Energy Regulatory Commission*, 187 F.3d 1007 (9th Cir. 1999)] (Bass et al., 2001).

In general, alternatives are discussed in Forty Questions Nos. 1 through 7. Question No. 5b asks if the analysis of the "proposed action" in an EIS is to be treated differently than the analysis of alternatives. The response states:

The degree of analysis devoted to each alternative in the EIS is to be substantially similar to that devoted to the "proposed action." Section 1502.14 is titled "Alternatives, including the proposed action" to reflect such comparable treatment. Section 1502.14(b) specifically requires "substantial treatment" in the EIS of each alternative including the proposed action. This regulation does not dictate an amount of information to be provided but rather, prescribes a level of treatment, which may in turn require varying amounts of information, to enable a reviewer to evaluate and compare alternatives.

3.2.2.1 Consistency with Purpose and Need

CEQ NEPA Regulations (40 C.F.R. 1502.13) require a statement “briefly specifying the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” In addition to the project objectives defined in Section 3.2.1.1 above, SDG&E’s PEA presents the following statement regarding the purpose and need for the SRPL project:

Maintain Reliability: *The project will enable the San Diego transmission system to satisfy the grid reliability requirements of the California Independent System Operator (“CAISO”). Absent the project, SDG&E and the CAISO project a reliability deficiency in the San Diego area starting in 2010. The project will continue to allow SDG&E and other Load Serving Entities (“LSEs”) within the San Diego service area to reliably serve their customers during periods of unusually high energy demand in the event of critical overlapping generation and transmission contingencies. Regulations, industry standards and good business practice require planning for the reliable operation of the electric transmission grid under adverse weather and system conditions.*

Promote Renewable Energy: *Consistent with Senate Bill (“SB”) 1078 and the State’s Energy Action Plan (“EAP”), Sunrise will provide California consumers more economical access to the Imperial Valley, an area that is rich in renewable resource potential. Further, it will encourage the development of such resources thereby diversifying the State’s resource mix and reducing its reliance on fossil-fueled generation. Similarly, Sunrise will also provide access for renewable wind resources development in the southeastern portions of San Diego County.*

Reduce Energy Costs: *In addition to maintaining grid reliability and improving access to renewable energy resources, this cost-effective project will provide \$552 million per year in net energy savings for California electricity customers under normal operating conditions. These savings will come in the form of reduced energy costs and congestion savings resulting from increased access to lower cost sources of power in the desert southwest and reduced reliance on older, less-efficient in-area generation. All customers in the CAISO control area will share in these benefits. Indeed, the CAISO confirms that these benefits enable Sunrise to pay for itself.*

3.2.2.2 Feasibility

The environmental consequences of the alternatives, including the proposed action, are to be discussed in the EIR/EIS in accordance with CEQ NEPA Regulations (40 C.F.R. 1502.16). The discussion shall include “Possible conflicts between the proposed action and the objectives of federal, regional, State, and local land use plans, policies and controls for the area concerned.” Other feasibility factors to be considered may include cost, logistics, technology, and social, environmental, and legal factors (Bass et al., 2001). The feasibility factors are substantially the same as described for CEQA in Section 2.2.1.2, above.

3.2.3 Summary of CEQA and NEPA Screening Methodology

Unlike CEQA’s requirements, NEPA does not require screening of alternatives based on their potential to avoid or lessen significant environmental effects. However, to ensure that the alternatives considered in the EIR/EIS would meet the requirements of both CEQA and NEPA, the stricter requirements of CEQA have been applied as the screening methodology. As such, a reasonable range of alternatives has

been considered and evaluated as to whether or not the alternatives meet (1) most of the project objectives/purpose and need, (2) are considered potentially feasible, and (3) would avoid or substantially lessen any significant effects of the Proposed Project.

3.3 Public Utilities Code Considerations for Alternatives

The final project decision by the CPUC will be guided by the Public Utilities Code in addition to the requirements of CEQA. The Public Utilities Code in Section 1002 states that:

Section 1002. (a) The commission, as a basis for granting any certificate pursuant to Section 1001 shall give consideration to the following factors:

(1) Community values.

(2) Recreational and park areas.

(3) Historical and aesthetic values.

(4) Influence on environment, except that in the case of any line, plant, or system or extension thereof located in another state which will be subject to environmental impact review pursuant to the National Environmental Policy Act of 1969 (Chapter 55 (commencing with Section 4321) of Title 42 of the United States Code) or similar state laws in the other state, the commission shall not consider influence on the environment unless any emissions or discharges therefrom would have a significant influence on the environment of this state.

The CPUC will consider the “community values” as expressed in the CPUC’s proceeding on the SRPL project and in comments on the Draft EIR/EIS. The CPUC anticipates that the final decision will represent a reasonable balancing of the communities’ interests, the need to protect environmental resources in the area, and the need for the project.

4. Alternative Descriptions and Determinations

4.1 Introduction

The alternatives presented in this section include minor routing adjustments to SDG&E's proposed 500 kV project route, entirely different transmission line routes, alternative system voltages and system designs, and non-wires alternatives such as generation and conservation. After initial screening, if a potential alternative was found to be unable to meet the basic project objectives, purpose, and need; proven infeasible, or if it did not appear to reduce or avoid potentially significant impacts of the Proposed Project without creating other significant impacts of its own, then it was eliminated from full evaluation (listed in Table C-3 in Section C). The alternatives that have been determined to meet the CEQA/NEPA alternatives screening criteria have been retained for full analysis in the EIR/EIS (listed in Table C-2, Section C).

Route segment alternatives are addressed in Section 4.2 (Imperial Valley Link Route Segment Alternatives), Section 4.3 (Anza-Borrego Link Route Segment Alternatives), Section 4.4 (Central Link Route Segment Alternatives), Section 4.5 (Inland Valley Link Route Segment Alternatives), and Section 4.6 (Coastal Link Route Segment Alternatives). Section 4.7 discusses Substation Alternatives. Section 4.8 addresses alternatives that would follow a portion of the Southwest Powerlink #1 corridor and Section 4.9 discusses alternatives to the full project route and system alternatives. Finally, Section 4.10 discusses non-wires alternatives. The No Project/Action Alternative is required to be considered in an EIR/EIS by NEPA and CEQA, so is described in Section C.6 of the EIR/EIS and is not discussed in this Appendix.

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4.2 Imperial Valley Link Route Segment Alternatives

The Imperial Valley Link of the Sunrise Powerlink Transmission Line project generally would consist of a 500 kV transmission line from the existing Imperial Valley Substation located west of El Centro to the eastern boundary of Anza-Borrego Desert State Park (MP 60.9). The Imperial Valley Substation would require some modifications to accommodate the project and all improvements would take place within the fences of the existing substation.

The following chapter of the Alternatives Screening Report represents a comprehensive summary and assessment of all transmission line (wires) alternatives including those originally developed by SDG&E, alternatives suggested by the public and agencies during review of the NOP and NOI and during public scoping efforts and also includes all alternatives developed independently by the CPUC, BLM and their EIR/EIS team. To date, ten Imperial Valley Link alternatives have been developed. Three of the Imperial Valley Link alternatives are recommended to be retained for further analysis in the EIR/EIS. Each of the Imperial Valley Link Alternatives is described below and all of the Imperial Valley Link route segment alternatives considered are shown in Figure Ap.1-1.

Retained for Analysis

4.2.1 FTHL Eastern Alternative

Alternative Description

This alternative was developed by the EIR/EIS team as a way to avoid almost 2 miles within the Flat-Tailed Horned Lizard (FTHL) Management Area. This route is shown in Figures Ap.1-1 and Ap.1-2 and would begin at MP 3 by turning north and diverging from the proposed route. The alternative would travel for approximately 4.5 miles north following section lines across agricultural lands and crossing I-8 (approximately 1 mile east of where the proposed route would cross I-8) to rejoin the Proposed Project at MP 8.8. This route would be approximately 1.5 miles shorter than the proposed route.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The FTHL Eastern Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Shorter Length and Ground Disturbance. This route would be approximately 1.5 miles shorter than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Biological Resources. This alternative would cross through less potential special status species habitat and would avoid approximately 2 miles of the BLM Flat-Tailed Horned Lizard Designated Management Area.

Land Use. This alternative would be one mile farther east of a large master plan community development project.

Environmental Disadvantages

Agricultural Resources. The alternative would cross approximately 4.5 miles of agricultural land whereas the Proposed Project would skirt the western edge of the agricultural lands. It is anticipated that construction activities would temporarily interfere with agricultural operations on these lands, which could reduce production.

Visual Resources. This alternative would be farther east, which would be closer to residential and farming areas through the flat desert area. Therefore, the alternative would have a greater visibility to sensitive receptors and travelers than the proposed route.

Residential Use. The alternative would have a higher occurrence of rural residential use due to its location on private agricultural land as opposed to the proposed route on BLM land.

Soil Contamination. This alternative would have a greater likelihood that excavation could encounter soils contaminated with pesticides and herbicides that could be present in the 4.5 miles of agricultural lands.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and would be potentially feasible. Although the alternative would have greater agricultural, land use and public health and safety impacts, it would reduce impacts to the BLM FTHL Management Area, would be shorter and would be farther from a master plan community development. Therefore, this alternative has been retained for full analysis in this EIR/EIS.

4.2.2 SDG&E West of Dunaway Alternative

Alternative Description

This alternative was suggested by SDG&E and approved by the proposed land use developer in the area. This route is shown in Figures Ap.1-1 and Ap.1-2 and would diverge from the Proposed Project at MP 4. The SDG&E West of Dunaway Alternative would follow SWPL approximately 1.7 miles farther west-northwest than the Proposed Project. The route would turn north for approximately 2.5 miles, parallel-

Figure Ap.1-1. Imperial Valley Link – Alternatives Considered
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Figure Ap.1-2. Imperial Valley Link – Alternatives Retained
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ing Dunaway Road (approximately 0.25 miles west of the roadway) and would traverse BLM land to meet the Arizona and San Diego Railroad ROW. South of the railroad ROW, the route would turn east and would parallel the tracks for 1.25 miles before turning briefly north to cross the tracks and Evan Hewes Highway and then turn northeast to rejoin the proposed route at MP 7.9. This route would be 2.2 miles longer than the proposed route.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E West of Dunaway Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Land Use. This alternative would be west of and would avoid a major master plan community development project, whereas the proposed route would bisect the middle of the land development project.

Environmental Disadvantages

Longer Length and Ground Disturbance. This route would be approximately 2.2 miles longer than the proposed route, which will slightly affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination in the agricultural lands, and geologic resources related to soil erosion.

Military Land. This alternative would be farther west and closer to the boundary of the Desert Range and the height restriction and no-fly zones.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and would be potentially feasible. Although the route would be longer, it would avoid a major planned land development project that the proposed route would bisect. Therefore, this alternative has been retained for full analysis in this EIR/EIS.

4.2.3 SDG&E West Main Canal–Huff Road Modification Alternative

Alternative Description

SDG&E suggested a modification to the two Bullfrog Farms Alternatives described below (see Sections 4.2.8 and 4.2.9), in which the transmission line route would diverge from the proposed route at MP 11 and follow the IID Westside Main Canal to the east-northeast, and then turn north on Huff Road. The route would head north for 1.5 miles along the east side of Huff Road. Existing IID 92 kV transmission lines are located on the west side of Huff Road along most of this segment; however, where the IID line would turn northwest, this alternative would continue straight along Huff Road to reconnect with the Proposed Project at Tower AG46, 0.2 miles south of Wheeler Road (MP 15.9). The lengths of the alternative and the proposed routes would be essentially the same; however, this route would avoid direct effects to the Bullfrog Farms and also to the Raceway development. The route is shown in Figures Ap.1-1 and Ap.1-2.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E West Main Canal–Huff Road Modification Alternative would meet all project objectives.

Feasibility

IID is planning system upgrades of its transmission system from 92 kV to 230 kV. These upgrades would include the existing 92 kV line that parallels Huff Road to its west side. However, IID stated in a data response dated January 12, 2007 that as long as the two lines are separated by a sufficient distance to avoid reliability concerns with existing transmission and distribution lines then the new 500 kV transmission line would not prevent upgrade of the IID lines. Therefore, this alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Agricultural Resources. This alternative would avoid Bullfrog Farm and would be farther from its calving facilities and thereby would eliminate impacts to dairy and farming operations. Scoping comments cited studies that have found that milk production in cows is lower when there is a close proximity to transmission lines.

Consolidation of Transmission Lines. A portion of this alternative would be parallel to an existing IID 92 kV transmission line ROW along Huff Road. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors. It would also minimize impacts for aerial applicators in the area who are already aware of and avoid the IID 92 kV line.

Land Use. The alternative would avoid the proposed Desert Springs Oasis Resort, a planned luxury motor coach destination resort by Raceland Holdings, LLC with 3,000 condo lots located west and southwest of Bullfrog Farms that is in process of entitlement applications with Imperial County.

Military Land. This alternative would be farther east from the Desert Range and the height restriction and no-fly zones.

Recreation and Wilderness. The route would be located farther from BLM's Superstition Mountain OHVA, which is to the north-northwest of Bullfrog Farms.

Environmental Disadvantages

Visual Resources. The proposed route would be more removed from the public because it would be adjacent to the Desert Range, which is a restricted military area. Huff Road, where this alternative would be located along, is a more traveled two-lane north-south road through the area. The topography is flat so the line would be closer to and visible to a great number of sensitive receptors and travelers on Huff Road.

Agricultural Resources. Similar to the proposed route, this alternative would be located in agricultural lands adjacent to the Westside Main Canal and Huff Roads, which could interfere with farming operations.

Alternative Conclusions

RETAINED FOR ANALYSIS. Planned IID system upgrades that could affect the existing 92 kV line along Huff Road would not affect the potential technical feasibility of this alternative. As a result, this alternative would meet project objectives and would be potentially feasible. It would also avoid Bullfrog Farms and impacts to a planned land development. Therefore this alternative has been retained for full evaluation in this EIR/EIS.

Eliminated from Consideration

4.2.4 SDG&E Desert Western Route Alternative

Alternative Description

This alternative was initially considered to be the preferred alignment by SDG&E during its public alternatives development process. Although it is no longer SDG&E's proposed route for the Sunrise Powerlink Project, the route was evaluated in the PEA as Alternative Alignment N2-N4-N41-N38 under the Desert Link discussion of "500 kV Transmission Line from Imperial Valley Substation to the Western ABDSP Boundary."

The SDG&E Desert Western Route Alternative would diverge from the Proposed Project approximately 4 miles northwest of Imperial Valley Substation. The alternative would continue northwest and then west for approximately 8.64 miles following the existing SWPL #1 line within the BLM Dedicated Utility Corridor, through Plaster City and crossing SR80. The route would then diverge from SWPL #1 and would head north for 14.79 miles along an existing disturbed jeep trail on BLM land, east of and outside of Coyote Mountains and Fish Creek Federal Wilderness Areas. From Milepost (MP) 23.4 the route would follow the existing IID 92 kV transmission line for 8.34 miles to where it would rejoin the Proposed Project at MP 54.1. As shown in Figure Ap.1-1, the alternative route would be 20 miles shorter than the proposed route in the Desert Link.

Lattice structures would be used for most of this alternative, but H-Frames would be used along DoD restricted airspace areas due to their shorter height (90 feet). If this alternative route is used then the existing Imperial Valley–Narrows 92 kV transmission line would be relocated west to this corridor.

The portion of this alternative that would follow the existing SWPL #1 line would be within a designated utility corridor. However, the remainder of the alternative on BLM land would not be within a designated utility corridor and would require a BLM Land and Resource Management Plan Amendment for a 1,500-foot corridor.

Initial Route Segments Considered by SDG&E. Four different routes spanning the western boundary of Desert Range military lands were initially considered by SDG&E prior to development of the route used for the SDG&E Desert Western Alternative and based on the goal of following linear features. Three of the routes would parallel north-south section lines through undisturbed areas and Segment 3D would parallel a jeep trail in an already disturbed area. Although the three routes that would parallel section lines would be farther from designated wilderness area to the west, they would travel through undisturbed lands closer to the center of the Desert Range and its height limitation area. Therefore, Segment 3D, which traverses more disturbed terrain closer to the western boundary of the Desert Range, was carried forward. Using GPS (global positioning system) and field reconnaissance, Segment 3D was then refined to more closely parallel the existing jeep trail and it is the precursor to what is described above as the SDG&E Desert Western Route Alternative.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Desert Western Route Alternative would meet all project objectives.

Feasibility

Legal Feasibility. The SDG&E Desert Western Route Alternative has the potential to be legally feasible.

Technical Feasibility. This alternative would cross through the Desert Range height limitation and/or obstruction-free zone area that prohibits structures taller than 20 feet. It is not technically feasible to construct a 500 kV line with 20-foot towers and keep the line above the minimum height from the ground, as required by CPUC G.O. 95. It should be noted that towers for the proposed 500 kV line in the Imperial Valley Link would have a mean height of 160 feet. Therefore, given the DoD height restrictions of 20 feet in places, construction of a 500 kV line and structures that would be within the height requirements would not be technically feasible.

Regulatory Feasibility. There several regulatory feasibility issues including:

- *Federal and State Sensitive Management Area – Flat-Tailed Horned Lizard (FTHL).* This alternative would cross through the Federal and State Sensitive Management Area – Flat-Tailed Horned Lizard (FTHL). The FTHL Rangewide Management Strategy has a planning action that states: “Land use

applications will continue to be reviewed on a case-by-case basis for impacts on FTHLs and their habitat. Every attempt shall be made to locate projects outside of MAs [Management Areas]. New ROWs may be permitted along the boundaries of MAs and only if impacts can be mitigated to avoid long-term effects on FTHLs in the MA. Where discretionary, other new authorizations may be permitted if the habitat disturbance does not pose a significant barrier to lizard movements. Disturbance shall be limited to 10 acres or less per authorization, if possible. If individual disturbances over 10 acres are necessary, the ICC [Interagency Coordinating Committee] and the MOG [Management Oversight Group] shall be contacted to provide suggestions for minimizing potential impacts to FTHLs.” Therefore, the project would be held to mitigation measures in the FTHL Rangewide Management Strategy, but there would also be compensation required for providing perches (towers only, not the actual transmission lines) for FTHLs, such as loggerhead shrikes. Therefore, SDG&E would have to minimize impacts based on ICC and MOG requirements that have not been yet determined; however, the alternative has the potential to be regulatorily feasible.

- *Military Operations Area with DoD Restricted Airspace and/or Obstruction Free Zone.* The alternative would traverse Department of Defense Military Operations Area that includes DoD Restricted Airspace and/or an Obstruction-Free Zone. It also crosses through Military Height Limitations areas of 20 feet and 20 to 200 feet. The current mission of the Desert Range (also called the R-2510 complex) is to support Navy and Marine Corps tactical training for units from across the country year-round (also including Air Force, and National Guard). In support of this mission, the R-2510 complex has Special Use Airspace (SUA) and ground ranges consisting of over 241 square nautical miles of restricted airspace and two target complexes with electronic, computerized scoring systems. Inert air-to-ground bombing, rocket, strafing, and Mobile Land Track (MLT) training all take place within R-2510. The range has lighting for night deliveries and has a Weapons Impact Scoring System (WISS). Freefall and static line parachute operations also are conducted within the 154,473-acre area. The R-2510 complex is in high demand for use due to the fact that the location is convenient to units from Naval Air Station (NAS) North Island, Marine Corps Air Station (MCAS) Miramar, NAS Lemoore, and MCAS Yuma, as well as being available nearly every day due to good climate and the targets have lighting for night training (DON, 2007).

As a result, the Department of the Navy (DON) has stated in a letter to the CPUC dated April 20, 2007 that it “has an obligation to manage Special Use Airspace (SUA) and range complexes to ensure they are capable of supporting current and future operational requirements while protecting human health and the environment. In doing so, the DON encourages and supports development of energy transmission corridors while simultaneously avoiding adverse encroachment impacts to the military's aviation mission and flight safety. Due to the relatively small size of airspace in relationship to aircraft speed and existing constraints, any encroachment into the R-25 10 complex potentially jeopardizes safety of flight and could significantly limit the usefulness of the area. As a result, the DON requests that no alternative for the proposed Sunrise Powerlink Transmission be permitted across the R-2510 complex” (DON, 2007). In addition, Air Station representatives had communicated to IID that it has plans to use specialized aircraft that required the ability to fly low to the ground, making the siting of a transmission line at the west side of the base infeasible due to its incompatibility with future operations. Due to future aircraft operations, this alternative would not be regulatorily feasible. IID has also decided to no longer pursue this alternative (Sandoval, 2007).

- *BLM Land and Resource Management Plan Amendment.* As mentioned above, a Plan Amendment would be required for the proposed transmission line across BLM lands. The requirement for a plan amendment may not make the alternative infeasible, but it would add a series of regulatory requirements: (a) NEPA clearance of the plan amendment would be required; (b) public noticing would be required by filing in the Federal Register; (c) an extension of the Draft EIR/EIS public review

period from 60 to 90 days; and (d) a 60-day Governor's Consistency Review following the publishing of the Final EIR/EIS. The Final EIR/EIS would also have to identify in its title that the EIR/EIS also evaluates a proposed Plan Amendment. It is not known at this time whether BLM would approve the required plan amendment; therefore, regulatory feasibility is not certain.

While this alternative has the potential to be legally feasible, it would not be regulatorily or technically feasible to construct.

Environmental Advantages

Shorter Length and Ground Disturbance. This route would be approximately 20 miles shorter than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Already Disturbed Corridor. This alternative would follow continuous disturbed ROW (the existing SWPL line, an existing jeep trail, and an existing IID 92 kV transmission line ROW). In general, consolidating transmission lines within common utility corridors, as would occur for 17 miles with this alternative, is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Agricultural Resources. This alternative would eliminate short-term and permanent impacts to agricultural resources and farming operations resulting from the construction of the proposed route and a new permanent access road for the transmission line. It would eliminate 320.9 acres of impacts to agricultural lands, including dairy farms, such as Bullfrog Farms, in the Imperial Valley. Unlike the proposed route, the alternative also would not impact any Williamson Act lands.

Biological Resources. Based on field reconnaissance by SDG&E, the habitat along the alternative was lower quality habitat than the Proposed Project in the Flat-Tailed Horned Lizard Management Areas. The linear distance of impact to FTHL Management Areas (MA) for the Desert West Alternative (i.e., where it would replace MP 4 to MP 54 of the Proposed Project) would be approximately 8 miles. Of this 8 miles, a portion of the habitat within FTHL Management Area (approximately 1.5 linear miles; 19 percent of the total distance in MA) would be disturbed habitat. Whereas the linear distance of impact to FTHL Management Areas for the Proposed Project between MP 4 and MP 54 would be approximately 15 miles; approximately 1.4 linear miles of which (9 percent of the total distance in Management Area) would be disturbed habitat.

Visual Resources. This alternative would be less visible than the proposed route because much of it would be on undeveloped restricted-access military land.

Geology. This alternative would avoid seven overhead fault crossings that would be required with the proposed route.

Environmental Disadvantages

Wilderness and Recreation. The route would pass through a Designated Recreational Use Area and would pass just east of two Wilderness Areas.

Biological Resources. Like the proposed route, the alternative would traverse Flat-Tailed Horned Lizard Management Areas and Designated Critical Habitat for bighorn sheep. With regards to designated critical habitat specifically as associated with the Peninsular bighorn sheep, habitats along the alternative, which crosses the eastern margin of the Designated Critical Habitat, were found to be of higher quality than the proposed route in this segment. The route would also pass just east of two designated Wilderness Areas (Coyote Mountains and Fish Creek Mountains).

Recreation. Users on the San Felipe trail may be impacted by the addition of a transmission line corridor in close parallel proximity.

Off-Road Vehicle (ORV) Area. The alternative alignment would traverse approximately four times more acres of designated ORV area than the proposed route. The California Off-Highway Motor Vehicle Recreation Commission provides policy guidance for the management of ORV lands in California and mandates consideration of ORV designated areas in siting transmission lines.

Visual Resources. The Painted Gorge is a mountain located north of I-8 and just east of Ocotillo and is accessed from Old Highway 80. This alternative would introduce a new transmission corridor and industrial structures into the area around Painted Gorge and could impact views from the top of the mountain of the surrounding limited-access open desert.

Hazards and Hazardous Materials. Contamination and/or ordnances may be encountered due to ground disturbing activities on military lands.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be legally feasible. This alternative would be 20 miles shorter than the Proposed Project in the Desert Link. In addition, it would be entirely along an already disturbed corridor on federal land, which would avoid agricultural lands in the Imperial Valley, and would thereby result in substantially less ground disturbance and impacts to all issue areas. However, the alternative would traverse Department of Defense Military Operations Area that includes DoD restricted airspace and/or an obstruction-free zone thereby making this alternative regulatorily infeasible and technically infeasible to construct within the 20-foot height limitation. Due to future aircraft operations, IID has decided that this route is no longer feasible to pursue (Sandoval, 2007). As a result, the Desert Western Alternative has been eliminated from consideration in this EIR/EIS.

4.2.5 SDG&E Segment 1/Imperial Valley via 92 kV Alternative

Alternative Description

This alternative is part of an alternative that was originally developed (and eliminated) in PEA Section 3.3.1.2 and would begin at the existing Imperial Valley Substation. The route would head north paralleling roadways, section lines, and canals for 11 miles through agricultural lands, as is shown in Figure Ap.1-1.

Specifically, the route would depart from Imperial Valley Substation heading north through open desert and agricultural lands for 3,500 feet before crossing an unnamed roadway and paralleling Liebert Road for another 3,500 feet to Wixom Road. The line would continue north-northwest for approximately 4,000 feet through agricultural land to W. Diehl Road where it would join and parallel Jessup Road for

3.3 miles, crossing over I-8. After crossing County Highway S80, the route would jog approximately 875 feet to the west would continue north paralleling Molitor Road for 7,000 feet. At Curtis Road where Molitor Road jogs to the east, this route would continue north through agricultural land to join and begin paralleling Huff Road at a point approximately 1,750 feet north of Hetzel Road. Existing IID 92 kV transmission lines are located on the west side of Huff Road along most of this segment and the alternative would turn northwest and would traverse for 23 miles through mostly unoccupied BLM lands following the existing IID Imperial Valley–Narrows 92 kV transmission line corridor to a point where it would intercept the Proposed Project outside of the military facility at approximately MP 54. This route would be 20 miles shorter than the Proposed Project.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 1 via 92 kV Alternative would meet all project objectives.

Feasibility

Regulatory Feasibility. This alternative would pass through the middle of the area that has height restrictions and restricted airspace that prevents any construction up to 20 feet and height restriction areas of 20 to 200 feet. Discussions by SDG&E and IID with DoD have indicated that no new poles higher than the existing structures, which are 65 feet tall, can be placed along this segment. This alternative would not be regulatorily feasible.

This alternative would cross through the Federal and State Sensitive Management Area – Flat-Tailed Horned Lizard (FTHL). The FTHL Rangelwide Management Strategy has a planning action that states: “Land use applications will continue to be reviewed on a case-by-case basis for impacts on FTHLs and their habitat. Every attempt shall be made to locate projects outside of MAs [Management Areas]. New ROWs may be permitted along the boundaries of MAs and only if impacts can be mitigated to avoid long-term effects on FTHLs in the MA. Where discretionary, other new authorizations may be permitted if the habitat disturbance does not pose a significant barrier to lizard movements. Disturbance shall be limited to 10 acres or less per authorization, if possible. If individual disturbances over 10 acres are necessary, the ICC [Interagency Coordinating Committee] and the MOG [Management Oversight Group] shall be contacted to provide suggestions for minimizing potential impacts to FTHLs.” Therefore, SDG&E would have to minimize impacts based on ICC and MOG suggestions; however, the alternative would be regulatorily feasible.

Technical and Legal Feasibility. Although it is technically feasible, prudent engineering would not construct a 500 kV line with 65-foot towers (the height of the existing 92 kV line), because the span lengths would be extremely short in order to ensure that the line would be above the minimum height from the ground, as required by CPUC G.O. 95. Towers for the proposed 500 kV line in the Imperial Valley Link would have a mean height of 160 feet.

The SDG&E Segment 1 via 92 kV Alternative has the potential to be technically and legally feasible, but would not make sense from a construction and engineering perspective. In addition, the alternative would not be regulatorily feasible, because it would bisect the center of the Desert Range height limitation and/or obstruction-free zone.

Environmental Advantages

Shorter Length and Ground Disturbance. This route would be approximately 20 miles shorter than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Consolidation of Transmission Lines. A portion of this alternative would be parallel to an existing IID 92 kV transmission line ROW along a portion of Huff Road. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance and additional visual impacts that typically result from separate transmission line corridors. It would also minimize impacts for aerial applicators in the area who are already aware of and avoid the IID 92 kV line.

Agricultural Resources. This alternative would avoid Bullfrog Farm and thereby would eliminate impacts to dairy and farming operations. Scoping comments cited studies that have found that milk production in cows is lower when there is a close proximity to transmission lines. Beginning along Huff Road this alternative would also be located parallel to the IID 92 kV transmission line, which would minimize the impacts of a new line on aerial applicators in the agricultural lands in the area who are already aware of and avoid the IID 92 kV line.

Biological Resources. This alternative would cross through less potential special status species habitat and less habitat within the BLM Flat-Tailed Horned Lizard Designated Management Area, specifically in the open space desert area where the proposed route would follow SWPL #1.

Environmental Disadvantages

Military Height Limitation Areas and Restricted Airspace/Obstruction-Free Zones. The eastern portion of the alternative parallels the DOD height limitation area and DOD-restricted airspace as is discussed under Regulatory Feasibility above.

Biological Resources. This alternative contains a high occurrence of potential special status species habitat and would traverse a greater area within the BLM Flat-Tailed Horned Lizard Designated Management Area.

Wilderness and Recreation. The alternative would have a higher occurrence of regional and local parks, designated open space, and/or preserves than with the Proposed Project because it would cross closer to the Fish Creek Wilderness Area and the San Felipe Trail.

Agricultural Resources. This alternative would traverse agricultural lands at the southern portion of the alternative, following property lines where possible but also bisecting some farmland parcels, which could temporarily and permanently interfere with farming operations.

Visual Resources. This alternative would be farther east, which would be closer to residential and farming areas, and it would parallel roadways through the flat desert area. Therefore, the alternative would have a greater visibility to sensitive receptors and travelers than the proposed route.

Residential Use. The alternative would have a higher occurrence of residential use.

Traffic and Transportation. This alternative would parallel two-lane roadways for most of the southern portion and construction could interfere with traffic traveling north-south through the area.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives; however, it would not be regulatorily feasible and it would cause much greater impacts to agricultural operations and residential receptors even though it would be 20 miles shorter. Therefore, it was eliminated from full consideration in this EIR/EIS because it would cross through the center of the height limitation and restricted airspace/obstruction-free zones within the DoD lands it would traverse. If it is even technically feasible, prudent engineering would not design and construct a 500 kV transmission line that is 65 feet high. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS.

4.2.6 Imperial Valley FTHL Alternative

Alternative Description

This alternative was developed by the EIR/EIS team as a way to avoid the Flat-Tailed Horned Lizard (FTHL) Management Area. This route is shown in Figure Ap.1-1 and would begin at Imperial Valley Substation traveling northwest for almost 1.0 mile through open desert to the edge of the cultivated agricultural land and an unnamed road that becomes Dixie Drain 4. The route would turn west-northwest and then north as it would parallel the edge of the agricultural land on the north side of Dixie Drain 4/unnamed road, outside of the BLM FTHL Management Area on private agricultural land for 3.7 miles. Approximately 1,300 feet south of Hardy Road, the route would turn west parallel to the edge of agricultural land for 1.0 mile to rejoin the proposed route at MP 5. This route would be 0.7 miles longer than the proposed route.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Imperial Valley FTHL Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative has the potential to be legally and regulatorily feasible.

Technical Feasibility. There would be technical feasibility conflicts associated with IID planned 230 kV upgrades along its Westside Main Canal, which are planned in the same area as this alternative. IID is building a new transmission line from the Imperial Valley Substation to connect to its currently 92 kV system at a proposed Dixieland Substation. The transmission line route is along IID-owned ROW for the canal system that is part of the IID irrigation system. The land on both sides of the canals is privately owned farm, ranch, or residential land. IID has stated that the route is feasible for its 230 kV line because it requires a less wide ROW and it can make the required turns to follow the canal and avoid privately owned lands along its ROW. A 500 kV line would not likely be able to make the many angled turns necessary to avoid the FTHL habitat and also avoid multiple crossings over the IID transmission line (IID, 2007). In order to move this alternative route to allow for adequate separation between the 230 kV and 500 kV lines so that if one tower/line fell it would not reach the phases of the parallel line, this route would either be within the BLM FTHL or would bisect agricultural lands, thereby causing greater impacts associated with two adjacent ROWs.

Environmental Advantages

Biological Resources. This alternative would cross through approximately 3.8 miles less of the BLM Flat-Tailed Horned Lizard Designated Management Area.

Environmental Disadvantages

Longer Length and Ground Disturbance. This route would be approximately 0.7 miles longer than the proposed route, which will slightly affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with greater ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Agricultural Resources. The alternative would cross approximately 4.5 miles of agricultural land whereas the Proposed Project would skirt the western edge of the agricultural lands. It is anticipated that construction activities would temporarily interfere with agricultural operations on these lands, which could reduce production.

Visual Resources. This alternative would be farther east, which would be closer to residential and farming areas through the flat desert area. Therefore, the alternative would have a greater visibility to sensitive receptors and travelers than the proposed route.

Residential Use. The alternative would have a higher occurrence of residential use due to its location across private lands as opposed to BLM land with the proposed route.

Soil Contamination. This alternative would have a greater likelihood that excavation could encounter soils contaminated with pesticides and herbicides that could be present in the 4.5 miles of agricultural lands.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be legally and regulatorily feasible. There would be technical feasibility issues due to IID 230 kV planned upgrades along the Westside Main Canal in this area. In addition, the route would pass adjacent to a large pro-

posed residential development and could result in potential agricultural conflicts. Although this route would avoid BLM Flat-Tailed Horned Lizard Designated Management Area, it would be located almost entirely in agricultural land with greater environmental impacts. Therefore, due to the technical feasibility issues as well as greater land use, visual, contamination, ground disturbance, and agricultural impacts, this alternative has been eliminated for full analysis in this EIR/EIS and has been replaced with FTHL Eastern Alternative (see Section 4.2.1), which would reduce impacts to the BLM FTHL Management Area while also avoiding these feasibility concerns and minimizing other environmental impacts.

4.2.7 SDG&E Imperial Valley FTHL Modification Alternative

Alternative Description

This alternative was suggested by SDG&E and is similar to the Imperial Valley FTHL Alternative (see Section 4.2.6) beginning at Imperial Valley Substation and traveling north to the agricultural lands, which are north of and outside of the BLM FTHL Management Area. However, the SDG&E Imperial Valley FTHL Modification Alternative would follow the east side of the Westside Main Canal, crossing I-8 to Stevens Road where it would turn west, cross the canal, and follow Strobel Road to rejoin the proposed route one structure north of I-8 at MP 6.1. This route is shown in Figure Ap.1-1.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Imperial Valley FTHL Modification Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative has the potential to be legally and regulatorily feasible.

Technical Feasibility. There would be technical feasibility conflicts associated with IID planned 230 kV upgrades along its Westside Main Canal, which are planned in the same area as this alternative. In order to move this alternative route to allow for adequate separation between the 230 kV and 500 kV lines so that if one tower/line fell it would not reach the phases of the parallel line, this route would either be within the BLM FTHL or would bisect agricultural lands, thereby causing greater impacts associated with two adjacent ROWs.

Environmental Advantages

Biological Resources. This alternative would cross through less potential special status species habitat and would avoid approximately 3.8 miles of the BLM Flat-Tailed Horned Lizard Designated Management Area.

Land Use. This alternative would be farther east of a major master plan community development project.

Environmental Disadvantages

Agricultural Resources. The alternative would cross approximately 4.5 miles of agricultural land whereas the Proposed Project would skirt the western edge of the agricultural lands. It is anticipated that construction activities would temporarily interfere with agricultural operations on these lands, which could reduce production.

Visual Resources. This alternative would be farther east, which would be closer to residential and farming areas through the flat desert area. Therefore, the alternative would have a greater visibility to sensitive receptors and travelers than the proposed route.

Residential Use. The alternative would have a higher occurrence of rural residential use due to its location in private agricultural land as opposed to BLM land with the proposed route.

Soil Contamination. This alternative would have a greater likelihood that excavation could encounter soils contaminated with pesticides and herbicides that could be present in the 4.5 miles of agricultural lands.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would potentially be legally and regulatorily feasible. There would be technical feasibility issues due to IID 230 kV planned upgrades along the Westside Main Canal in this area. Although this route would avoid much of the BLM Flat-Tailed Horned Lizard Designated Management Area, it would be located almost entirely in agricultural land with greater environmental impacts to land use, visual resources, contamination as well. Therefore, this alternative has been eliminated for full analysis in this EIR/EIS and has been replaced with FTHL Eastern Alternative (see Section 4.2.1), which would reduce impacts to the BLM FTHL Management Area while also avoiding these feasibility concerns and minimizing other environmental impacts.

4.2.8 SDG&E Bullfrog Farms Alternative

Alternative Description

Several scoping comments expressed concerns about the impacts of the 500 kV transmission line on dairy operations at Bullfrog Dairy Farm. As a result, this alternative was submitted by SDG&E in response to Data Request No. 1 (dated September 27, 2006). It would be a 1.9-mile segment that would diverge from the Proposed Project at approximately MP 13.5 and would continue east across agricultural land where the proposed route would turn north following the Desert Range boundary (at Tower AG35). The alternative would travel east following the property lines where possible for 0.7 miles (3 towers) before turning north. The route would head north for 1.2 miles and would reconnect with the Proposed Project at Tower AG42 (MP 15.2). This alternative would be 0.2 miles longer than the proposed route. This route is shown in Figure Ap.1-1.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objec-

tives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Bullfrog Farms Alternative would meet all project objectives.

Feasibility

This alternative would be potentially technically, legally, and regulatorily feasible.

Environmental Advantages

Agricultural Resources. This alternative would avoid the main building of Bullfrog Farms and thereby would eliminate impacts to dairy and farming operations in that area. Scoping comment cited studies that have found that milk production in cows is lower when there is a close proximity to transmission lines. Nearby high voltage transmission lines can cause induced shocks on cow udders when they are attached to the metal milking machines, thereby resulting in overall decreased milk production.

Environmental Disadvantages

Visual Resources. The proposed route would be more removed from the public because it would be adjacent to the Desert Range, which is a restricted military area. The topography is flat, and on the other hand, the alternative line would be 0.7 miles farther east so it would be closer to and visible to a great number of rural sensitive receptors and travelers on Huff Road.

Agricultural Resources. This alternative would be located in agricultural lands, following property lines where possible but also bisecting some farmland parcels, which could temporarily and permanently interfere with farming operations. In addition, the route would be closer to dairy calving operations on Bullfrog Farm.

Land Use. The alternative would impact the proposed Desert Springs Oasis Resort, a planned luxury motor coach destination resort with 3,000 condo lots located west and southwest of Bullfrog Farms that is in process of entitlement applications with Imperial County.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially feasible. It would also avoid the main building of Bullfrog Farms; however, it would impact its dairy calving operations. The route would also impact a planned development south of Bullfrog Farms. Therefore this alternative has been eliminated from full evaluation in this EIR/EIS and has been replaced with SDG&E West Main Canal–Huff Road Modification Alternative suggested by SDG&E (see Section 4.2.3).

4.2.9 Huff Road Bullfrog Farms Alternative

Alternative Description

Several scoping comments expressed concerns about the impacts of the 500 kV transmission line on dairy operations at Bullfrog Farms. This alternative was developed in response by the EIR/EIS team. It would be a 3.0-mile segment that would diverge from the Proposed Project at approximately MP 13.8

by turning east and paralleling Payne Road. The alternative would travel east adjacent to Payne Road for 1.7 miles before turning north onto Huff Road. The route would head north for 1.3 miles along the east side of Huff Road. Existing IID 92 kV transmission lines are located on the west side of Huff Road along most of this segment; however, where the IID line would turn northwest, this alternative would continue straight along Huff Road to reconnect with the Proposed Project at Tower AG46, 0.2 miles south of Wheeler Road (MP 15.9). The lengths of the alternative and the proposed routes would be essentially the same. This route is shown in Figure Ap.1-1.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Huff Road Bullfrog Farms Alternative would meet all project objectives.

Feasibility

Imperial Irrigation District is planning system upgrades of its transmission system from 92 kV to 230 kV. These upgrades would include the existing 92 kV line that parallels Huff Road to its west side. However, IID stated in a data response dated January 12, 2007 that as long as the two lines are separated by a sufficient distance to avoid reliability concerns with existing transmission and distribution lines then the new 500 kV transmission line would not prevent upgrade of the IID lines. Therefore, this alternative would be potentially technically, legally, and regulatorily feasible. It also has the potential to be legally and regulatorily feasible.

Environmental Advantages

Agricultural Resources. This alternative would avoid the main building of Bullfrog Farms and thereby would eliminate impacts to dairy and farming operations in this area. Scoping comment cited studies that have found that milk production in cows is lower when there is a close proximity to transmission lines. Nearby high voltage transmission lines can cause induced shocks on cow udders when they are attached to the metal milking machines, thereby resulting in overall decreased milk production.

Consolidation of Transmission Lines. A portion of this alternative would be parallel to an existing IID 92 kV transmission line ROW along Huff Road. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors. It would also minimize impacts for aerial applicators in the area who are already aware of and avoid the IID 92 kV line.

Military Land. This alternative would be farther east from the Desert Range and the height restriction and no-fly zones.

Recreation and Wilderness. The route would be located farther from BLM's Superstition Mountain OHVA, which is to the north-northwest of Bullfrog Farms.

Environmental Disadvantages

Visual Resources. The proposed route would be more removed from the public because it would be adjacent to the Desert Range, which is a restricted military area. Huff Road is a more traveled two-lane north-south road through the area. The topography is flat, so on the other hand, the alternative line would be closer to and visible to a great number of sensitive receptors and travelers on Huff Road than the proposed route adjacent to the Desert Range.

Agricultural Resources. Similar to the proposed route, this alternative would be located in agricultural lands adjacent to Payne and Huff Roads, which could interfere with farming operations. In addition, the route would be closer to dairy calving operations on Bullfrog Farm.

Land Use. The alternative would impact the proposed Desert Springs Oasis Resort, a planned luxury motor coach destination resort by Raceland Holdings, LLC with 3,000 condo lots located west and southwest of Bullfrog Farms that is in process of entitlement applications with Imperial County.

Alternative Conclusions

ELIMINATED. Planned IID system upgrades that could affect the existing 92 kV line along Huff Road would not affect the technical feasibility of this alternative. This alternative would meet project objectives and would be potentially feasible. It would also avoid the main building of Bullfrog Farms, however, it would impact its dairy calving operations. The route would also impact a planned development south of Bullfrog Farms. Therefore this alternative has been eliminated from full evaluation in this EIR/EIS and has been replaced with SDG&E West Main Canal-Huff Road Modification Alternative suggested by SDG&E (see Section 4.2.3).

4.2.10 New River Alternative

Alternative Description

This alternative was suggested during scoping and would diverge from the Proposed Project around MP 11 and briefly following section lines to the New River, which roughly runs southwest to northeast across the valley (see Figure Ap.1-1). The route would follow the north side of the river (adjacent to but not on the agricultural land) in the northeast direction for almost 8 miles to its intersection with the existing IID transmission corridor where it would turn northwest for 1.2 miles and would rejoin the Proposed Project around MP 20.5. The route would be essentially the same length as the proposed route.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term

(2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The New River Alternative would meet all project objectives.

Feasibility

Legal Feasibility. This alternative would be potentially legally feasible.

Regulatory Feasibility. The New River is an U.S. Army Corps of Engineers jurisdictional river and any line running within the river would have to be permitted under Section 404 of the Clean Water Act. These permits are reviewed with the main goal of avoidance of impacts to waters of the U.S. (i.e., moving the line out of the river). If impacts cannot be avoided, the U.S. Army Corps would aim to minimize impacts (also by moving the line out of the river). Finally, any impacts that do occur would have to be mitigated. Therefore, because the line could be located outside of the New River banks, the U.S. Army Corps of Engineers likely would not permit a line running within the New River due to impacts to navigation.

Technical Feasibility. Although it is potentially technically feasible, engineering would be challenging to construct a 500 kV line within the river, because there would be major difficulties in construction of the foundations and maintenance concerns for access to the lines during operation. Running the line adjacent to the river but in the floodplain would likely entail special foundations that are built up so the top of the foundation and tower base are above the 100-year flood level. The foundations would also have to be designed to resist loadings imposed by flood conditions. The foundations would also need to have additional depth to allow for ground scouring as a result of floods.

Environmental Advantages

Agricultural Resources. This alternative would avoid Bullfrog Farms and thereby would eliminate impacts to dairy and farming operations. Scoping comments cited studies that have found that milk production in cows is lower when there is a close proximity to transmission lines.

Military Land. This alternative would be farther east from the Desert Range and the height restriction and no-fly zones.

Recreation and Wilderness. The route would be located farther from BLM's Superstition Mountain OHVA, which is to the north-northwest of Bullfrog Farms.

Environmental Disadvantages

Hydrology and Water Quality. The New River has year-round flow at the U.S./Mexico border of around 200 cubic feet-per-second. The New River brings in wastewater from Mexico and has cut down into the farmland, such that installing the towers in the bed of the river and near the side slopes would be difficult and could result in additional bank erosion. If the line were to zig-zag along the unused areas adjacent to the stream bed, the towers would be located in its floodplain and would thereby also result in erosion and greater water quality impacts.

Visual Resources. This alternative would diagonally bisect the valley in the middle of the agricultural land creating greater visual impacts than skirting the edge of the agricultural lands.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially legally feasible. There are regulatory concerns with permitting from the U.S. Army Corps of Engineers and technical feasibility issues due to the risk of installing a major transmission line in or in the floodplain directly adjacent to an active riverbed with year-round flow. Flowing water can undermine tower footings and riverbed soils can be unstable, presenting challenges to engineering. Although this alternative would reduce impacts to agricultural resources, it would be challenging to construct and would cause greater erosion and water resource impacts, and therefore, has been eliminated from full consideration in this EIR/EIS.

4.3 Anza-Borrego Link Route Segment Alternatives

The Anza-Borrego Link of the Sunrise Powerlink Transmission Line project generally would consist of a 500 kV transmission line extending for 22.6 miles through the Park, from MP 60.9 to MP 83.5. The Proposed Project within the entire Anza-Borrego Link would require relocation of the existing IID 92 kV and SDG&E 69 kV transmission lines as well.

The following chapter of the Alternatives Screening Report represents a comprehensive summary and assessment of all transmission line (wires) alternatives including those originally developed by SDG&E, alternatives suggested by the public and agencies during review of the NOP and NOI and during public scoping efforts and also includes all alternatives developed independently by the CPUC, BLM and their EIR/EIS team. To date, 13 Anza-Borrego Link alternatives have been developed. Each of the Anza-Borrego Link Alternatives is described below and all of the Anza-Borrego Link route segment alternatives are shown in Figure Ap.1-3. Two of the Anza-Borrego Link alternatives are recommended to be retained for further analysis in the EIR/EIS as shown in Figure Ap.1-4.

Retained for Analysis

4.3.1 Partial Underground 230 kV ABDSP SR78 to S2 Alternative

Alternative Description

This alternative was developed by the EIR/EIS team and would include installation of a double-circuit bundled 230 kV line (as opposed to 500 kV with the Proposed Project) that would be installed underground in SR78 through ABDSP (including the segment of SR78 in which SDG&E is proposing to underground the existing 92 and 69 kV lines as part of the Proposed Project). The underground ROW and survey area for all options would be 60 feet wide.

The line would transition underground at the San Felipe Substation (MP 58.8), approximately two miles east of ABDSP. The 230 kV underground line would travel north in Split Mountain Road for 2.6 miles and then west in SR78 for 8.2 miles to the intersection of SR78/Old Kane Springs Road at MP 68.2 where it would meet back up with the proposed route. It would then travel approximately 13 miles in SR78 to a point 1.0 miles east of the intersection with S2 (San Felipe Road) where it would transition overhead on the north side of the roadway at a point that would be 50 to 100 feet east of the Earthquake Valley Fault and the Alquist-Priolo Zone. San Felipe Creek is adjacent to the north side of SR78 and steep hills with washes border SR78 to the south.

After traveling one mile overhead to the west, around the northeast corner of the SR78 intersection with S2, the route would transition back to underground and would turn northwest in S2 for 3 miles. Approximately 50 to 100 feet west of the Earthquake Valley Fault zone, the line would transition to overhead once again and would continue north adjacent to the east side of S2 (San Felipe Road) outside of ABDSP for 8.8 additional miles, bypassing the Central East Substation area. The route would rejoin the proposed route on S2 at MP 92.7 near Montezuma Valley Road (S22). The route is illustrated in Figure Ap.1-4.

Please refer to Section 4.9.27 and the information below for a discussion of underground transmission lines. A High Voltage Direct Current (HVDC) Light Underground Alternative was considered but eliminated from detailed analysis, and is discussed in Section 4.3.12.

Substation Construction

The proposed Central East Substation would not be constructed with this alternative and approximately 2 miles of transmission line (one mile of 500 kV and one mile of 230 kV) to and from the substation would be eliminated. Instead a new 500 kV/230 kV substation would be constructed adjacent to the existing IID San Felipe Substation to accommodate the new transmission line. The San Felipe Substation is shown in Figure Ap.1-5, and Table Ap.1-2 lists the associated earthwork quantities, estimated acreage requirements, general site development.

Consolidation Option. In addition to the two 230 kV circuits, an existing 69/92 kV circuit could also be undergrounded in and along SR78 between Old Kane Springs Road (MP 68.2) and Yaqui Pass Road (S3). The underground 92 kV circuit would be approximately 1.5 miles beginning near Old Kane Springs Road and ending at the Narrows Substation (MP 69.7) to the west. The underground 69 kV circuit would be approximately 5.1 miles long traveling west from the Narrows Substation to Yaqui Pass Road/S3 (MP 74.8). The 69 kV line would transition back to overhead on the west side of Yaqui Pass Rd to avoid the campground.

Table Ap.1-2. San Felipe 500/230 kV Substation General Site Development

Site Development	Details
Earthwork	<ul style="list-style-type: none"> • Cut to Fill – 220K approximately cubic yards without bulking/shrinkage factors • Schematic grading would require elevation adjustment to balance cut/fill. Adjustment will depend on actual site soil conditions.
Access Road	<ul style="list-style-type: none"> • Approximately 0.1 miles from Split Mountain Road • Impact area approximately 0.5 acres
Pad & Laydown Yard	<ul style="list-style-type: none"> • Pad (includes laydown) – approximately 53 acres • Impact area – approximately 70 acres (assumes 150-foot buffer area to pad)
Terrain/Geology discussion	<ul style="list-style-type: none"> • Site is low-sloped desert terrain. A “desert wash” appears to run in an easterly/westerly direction across the northerly portion of the pad. Drainage volumes may be moderate to high for this drainage course. Adjustment of pad location may be recommended based on hydrology and water surface elevation study. • Site soils may be alluvial deposits consisting of silty sand, underlain by silty clays. Site earthwork likely is significantly increased due to removal, blending, and compaction of alluvial soils. • Maximum cut/fill slopes appear to be on the order of 20 to 30 feet

All Underground Option. This option would place the entire 230 kV transmission line for the Partial Underground 230 kV ABDSP SR78 to S2 Alternative underground in paved roadways. By eliminating the two overhead segments of this alternative, this option would avoid direct impacts to the State-designated Grapevine Mountains Wilderness Area and eliminate nearly all visual impacts along highway S2. Refer to Figure Ap.1-4 for an illustration of this route option. The two segments that are defined in the Partial Underground 230 kV ABDSP SR78 to S2 Alternative as being overhead are intended to avoid an underground crossing of the Earthquake Valley Fault. However, given the visual sensitivity of the area and the relative infrequency of anticipated fault rupture, installation of these underground is proposed as an option to the Partial Underground Alternative. The two segments are:

Figure Ap.1-3. Anza-Borrego Link – Alternatives Considered
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Figure Ap.1-4. Anza-Borrego Link – Alternatives Retained
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Figure Ap.1-5. San Felipe 230/500 kV Substation for Partial Underground 230 kV ABDSP SR78
to S2 Alternative

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- **Segment 1: Within Grapevine Mountains Wilderness.** Where the Partial Underground 230 kV ABDSP SR78 to S2 Alternative route would transition overhead 1.0 mile east of the SR78 intersection with S2 (San Felipe Road), the All Underground ABDSP Option would continue underground in SR78. The underground route would cross and then roughly parallel the Earthquake Valley Fault and its Alquist-Priolo Fault Zone for approximately 1.0 mile. Just north of the SR78/S2 intersection, which is west of and outside ABDSP, the Option would rejoin the underground alternative route as it would continue underground to the north in S2.
- **Segment 2: Along Highway S2.** This segment would be underground along S2, thereby avoiding degradation of the visual landscape and the resulting recreation impacts to the Pacific Crest Trail, which parallels the San Felipe Valley in the Grapevine Mountains. Where the Partial Underground 230 kV ABDSP SR78 to S2 Alternative route would transition overhead 3.0 miles west of the SR78 intersection with S2 (San Felipe Road), this option would continue underground in S2. The underground route would roughly parallel the Earthquake Valley Fault and its Alquist-Priolo Fault Zone for approximately 8.8 miles. The option would transition overhead immediately west of S2 at MP SR-35 to join the Proposed Project 230 kV route, just north of the location of the Central East Substation (which would not be required with this alternative).

Underground Construction

Underground Configuration. The proposed alternative would consist of two 230 kV underground circuits installed in separate concrete encased duct banks. Each duct bank would contain six 8-inch conduits and a 2-inch conduit for a communication cable. There would be two duct banks at the sides of the road, one for the Partial Underground 230 kV ABDSP SR78 to S2 Alternative and one for future circuits (see Section B.2.7 for a discussion of future transmission system expansion). SDG&E has stated that it would prefer a 60-foot transmission easement for double-circuit underground 230 kV transmission lines; however, using a minimum distance of 6 feet combined with a duct bank spacing of 8 feet, results in a total minimum width of 20 feet that would be technically feasible to construct within the roadway. Figure Ap.1-6 depicts an underground cross-section of the duct bank in a narrow road section (SR78 is as narrow as 23 feet wide in places). At vault locations, which are approximately 1,600 feet apart, 10 additional feet in width would be necessary; however, the vaults could be staggered to maintain the narrow width in tight places (road closure would still likely be required). The 230 kV vault dimensions would be 12 feet wide with a 10-foot height and a 26-foot length.

Under this two-duct bank configuration (as opposed to one big duct bank in the middle of the roadway), traffic management would be easier and one duct bank could be built now and the second one could be added at a future time. Reduced spacing between the two duct banks, as is shown in Figure Ap.1-6 would create other issues such as reduced capacity and maintenance issues that are discussed below.

Consolidation Option. An additional ten feet would be required if a 69 kV or 92 kV duct bank is also installed under the consolidation option. To avoid needing greater separation between the circuits with the 69/92 kV circuits consolidation, the installation could use oversized cables that would then be derated to address mutual heating and still provide the necessary transfer capacity.

Capacity Limitations with the Underground Design. As mentioned above, limited spacing between the circuits would create de-rating of the underground transmission capacity. The close proximity between conductors would cause mutual heating. Excessive heating of the conductors would cause damage to conductors. In order to reduce the heating of the conductors the amount of current passing through the conductors would have to be reduced, thus de-rating the capacity of each circuit.

Preliminary underground transmission line capacity studies, which demonstrate capacity in amps for varying duct bank spacing, were performed by the EIR/EIS team. Figure Ap.1-6 depicts a typical cross-section that was used to develop this information.

SDG&E has stated that the proposed 500 kV line would be rated 2,000 amperes continuous. The EIR/EIS team examined what the equivalent rating would be for two 230 kV lines. This would result in current loadings of about 2,300 amperes for one 500 kV circuit and 2,500 amperes on each 230 kV circuit. Underground cables are able to carry these current loadings and so analysis was also performed to see how much cable heating could lead to cable de-rating. Figure Ap.1-6 depicts the two 230 kV circuits, both located in one duct bank, with an “effective” duct bank spacing of 3 feet. The cable ampacity is estimated to be 1,900 to 2,000 amperes. In the modeling it was assumed that the area above the concrete duct bank and below the roadway would be filled with a fluidized thermal backfill (FTB) to improve heat dissipation from the underground cables.

Although the closer spacing results in a lower underground cable rating, additional engineering analysis may identify methods to increase the cable rating. Alternative configurations (i.e., jack and bore, horizontal directional drill, or horizontal duct banks) may be feasible; however, additional geotechnical studies, surveying and other engineering studies would be required to determine the feasibility of these methods.

In addition, there is a new technology called the Milliken Enameled cable that is on the cusp of commercial use that would consist of a segmented copper conductor with enameled wire, which separates the individual pieces with special splices/terminations and allows much greater capacity in the same size cable. In general a 3000 MCM cable of this type would provide the same capacity as 3500 MCM cable of typical manufacturing (compact stranded). Therefore, use of this technology would eliminate the capacity concerns due to cable heating and de-rating.

Future Transmission System Expansion. As discussed in Section B.2.7, it is anticipated that SDG&E may require four additional future 230 kV circuits (to serve San Diego area growth) and one 500 kV circuit (to connect to the Southern California Edison transmission system). Because in this alternative, the 500/230 kV substation would be located at San Felipe instead of the proposed Central East Substation site, the additional future circuits would have to be installed east of the San Felipe Substation. To reduce future construction impacts in ABDSP, installation of one additional 230 kV duct banks during the initial construction in SR 78 would be suggested, which would result in an additional 10 feet width of the trench per duct bank. Additional future 230 kV or 500 kV transmission lines, if required, would likely have to be installed overhead through ABDSP following the route of the Proposed Project through Grapevine Canyon. Impacts of the installation of these additional circuits would be similar to those of the Proposed Project. Alternatively, a future 500 kV transmission line could follow any of the SWPL Alternative routes defined in this Appendix (see Section 4.8). If proposed in the future, a separate complete CEQA/NEPA analysis would be required for consideration of impacts of these future lines.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load

Figure Ap.1-6. Underground Cross Section of Duct Bank
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growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid.

However, the transmission line capacity is greatly reduced with the reduced spacing between the duct banks. This reduced capacity creates a bottleneck in the new transmission line power delivery and it may force a need for additional future transmission lines. The delivery of power is reduced with overhead 230 kV compared to 500 kV with undergrounding 230 kV further reducing the transfer capacity. Beyond the specifics about import capability into the San Diego area, SDG&E has stated that it has serious concerns about this alternative, chief of which is expandability (SDG&E, 2006b). The high level design goal for the Sunrise Powerlink project is to bring a single 500 kV line as close to the SDG&E load center as is reasonably practicable, then to use 230 kV lines to distribute the power to major 230 kV load-serving substations within the San Diego load center.

Based on SDG&E's current construction standards, it takes four 230 kV lines to match the capacity of one 500 kV line. Therefore, under an ultimate design for an all-lines-in-service condition there could be at least four 230 kV circuits coming out of the proposed Central East Substation. However, in order to maintain transfer capability on the 230 kV circuits equivalent to the transfer capability of the 500 kV portion of the project for an N-1 or a credible N-2 outage of the 230 kV circuits, there should be really be five or six 230 kV circuits coming out of Central Substation. The design and layout of Central substation is such that it can accommodate up to six 230 kV lines.

If the San Felipe Substation were to become the transition point between 500 kV and 230 kV with 230 kV underground lines brought through the ABDSP then ultimately as many as four additional 230 kV circuits would be required through the ABDSP, for a total of six 230 kV circuits. Environmentally and economically, it is preferable to have one 500 kV transmission line through the ABDSP than to have six 230 kV transmission lines through the Park with many more towers and lines and much greater ground disturbance. Refer to the Overhead 230 kV ABDSP Alternative in Section 4.3.13 for a discussion of the impacts of a 230 kV transmission line (compared to a 500 kV line) through ABDSP.

Although this ultimate build out may not be needed for decades, at least one or two additional 230 kV circuits are possible within the first decade following completion of the Sunrise Powerlink in 2010. If additional 230 kV circuits could not be put through ABDSP, then one of the objectives of the Sunrise Powerlink, "expandability," would not be met.

Although cost is not considered under CEQA, the cost to construct and maintain underground 230 kV circuits is higher than the cost to construct and maintain an overhead 500 kV line. Compared to a single 500 kV line, 230 kV circuits provide reduced ampacity (and therefore reduced transfer capability) through the desert due to ambient heating (there would be no wind-induced cooling effects). To compensate for this reduced ampacity, cable size could be made larger through the desert, further increasing costs. Compared to a single 500 kV line there would also be increased losses with underground 230 kV circuits. Although cost would not rule out an alternative that would substantially reduce impact, this electricity loss with use of 230 kV underground circuits would further increase costs incurred by ratepayers and further reduce net transfer capability.

The Underground 230 kV along SR78 to S2 would meet most project objectives.

Feasibility

Technical Feasibility. The Earthquake Valley Fault, which is part of the Elsinore Fault Zone, runs up the San Felipe Valley and is parallel to S2 for much of this route (see Figure Ap.1-7). The Earthquake

Figure Ap.1-7. Earthquake Valley Fault Zone
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Valley Fault has not been as well studied; however, the fault was zoned based on field surveys conducted by the CGS in 1979. To be Alquist-Priolo zoned, a fault has to have had activity in the Holocene (the last 11,000 years). This fault was zoned because the field mapping showed evidence of offset of young (Holocene aged) alluvial fans and stream channels and in places older granite rocks had been faulted over young alluvial deposits. Although no detailed trenching studies have been conducted on this fault to determine recurrence interval, slip rates, or other characteristics, based on its length, estimated maximum earthquake offsets would likely be within the range of several feet.

There is some interaction off the Elsinore and Earthquake Valley Faults in the area and they could both potentially rupture with a large earthquake on the Elsinore Fault. There is also some speculation that some of the slip along the Julian segment of the Elsinore Fault is being transferred to the Earthquake Valley Fault, which could ultimately result in larger earthquakes on this fault. Due to a perpendicular fault crossing near the SR78/S2 intersection and S2's location parallel to the fault strands and crossing many fault traces up the San Felipe Valley, in the event of a seismic event, multiple sections of duct bank could be damaged. Therefore, mitigation to improve recovery time for over 10 miles of underground transmission line that crosses many fault strands would not be possible, even with offset of only a few feet. To overcome this technical feasibility issue, this alternative would transition overhead east of the Alquist-Priolo Fault Zone and would continue overhead north along S2. Prior to final engineering, trenching to determine the exact location of the fault traces, defined as the zone in which there is a potential for ground rupture due to movement along a fault line, and the Alquist-Priolo Fault Zone would be necessary as to ensure that the underground portions of the route would be at least 50 feet away. As a result, overhead crossings should not present any significant technical feasibility issues.

The All Underground Option, described above, would cross the Earthquake Valley Fault in Segment 1, and would parallel the fault for several miles in Segment 2 along Highway S2. Major fault crossings are not generally recommended for high voltage transmission lines due to the risk of rupture and time required for repair. However, due to the extremely high value of the open space in ABDSP and the San Felipe Valley, and the unknown frequency of major earthquakes in this area (likely substantially less frequent than once in 100 years), the underground line is considered to be feasible and a worthwhile trade-off for elimination of impacts.

Construction in S2 would be potentially feasible, but SR78 is narrow (as narrow as 23 feet in width) and windy with rocky slopes on both sides of the roadway, which would make construction challenging and costly in this portion, but it is potentially feasible. A job hazard analysis prior to the start of construction would be required to evaluate the risk of falling rock due to vibration from construction equipment. The job hazard analysis would identify the hazard and would propose solutions to mitigate or eliminate the risk of falling rocks.

The preferred width for the construction of two 230 kV duct banks through the ABDSP is larger than the width of the existing road, which at times narrows down to 23 feet in width. In several areas, such as east of the bridge on SR78 and east of San Felipe Road, the roadway is adjacent to steep, rocky slopes. In order to construct an underground line through such areas or with trenching below the roadway, blasting of rock slopes may be necessary, which is more challenging and has greater ground disturbance, but is still potentially technically feasible.

As mentioned above, in an effort to reduce the width of easement and construction, a minimum spacing between duct banks of 8 feet has been used. Due to mutual heating, the underground cables would be de-rated thereby reducing the transfer capacity of the transmission link. In addition to the close spacing

of the 230 kV cables, the nature of the soils in this area would compound this issue, because rock is a very poor conductor of heat.

One solution that would include using an engineered/thermal backfill would not be environmentally preferable, because it could require excavating a trench as wide as the entire roadway. Using even larger cables is also questionable since SDG&E's analysis is based on 3,500 kcmil copper cable. Based on the results of their preliminary capacity studies it appears that two 230 kV underground lines in this area would have a transfer capacity of approximately 1,500 to 1,600 MVA, which is substantially short of the 2,000 MVA need stated as an objective in the PEA for the proposed 500 kV line. Therefore, transfer capacity limitations would also question the potential feasibility of this alternative.

Regulatory Feasibility. There are several regulatory feasibility issues including:

- **California Department of Parks and Recreation.** Equipment and materials lay-down areas would be required for construction. A total of five to six of such areas along the route will be required with each area being approximately five acres. These lay-down areas would be distributed at regular intervals along the routes. This would require anywhere from 2 to 3 lay-down areas within ABDSP. These areas will be fenced and either graveled or watered for dust control. Upon the completion of the underground construction, the laydown areas would be returned to their pre-construction conditions, to the extent feasible. Mitigation measures and restoration techniques for the potentially significant impacts to the ABDSP, and notably to designated state wilderness and designated critical habitat, would be subject to approval of the ABDSP and the appropriate resource agencies. Construction of the overhead portion of this alternative would be within State-designated Grapevine Mountain Wilderness Area then it would require a de-designation of approximately one mile of Wilderness Area, which would require a State Park Plan Amendment and thus could create regulatory infeasibilities that could delay the in-service date.
- **California Department of Transportation.** In the narrow roadway areas bordered by steep rock cuts on one side and down slopes on the other side, there is limited work space for equipment. For example, front end loaders with outriggers need room to lift up rock or other excavated material, turn, and load the material into waiting dump trucks within a given work radius. The limited work space afforded by the narrow roadway would require different and slower operations than what are normally used, and would require road closures and detours during these operations, which would need to be approved by Caltrans.

In addition, the underground route crosses an existing bridge on SR78. The bridge appears structurally sound and capable of supporting the conduit and cable loads. However, approval from Caltrans for bridge attachments would be required. In addition, rock excavation is anticipated near bridge entrances and exits from underground duct bank to headwall of the bridge which may pose some risks to the bridges structural integrity.

- **San Felipe Hills Wilderness Study Area.** The alternative route would pass adjacent to the San Felipe Hills Wilderness Study Area (WSA) west of ABDSP and along Highway S2. In Section 603(a) of The Federal Land Management Policy Act (FLMPA) of 1976, Congress directed BLM to identify potential wilderness areas in lands under its jurisdiction. The areas were to have characteristics of wilderness as defined in the Wilderness Act of 1964 of which the San Felipe Hills was one such area. However, the California BLM presented its suitability recommendations to Congress in the Eastern San Diego County Management Framework Plan (1981) in which BLM recommended that San Felipe Hills be removed from consideration as a Wilderness Area. As Congress has not yet made a determination as to whether San Felipe Hills will be removed from consideration, the area shall be managed according to the direction provided in Section 603(c) of the FLMPA (commonly

called the “Interim Management Policy for Lands Under Wilderness Review”). Generally, this directive requires BLM to maintain the characteristics of wilderness so that the suitability of the WSA for preservation as a wilderness area is not impaired. However, as the line would be west of and outside of the WSA, there would be no regulatory feasible issues.

- **San Felipe Valley Wildlife Area.** The San Felipe Valley Wildlife Area is a 6,690-acre habitat preserve/wildlife area acquired by the CDFG Wildlife Conservation Board through Proposition 70 (Wildlife and Natural Areas Conservation Program of 1988), Proposition 117 (Habitat Conservation Fund/Mountain Lion Initiative) and from Proposition 12 (Parks Bond Act of 2000). Consultation would be required with CDFG to cross this area along S2, but it would potentially be regulatorily feasible.

Legal Feasibility. This alternative is potentially legally feasible.

Environmental Advantages

Elimination of Central Substation Construction. Under this alternative, the proposed Central East Substation would not be constructed. This alternative would eliminate disturbance of approximately 106 acres and approximately 1.5 to 1.8 million cubic yards of cut and fill earthwork. In addition, one mile of 500 kV transmission line into Central East Substation and one mile of 230 kV transmission line out of the substation to reconnect with the proposed route would be eliminated.

Visual Resources. Underground installation of the transmission line would eliminate visual impacts within all but one mile of ABDSP. The 230 kV towers in the overhead sections of this alternative at the western end of ABDSP and in the San Felipe Valley would be approximately 20 feet shorter than 500 kV towers. Elimination of the proposed Central East Substation and the transmission lines in/out of the substation would eliminate significant visual impacts from the San Felipe Valley of these industrial structures in a primarily open space area. The All Underground Option would eliminate all visual impacts along the proposed route in this segment except for at the San Felipe Substation and the overhead transition structure at its western end.

Biological Resources. Construction would occur in a paved roadway, which is in good condition, and therefore, vegetation and wildlife habitat would not be disturbed unless the roadway needs to be widened to accommodate the underground duct banks and vaults.

Cultural Resources. Construction would occur in a paved highway and therefore the potential to impact known or unknown cultural or archaeological resources is less. This underground route would avoid Grapevine Canyon and would eliminate potential archaeological impacts in that area and to resources in the Angelina Springs District.

Residential Use. This alternative would avoid rural residential receptors along Old Kane Springs Road.

Noise. This alternative would eliminate corona noise impacts to the residential receptors along Old Kane Springs Road.

Environmental Disadvantages

Longer Length. This route would be approximately 2.4 miles longer than the proposed route, however, with elimination of the transmission line in and out of the Central East Substation, the routes would be essentially the same length.

Ground Disturbance. Construction of this underground alternative (two 230 kV circuits) would require substantially more construction activity and ground disturbance due to the continuous trenching in a roadway that would be required. In areas where spacing is limited, construction activities may have to occur outside of the existing roadway. Overhead double-circuit 230 kV transmission line construction would result in construction disturbance primarily at individual structure sites, located approximately every 1,000 feet along the alignment. Underground construction and trenching would involve much greater ground disturbance and construction-related impacts (traffic, air quality and dust, and noise). There is also a greater potential to encounter contaminated soils and cultural resources, and to impact biological resources due to the greater ground disturbance. With construction outside of the existing roadway in areas, there would be an incremental increase in disturbance to existing vegetation, including sensitive wetlands associated with San Felipe Creek located immediately adjacent to SR78. Construction of the transition stations would each require a footprint of 1 to 1.25 acres, resulting in temporary and permanent biological, cultural, and visual resources impacts as well.

Biological Resources. A riparian corridor along San Felipe Creek and associated wetlands are located adjacent to the narrow SR78 roadway both inside and outside of ABDSP's western entrance. The area is also bighorn sheep designated critical habitat and the San Felipe Hills Wilderness Study Area is located on the north-northeast side of S2 and the San Felipe Valley Wildlife Area is located on both sides of S2.

Cultural Resources. Consultation with Native American representatives indicates that the San Felipe Valley is considered to be a very sensitive area to the Kumeyaay, similar to Grapevine Canyon within ABDSP. Some tribal members would consider this valley to be a Traditional Cultural Property (TCP), similar to the village area of Grapevine Canyon.

Wilderness and Recreation. Grapevine Mountain Wilderness Area is located on both sides of SR78, and therefore, temporary construction impacts could occur on a designated State Wilderness Area. In addition, the San Felipe Hills Wilderness Study Area is located on the north-northeast side of S2 and the San Felipe Valley Wildlife Area is located on both sides of S2. The Pacific Crest Trail (PCT) runs down the crest of the Grapevine Mountains and through the Grapevine Mountain Wilderness and San Felipe Hills Wilderness Study Area, parallel to the north side of S2. The alternative would cross the PCT near the intersection of SR78 and S2.

Visual Resources. The construction activity and transmission lines would be highly visible along the scenic San Felipe Valley through which S2 crosses. In addition, the alternative would be visible from the Pacific Crest Trail (PCT), which runs down the crest of the Grapevine Mountains and through the Grapevine Mountain Wilderness and San Felipe Hills Wilderness Study area and parallels S2 to the north.

Land Use. Construction of the San Felipe Substation and the underground route would cause construction disturbance in the vicinity of scattered residences east of the eastern Park boundary.

Traffic and Transportation. The entire route consists of heavily used two lane roads (SR78 and S2) with one lane for each direction. During underground vault construction and in some cases during trenching, the roads will have to be closed and the traffic detoured through Borrego Springs. Depending on the route, these detours may add more than 10 miles of distance and significant travel time. This will put a large burden on the surrounding residents, park users, motorists, and businesses relying on trucking. If traffic has to be maintained with one lane open, construction activities would be limited to one lane of work space. Productivity and work efficiency would be impacted tremendously, significantly increasing construction time and costs. In late 2006, Caltrans closed the SR78 for 8 weeks for maintenance, so although road closure would be an inconvenience for traffic, it is feasible.

Construction and Repair Time. The installation of an underground transmission line would require more time than construction of an equivalent length of overhead line because of the time required for excavating trenches, constructing the duct banks, fluid reservoirs, and/or stop joints. Construction could be substantially extended due to restrictions on the times of the year available for construction, required to limit the impacts on the environment. In addition, maintenance and restoration time in the event of an outage would also be more difficult and could result in longer outages and repair times. Accessing manholes will require intensive traffic control. In addition, duct bank repair would require rock excavation, traffic control, and possible roadway closure. In addition, the close proximity of the underground circuits will likely cause mutual inductance. To maintain these circuits safely, it may be required to de-energize all underground circuits when doing maintenance on any one circuit. This could cause some problems with service to customers, especially if the 69/92 kV needs to be de-energized on a regular basis. Although electric fields are reduced with increasing burial depth, magnetic fields above underground conductors are generally higher than from overhead lines due to closer proximity to the conductors to the ground.

Blasting. Blasting into the hillside may be necessary along the route in areas where the roadway is narrow and riparian habitat is located south of SR78. This could result in increased erosion, noise impacts to wildlife and recreationists. There could also be a direct loss of designated critical habitat for the Peninsular bighorn sheep.

Excavation. Excavation of rock is anticipated during trenching in the area. Difficult rock excavation and removal will be anticipated during trenching and vault installation at these areas. Limited work-space will make trenching and vault installations hazardous and time consuming. Hazardous activities include blasting to perform trenching and deep vault excavations, the use of heavy equipment to break up the rock, and the use of heavier-than normal equipment to remove the rock.

Stockpiling and Removal of Spoils. Due to the limited space within the roadway, spoils from excavations would need to be temporarily stockpiled off the roadway before they could be removed. This stockpiling would create additional ground impacts and potentially impacts to water quality. If space for stockpiling is limited or unavailable, more truck trips will be required resulting in additional impacts.

Geologic Resources. The Earthquake Valley Fault, which is part of the Elsinore Fault Zone, has not been as well studied; however, based on its length, estimated maximum earthquake offsets would likely be within the range of several feet. Highway SR78 crosses the Earthquake Valley Fault and S2 runs parallel to the fault, crossing many of its fault traces up the San Felipe Valley. A seismic event could result in the rupture of multiple sections of duct bank and a much slower recovery time in the event of an outage, especially for the All Underground Option.

Alternative Conclusions

RETAINED FOR ANALYSIS. Despite capacity limitation and future expandability concerns, an underground 230 kV from the San Felipe Substation would meet most of the project objectives. The route would transition overhead to cross the Earthquake Valley Fault in order to eliminate technical feasibility concerns related to the underground crossing of the fault, though an all-underground option is also retained to reduce visual and recreational impacts. Some blasting and road closures may be necessary as a result of space limitations in the existing roadways; however, this alternative would avoid Grapevine Canyon and much of it would be constructed within paved roadways reducing visual, biological, and cultural resources impacts. Because this alternative would reduce significant impacts of the proposed route within ABDSP, it has been retained for full evaluation in this EIR/EIS.

4.3.2 Overhead 500 kV ABDSP Within Existing ROW Alternative

Alternative Description

This alternative was suggested by SDG&E and developed by the EIR/EIS team in an attempt to minimize impacts on Pinyon Ridge Wilderness Area by staying entirely within a 100-foot ROW, and not requiring the additional 50-foot expansion needed by the Proposed Project⁶. Thus, in the Grapevine Canyon area in the Angelina Springs Cultural District, the alternative would remain within the existing SDG&E 69 kV ROW/easement and towers would not be located on State-designated Wilderness. The alternative is shown in Figure Ap.1-4.

As it was proposed by SDG&E, undergrounding of the existing 69 kV and 92 kV lines would not occur with this alternative; instead, the lines would be underbuilt on Delta lattice towers. Structures would be Delta lattice towers ranging in height from 135 feet to 175 feet (median height of 160 feet and mean height of 157 feet), with the exception of three steel poles (median height of 170 feet), which may be required in a few locations due to the close proximity of the alignment to SR78. In comparison, the 500 kV towers with 69 kV underbuild with the Proposed Project in a 150-foot ROW would have a height of 130 feet. Ground disturbance for the lattice towers and steel poles would be 79 square feet (similar to the Proposed Project) and 64 square feet, respectively.

In order to stay within a 100-foot ROW, which is not straight, 500 kV (with 69 kV underbuild) towers would be located 248 feet to 1,104 feet apart, with an average span of 809 feet (as opposed to a median distance of 445 feet with the proposed route). The total structures in ABDSP, including the starting and ending towers at MPs 60.9 and 83.5, would be 143 for the Proposed Project and 147 for the Existing ROW Alternative.

East of Tamarisk Grove Campground 150-Foot Option. This option was suggested by SDG&E in which the alternative would follow the Proposed Project route in the 150-foot alignment, and not the existing 100-foot ROW, between the eastern Park boundary (MP 60.9) and the west side of Tamarisk Grove Campground (MP 74.8) near the SR78/Highway S3 intersection. In comparison to the Overhead 500 kV ABDSP Within Existing ROW Alternative, this option would move the new 500 kV transmission line farther from SR78 and Tamarisk Grove Campground, reducing highway encroachment and tree trimming around the campground. Use of the option would require discretionary action/approval from California State Park that would not be otherwise required under the Overhead 500 kV ABDSP Within Existing ROW Alternative.

Similar to the Proposed Project described in Section B.2.2, SDG&E would remove the 92 kV conductors from the existing wood poles between MP 60.9 and MP 68.2 and attach (underbuild) them to the new 500 kV lattice steel towers. At MP 68.2, the 92 kV circuit would transition from overhead to underground, and continue within SR78 road ROW, whereas the 500 kV line would continue as an overhead line on the north side of SR78. The relocated 92 kV underground transmission line would terminate at the existing Narrows Substation. The 500 kV line would not connect with the Narrows Substation.

SDG&E's existing 69 kV line to Borrego Springs would intersect the Overhead 500 kV ABDSP Within Existing ROW Alternative corridor just west of the Narrows Substation (MP 69.7). Between MP 69.7

⁶ Note that the width and location of the existing ROW is unclear, as described in Section B.2.2. There may be places where the ROW is less than 100 feet wide. Regardless, this alternative is defined as requiring a total of 100 feet of width.

and MP 74.8, the existing 69 kV line would be placed underground within the SR78 road ROW, whereas the 500 kV line would continue west as an overhead line within the SDG&E's existing easement on the north side of SR78.

At the intersection of S3 and SR78 (MP 74.8), the 69 kV line would transition back to an overhead configuration and would be attached (underbuilt) onto the new 500 kV lattice steel towers. This segment would traverse Grapevine Canyon following the existing 100-foot ROW to the western boundary of ABDSP (MP 83.5). The wood poles that currently support the 69 or 92 kV segments that would be underbuilt on the new 500 kV structures or placed underground would be removed (MP 61.7 to MP 83.5).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Overhead 500 kV ABDSP Within Existing ROW Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible. This route, with the exception of east of Tamarisk Grove Campground 150-foot option, would not require approval from California Department of Park and Recreation because it would be entirely within a BLM utility easement. The alignment and any structure locations that would encroach in the SR78 ROW would be subject to review and approval by Caltrans.

Environmental Advantages

Wilderness and Recreation. The Grapevine Canyon area, except for SDG&E's current easement, has been designated as Wilderness by the California Department of Park and Recreation. The Proposed Project ROW would be located southwest of Pinyon Ridge State Wilderness and northeast of Grapevine Mountain State Wilderness. Because the proposed route would require an additional 50 foot easement and because it has been modified to reduce impacts to the Angelina Springs Cultural District, the Proposed Project would cross through State-designated Wilderness. This alternative on the other hand, with the exception of east of Tamarisk Grove Campground 150-foot option, would avoid direct impacts to State-designated Wilderness by staying within a 100-foot ROW.

Environmental Disadvantages

Cultural Resources. This route would cross through the center of the highly sensitive Angelina Springs Cultural District creating greater impacts to known and unknown resources.

Visual Resources. On average the tower heights would be approximately 30 feet taller with four additional towers within ABDSP resulting greater visual impacts from within the Park.

Greater Ground Disturbance. This route would 4 more towers than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources (especially in Grapevine Canyon) and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native desert vegetation.

Wilderness and Recreation. Due to the taller towers and four additional structures, the construction and operational impacts to the recreational experience within the Park and indirectly from the adjacent Wilderness areas would be greater.

Traffic and Transportation. This alternative would require a greater number of crossings of SR78 and would be closer to the roadway, thereby resulting in greater traffic impacts during construction activities. The consolidation option would reduce this impact.

Alternative Conclusions

RETAINED FOR ANALYSIS. This Overhead 500 kV ABDSP Within Existing ROW Alternative would meet project objectives and would be potentially feasible. The alternative would cause greater impacts to almost all issue areas and would cross directly through the Angelina Springs Cultural District. However, because it would stay within SDG&E's 69 kV existing easement and thereby eliminate direct impacts to State-designated Wilderness and regulatory feasibility issues associated with re-designating Wilderness, this alternative has been retained for full evaluation in this EIR/EIS.

Eliminated from Consideration

4.3.3 SDG&E 100-Foot ROW Shorter Structure Alternative

Alternative Description

This alternative was suggested by SDG&E on May 19, 2007 as a supplemental response to a CPUC Data Request (dated March 28, 2007). This alternative would eliminate the 69/92 kV underbuild and would utilize different structure configurations, specifically narrower steel H-frames and 3-pole structures. This alternative would both reduce the structure heights and width to stay within a 100-foot right-of-way. To further reduce the structure height to an average of approximately 100 feet, additional structures would be needed as compared to the Proposed Project.

This configuration could be used within a 100-foot right-of-way either following the alignment of the existing 69/92 kV transmission line or the East of Tamarisk Grove Campground 150-Foot Option discussed under the Overhead 500 kV ABDSP Within Existing ROW Alternative in Section 4.3.2, which is a combination of the Proposed Project and the existing 69 kV right-of-way. As discussed above, the option would reduce the number of times the transmission line would cross SR78 by staying north of SR78 from the junction of SR78 and Old Kane Springs Road to just west of the junction of SR78 and S3. Diagrams of typical 500 kV structures for this alternative are in Figure Ap.1-8.

To eliminate the 69/92 kV underbuild, a double-circuit 69 kV transmission line with both overhead and underground segments would be constructed from the existing Warner Substation to the existing Borego Substation. This transmission line would support the existing 69 kV circuit and a new 69 kV circuit. From Warner Substation to the S2/S22 intersection, the proposed 69 kV transmission line would

Figure Ap.1-8. SDG&E 100-Foot ROW Shorter Structure Alternative – Typical 500 kV Structures
[CLICK HERE TO VIEW](#)

Figure Ap.1-9. SDG&E Existing ROW Shorter Structure Alternative – Typical 69 kV Structures
[CLICK HERE TO VIEW](#)

be constructed on double-circuit poles and would replace the existing overhead 69 kV transmission line. The proposed overhead 69 kV transmission line would continue south along the east side of S2 until reaching the ABDSP boundary located north of the S2/SR78 intersection (Scissors Crossing).

Near the western ABDSP boundary, the 69 kV circuits would transition underground and would continue through the park within S2, SR78 and S3 (Yaqui Pass Road) ROW. After crossing the ABDSP boundary along S3, the circuits would transition to overhead and continue north through Borrego Springs ultimately terminating at the Borrego Substation. The proposed alignment would generally follow the existing 12 kV and 69 kV overhead lines. The existing overhead lines would be replaced with double-circuit 69 kV poles with distribution underbuild as required. This configuration for the 69 kV circuits would eliminate the need for both Narrows Substation and the existing 92 kV circuit east of Narrows. Diagrams of typical 69 kV structures for this alternative are shown in Figure Ap.1-9.

Another option to serve Borrego Springs customers would be to construct a single-circuit 69 kV transmission line and install a small generator adjacent to Borrego Substation for backup power in the event of an outage. This configuration would reduce the amount of new 69 kV transmission line construction, as portions of the existing 69 kV transmission lines would not have to be replaced. Between the S2/S22 crossing and the intersection with the existing 69 kV transmission line in Borrego Springs, construction and routing of the underground and overhead segments would be the same as described above except only a single circuit would be installed.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E 100-Foot ROW Shorter Structure Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, regulatorily, and legally feasible.

Environmental Advantages

Visual Resources. This alternative would both reduce the structure heights (100-foot average height) and width to stay within a 100-foot ROW.

Removal of Existing Facilities. This alternative configuration for the 69 kV circuits would eliminate the need for both Narrows Substation and the existing 92 kV circuit east of Narrows Substation.

Wilderness and Recreation. The Grapevine Canyon area, except for SDG&E's current easement, has been designated as Wilderness by the California Department of Park and Recreation. The Proposed Project ROW would be located southwest of Pinyon Ridge State Wilderness and northeast of Grapevine Moun-

tain State Wilderness. Because the proposed route would require an additional 50-foot easement and because it has been modified to reduce impacts to the Angelina Springs Cultural District, the Proposed Project would cross through State-designated Wilderness. This alternative would avoid direct impacts to State-designated Wilderness by staying within a 100-foot ROW.

Environmental Disadvantages

Visual Resources. This alternative would include a new 69 kV line parallel to S2, which is a highly traveled route through ABDSP and there is no existing transmission ROW following S2. It would also have a high occurrence of Agency Designated Viewsheds and the visual guidelines identified by California State Parks would pose additional siting constraints. Additional, wider towers would result in greater visual impacts from within the Park.

New Transmission Corridor along S2. This alternative would establish a new transmission line corridor. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Cultural Resources. This route would cross through the center of the highly sensitive Angelina Springs Cultural District creating greater impacts to known and unknown resources.

Greater Ground Disturbance. In addition to underground construction, to reduce the structure heights, additional, wider structures would be needed as compared to the Proposed Project, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources (especially in Grapevine Canyon) and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native desert vegetation.

Wilderness and Recreation. Due to the additional structures, the construction and operational impacts to the recreational experience within the Park and indirectly from the adjacent Wilderness areas would be greater.

Traffic and Transportation. This alternative would require a greater number of crossings of SR78 and would be closer to the roadway, thereby, resulting in greater traffic impacts during construction activities. The consolidation option would reduce this impact. In addition there would be underground construction in SR78, which is a heavily used two lane road with one lane for each direction. During underground construction and in some cases during trenching, the roads may have to be closed and the traffic detoured through Borrego Springs. Depending on the route, these detours may add more than 10 miles of distance and significant travel time. This will put a large burden on the surrounding residents, park users, motorists, and businesses relying on trucking. If traffic has to be maintained with one lane open, construction activities would be limited to one lane of work space. Productivity and work efficiency would be impacted tremendously, significantly increasing construction time and costs. In late 2006, Caltrans closed SR78 for 8 weeks for maintenance, so although road closure would be an inconvenience for traffic, it is feasible.

Alternative Conclusions

ELIMINATED. While the SDG&E 100-Foot ROW Shorter Structure Alternative would meet project objectives and would be feasible, it would have much greater environmental impacts than the Proposed Project. Although this alternative would remain within a 100-foot ROW, thereby avoiding Pinyon Ridge Wilderness Area, and it would have shorter structures by eliminating the underbuild of the lower voltage circuit, it would result in a wider tower design and more towers within ABDSP (including the area around Angelina Springs Cultural District). This alternative would require underground construction within the narrow, windy portion of SR78, creating greater ground disturbance (though primarily within the road ROW) and major traffic impacts. Additionally, the alternative would also create a new transmission corridor along S2 through the scenic San Felipe/Earthquake Valley. Therefore, due to greater environmental impacts, this alternative has been eliminated from full consideration in this EIR/EIS.

4.3.4 SDG&E Segment A/Northern Borrego Springs via S22 Alternative

Alternative Description

The SDG&E Segment A/Northern Borrego Springs via S22 Alternative was discussed and eliminated in PEA Section 3.3.1.2. SDG&E states that it was designed because it would follow an existing linear feature, S22. As shown in Figure Ap.1-1, the route would begin at the Imperial Valley Substation and would extend north for 5.4 miles paralleling an existing IID 92 kV transmission line through private agricultural lands west of El Centro, following property boundaries and section lines to a point near an existing IID 161 kV transmission line. The alternative would then follow an existing IID 161 kV transmission line for 37.5 miles until it would intercept S22.

From this point, the route would parallel S22 (Borrego Salton Seaway) westward for 7.8 miles through Imperial County before entering San Diego County and traversing the ABDSP via S22 for 12 miles, crossing south of Santa Rosa Mountains Wilderness and north of Desert Oasis Wilderness. The alternative would continue to parallel S22 west through unincorporated San Diego County and the town of Borrego Springs for 9.2 miles, following S22 by turning south on Peg Leg Road and then west on Palm Canyon Road. Where S22 turns south and becomes Montezuma Valley Road, the route would again enter ABDSP for 11.2 miles until it would reach the town of Ranchita, just west of the Park boundary. The route would continue along S22 past the intersection with Grapevine Canyon Road until it would rejoin the Proposed Project at MP 87.6. Like the Proposed Project, this segment would also traverse the Park Wilderness Area that has been designated by statute. At 91.8 miles long, the SDG&E Segment A/Northern Borrego Springs via S22 Alternative would be 4.2 miles longer than the Proposed Project.

If the alternative were to diverge near SR86 (at MP 37.8 of the Proposed Project) instead of at the Imperial Valley Substation, then the alternative route at 58.8 miles would be approximately 9 miles longer than the Proposed Project.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives stated by SDG&E. It would also improve regional transmission infrastructure thereby satisfy-

ing reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment A/Northern Borrego Springs via S22 Alternative would meet all project objectives.

Feasibility

Regulatory Feasibility. This route traverses an area of State Designated Wilderness Area and is not within a corridor that allow for transmission lines. This would require a re-designation of Wilderness Area and a State Park Plan Amendment and thus faces regulatory issues, and could delay the in-service date. The Park's General Plan does not allow the transmission lines in this portion of the Park and this route could traverse as many as four Wilderness Areas (Santa Rosa Mountains Wilderness, Desert Oasis Wilderness, Sheep Canyon Wilderness, and Pinyon Ridge Wilderness) and just south of Wil-ye-e Wilderness Area when it is outside of ABDSP near Borrego Springs. The Department of Parks and Recreation has indicated that they would prefer State Designated State Wilderness area boundaries not be changed where an existing corridor through the ABDSP may already provide for co-location of a proposed transmission line with an existing line. The CA Public Resources Code Section 5093.31 ("The California Wilderness Act") states as follows:

In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas on state-owned lands within California, leaving no areas designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the State of California to secure for present and future generations the benefits of an enduring resource of wilderness. [emphasis added]

Therefore, the regulatory feasibility of this alternative is in question (Department of Parks and Recreation, 2007).

Technical Feasibility. There are constructability challenges with following Montezuma Grade due to the steep slopes and topography along Montezuma Grade.

Legal Feasibility. This alternative would be legally feasible with the de-designation of the designated State Wilderness.

Environmental Advantages

Cultural Resources. This alternative would avoid Grapevine Canyon and its associated Wilderness Area, which is an area that is rich with cultural and archaeological resources and may be unavoidable with the Proposed Project.

Environmental Disadvantages

Residential Use. This route travels through populated areas of Ranchita, Borrego Springs and in the Park, and would follow S22 along Montezuma Grade to connect with S2.

Longer Length and Ground Disturbance. This route would be approximately 4.2 miles longer than the proposed route, which will affect the length and intensity of short-term construction impacts and ground

disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native desert vegetation.

New Transmission Line Corridor. This alternative would establish a new transmission line corridor for a portion of the route where it does not parallel the IID 161 kV line. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Biological Resources. Like the proposed route, the alternative would traverse Designated Critical Habitat for bighorn sheep.

Traffic and Transportation – Airport. The route would travel along S22 (also called Palm Canyon Drive in this section) adjacent to the Borrego Valley Airport (1829 Palm Canyon Drive), 3 miles east of Borrego Springs. The airport accommodates smaller planes, including student pilots, which could be impacted by the addition of a 500 kV transmission line in such close proximity.

Wilderness and Recreation. This alternative would traverse approximately eight more miles of ABDSP than the proposed route. It would also pass through four Wilderness Areas (Santa Rosa Mountains Wilderness, Desert Oasis Wilderness, Sheep Canyon Wilderness, and Pinyon Ridge Wilderness) and just south of Wil-yea Wilderness Area when it is outside of ABDSP near Borrego Springs.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives but was eliminated due to the regulatory and technical hurdles associated with traversing through four State Designated Wilderness Areas and down the steep Montezuma Grade. In addition, this route has significantly more impacts compared to the Proposed Project since it would create a new transmission line corridor parallel to heavily traveled Park roadways, would be longer, would travel through critical bighorn sheep habitat, and would pass by several populated areas and an airport. Therefore, this alternative was eliminated from full consideration in this EIR/EIS.

4.3.5 SDG&E Segment 4/ABDSP via S2 Alternative

Alternative Description

SDG&E suggested this alternative in PEA Section 3.3.1.3 because it would follow linear features through ABDSP; however, SDG&E eliminated the alternative due to increased environmental impacts, namely to visual resources within ABDSP.

As shown in Figure Ap.1-1, the route would begin at the existing Imperial Valley Substation and would parallel the existing SWPL line to the northwest and then west for almost 21 miles. Where the SWPL #1 line intersects S2, the alternative segment would turn northwest and would parallel S2 for approximately 44.1 miles until it would terminate at the SR78 and S2 intersection or at the proposed Central East Substation. The major portion of this alternative along S2 would travel through the ABDSP for approximately 42 miles. The alternative would be 65.1 miles long to SR78.

If the alternative route were to continue north along S2 for an additional 11 miles (for a 76.1-mile total length), it would rejoin the Proposed Project at the proposed Central East Substation, thereby replacing a 91-mile segment of the Proposed Project.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 4/ABDSP via S2 Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. This route would require the longest distance through the ABDSP where there is no existing transmission line ROW. This would require a de-designation of Wilderness Area and a State Park Plan Amendment and thus faces regulatory infeasibilities, and could delay the in-service date. The Park's General Plan does not allow the transmission lines in this portion of the Park and this route could traverse as many as seven designated Wilderness Areas (Carrizo Canyon, Sin Nombre, Sombrero Peak, Agua Caliente, Whale Peak, Granite Mountain, Grapevine Mountain Wilderness Areas). The Department of Parks and Recreation has indicated that they would prefer State Designated State Wilderness area boundaries not be changed where an existing corridor through the ABDSP may already provide for co-location of a proposed transmission line with an existing line. The CA Public Resources Code Section 5093.31 ("The California Wilderness Act") states as follows:

In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas on state-owned lands within California, leaving no areas designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the State of California to secure for present and future generations the benefits of an enduring resource of wilderness. [emphasis added]

Therefore, the regulatory feasibility of this alternative is in question (Department of Parks and Recreation, 2007).

Environmental Advantages

Existing SDG&E Right-of-Way. This alternative would parallel an existing SDG&E 500 kV transmission line ROW (SWPL #1) at its southeastern end for almost 21 miles. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Existing S2 Right-of-Way. The alternative would parallel the existing S2 ROW. Following an existing transportation corridor, which is considered developed, is preferable, especially for biological and cultural resources to traversing through open space.

Shorter Length and Ground Disturbance. This route would be approximately 15 miles shorter than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Cultural Resources. This alternative would avoid Grapevine Canyon and would thus eliminate impacts to known and unknown cultural and archeological resources in the area.

Environmental Disadvantages

Visual Resources. This alternative would parallel S2, which is a highly traveled route through ABDSP and there is no existing transmission ROW following S2. It would also have the highest occurrence of Agency Designated Viewsheds and the visual guidelines identified by California State Parks would pose additional siting constraints.

New Transmission Corridor Along S2. This alternative would establish a new transmission line corridor. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Biological Resources. This alternative would include the highest occurrence of designated critical habitat among the area alternatives for the bighorn sheep. It would also include some occurrence of Potential Special Species Habitat area.

Wilderness and Recreation. This alternative would traverse a greater amount of existing State Park Designated Wilderness passing through seven Wilderness Areas (Carrizo Canyon, Sin Nombre, Sombrero Peak, Agua Caliente, Whale Peak, Granite Mountain, Grapevine Mountain Wilderness Areas). This designation inherently would preclude improvements and structures in those areas and because this route would be off of the highway, construction of the new 500 kV line itself would likely be within Wilderness. The alternative route through ABDSP for approximately 42 miles is also approximately 20 miles longer within the Park than the proposed route at 22.6 miles.

Cultural Resources. Archaeological sites located within the ABDSP and identified by California State Parks would pose additional siting constraints.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible. Due to the much greater distance through ABDSP and seven State-Designated Wilderness Areas, the regulatory feasibility of this alternative is in question. In addition, the visual and biological impacts of a new transmission line corridor along S2 and through seven Wilderness Areas would create additional significant impacts, even though the route would be 15 miles shorter. Therefore, this alternative was eliminated from full consideration in this EIR/EIS.

4.3.6 SDG&E SR78 West of Anza Alternative

Alternative Description

This alternative was suggested (and then eliminated) by SDG&E in PEA Section 3.3.1.3 and described as part of Segment 2, because it would provide a continuous alignment along SR78.

The alternative route would diverge from the Proposed Project at MP 47.1 in Imperial County. Where the proposed route would turn south and away from SR78, this alternative would continue to follow SR78 westward for 6 miles in Imperial County and 12 miles in San Diego County until it would rejoin the Proposed Project at MP 68.2 (see Figure Ap.1-3). This alternative would be approximately 3.1 miles shorter than the proposed route.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E SR78 West of Anza Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. The Federal Aviation Administration (FAA) restrictions associated with the Ocotillo Wells County Airport that require avoidance of airport obstruction-free areas would make siting a 500 kV transmission line along SR78 difficult. In order to be regulatorily feasible the line would need to be sited outside of the obstruction-free areas.

Assuming that the line could be routed to avoid impacts to Ocotillo Wells County Airport, this alternative would be technically, legally, and regulatorily feasible.

Environmental Advantages

Shorter Length and Ground Disturbance. This route would be approximately 3.1 miles shorter than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Existing SR78 ROW. The alternative would continuously parallel the existing SR78 ROW. Following an existing transportation corridor, which is considered developed, is preferable, especially for biological and cultural resources to traversing open space.

Environmental Disadvantages

Visual Resources. SR78 is considered a main eastern entrance to ABDSP and a new transmission line paralleling the road would be highly visible to Park visitors and other travelers along this scenic highway.

Land Use. Land use constraints include the Ocotillo Wells County Airport, an ORV campground, and residential and commercial land uses along SR78, especially around Split Mountain Road east of the entrance to ABDSP. A small café, gas station and general store are directly across SR78 from the airport as well.

Transportation. The Ocotillo Wells County Airport, which includes two runways situated on a dry lake bed, would be located adjacent to the alternative route along SR78 in San Diego County. Federal Aviation Administration (FAA) regulations require the alignment avoid airport obstruction-free areas, which would have effectively pushed the alignment into other constraint areas (undisturbed ABDSP lands, desert washes, campground, and commercial uses).

Recreation. The route would pass within the Ocotillo Wells State Vehicular Recreation Area along SR78 at Split Mountain Road.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially technically and legally feasible. Although the route would be over 3 miles shorter than the proposed route, this alternative would pass within the FAA obstruction-free area around the Ocotillo Wells County Airport on SR78 thus raising regulatory feasibility issues. Avoiding the FAA obstruction-free area would effectively push the alignment into other constraint areas, such as undisturbed ABDSP lands, desert washes, campground, and commercial uses. SR78 is considered a main eastern entrance to ABDSP and a new transmission line paralleling the road would be highly visible to Park visitors and other travelers along this scenic highway. Due to greater environmental impacts and regulatory feasibility issues associated with FAA regulations, this alternative was eliminated from full consideration in this EIR/EIS.

4.3.7 SDG&E ABDSP North Side of SR78 Alternative

Alternative Description

This alternative was discussed and retained for analysis by SDG&E in the PEA as Alignment N10-N11-N62-N12 and is considered as the western part of SDG&E's Segment 2. It could also be used in conjunction with SDG&E ABDSP Borrego Valley Alternative (see Section 4.3.8).

The alternative route would diverge from the Proposed Project at MP 61.9 and would travel north, just east of and outside of the ABDSP boundary, for approximately 2.35 miles to SR78. At SR78, the route would turn west and follow the north side of SR78 approximately 6.61 miles and would rejoin the Proposed Project at MP 68. The alternative, which is shown in Figure Ap.1-3, would be 8.96 miles long and the proposed route would be 6.1 miles long.

The existing 92 kV transmission line would be removed along the proposed route from MP 61.9 to MP 68 and would be underbuilt on the 500 kV lattice structures along the alternative route.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives stated by SDG&E. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E ABDSP North Side of SR78 Alternative would meet all project objectives.

Feasibility

This alternative would be technically, regulatorily, and legally feasible.

Environmental Advantages

Recreation. This alternative would traverse approximately five miles less of ABDSP land at the eastern end of the Park.

Environmental Disadvantages

Longer Length and Ground Disturbance. This route would be approximately 2.86 miles longer than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with greater ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of less native desert vegetation.

New Transmission Corridor. This alternative would establish a new transmission line corridor. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Visual Resources. This alternative would travel north and would travel adjacent to SR78 at the eastern entrance to ABDSP. SR78 is considered a main eastern entrance to ABDSP and a new transmission line paralleling the road would be highly visible to Park visitors and other travelers along this scenic highway.

Wilderness and Recreation. This alignment would pass within 0.25 miles of the Desert Ironwoods RV Park (a private developed recreation site), approximately 2 miles west of where the alternative would join SR78.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be feasible. However, the route would be longer, thereby creating greater construction impacts to almost all issue areas, and it would establish a new highly visible transmission line corridor along SR78, which is considered a main eastern entrance to ABDSP. In addition, it would not reduce any significant impacts of the proposed route, and therefore, it has been eliminated from full consideration in this EIR/EIS.

4.3.8 SDG&E Borrego Valley Alternative

Alternative Description

Routing

This alternative was developed by SDG&E in the PEA as N62-N66 and is shown in Figure Ap.1-3. The route would be approximately 19.69 miles long (from its departure from SR78) and would follow parcel boundaries/section lines and other linear features where possible using lattice steel towers. This alternative would diverge from SR78 so it could diverge from the SDG&E ABDSP North Side of SR78 Alternative at MP 7.1 or from the Proposed Project at MP 68.

At MP 68, the alternative would turn northeast where the proposed route would intersect (and would turn west on) SR78. The route would travel approximately 2 miles on SR78 and then would turn northwest crossing through ABDSP towards Borrego Springs for approximately 1.1 miles before exiting the Park. Once outside the Park the route would turn west and would parallel the Park boundary to the north for 4.0 miles before turning northwest for 5 miles continuing to remain outside of ABDSP. At this point the route would turn west and would reenter ABDSP for approximately 7 miles and would cross through Pinyon Ridge Wilderness Area.

After exiting ABDSP, the alternative would continue west for 2.6 miles before rejoining the Proposed Project at MP 86. The alternative would be approximately 4 miles longer than the Proposed Project but would travel through 5.5 miles less of ABDSP and 130 less acres of designated Wilderness.

This alternative would require the construction of a new 500/12 kV substation described below and in SDG&E's PEA Section 3.5.1. However, the existing Narrows Substation and Borrego Substation would be removed, and the existing Narrows-IID San Felipe 92 kV, Narrows-Borrego 69 kV, and Narrows-Warner 69 kV transmission facilities located in ABDSP would be removed.

Borrego Springs 500/12 kV Substation

A new 500/12 kV distribution substation would be required in the Borrego Springs area to feed the Borrego load if the 500 kV transmission line is routed through this area. The substation would be located in the southern portion of the Borrego Springs community. It would be located directly west of S3 and southeast of S22, and it would occupy approximately 10 acres fenced area. The access road would be approximately 0.75 miles long and 20 feet wide to accommodate transportation of the substation equipment. An 8-foot chain link fence with barbed wire on top would surround the substation pad. Additional property chain link fence may be required for security reasons.

The substation electrical facilities include 500 kV air insulated ring bus, two 500 kV line terminals, four single phase 500/12 kV, 50 MVA, power transformers, 12 kV current limiting reactors, 12 kV switchgear and associated high side and low side breakers, disconnect switches, protective relays, meter-

ing and SCADA systems. Other facilities would include a single story control shelter, DC power systems, oil containment and fire prevention system with firewalls, hydrants and on sight water tank.

The area lighting plan would include installation of multiple 300 watt tungsten-quartz lamps placed near major electrical equipment. This lighting would normally be turned off and only used by crews at night during troubleshooting. A 100-watt yellow directional floodlight would be mounted near the entrance gate for safety.

The highest structures in the substation would be the transmission line, bus, and transformers dead end structures, which would vary in height from 85 feet to 135 feet.

Facilities Details. SDG&E in its PEA suggested that the Borrego Substation would include the following components:

- Air insulated 500 kV ring bus
- 3-500 kV gas circuit breakers
- 6-500 kV air insulated disconnect switches
- 6-500 kV, oil, potential devices
- 4-500/12 kV, 50 MVA, single phase, oil, auto transformers
- 12 kV, air core, reactors
- 12 kV, air insulated switchgear with vacuum circuit breakers
- 3-12 kV distribution circuits
- Fiber optic and copper line communication systems
- 40-foot-by-40-foot control shelter, with lighting, heating and air conditioning
- 2-125 V DC battery systems
- Protective relays for line, bus transformers and distribution circuits
- Fiber optic communication equipment

Construction of the proposed Alternative Borrego Substation would take place within the 50-acre private property. Approximately 22 acres would be disturbed during construction of the new substation pad and access road. All construction equipment, vehicles, personnel and material staging areas would be accommodated within the properly lines of the proposed substation site.

The temporary construction power needed during construction comes from the existing 12 kV circuit in the area. The circuit would be routed through the substation on wood poles identical to the existing poles. The number of new poles would be determined in the final design.

The below grade construction would follow the site preparation work; and, it would include installation of piers, foundations for the structures and equipment; and installation of firewalls, oil containment, control shelters, cable trenches, electrical ducts and the ground grid.

The above-grade construction would include installation of support structures, bus conductors, equipment jumpers; setting equipment on foundations, pulling control cable, wiring the control shelter and commissioning the equipment.

The power transformers, due to their weight, would require specialized 80-foot, 300-ton heavy-hauler tractors to transport the units to required positions. Installing all other substation equipment would require the use of cranes, man lifts, portable welding units, line trucks, oil transports and a variety of crew vehicles.

The active construction schedule at the substation would occur for approximately 13 months, from the start of the site work to installation of the final electrical equipment. Longer time duration may be required to accommodate site re-vegetation, biological mitigation measures or delays due to inclement weather. The construction duration would be overlapping and is not sequential.

If this alternative is selected, the existing Borrego and Narrows Substations would be dismantled and removed. After the load is transferred to the 500/12 kV substation, the oil in the existing Borrego Substation breakers, transformer, regulator and the potential transformers will be tested for contamination. Standard clean or contaminated oil handling protocols would be used in removal, transportation and storage of the equipment. Once the oil is removed the equipment would be transported to a storage facility for further evaluation.

The structural steel would be removed and disposed following standard procedures. The control shelter would be cleared and demolished. The foundations would be broken up and removed. The soil inside the fence would be tested for contamination. The spoil would be transported to an appropriate dump site. Once the equipment is removed, the station fence would be taken out and the site would be irrigated and landscaped. Tables Ap.1-3 through Ap.1-7 illustrate the substation construction schedule and the duration of use of the required equipment.

Table Ap.1-3. Alternative 500/12 kV Substation Construction Schedule

Construction Activity	Months (approximate)
Site preparation	2
Below grade construction	3
Above grade installations	6
Testing and energizing	2

Table Ap.1-4. Alternative 500/12 kV Substation Site Development Construction

Total Estimated Vehicles Used	Hours Operating at Site/Day	Days
2 – Trucks QA and QC	8	40
3 – Tractors (dozers)	10	20
3 – Water trucks	10	40
3 – Scrapers and/or paddle wheel	10	20
2 – Compactors	10	20
2 – Blade	10	40
3 – Backhoe	10	40
1 – Water pump	10	40
1 – Ditch Witch	10	10
2 – Truck (10 yd)	10	4
5 – Truck (20yd)	10	20
2 – Concrete trucks	10	5
1 – Asphalt paver	10	5
2 – Vibrating roller	10	20

Table Ap.1-5. Alternative 500/12 kV Substation Below Grade Construction Equipment Usage

Total Estimated Vehicles Used	Hours Operating at Site/Day	Duration (days)
2 – Caterpillar D9 or larger	8	60
3 – Water Trucks	8	60
1 – Compactor	8	60
1 – 980 Loader	8	20
2 – 773 Rock Trucks	8	20
5 – Backhoe	8	40
2 – Ditch Witch	8	10
8 – Concrete Truck	8	15
1 – Water Pump	8	60
1 – Asphalt Paver	8	10
1 – Asphalt Emulsion Truck	8	10
2 – Vibrating Roller	2	20
2 – Drill Rigs	8	30
1 – Truck (Delivery)	1	60
2 – Construction Fork	8	60
2 – QA & QC Trucks	8	60

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid.

Table Ap.1-6. Alternative 500/12 kV Substation Above Grade Construction Equipment Usage

Total Estimated Vehicles Used	Hours Operating at Site/Day*	Duration (days)
2 – Boom truck	6	15
2 – Bucket trucks	6	15
6 – Man lifts	8	120
2 – Crane	8	14
3 – Construction forks	8	60
2 – Overhead line	8	20
1 – Cable dolly (trailer)	4	20
2 – Stringing rigs (trailer)	4	20
1 – Oil Rig (trailer w/generator)	8	14
1 – SSF6 gas cart (trailer)	0	20
3 – Water truck	8	120
10 – Crew trucks/cars	0	120
2 – Trucks w/trailers (equip. delivery)	2	80
2 – Compressors	2	30

* Per vehicle

Table Ap.1-7. Alternative 500/12 kV Substation Testing and Energizing Equipment Usage

Total Estimated Vehicles Used	Hours Operating at Site/Day	Duration (days)
1 – Bucket trucks	5	40
1 – Man lifts	5	40
8 – Pickup/vans/car	0	40

This alternative would enhance reliability for Borrego Springs and remove all the existing transmission facilities in the Park. It would also improve voltage levels and power quality in Borrego Springs. The SDG&E Borrego Valley Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. Though the route through Tubb Canyon would be steep and narrow, helicopter construction would be used and this route has the potential to be technically and legally feasible.

Regulatory Feasibility. This route traverses the ABDSP in an area that is designated as State-Designated Pinyon Ridge Wilderness Area. This would require a re-designation of Wilderness Area and a State Park Plan Amendment and thus faces regulatory issues, and could delay the in-service date. The Park’s General Plan does not allow the transmission lines in this portion of the Park and this route and the Department of Parks and Recreation has indicated that they would prefer State Designated State

Wilderness area boundaries not be changed where an existing corridor through the ABDSP may already provide for co-location of a proposed transmission line with an existing line (Department of Parks and Recreation, 2007). The CA Public Resources Code Section 5093.31 (“The California Wilderness Act”) states as follows:

In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas on state-owned lands within California, leaving no areas designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the State of California to secure for present and future generations the benefits of an enduring resource of wilderness. [emphasis added]

Therefore, the regulatory feasibility of this alternative is in question.

Environmental Advantages

Wilderness and Recreation. The alternative route through ABDSP would be 9.9 miles shorter within the Park than the proposed route.

Removal of Existing Facilities. Transmission facilities within the ABDSP would be removed if this alignment were constructed, including the existing SDG&E Transmission Lines (TL) 686, TL 687, IID 92 kV transmission line, as well as the Narrows (0.62 acres) and Borrego (0.51 acres) Substations within the ABDSP and Borrego Springs.

Biological Resources. The Proposed Project goes through significantly more bighorn sheep critical habitat than does the alternative, which extends around more of the critical habitat designation within the Park.

Cultural Resources. This alternative would avoid Grapevine Canyon and its associated Wilderness Area, which is an area that is rich with cultural and archaeological resources and may be unavoidable with the Proposed Project.

Access Roads and Water Quality. There is no existing access road east of Tamarisk Grove Campground, and using SR78 as access for the Proposed Project would result in fill of “waters of the United States” for purposes of Army Corps of Engineers Section 404 permitting. Moving structures outside of the wash from the Campground to Narrows Substation, as is proposed for the proposed route, could require significant grading for structure sites and up to four miles of new access roads. On the other hand, the alternative route only has two miles without existing access. In addition, using helicopters for construction and maintenance under this alternative would not extend any road into the existing roadless area. Thus, this route may have fewer impacts to washes and navigable waters.

Visual Resources. This route would minimize impacts to SR78, a State Designated Scenic Highway, by traveling north of the roadway where the alternative would diverge from the proposed route.

Environmental Disadvantages

Longer Length and Ground Disturbance. This route would be approximately 2.4 miles longer than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The

potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native desert vegetation.

In addition, a new 500/12 kV distribution substation would be required in the Borrego Springs area to feed the Borrego load if the 500 kV transmission line is routed through this area. The substation would be located in the southern portion of the Borrego Springs community. It would be located directly west of S3 and southeast of S22, and it would occupy an approximately 10-acre fenced area. The access road would be approximately 0.75 miles long and 20 feet wide to accommodate transportation of the substation equipment resulting in much greater ground disturbance and associated impacts.

New Transmission Corridor. This alternative would establish a new transmission line corridor through ABDSP and would create direct effects on State-designated Wilderness and town of Borrego Springs. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Wilderness and Recreation. This alternative would create a new transmission corridor through approximately 4.64 miles of the existing State Park Designated Pinyon Ridge Wilderness Area and there is no precedent for compensation/mitigation for loss of Wilderness. This designation inherently would preclude improvements and structures in the areas. Although the Borrego Valley Alternative would provide compensatory measures for the remaining Park impacts resulting in net increase in designated Wilderness; however, no State or Federal Wilderness Areas have ever been de-designated in this manner. The SDG&E Borrego Valley Alternative would reduce the value of Wilderness lands and ABDSP recreation by creating a new and highly visible transmission corridor through the currently undisturbed Pinyon Ridge Wilderness Area.

Visual Resources. The new Borrego Springs Substation would be located in the southern portion of the Borrego Springs community, directly west of S3 and southeast of S22, and it would be a prominently visible, highly industrial appearing feature in an otherwise, relatively undeveloped portion of the southern Borrego Valley landscape lacking similar features. The substation, along with the structurally complex and also industrial appearing transmission line towers would substantially change the existing landscape character in that portion of Borrego Valley. The substation and transmission line would be highly visible to nearby residences as well as other residents of Borrego Springs and visitors entering and leaving the Valley and Park along Borrego Springs Road and Yaqui Pass Road. In addition, the transmission line ascending the escarpment to the west would be prominently visible from the scenic overlook on Montezuma Valley Road. In addition, the alignment would traverse and be visible from a Wilderness Area within the ABDSP. The resulting visual impact would likely be significant (Class I) from both the Valley floor and the overlook.

Biological Resources. This route would significantly impact bighorn sheep habitat by placing a new transmission line and corridor on the steep slopes through Tubb Canyon. Tubb Canyon is an unusually diverse and sensitive habitat area (inclusive of approximately 1,000 acres) on the western terminus of the Sonoran Desert (Colorado Upland Subdivision). Tubb Canyon terrain extends from an ancient bajada into arid mountain elevations. It is surrounded on three sides by Anza Borrego Desert State Park. The BV Alternative would significantly impact 'essential habitat' delineated in the *Recovery Plan for Bighorn Sheep in the Peninsular Ranges, California* (USFWS, 2000) and designated 'critical habitat' (66 *Federal Register* 8650-8677) for Peninsular bighorn sheep by placing a new transmission line and corridor on the steep slopes of Tubb Canyon in high value, designated critical habitat for bighorn sheep.

- Tubb Canyon supports a herd of approximately 38 Federally listed Endangered and State-listed Threatened Peninsular bighorn sheep, as well as a California Department of Fish and Game Species of Special Concern, the burrowing owl.
- Tubb Canyon attracts bighorn sheep all times of the year including the important summer months, because it contains a natural spring and an artificial drinker (“guzzler”) that provide this subpopulation with water. It is also an important summer foraging area due to the available water and vegetation in its deep shaded canyons. Any disturbance near a desert water source may cause ewes to abandon that source and even abort their lambs (to preserve their own lives and future breeding capacity). Adult sheep may risk dying of thirst by staying away from any water source that is in proximity to human intrusion.
- The cumulative effects of habitat degradation and fragmentation from the pre-construction, construction and operation of the new 500 kV transmission line could result in bighorn sheep avoidance of the area, increased off-road and other human activity along maintenance roads, introduction of invasive non-native plants via equipment and other traffic, and interference with resources, such as use of water sources. If sheep avoid using Tubb Canyon in the future, it is doubtful that alternative food and water resources would be sufficiently available within the home ranges of affected bighorn sheep to sustain current population levels in the southern San Ysidro Mountains ewe group.
- One of the goals for recovery of the species is to maintain connectivity throughout its entire range in the U.S. and Baja California, Mexico. Connectivity between sheep populations is critical to long-term survival, and anything that severs critical sheep habitat is especially adverse. Designated critical habitat for bighorn sheep north-south movement is at its narrowest in the Tubb Canyon area. The sheep are already reluctant to cross Montezuma Grade (Highway S22), which is located just north of the BV Alternative, also in the narrowest portion of the critical habitat. The BV Alternative transmission line and corridor would further adversely affect sheep movement in that narrow north-south area and a transmission line could potentially sever that north-south connection. Thus, loss of subpopulation connectivity would be expected to destabilize the population as a whole, ultimately resulting in declines and potential extirpation of individual subpopulations, such as the northern or southern San Ysidro Mountains ewe groups.

Cultural Resources. Based on the Class I Background Study and Class III Archaeological Inventory and subsequent data submittals prepared by Gallegos & Associates (2006a; 2006b; 2006c), approximately 40 percent of the SDG&E ABDSP Borrego Valley Link of the Alternative Project was intensively surveyed for cultural resources for this and/or previous projects.

A total of 10 cultural resources have been identified within the 150-foot-wide survey corridor, all but one of which have been identified as prehistoric. One of these resources (D-I-001) is an isolate and therefore not eligible for the NRHP or CRHR; the remaining nine resources have the potential for NRHP/CRHR inclusion. The site record for San Diego Museum of Man Site C-131 describes multiple sites within the Borrego Valley including human remains, but it is unclear how many of these sites are located within the ABDSP Borrego Valley Alternative alignment.

In addition to the 10 sites noted above, the ABDSP Borrego Valley Alternative is located approximately 6 meters (20 feet) from a large historic period ranching open space area (P-37-018313). If P-37-018313 is determined to be NRHP/CRHR-eligible, the ABDSP Borrego Valley Alternative has the potential to cause indirect visual impacts (adverse effects) to the resource.

Because 60 percent of the ABDSP Borrego Valley Alternative has not been surveyed for cultural resources, this alternative has the potential to impact (adversely affect) unknown cultural resources. The new Borrego Springs Substation located within this alternative also has not been surveyed for cultural resources and retains the potential for unknown cultural resources.

Geological Resources. Construction of a transmission line through Tubb Canyon, which is extremely steep and narrow, could result in increased erosion from ground disturbance on the hillsides.

Water Resources. Tubb Canyon is one of only four “recharge” corridors and watersheds which deliver surface and underground spring water into the Borrego Valley aquifer. In addition, many residences in Tubb Canyon have private water systems based on surface springs or alluvial wells that could be impacted from construction activities.

Residential Use. The route would pass by residences in the Town of Ranchita at the western boundary of ABDSP along S22/Montezuma Valley Road, and the proposed route is primarily within unoccupied park lands.

Noise. Helicopter construction in the Tubb Canyon area could cause noise and vibration impact to nearby sensitive receptors and residences. The Federal Aviation Administration could require any homes near helicopter activity to be temporarily vacated for safety reasons.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially legally feasible. Construction along the Montezuma Grade into Borrego Valley would be challenging but should be technically feasible. Although fewer acres of designated Wilderness would be impacted, there would be regulatory feasibility issues associated with construction of a new transmission line corridor through State Park Designated Pinyon Ridge Wilderness Area (the proposed route would follow an existing transmission corridor). Also, although the alternative would result in the removal of substation and transmission facilities within ABDSP, it would result in the construction of a much larger and visible Borrego Springs 500 kV substation in the Borrego Valley. In addition, the route would be highly visible in the Borrego Valley and would cross nearby residences in both Borrego Spring and Ranchita. It would also create a new transmission corridor through sensitive bighorn sheep habitat and Wilderness, and would be approximately 4 miles longer, creating greater temporary and permanent impacts in most issue areas. Due to regulatory issues that question the feasibility of this alternative, and coupled with steeper topography and greater environmental impacts, this alternative has been eliminated from full consideration in this EIR/EIS.

4.3.9 SDG&E Borrego Valley Underground Alternative

Alternative Description

This alternative was suggested by SDG&E and would begin at an expanded 500 kV/230 kV San Felipe Substation (MP 58.9), as is shown in Figure Ap.1-3, and the underground ROW would be 60 feet wide. The 230 kV underground line would travel north in Split Mountain Road for 2.6 miles and then west in SR78 for 6.5 miles to Borrego Valley Road/S3. The route would continue for 9 miles in Borrego Valley Road and Highway S3 to a new 230 kV/12 kV substation in Borrego Springs. From there, the route would travel within Tubb Canyon Road for approximately 1.5 miles to the base of the escarpment where it would transition overhead and would follow the SDG&E Borrego Valley Alternative overhead route, as described in Section 4.3.8 above, but at 230 kV.

This alternative would require expansion of the San Felipe Substation to a 500/230 kV substation. Like the SDG&E 500 kV Borrego Valley Alternative, this partial underground alternative would require the construction of a new 230/12 kV substation (except at 230 kV rather than 500 kV) in the Borrego Springs area to feed the Borrego load. The substation would be located in the southern portion of the Borrego Springs community. It would be located directly west of S3 and southeast of S22. The access road would be approximately 0.75 miles long and 20 feet wide to accommodate transportation of the substation equipment. An 8-foot chain link fence with barbed wire on top would surround the substation pad. Additional property chain link fence may be required for security reasons.

However, this alternative and the new substation would also allow for removal of the existing Narrows and Borrego Substations and the existing Narrows-IID San Felipe 92 kV, Narrows-Borrego 69 kV, and Narrows-Warner 69 kV transmission facilities.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

As is discussed with the Partial Underground 230 kV ABDSP SR78 to S2 Alternative (see Section 4.3.1), this alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid.

However, the transmission line capacity is greatly reduced with the reduced spacing between the duct banks. This reduced capacity creates a bottleneck in the new transmission line power delivery and it may force a need for additional future transmission lines. The delivery of power is reduced with overhead 230 kV compared to 500 kV with undergrounding 230 kV further reducing the transfer capacity.

Based on SDG&E's current construction standards, it takes four 230 kV lines to match the capacity of one 500 kV line. Therefore, under an ultimate expandability design for an all-lines-in-service condition there could be at least four 230 kV circuits coming out of the proposed Central East Substation. However, in order to maintain transfer capability on the 230 kV circuits equivalent to the transfer capability of the 500 kV portion of the project for an N-1 or a credible N-2 outage of the 230 kV circuits, there should be really be five or six 230 kV circuits coming out of Central Substation. The design and layout of Central Substation is such that it can accommodate up to six 230 kV lines.

If the San Felipe Substation were to become the transition point between 500 kV and 230 kV with 230 kV underground lines brought through the ABDSP then ultimately as many as four additional 230 kV circuits would be required through the ABDSP, for a total of six 230 kV circuits. Environmentally and economically, it is preferable to have one 500 kV transmission line through the ABDSP than to have six 230 kV transmission lines through the Park with many more towers and lines and much greater ground disturbance. Refer to the Overhead 230 kV ABDSP Alternative in Section 4.3.13 for a discussion of the impacts of a 230 kV transmission line (compared to a 500 kV line) through ABDSP.

Although this ultimate build out may not be needed for decades, at least one or two additional 230 kV circuits are possible within the first decade following completion of the Sunrise Powerlink in 2010. If

additional 230 kV circuits could not be put through ABDSP, then one of the objectives of the Sunrise Powerlink, “expandability,” would not be met.

Although cost is not considered under CEQA, the cost to construct and maintain underground 230 kV circuits is higher than the cost to construct and maintain an overhead 500 kV line. Compared to a single 500 kV line, 230 kV circuits provide reduced ampacity (and therefore reduced transfer capability) through the desert due to ambient heating (there would be no wind-induced cooling effects). To compensate for this reduced ampacity, cable size could be made larger through the desert, further increasing costs. Compared to a single 500 kV line there would also be increased losses with underground 230 kV circuits. Although cost would not rule out an alternative that would substantially reduce impact, this electricity loss with underground 230 kV circuits would further increase costs incurred by ratepayers and further reduce net transfer capability.

The SDG&E Borrego Valley Underground Alternative would meet most project objectives.

Feasibility

Technical and Legal Feasibility. Though the route through Tubb Canyon would be steep and narrow, helicopter construction would be used and this route has the potential to be technically and legally feasible.

Regulatory Feasibility. The regulatory feasibility of this alternative is in question in the segment where it would be the same as the SDG&E Borrego Valley Alternative (see Section 4.3.8) and would create a new corridor through State-designated Wilderness. The Department of Parks and Recreation has indicated that they would prefer State Designated State Wilderness area boundaries not be changed where an existing corridor through the ABDSP may already provide for co-location of a proposed transmission line with an existing line (Department of Parks and Recreation, 2007).

Environmental Advantages

See the discussion under SDG&E Borrego Valley Alternative in Section 4.3.8 above. The overhead 230 kV towers for a portion of this alternative would be approximately 20 feet shorter than 500 kV towers. See also the Partial Underground ABDSP SR78 to S2 Alternative in Section 4.3.1 for a discussion of the environmental advantages associated with underground construction of transmission lines in ABDSP.

Environmental Disadvantages

See the discussion under SDG&E Borrego Valley Alternative in Section 4.3.8 above. The overhead 230 kV towers for a portion of this alternative would be approximately 20 feet shorter than 500 kV towers. See also the Partial Underground ABDSP SR78 to S2 Alternative in Section 4.3.1 for a discussion of the environmental disadvantages associated with underground construction of transmission lines in ABDSP.

Future Expansion. If the San Felipe Substation were to become the transition point between 500 kV and 230 kV with 230 kV lines brought through the ABDSP then ultimately as many as four additional 230 kV circuits would be required through the ABDSP, for a total of six 230 kV circuits. Environmentally would be preferable to have one 500 kV transmission line through the ABDSP (as is proposed) than to have six 230 kV transmission lines through the Park with many more towers and lines and much greater ground disturbance. Refer to the Overhead 230 kV ABDSP Alternative in Section 4.3.13 for a discussion of the impacts of a 230 kV transmission line (compared to a 500 kV line) through ABDSP. Although this ultimate build out may not be needed in the immediate future, at least one or two additional 230 kV circuits would be possible within the first decade following completion of the Sunrise Powerlink in 2010.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be legally feasible. Construction along the Montezuma Grade into Borrego Valley would be challenging but should be technically feasible. Although fewer acres of designated Wilderness would be impacted, there would be regulatory feasibility issues associated with construction of a new transmission line corridor through State Park Designated Pinyon Ridge Wilderness Area (the proposed route would follow an existing transmission corridor). Also, although the alternative would result in the removal of substation and transmission facilities within ABDSP, it would result in the construction of a much larger and visible Borrego Springs 500 kV substation in the Borrego Valley. In addition, the route would be highly visible in the Borrego Valley and would cross nearby residences in both Borrego Spring and Ranchita. It would also create a new transmission corridor through sensitive bighorn sheep habitat and Wilderness. As a result, this alternative would create similar severe impacts, namely to Tubb Canyon and from the construction of a new 230 kV/12 kV substation in Borrego Springs, as the SDG&E Borrego Valley Alternative discussed in Section 4.3.8 above. Due to regulatory issues that question the feasibility of this alternative, and coupled with steeper topography and greater environmental impacts, this alternative has been eliminated from full consideration in this EIR/EIS.

4.3.10 SDG&E SR78 Julian Alternative

Alternative Description

This alternative was discussed and eliminated by SDG&E in PEA Section 3.3.1.3 as an option using SDG&E Segments 6 and 8 to connect into the Central Substation area. The route, as shown in Figures Ap.1-3 and Ap.1-10, would slowly diverge from the Proposed Project at MP 75 east of Grapevine Canyon and would turn southwest to travel along the northwest side of SR78. The alternative would then continue to extend west and southwest for 26.3 miles paralleling SR78 past S2 and through the town of Julian until it would terminate at the existing Santa Ysabel Substation, approximately 1.0 mile east of the Proposed Project at MP 108.5. This alternative would be 7.2 miles shorter than the Proposed Project.

This alternative could also be used together with portions SDG&E ABDSP SR78 to S2 Central Alternative. This alternative would be used in conjunction with the Central South Substation Alternative, and therefore, the transmission line would be 500 kV in this segment.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E SR78 Julian Alternative would meet all project objectives.

Feasibility

Technical Feasibility. The Banner Grade east of Julian is narrow and unstable. Engineering and construction would be challenging, but it should be technically feasible.

Legal Feasibility. This alternative has the potential to be legally feasible.

Regulatory Feasibility. This route traverses the ABDSP in an area that is designated as State-Designated Grapevine Mountain Wilderness Area. This would require a re-designation of Wilderness Area and a State Park Plan Amendment and thus faces regulatory issues, and could delay the in-service date. The Park's General Plan does not allow the transmission lines in this portion of the Park and this route and The Department of Parks and Recreation has indicated that they would prefer State Designated State Wilderness area boundaries not be changed where an existing corridor through the ABDSP may already provide for co-location of a proposed transmission line with an existing line. The CA Public Resources Code Section 5093.31 ("The California Wilderness Act") states as follows:

In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas on state-owned lands within California, leaving no areas designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the State of California to secure for present and future generations the benefits of an enduring resource of wilderness.
[emphasis added]

Therefore, the regulatory feasibility of this alternative is in question.

In addition, this alternative would pass within 350 feet of Julian High School (1656 Highway 78). The California Department of Education has enacted policy regulations that require schools to be certain distances from the edge of a transmission line ROW. These regulations require that schools be set back 100 feet from 50 to 133 kV lines, 150 feet from 220 to 230 kV lines, and 350 feet from 500 to 550 kV lines. The line would need to be relocated greater than 350 feet from the school in this area.

Though it would not make the route infeasible, this alternative would require more new private ROW than the proposed route. Acquiring private ROW could require more condemnation and relocation of homes and businesses, which could thus delay the project in-service date.

Environmental Advantages

Existing SR78 ROW. The alternative would continuously parallel the existing SR78 ROW. Following biological and cultural resources, to traversing open space.

Shorter Length and Ground Disturbance. This route would be approximately 7.2 miles shorter than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Cultural Resources. This alternative would avoid the known and unknown cultural resources within Grapevine Canyon and the Angelina Springs District.

Environmental Disadvantages

Land Use and Residences. This segment goes through the community of Julian and impacts the residential and commercial areas in this community. The Proposed Project would instead follow an existing transmission line ROW and would not pass through developed residential areas along this segment.

Schools. This alternative would pass within 350 feet of Julian High School at the top of the Banner Grade east of Julian.

Biological Resources. This alternative would include a high occurrence of designated critical habitat and potential special status species habitat for species, such as the pallid San Diego pocket mouse, peninsular bighorn sheep, desert spike-moss, northern red diamond rattlesnake, Townsend's big-eared bat, least Bell's vireo, coast horned lizard, rosy boa, southern grasshopper mouse, unarmored three-spine stickleback, ayenia, Cove's cassia, two-striped garter snake, mesquite bosque, Dulzura pocket mouse, bristly scaleseed, and Mohave tui chub. It would also cross through the Santa Ysabel Open Space Preserve located east of the SR78/SR79 intersection.

Wilderness and Recreation. This alternative would place a new transmission corridor through approximately 4 miles of Grapevine Mountain Wilderness Area. The line would be visible from the Inaja Monument Park Overlook, which is the main access to the trailhead for the Inaja National Recreation Trail. It would also cross through the Santa Ysabel Open Space Preserve, which is located east of the SR78/SR79 intersection and north of SR78, and includes several hiking trails, such as the Coast to Crest Trail.

New Transmission Line Corridor. This alternative would establish a new transmission line corridor. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Visual Resources. The route would be visible to viewers at the Inaja Monument Park Overlook off of SR78 west of Julian.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be legally feasible. Technically the Banner Grade would require difficult construction due to steep, rocky slopes and creating a new transmission line corridor through Grapevine Mountain Wilderness Area would create regulatory feasibility issues. Although this alternative would be shorter and would avoid the cultural resources associated with Grapevine Canyon, this alternative would pass nearby residences and through the center of the Town of Julian, would establish a new transmission line corridor through valuable biological habitat and Wilderness, and would pass within 350 feet of Julian High School. Therefore, due to technical and regulatory feasibility issues and greater significant environmental impacts, this alternative was eliminated from full consideration in this EIR/EIS.

4.3.11 SDG&E ABDSP SR78 to S2 Central Alternative

Alternative Description

This alternative was suggested during scoping and was discussed by SDG&E in the PEA as Alignment N74-N15-N42 in the Desert Link together with PEA Alignment N42-N67A to proposed Central Substa-

tion or N42-N16A to an alternative substation in the Central Link. It uses portions of SDG&E's Segments 6 and 7 discussed in Appendix B of the PEA. The route is shown in Figure Ap.1-3.

The route would diverge from the Proposed Project at MP 78 and would turn southeast to travel along the northwest side of SR78 for 3.69 miles. At the intersection with S2, the route would turn northwest and would follow the north side of S2 (San Felipe Road) alignment through the ABDSP for approximately 2.22 miles. Outside of the Park the route would then continue to follow S2 for 8.53 additional miles and would rejoin the Proposed Project at the proposed Central East Substation or 0.28 miles farther north on S2 at MP 90 if an alternative substation is used.

This alternative would use lattice towers with the existing 69 kV circuit underbuilt. The existing 69 kV transmission line from MP 78 to MP 88 that is proposed to be underbuilt along the Proposed Project route would be removed. This alternative could also be used together with portions SDG&E SR78 Julian Alternative (see Section 4.3.10).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E ABDSP SR78 to S2 Central Alternative would meet all project objectives.

Feasibility

Technical Feasibility. There could be technical feasibility issues with construction along SR78 in this area, because it is very narrow and windy with steep slopes. In addition, this alternative would cross and parallel the Earthquake Valley Fault and its fault strands along S2 and the western end of SR78 and would be located within the Alquist-Priolo Fault Zone. However, these crossings would be overhead and so they should not present any significant technical feasibility issues.

Legal Feasibility. This alternative has the potential to be legally feasible.

Regulatory Feasibility. This route traverses the ABDSP in an area that is designated as State-Designated Grapevine Mountain Wilderness Area. This would require a re-designation of Wilderness Area and a State Park Plan Amendment and thus faces regulatory issues, and could delay the in-service date. The Park's General Plan does not allow the transmission lines in this portion of the Park and this route and the Department of Parks and Recreation has indicated that they would prefer State Designated State Wilderness area boundaries not be changed where an existing corridor through the ABDSP may already provide for co-location of a proposed transmission line with an existing line. The CA Public Resources Code Section 5093.31 ("The California Wilderness Act") states as follows:

In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas on state-owned lands within California, leaving no areas designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the State of California to

secure for present and future generations the benefits of an enduring resource of wilderness. [emphasis added]

Therefore, the regulatory feasibility of this alternative is in question.

Environmental Advantages

Existing SR78 and S2 ROW. The alternative would continuously parallel the existing SR78 and S2 ROWs. Following existing transportation corridors, which are considered developed, is preferable to traversing through open space.

Cultural Resources. Use of this alternative would avoid the known and unknown cultural resources in Grapevine Canyon and the Angelina Springs District.

Residential Use. There are a greater number of scattered residences in the Grapevine Canyon area along the proposed route than along this alternative SR78 and S2 alignment.

Environmental Disadvantages

New Transmission Corridor. This alternative would establish a new transmission line corridor along SR78 and S2, which are more traveled than the proposed route. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors. Because there are no access roads in the area, spur roads from SR78 would likely be required as well.

Visual Resources. The construction activity and transmission lines would be highly visible along the scenic San Felipe Valley through which S2 crosses. In addition, the alternative would be visible from the Pacific Crest Trail (PCT), which runs down the crest of the Grapevine Mountains and through the Grapevine Mountain Wilderness and San Felipe Hills Wilderness Study area and parallels S2 to the north.

Biological Resources. This alternative would include a high occurrence of designated critical habitat and potential special status species habitat for species, such as the pallid San Diego pocket mouse, peninsular bighorn sheep, desert spike-moss, northern red diamond rattlesnake, Townsend's big-eared bat, least Bell's vireo, coast horned lizard, rosy boa, southern grasshopper mouse, unarmored three-spine stickleback, ayenia, Cove's cassia, two-striped garter snake, mesquite bosque, Dulzura pocket mouse, bristly scaleseed, and Mohave tui chub. The San Felipe Valley Wildlife Area is located on sides of S2 in this area.

Wilderness and Recreation. This alternative would create a new transmission line corridor through approximately 4 miles of State Park Designated Grapevine Canyon Wilderness Area within ABDSP. It would also cross through the San Felipe Valley Wildlife Area, which is on both sides of S2, and the San Felipe Hills Wilderness Study Area, which is on the east side of S2. In addition, the Pacific Crest Trail (PCT) runs down the crest of the Grapevine Mountains and through the Grapevine Mountain Wilderness and San Felipe Hills Wilderness Study Area parallel to S2. The alternative would cross the PCT near the intersection of SR78 and S2.

Cultural Resources. Gallegos & Associates (G&A), a subcontractor to SDG&E, recorded a multicomponent (historic and prehistoric) site that includes a habitation site within the alternative route in the San Felipe Valley. Additionally, it is likely that an ethnographic Native American village site located on the western side of S2 changed locations within the valley over time as spring locations changed or for other reasons. The valley is mostly undeveloped and the addition of a transmission line within or adjacent to

the valley would change the setting and could even be considered an adverse effect to a cultural landscape. Although the alternative would not likely directly impact the ethnohistoric village site located on the west side of S2, there are likely other cultural resources within the valley that could be impacted.

Geological Resources. Portions of SR78 through Grapevine Canyon Wilderness Area are narrow and windy and some blasting may be required, which would result in increased ground disturbance and erosion potential. In addition Earthquake Valley Fault runs parallel to the roadway along S2 and crosses the western end of SR78; however, fault crossings with overhead lines are not a major concern for geologic impacts in the event of a seismic event.

Traffic and Transportation. SR78 is a narrow and windy two-lane road that is more traveled than the proposed route. Construction activity in the area could affect travelers through the Park.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be legally feasible. Construction and engineering would be challenging due to the topography along SR78 and the alternative would establish a new transmission line corridor through Wilderness, which would present regulatory feasibility issues. In addition, SR78 and S2 are more heavily traveled roadways through the scenic and currently undeveloped San Felipe Valley. Therefore, due to technical and regulatory feasibility issues and environmental impacts associated with a new transmission line corridor in the San Felipe Valley, this alternative was eliminated from full consideration in this EIR/EIS. However, it should be noted that an underground transmission line along this same route has been retained for full analysis in this EIR/EIS as the Partial Underground 230 kV ABDSP SR78 to S2 Alternative (see Section 4.3.1).

4.3.12 HVDC Light Underground Alternative

Alternative Description

This alternative is based on scoping comments requesting consideration of advanced technologies that could place substantial portions of the Proposed Project underground (comments from Joanne Fogel, Carmel Valley Neighborhood 10 North HOA). The HVDC Light Underground Alternative would involve installation of a proprietary transmission line system called HVDC Light (developed by ASEA Brown Boveri/ABB; ABB, 2006) with one converter station at a new location near IID's existing San Felipe Substation and a second converter station at or near the location of the proposed Central Substation. Three HVDC Light circuits, each with approximately 350 MW capacity, would be installed underground in roadways through ABDSP and along Highway S2, with potential overhead segments at fault crossings. This alternative would follow the same route as the Partial Underground 230 kV ABDSP SR78 to S2 Alternative (see Section 4.3.1), which is shown in Figure Ap.1-4.

This alternative would include:

- Approximately 58.8 miles of new 500 kV transmission line overhead from the existing Imperial Valley Substation to a new San Felipe Converter Station and approximately 10.8 miles of overhead construction to cross and parallel the Earthquake Valley Fault along SR78 and S2
- Approximately 26.8 miles of new underground HVDC Light transmission line from the new San Felipe Converter Station to the proposed Central Substation
- New HVDC Light converter stations at San Felipe and the proposed Central Substation
- Other Proposed Project components west of the Central Substation.

According to information obtained from the manufacturer, ABB, HVDC Light technology was first introduced in 1997. This technology is being employed in a number of locations around the world. However, the high-capacity projects are presently in the 300 to 400 MW range. ABB is pursuing the development of HVDC Light capacity ratings up to about 1,100 MW at +/- 300 kV. Thus, in order for the current state of this technology to provide for the same import capacity as the Proposed Project, this alternative would require three or more circuits, assuming 350 MW per circuit.

Advantages of the HVDC Light technology are: (1) the associated ROW width requirements for underground or overhead DC circuits are substantially reduced from that required for similar AC operation; (2) in the event of a line outage, the converter stations can provide voltage support to the local transmission/distribution system; and (3) the circuits can be readily undergrounded. Disadvantages of this technology include: (1) each circuit would require its own converter station costing between \$100 to \$250 million per station at each end of the DC circuit; (2) the current limitations on the capacity of each circuit; and (3) the need for multiple circuits could more than offset the reduced tower height and ROW width benefits of a single DC circuit. Installing three 350 MW circuits in modules could be accomplished with equipment that is commercially viable. An HVDC Light system with capacity up to 1,100 MW would be by far the largest of its kind anywhere.

This alternative would occur along the route of the Proposed Project, except within ABDSP, where the route would be underground in existing roadways. Although substantial space exists around the Imperial Valley Substation for converter stations, multiple converter stations and transitions between underground and overhead HVDC Light conductors would be impractical. To provide the future option of an interconnection to the IID system at the San Felipe location, this alternative would include San Felipe as the eastern converter location. Because there are likely space limitations on the number of converters that could be placed at the Sycamore Canyon Substation, the western converter location would be at the proposed Central Substation site. Although this alternative offers the ability to place circuits underground, installation costs would substantially exceed those of the Proposed Project and those of the Four 230 kV Circuits Alternative (described in Section 4.9.25).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet all objectives assuming that sufficient circuits could be installed to accommodate a comparable amount of capacity as the Proposed Project, except for those pertaining to economics. It is questionable whether it would meet the objective to reduce the above-market costs associated with maintaining reliability in the San Diego area due to the cost uncertainty of constructing multiple HVDC Light circuits with their associated converter stations.

In addition to the cable, estimated costs for the HVDC line include: \$500 million for the two HVDC converter stations (\$225 million at each end) and a delay in the project schedule to restart planning. Increased costs associated with construction of the converter stations and other upgrades would need to be passed on from the transmission owner to the customers of transmission service. This would diminish the economic performance of the line and reduce the likelihood of achieving the economic objectives of the Proposed Project to reduce energy costs in the San Diego region.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible, but it would increase project capital costs by at least \$500 million due to the high costs of the converter stations. The increased costs associated with construction of the converter stations and other upgrades would need to be passed on from the transmission owner to the customers of transmission service. This would diminish the economic performance of the line and reduce the likelihood of achieving the economic objectives of the Proposed Project without substantially reducing environmental impacts of the project.

Other than the opportunity to install the circuits underground, few additional benefits would be achieved to compensate for the higher cost of the HVDC Light system. To match the capacity of the overhead 500 kV circuit could require three HVDC circuits in the near term and potentially five circuits total to address expandability. Although multiple circuits may be required to afford the same capacity of the Proposed Project, these circuits could optionally be built to terminate at multiple locations thereby providing a better distribution of the imported capacity throughout the SDG&E service area.

Environmental Advantages

This underground alternative would reduce impacts of the Proposed Project by avoiding Grapevine Canyon and eliminating impacts of the proposed 500 kV overhead lines through ABDSP, namely to visual, recreation, cultural, and biological resources.

Environmental Disadvantages

Land Use and Visual Resources. Converter stations at San Felipe Substation and the proposed Central East Substation would require additional land disturbance beyond that of the Proposed Project. Construction of the converter stations would require permanent disruption of large new land areas, approximately 20 to 40 acres each, at the two termination points. The structure housing each converter station would be approximately 70 to 100 feet tall, and the footprint of the building would be approximately 400 to 600 feet on each side. This would introduce an additional new industrial land use to the two endpoints.

Additional Transmission Lines. There would be less flexibility for interconnections with other existing or proposed alternating current (AC) transmission lines in the CAISO system, which could lead to construction of additional AC facilities parallel to the HVDC line.

Static Discharge. A typical DC circuit employs two conductors per circuit. An environmental consequence of this configuration is static discharge in the area around the converter terminals. Another option is to employ three conductors with the third acting as the ground return. Due to the capacity limitations of HVDC Light there would need to be at least three to four circuits, with two conductors per circuit.

Alternative Conclusions

ELIMINATED. This alternative would meet most project objectives and is technically feasible. Although the ability to place HVDC Light transmission cables underground for extended distances offers the ability to avoid the impacts of the proposed 500 kV overhead lines through ABDSP, the higher costs of this alternative make it infeasible using CEQA guidelines. In addition, DC lines would allow for less interconnection flexibility into the AC CAISO system, resulting in additional AC lines, increased ground disturbance from underground trenching and the converter stations, and the converter stations would also create an added visual and land use impact to the residences along Kane Springs Road. Therefore, it has been eliminated from full consideration in this EIR/EIS.

4.3.13 Overhead 230 kV ABDSP Alternative

Alternative Description

This alternative was developed by the EIR/EIS team in order to replace the 500 kV transmission line through ABDSP with a smaller 230 kV double-circuit line and in an attempt to minimize impacts on Wilderness Areas by staying within the existing 100-foot ROW, and not requiring the additional 50-foot expansion needed by the Proposed Project.

The existing San Felipe Substation, approximately two miles east of ABDSP, would be converted to a 500 kV/230 kV substation. The 230 kV towers and transmission line would begin at the San Felipe Substation (MP 58.8), approximately 32.2 miles east of the Central East Substation (MP 91), thereby replacing the 500 kV towers and transmission line with 230 kV towers through ABDSP. Towers for a 230 kV transmission line would be approximately 20 feet shorter than 500 kV towers. The alternative would end at MP 90, one mile north of the proposed Central East Substation.

It should be noted that the proposed Central East Substation would not be constructed with this alternative and approximately 2 miles of transmission line (one mile of 500 kV and one mile of 230 kV) to and from the substation would be eliminated. Instead a new 500 kV/230 kV substation would be constructed adjacent to the existing IID San Felipe Substation to accommodate the new transmission line.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid.

SDG&E has serious concerns about this alternative, chief of which is expandability. The high level design goal for the Sunrise Powerlink project is to bring a single 500 kV line as close to the SDG&E load center as is reasonably practicable, then to use 230 kV lines to distribute the power to major 230 kV load-serving substations within the San Diego load center.

SDG&E's PEA (page 1-1) identifies the 500 kV line as having a 2,000 MVA continuous rating. If this capacity is necessary for the portion of the project up to the Central East Substation, the analysis related to cable de-rating provided by SDG&E would indicate an approximate 25 percent shortfall in capacity for double-circuit 230 kV through ABDSP. Based on SDG&E's current construction standards, it takes four 230 kV lines to match the capacity of one 500 kV line. Therefore, under an ultimate design for an all-lines-in-service condition there could be at least four 230 kV circuits coming out of Central substation. However, in order to maintain transfer capability on the 230 kV circuits equivalent to the transfer capability of the 500 kV portion of the project for an N-1 or a credible N-2 outage of the 230 kV circuits, there should be really be five or six 230 kV circuits coming out of Central Substation. The design and layout of Central Substation is such that it can accommodate up to six 230 kV lines.

If the San Felipe Substation were to become the transition point between 500 kV and 230 kV with 230 kV lines brought through the ABDSP then ultimately as many as four additional 230 kV circuits would be required through the ABDSP, for a total of six 230 kV circuits. Environmentally and economically, it is better to have one 500 kV transmission line through the ABDSP than to have six 230 kV transmission lines through the Park with many more towers and lines and much greater ground disturbance. Although this ultimate build out may not be needed for decades, at least one or two additional 230 kV circuits are possible within the first decade following completion of the Sunrise Powerlink in 2010. If additional 230 kV circuits could not be put through ABDSP, then one of the objectives of the Sunrise Powerlink, "expandability," would not be met.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. This alternative would follow the proposed route and would have similar issues related to traversing designated Wilderness land. However, this alternative would diverge from the existing ROW only in the area of the major cultural site, eliminating much of the Proposed Project's expansion into designated Wilderness.

Environmental Advantages

Ground Disturbance. The 230 kV tower footprints under this alternative would be smaller, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Elimination of Central Substation Construction. Under this alternative, the proposed Central East Substation would not be constructed. This alternative would eliminate disturbance of approximately 106 acres and approximately 1.5 to 1.8 million cubic yards of cut and fill earthwork. In addition, one mile of 500 kV transmission line into Central East Substation and one mile of 230 kV transmission line out of the substation to reconnect with the proposed route would be eliminated.

Visual Resources. The 230 kV towers and transmission line would begin at the San Felipe Substation (MP 58.8), approximately 32.2 miles east of the Central East Substation (MP 91), thereby replacing the 500 kV towers and transmission line with 230 kV tower through ABDSP. Towers for a 230 kV transmission line would be approximately 20 feet shorter than 500 kV towers.

Biological Resources. There would be less temporary and permanent impacts to vegetation because the tower footprints would be smaller than with a 500 kV line.

Cultural Resources. Smaller tower footprints would result in less potential to affect known and unknown cultural and archaeological resources, especially within the Angelina Springs District.

Environmental Disadvantages

Future Expansion. If the San Felipe Substation were to become the transition point between 500 kV and 230 kV with 230 kV lines brought through the ABDSP then ultimately as many as four additional 230 kV circuits would be required through the ABDSP, for a total of six 230 kV circuits. It would be

environmentally preferable to have one 500 kV transmission line through the ABDSP (as is proposed) than to have six 230 kV transmission lines through the Park with many more towers and lines and much greater ground disturbance. Although this ultimate build out may not be needed in the immediate future, at least one or two additional 230 kV circuits would be possible within the first decade following completion of the Sunrise Powerlink in 2010.

Alternative Conclusions

ELIMINATED. This alternative would meet most of the project objectives, although placing future expansion circuits through ABDSP could be difficult and there could be capacity limitation issues associated with using two 230 kV lines instead of one 500 kV line. In addition, this alternative would not reduce impacts of the proposed route and would be less preferred environmentally in the long term due to future expansion plans that could place additional lines through ABDSP. Although the 230 kV towers would be approximately 20 feet shorter, consequentially, span lengths would also have to be shorter, which would result in a greater number of towers and would thus negate the ground-disturbance advantages associated with the smaller 230 kV-tower footprints. As a result of greater future environmental impacts and the fact that it would not reduce significant impacts of the proposed route, this alternative has been eliminated from full consideration in this EIR/EIS.

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4.4 Central Link Route Segment Alternatives

The eastern half of the Central Link generally would consist of a 500 kV transmission line from the Anza-Borrego Link (MP 83.5) to the proposed Central East Substation. A new double-circuit 230 kV transmission line would begin at the new Central East Substation and would extend to the southwestern edge of the Central Link boundary, which is southwest of the SR78 and SR79 junction near the community of Santa Ysabel (MP 110.8).

The following chapter of the Alternatives Screening Report represents a comprehensive summary and assessment of all transmission line (wires) alternatives including those originally developed by SDG&E, alternatives suggested by the public and agencies during review of the NOP and NOI and during public scoping efforts and also includes all alternatives developed independently by the CPUC, BLM and their EIR/EIS team. To date, eight Central Link alternatives have been developed. Four of the Central Link alternatives are recommended to be retained for further analysis in the EIR/EIS. Each of the Central Link Alternatives is described below and all of the Central Link route segment alternatives are shown in Figures Ap.1-10 and Ap.1-11.

4.4.1 Santa Ysabel Existing ROW Alternative

Alternative Description

This alternative was developed by the EIR/EIS team and was also suggested during scoping by the San Dieguito River Valley Regional Open Space Park, who suggested that the line be placed along the toe of the slope to the east so the line would be less visible. Therefore, this alternative would follow an existing 69 kV transmission line ROW, east of SR79 and along the toe slope for the southern portion of the alternative. The northern portion of the route (between MP 100 and MP 106 of the proposed route) was also evaluated by SDG&E as PEA Alignment N18-N68 in San Diego County and as part of SDG&E's Segment 9.

This alternative would begin at MP 100 and would travel south for approximately 4.7 miles on the west side of SR79, following the west side (farther from SR79) of an existing SDG&E 69 kV transmission line. Around MP 1.1, the line would be located approximately 400 feet farther west for approximately 0.8 miles to reduce impacts to residential receptors.

Where the southern border of the Santa Ysabel Reservation no longer parallels the east side of SR78 and the valley begins to open up, the alternative route and the existing 69 kV transmission line would cross to the east side of SR79 (approximately 1,800 feet south of School House Canyon Road). The route would be located approximately 800 to 1,600 feet east of SR79 and east of the existing 69 kV poles. The route would continue south for 3.2 miles (19 towers) on the east side of SR79, behind the Santa Ysabel Mission until it would pass east of the Santa Ysabel Substation and then cross SR78 as it turns south in the town of Santa Ysabel. The route would continue south for 0.5 miles before turning southwest for 1.0 mile and rejoining the Proposed Project at approximately MP 109.5 (Tower C11). The alternative is illustrated in Figure Ap.1-12 and would be 0.5 miles shorter than the Proposed Project.

Consolidation Option. An option for this alternative would be a consolidated ROW like the Proposed Project that would include a double-circuit 230 kV with 69 kV underbuild. The existing 69 kV transmission line would be removed for the length of the alternative. With this option the towers would be approximately 10 to 12 feet taller.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Santa Ysabel Existing ROW Alternative would meet all project objectives.

Feasibility

This alternative would cross and parallel the Elsinore Fault and its fault strands along SR79 and would be located within the Alquist-Priolo Fault Zone. This crossing would be overhead and so it should not present any technical feasibility issues. This alternative has the potential to be technically, legally, and regulatorily feasible.

Consolidation Option. Because the existing 69 kV line is proposed to be consolidated on the new towers in this segment of the proposed route, there is a legal nexus between the two lines. Therefore, the option to also consolidate the 69 kV and 230 kV lines with the alternative is a legally feasible option under CEQA/NEPA. The Consolidation Option is also potentially technically, legally, and regulatorily feasible.

Environmental Advantages

Existing SDG&E Right-of-Way. This alternative would parallel an existing SDG&E 69 kV transmission line ROW and relocation would not be necessary (except for with the Consolidation Option). In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Visual Resources. The northern part of the alternative that would be to the west of SR79 would largely be blocked by trees adjacent to the roadway. The southern part of the alternative on the east side of SR79 would move the route in Santa Ysabel Valley so it would not run right down the center of the valley (both alongside and then south of Mesa Grande Road) to the location of the existing 69 kV line east of the highway. Visually, the alternative route would be better overall than the proposed route.

Biological Resources. The northern part of the route would be closer to SR79, and therefore, the route could pass through more disturbed and less sensitive habitat closer to the roadway. The entire alternative would also be located in an already disturbed corridor of the 69 kV line.

Shorter Length and Ground Disturbance. This route would be approximately 0.5 miles shorter than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Figure Ap.1-10. Central Link – Alternatives Considered
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Figure Ap.1-11. Central Link – Alternatives Considered – Santa Ysabel Detail
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Figure Ap.1-12. Santa Ysabel Valley Alternatives Retained
[CLICK HERE TO VIEW](#)

Environmental Disadvantages

Land Use. The alternative route would pass behind the Santa Ysabel Mission to the east of SR79.

Visual Resources. The alternative would be highly visible in the valley to the west of SR79 and the introduction of industrial character from the transmission line would be a major impact to this undeveloped open space. The lines may impact views from the Inaja Overlook off of SR78 and looking west out of the Town of Julian.

Wilderness and Recreation. The route would cross approximately 1.2 miles of the Santa Ysabel Open Space Preserve that is operated by the County of San Diego. It would also cross the trailhead of the West Vista Loop Trail within the Preserve.

Geologic Resources. The Elsinore Fault is located parallel to SR79 and the Santa Ysabel Valley in the northern portion of this alternative. Recent research on the Julian segment of the Elsinore Fault indicates that this segment ruptures infrequently (approximately every 2,000 to 3,000 years, with the last earthquake at about 1,500 to 2,000 years ago) with larger earthquakes that could potentially result in offsets ranging from 2 to 5 meters, depending on the size of the earthquake and length of the fault rupture. However, the crossing would be overhead so impacts would be less than significant in the event of a seismic event.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and would be potentially feasible. In addition, the alternative would parallel an existing ROW and no relocation would be required. The southern part of the alternative on the east side of SR79 would move the route away from the center of Santa Ysabel Valley to reduce impacts of the proposed route. Therefore, this alternative has been retained for full analysis in this EIR/EIS.

4.4.2 Santa Ysabel All Underground Alternative

Alternative Description

This alternative was suggested by several commenters and San Dieguito River Valley Regional Open Space Park during scoping and it is illustrated in Figures Ap.1-11 and Ap.1-12. This alternative would include undergrounding the 230 kV transmission line within SR79 through Santa Ysabel and the underground ROW would be 60 feet wide.

With the landowner's suggestion during scoping, the route has been modified to avoid the active fault zone of the Elsinore Fault, which is located parallel to SR79 and the Santa Ysabel Valley in the northern portion of this alternative. The underground route would be in hay fields on private ranching lands generally parallel to SR79.

The 8.9-mile alternative route would diverge from the proposed route at MP 100 and would follow the existing 69 kV ROW overhead for approximately 1,100 feet south until the line would be west of the Alquist-Priolo Fault Zone. The line would transition underground and would travel south for approximately 0.9 miles while being located east of and parallel to the existing 69 kV ROW. The Santa Ysabel All Underground Alternative would then turn east for approximately 1,500 feet and would cross a drainage area that would require a horizontal directional drill as well as existing hay fields to intersect

SR79. To the extent feasible, any vaults in operational agricultural fields would be located to line up with fence lines in the field to minimize interference with plowing operations. The alternative route would enter SR79 south of the designated Elsinore Fault Alquist-Priolo Fault Zone and would travel south in the roadway.

South of Mesa Grande Road, this alternative would be the same as the Santa Ysabel Partial Underground Alternative (see Section 4.4.3). The route would travel underground in SR79 for 3.5 miles to its intersection with SR78. A bridge crossing would be required south of Mesa Grande Road on SR79, which would require Caltrans approval because it would involve installation of a self-support bridge on both sides. The line would jog east passing the existing Santa Ysabel Substation and turning south for 0.6 miles on access roads for the existing Santa Ysabel-Creelman 69 kV transmission line. Where the existing 69 kV line turns southwest, this alternative would turn west-southwest and would follow an existing dirt road for approximately one mile to minimize land use impacts. It would rejoin the proposed route at approximately MP 109.4 where it would transition overhead.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Santa Ysabel All Underground Alternative would meet all project objectives.

Feasibility

Legal and Regulatory Feasibility. This alternative has the potential to be legally and regulatorily feasible. An Encroachment Permit would be required from Caltrans in order to place the underground transmission line within its ROW. A bridge crossing would be required south of Mesa Grande Road on SR79, which would require Caltrans approval because it would involve installation of a self-support bridge on both sides. An encroachment permit would also be required if the self-support bridge is within Caltrans ROW, but it should not present a regulatorily feasibility issue as long as, in the event of an accident, the bridge would not be a hazard to any vehicles leaving the roadway (Caltrans, 2007a).

In addition, a portion of SR79 is located on Tribal land (where the Santa Ysabel Reservation is located below or east of the roadway). The SR79 ROW, which was approved by the U.S. Department of the Interior Bureau of Indian Affairs on November 17, 1939, varies in width within this segment and is comprised of a strip of land lying between two ownerships, which are divided by the boundary between the Santa Ysabel Reservation and the Moretti family. The dividing line is neither parallel with or evenly split within the ROW. Caltrans has stated that the SR79 ROW may be a conditional easement granted for State highway purposes only. Therefore, Caltrans is researching whether approval of a non-highway facility, such as a transmission line, to be located within the State highway would require Caltrans, Bureau of Indian Affairs, or Santa Ysabel Tribe approval (Caltrans, 2007b). Because construction

would be entirely in the road, at this time it is assumed that approval would be granted and the alternative would be legally feasible.

Technically Feasible. The Elsinore Fault is located parallel to SR79 and the Santa Ysabel Valley in the northern portion of this alternative. Recent research on the Julian segment of the Elsinore Fault indicates that this segment ruptures infrequently (approximately every 2,000 to 3,000 years, with the last earthquake at about 1,500 to 2,000 years ago) with larger earthquakes that could potentially result in offsets ranging from 2 to 5 meters, depending on the size of the earthquake and length of the fault rupture. The Alquist-Priolo Fault Zone of the Elsinore Fault is depicted in Figure Ap.1-13.

Due to SR79's location parallel to the fault strands and crossing many fault traces down the Santa Ysabel Valley, in the event of a seismic event, multiple sections of duct bank could be affected. Therefore, the route has been moved west of and outside of the Alquist-Priolo Fault Zone onto private ranching roads. The Santa Ysabel All Underground Alternative would be technically feasible.

Environmental Advantages

Visual Resources. Visual impacts from the Proposed Project would be eliminated between MP 100.5 and MP 109.5. If the existing 69 kV line were to be collocated underground with the 230 kV line then the existing visual resources conditions would be improved in the scenic Santa Ysabel Valley.

Biological Resources. Construction would primarily occur in paved State highways, which are in good condition, or in dirt roadways through agricultural/ranching lands, and therefore, disturbance to vegetation and wildlife habitat would be reduced. Construction within San Dieguito Park would be avoided.

Cultural Resources. Construction would primarily occur in a paved highway or dirt roadways, and therefore, the potential to impact known or unknown cultural or archaeological resources is less.

Reduced Fire Risk. Underground transmission lines would reduce fire risk and would not impede fire fighting ability in the Santa Ysabel Valley.

Recreation. This alternative would be underground in SR79 through the San Dieguito River Park's Focused Planning Area, thereby eliminating operational impacts to recreation.

Environmental Disadvantages

Ground Disturbance. Construction of this underground alternative (two 230 kV circuits) would require substantially more construction activity and ground disturbance due to the continuous trenching required. In areas where spacing is limited, construction activities would have to occur outside of the existing roadway. Overhead transmission line construction would result in construction disturbance primarily at individual structure sites, located approximately every 1,000 feet along the alignment. Underground construction and trenching would involve much greater ground disturbance and construction-related impacts (traffic, air quality and dust, and noise). There is also a greater potential to encounter contaminated soils and cultural resources, and to impact biological resources due to the greater ground disturbance. A new permanent 20-foot-wide, one-mile-long dirt road would be trenched in the southern end of this alternative.

Transition Stations. Construction of the transition stations south of MP 100.5 and at MP 109.5 would each require a footprint of 1 to 1.25 acres, resulting in temporary and permanent biological, cultural, and visual resources impacts as well.

Construction and Repair Time. The installation of an underground transmission line would require more time than construction of an equivalent length of overhead line because of the time required for excavating trenches, constructing the duct banks, fluid reservoirs, and/or stop joints. Construction could be substantially extended due to restrictions on the times of the year available for construction, required to limit the impacts on the environment. In addition, maintenance and restoration time in the event of an outage would also be more difficult and could result in longer outages and repair times. Accessing manholes will require intensive traffic control. In addition, duct bank repair would require rock excavation, traffic control, and possible roadway closure. In addition, the close proximity of the underground circuits will likely cause mutual inductance. To maintain these circuits safely, it may be required to de-energize all underground circuits when doing maintenance on any one circuit. This could cause some problems with service to customers, especially if the 69 kV needs to be de-energized on a regular basis. Although electric fields are reduced with increasing burial depth, magnetic fields above underground conductors are generally higher than from overhead lines due to closer proximity to the conductors to the ground.

Transportation. Though there is adequate space on both sides of SR79, which is a two-lane roadway with one lane for each direction, during underground vault construction and in some cases during trenching, the road will have to be closed and the traffic detoured, which could place a burden on the surrounding residents, recreationists, motorists, and businesses relying on trucking. If traffic has to be maintained with one lane open, construction activities would be limited to one lane of work space. Productivity and work efficiency would be impacted tremendously, significantly increasing construction time and costs.

Geologic Resources. Recent research on the Julian segment of the Elsinore Fault indicates that this segment ruptures infrequently (approximately every 2,000-3,000 years, with the last earthquake at about 1,500-2,000 years ago) with larger earthquakes that could potentially result in offsets ranging from 2 to 5 meters, depending on the size of the earthquake and length of the fault rupture. The Earthquake Valley Fault, which is part of the Elsinore Fault Zone, has not been as well studied, however based on its shorter length and smaller estimated max earthquake offsets would more likely be estimated to be within the range of several feet. There is some interaction off these two faults in the area and they could both potentially rupture with a large earthquake on the Elsinore fault. There is also some speculation that some of the slip along the Julian segment of the Elsinore fault is being transferred to the Earthquake Valley fault, which could ultimately result in larger earthquakes on this fault.

Alternative Conclusions

RETAINED FOR ANALYSIS. This underground alternative would meet project objectives and has the potential to be feasible because it would cross the Elsinore Fault overhead and would be west of the Alquist-Priolo Fault Zone where it would be underground. This alternative would eliminate visual, recreational, and biological impacts because construction would be entirely within existing ranching roads or SR79 and therefore, this alternative has been retained for full analysis in this EIR/EIS. It should be noted that a partial underground alternative in this area is also discussed under the Santa Ysabel Partial Underground Alternative in Section 4.4.3.

4.4.3 Santa Ysabel Partial Underground Alternative

Alternative Description

This alternative was developed by the EIR/EIS team as a way to reduce visual impacts in the Santa Ysabel Valley and avoid underground crossings of the Elsinore Fault, which parallels SR79. The route

is shown in Figures Ap.1-11 and Ap.1-12. The underground portion of this route would require a 60-foot-wide ROW.

This 230 kV alternative would begin at MP 105.5 where the proposed route would join Mesa Grande Road at the base of the hills at the western side of the Santa Ysabel Valley. The alternative would transition underground at the southern side of Mesa Grande Road and would travel underground a short distance to the roadway where it would turn southeast for 1.3 miles to the Mesa Grande Road/SR79 intersection. This alternative would require a drainage crossing on Mesa Grande Road just west of SR79, which would utilize a jack-and-bore installation at the associated bridge. The Santa Ysabel Partial Underground Alternative would then intersect SR79 south of the Elsinore Fault, which parallels and crosses SR79 a little over one mile to the north.

Once this alternative turns south in SR79, it would be the same as the Santa Ysabel All Underground Alternative (see Section 4.4.2). Likewise, the Santa Ysabel Partial Underground Alternative would require a bridge crossing south of Mesa Grande Road on SR79, which would require Caltrans approval because it would involve installation of a self-support bridge on both sides.

The route would travel underground in SR79 for 3.5 miles to its intersection with SR78. The line would jog east, passing the existing Santa Ysabel Substation and turning south for 0.6 miles on access roads for the existing Santa Ysabel-Creelman 69 kV transmission line. Where the existing 69 kV line turns southwest, this alternative would turn west-southwest and would follow an existing dirt road for approximately one mile. It would rejoin the proposed route at approximately MP 109.5 where it would transition overhead.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Santa Ysabel Partial Underground Alternative would meet all project objectives.

Feasibility

The line would transition underground and join SR79 south of the Alquist-Priolo Fault Zone for the Elsinore Fault so it should not present any technical feasibility issues. The Alquist-Priolo Fault Zone of the Elsinore Fault is depicted in Figure Ap.1-13. Prior to final engineering, trenching to determine the exact location of the fault traces, defined as the zone in which there is a potential for ground rupture due to movement along a fault line, and the Alquist-Priolo Fault Zone would be necessary as to ensure that the underground portions of the route would be at least 50 feet south of the zone.

An Encroachment Permit would be required from Caltrans in order to place the underground transmission line within the SR79 ROW. A bridge crossing would be required south of Mesa Grande Road on SR79, which would also require Caltrans approval because it would involve installation of a self-sup-

port bridge on both sides, but it should not present a regulatory feasibility issue as long as, in the event of an accident, the bridge would not be a hazard to any vehicles leaving the roadway (Caltrans, 2007a).

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Visual Resources. Visual impacts from the Proposed Project would be eliminated in the southern portion of the route along SR79, western Mesa Grande Road and across the valley south of SR78.

Biological Resources. Construction would occur in paved State highways (SR79) and Mesa Grande Road, which are in good condition, and therefore, vegetation and wildlife habitat would not be disturbed. Construction within San Dieguito Park would be avoided.

Cultural Resources. Construction in the southern portion would occur in a paved highway, and therefore the potential to impact known or unknown cultural or archaeological resources is less.

Reduced Fire Risk. Underground transmission lines would reduce fire risk and would not impede fire fighting ability in the Santa Ysabel Valley.

Recreation. This alternative would be underground in SR79 through the San Dieguito River Park's Focused Planning Area, thereby eliminating operational impacts to recreation.

Visual Resources. The alternative would eliminate visual impacts to southern valley area.

Environmental Disadvantages

Ground Disturbance. Construction of this underground alternative (two 230 kV circuits) would require substantially more construction activity and ground disturbance due to the continuous trenching required. In areas where spacing is limited, construction activities would have to occur outside of the existing roadway. Overhead transmission line construction would result in construction disturbance primarily at individual structure sites, located approximately every 1,000 feet along the alignment. Underground construction and trenching would involve much greater ground disturbance and construction-related impacts (traffic, air quality and dust, and noise). There is also a greater potential to encounter contaminated soils and cultural resources beneath the roadway due to the greater ground disturbance.

Transition Stations. Construction of the transition stations along Mesa Grande Road and near MP 109.5 would each require a footprint of 1 to 1.25 acres, resulting in temporary and permanent biological, cultural, and visual resources impacts as well.

Construction and Repair Time. The installation of an underground transmission line would require more time than construction of an equivalent length of overhead line because of the time required for excavating trenches, constructing the duct banks, fluid reservoirs, and/or stop joints. Construction could be substantially extended due to restrictions on the times of the year available for construction, required to limit the impacts on the environment. In addition, maintenance and restoration time in the event of an outage would also be more difficult and could result in longer outages and repair times. Accessing manholes will require intensive traffic control. In addition, duct bank repair would require rock excavation, traffic control, and possible roadway closure. In addition, the close proximity of the underground circuits will likely cause mutual inductance. To maintain these circuits safely, it may be required to de-energize all underground circuits when doing maintenance on any one circuit. This could cause some

problems with service to customers, especially if the 69 kV needs to be de-energized on a regular basis. Although electric fields are reduced with increasing burial depth, magnetic fields above underground conductors are generally higher than from overhead lines due to closer proximity to the conductors to the ground.

Transportation. Though there is adequate space on both sides of the roadway, the entire route consists of two lane roads (Mesa Grande Road and SR79) with one lane for each direction, during underground vault construction and in some cases during trenching, the roads will have to be closed and the traffic detoured, which could place a burden on the surrounding residents, recreationists, motorists, and businesses relying on trucking. If traffic has to be maintained with one lane open, construction activities would be limited to one lane of work space. Productivity and work efficiency would be impacted tremendously, significantly increasing construction time and costs.

Geologic Resources. The Elsinore Fault is located parallel to SR79 and the Santa Ysabel Valley approximately one mile north of this alternative. Recent research on the Julian segment of the Elsinore Fault indicates that this segment ruptures infrequently (approximately every 2,000 to 3,000 years, with the last earthquake at about 1,500 to 2,000 years ago) with larger earthquakes that could potentially result in offsets ranging from 2 to 5 meters, depending on the size of the earthquake and length of the fault rupture. However, the line would be undergrounded in SR79 south of where it parallels SR79 so impacts would be less than significant in the event of a seismic event.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and is potentially feasible because it would have an overhead crossing of the Elsinore Fault and would join SR79 south of the fault crossing. The alternative would reduce significant visual impacts in the Santa Ysabel Valley and to the Santa Ysabel Mission located east of SR79. The portions of the alternative within SR79 would reduce temporary and permanent impacts to biological resources as well. For these reasons, this alternative has been retained for full evaluation in this EIR/EIS.

4.4.4 Mesa Grande Alternative

Alternative Description

This alternative to a one-mile portion of the proposed overhead 230 kV route was proposed by the landowner and also by SDG&E in order to reduce the visibility of the overhead line east of Mesa Grande Road. The route is shown in Figures Ap.1-11 and Ap.1-14.

The route would gradually diverge from the proposed route at MP 101.5 and would travel southeast for approximately 0.7 miles. At MP 102.2 it would turn southwest along the lower portion of the northwesterly facing slope of a small valley running from the northeast to the southwest to cut the angle and rejoin the Proposed Project at MP 103.5, on the southerly side of Mesa Grande Road.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary

objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Mesa Grande Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Visual Resources. The route would traverse the lower portion of the northwesterly facing slope of small valley running from the northeast to the southwest, and would therefore, be located lower on the ridgeline thereby reducing visual impacts of the proposed route on the Santa Ysabel viewshed.

Access Roads and Ground Disturbance. This alternative route would be approximately 0.3 miles shorter than the proposed route. It would also use existing access roads on the Cauzza property, would avoid use of access roads on non-impacted parcels on the Batchelder property, and would require less access road construction.

Land Use. The alternative route is preferred by the landowner.

Environmental Disadvantages

No environmental disadvantages compared to the proposed route have been identified for this alternative segment.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and has the potential to be feasible. It has been retained for full analysis in this EIR/EIS, because it would reduce visual resources impacts, require fewer access roads, and it is the landowner's preference.

4.4.5 SDG&E Central East Substation to SR79 Alternative

Alternative Description

This alternative was suggested during scoping and was retained for evaluation by SDG&E as PEA Alignment N67B-N17 and N16A-N16B. The route is illustrated in Figure Ap.1-10. This alternative would begin at the west side of the Central East Substation and would travel west and northwest approximately 5.0 miles crossing to the north of the San Felipe Hills Wilderness Study Area through Vista Irrigation District land to rejoin the proposed route at MP 97.4. Lattice steel towers would be used for this alternative and it would be 0.75 miles shorter than the proposed route.

Figure Ap.1-13. Elsinore Fault Alquist-Priolo Fault Zone
[CLICK HERE TO VIEW](#)

Figure Ap.1-14. Mesa Grande Alternative
[CLICK HERE TO VIEW](#)

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Central East Substation to SR79 Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Shorter Length and Ground Disturbance. This route would be 0.75 miles shorter than the Proposed Project, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native vegetation.

Visual Resources. The alternative route, exiting the proposed Central East Substation site to the west, would be less visible than the proposed route that exits the substation to the north.

Environmental Disadvantages

VID Preserve Land. The land on which this alternative would be built is owned by Vista Irrigation District (VID) and it will never be developed because it has been preserved due to its proximity to the district's water supply and Lake Henshaw. VID has indicated that it prefers the proposed route in this segment.

Land Use and Recreation. This alternative route would cross through and would be visible to the Mataguay Reservation, a Boy Scout camp that is accessed via a dirt road from SR79 at MP 98.

Cultural Resources. This route would be farther south and away from S2, as well as closer to the Santa Ysabel Reservation. A greater extent of prehistoric habitation site CA-SDI-17285 would be impacted by the Central East Substation to SR79 Alternative than the Proposed Project. The site is located where the proposed and alternative routes meet (approximately MP 97.2 to 97.5).

Water Quality. Because this alternative would be located on VID preserve land, ground disturbance and erosion during construction activities could increase sediment load and impact water quality in the area.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be feasible. Even though visual impacts could be reduced in the Central East Substation area, overall this alternative, which is located on preserve land, does not reduce significant impacts of the Proposed Project and Vista Irrigation District, the landowner, prefers the proposed route. Therefore, this alternative was eliminated from full consideration in this EIR/EIS.

4.4.6 SDG&E Warner S2 to SR79 Alternative

Alternative Description

This alternative was suggested by SDG&E in the PEA. It would begin at the Central East Substation and would travel north and then northwest parallel to S2 to its intersection with SR79 at the site of the Warner Substation Alternative (see Section 4.7.4). It would then turn southwest paralleling SR79 to rejoin the proposed route at MP 99.9. The route is depicted in Figure Ap.1-10.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Warner S2 to SR79 Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Existing S2 and SR79 ROW. The alternative would continuously parallel the existing S2 and SR79 ROW. Following an existing transportation corridor, which is considered developed, is preferable, especially for biological and cultural resources, to traversing open space.

Environmental Disadvantages

Visual Resources. This alternative area, especially at the highly visible S2 and SR79 intersection, is generally located in flat open space and would be highly visible to travelers on SR79 and for a far distance across the valley.

Longer Length of Transmission Line and Ground Disturbance. The intersection of SR79 and S2 is 1.5 miles north of the proposed route creating a longer transmission line. This will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and

geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with greater ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of less native desert vegetation.

VID Preserve Land. The route would be located on part of Vista Irrigation District land in an area preserved to protect the water supply and is farther north and closer to Lake Henshaw. Therefore, the surrounding area will never be developed and a transmission line would introduce industrial facilities into otherwise undeveloped open space.

Cultural Resources. A records search has not been performed for that area, but the existing Warner Substation is across SR79 from the site of Camp Wright, a Civil War era military camp and within or adjacent to the former Warner Ranch so there could be cultural resource concerns.

Biological Resources. The open space grassland habitat surrounding the S2 and SR79 intersection near the Warner Substation supports Stephen's kangaroo rat (*Dipodomys stephensi*), a federally listed endangered species.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially feasible. Although it would follow developed transportation corridors, the SDG&E Warner S2 to SR79 Alternative would be much more visible in the scenic valley creating new significant visual impacts. Therefore, due to greater environmental impacts, this alternative has been eliminated from full consideration in this EIR/EIS.

4.4.7 Volcan Mountain Alternative

Alternative Description

This alternative was developed by the EIR/EIS team to avoid much of the San Felipe Valley and the Santa Ysabel Valley. It would be 15 miles shorter than the proposed route and would eliminate construction of the Central East Substation. The route is shown in Figure Ap.1-10.

This alternative would begin at the San Felipe Substation (MP 58.8), approximately two miles east of ABDSP, and would include installation of a double-circuit bundled 230 kV line underground in Old Kane Springs Road and in SR78 through ABDSP. East of the Earthquake Valley Fault, which is one mile east of the SR78/S2 intersection, this alternative transition overhead on the north side of SR78 (to avoid an overhead crossing of SR78) would continue west and southwest paralleling SR78 (past S2) for approximately 5.0 miles to just east of the Banner Grade.

Just east of the Banner Grade, the route would turn north-northwest across BLM land and the Volcan Mountains and then west for approximately 7.5 miles passing less than 2 miles north of the Town of Julian. Where the alternative would intersect the existing SDG&E 69 kV Warner-Santa Ysabel corridor just east of SR79, the route would turn south for 0.3 miles paralleling SR79 and the 69 kV line (east of SR79) across the Santa Ysabel Open Space Preserve. The alternative would pass east of the Santa Ysabel Substation and then cross SR78 as it turns south, just south of the town of Santa Ysabel. The route would continue to follow the 69 kV line south for 0.5 miles before turning southwest for 1.0 mile and rejoining the Proposed Project at approximately MP 110 (Tower C11).

As mentioned above, the proposed Central East Substation would not be constructed with this alternative. Instead a new 500 kV/230 kV substation would be constructed adjacent to the existing IID San Felipe Substation to accommodate the new transmission line.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Volcan Mountain Alternative would meet all project objectives.

Feasibility

Legal Feasibility. This alternative has the potential to be legally feasible.

Technical Feasibility. This alternative would cross the Earthquake Valley Fault and its Alquist-Priolo Fault Zone just east of the SR78 and S2 intersection. The line would transition to overhead 50 to 100 feet east of the fault zone. Trenching prior to final engineering would determine the exact location of the easternmost fault traces. Therefore, this crossing would be overhead and so it would not present any significant technical feasibility issues. Although helicopter construction would likely occur in places, construction across Volcan Mountain (1,600 meters elevation) is potentially technically feasible as well.

Regulatory Feasibility. Because the alternative would need to transition overhead east of the Earthquake Valley Fault and its Alquist-Priolo Zone, the route would travel overhead for almost two miles within the State-designated Grapevine Mountain Wilderness. This would require a re-designation of Wilderness Area and a State Park Plan Amendment and thus faces regulatory issues, and could delay the in-service date. The Park's General Plan does not allow the transmission lines in this portion of the Park and this route and the ABDSP has indicated they do not want to change a designated State Wilderness Area boundary when there is a corridor through the ABDSP that already provides for co-location of a proposed transmission line with an existing line. Therefore, the regulatory feasibility of this alternative is in question.

Environmental Advantages

Shorter Length and Ground Disturbance. This route would be 15 miles shorter than the Proposed Project, which will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native vegetation.

Elimination of Central Substation Construction. Under this alternative, the proposed Central East Substation would not be constructed. This alternative would eliminate disturbance of approximately 106

acres and approximately 1.5 to 1.8 million cubic yards of cut and fill earthwork. In addition, one mile of 500 kV transmission line into Central East Substation and one mile of 230 kV transmission line out of the substation to reconnect with the proposed route would be eliminated.

Visual Resources. The alternative would eliminate all visual impacts to the scenic Santa Ysabel Valley and Grapevine Canyon that would occur with the Proposed Project. Only one mile of transmission line would be overhead within ABDSP with this alternative.

Cultural Resources. This alternative would avoid the known and unknown cultural resources within Grapevine Canyon and the Angelina Springs District.

Environmental Disadvantages

Wilderness and Recreation. This alternative would cross Volcan Mountains within Volcan Mountain Wilderness Preserve and would cross through the Santa Ysabel Open Space Preserve, which both have many hiking trails. Since 1988, the Volcan Mountain Preserve Foundation, private organizations, public governmental agencies, and principal landowners on the mountain have preserved over 4,500 acres in public ownership. The largest portion is the San Diego County Department of Parks and Recreation's Volcan Mountain Wilderness Preserve. San Dieguito River Park and California Department of Fish and Game administer other portions of the acreage on the east side of Volcan Mountain. In addition, this route would transition overhead within Grapevine Mountain Wilderness and would parallel SR78 to the north side within the Wilderness Area for almost two miles.

Biological Resources. Volcan Mountain is a 15-mile ridge that stretches from Lake Henshaw to the Anza Borrego Desert with the historic town of Julian to its south and covers more than 25,000 acres. Due to its size and elevation there is a wide range of different habitats from mixed evergreen forest on its highest ridges to the southern oak woodlands found on the western slopes to the mixed desert chaparral slopes which extend east to Anza Borrego Desert State Park, all of which would be impacted with this alternative crossing from east of Julian to SR79. A report prepared by the Nature Conservancy and Conservation Biology Institute for the Volcan Mountain Preserve Foundation and titled "Conservation Significance of the Volcan Mountains, San Diego County" (September 2005) discusses the ecological, biodiversity, and biological importance of the Volcan Mountains.

The Volcan Mountains provide an east-west landscape linkage between protected lands in the desert and the San Dieguito River Valley, and a north-south linkage between Palomar Mountain State Park and adjacent U.S. Forest Service land, VID water district land around Lake Henshaw, and federal and state lands to the south in the Cuyamaca and Laguna Mountains. Connectivity between habitats allows movement of demographic and genetic information, which is important in response to events such as catastrophic wildfires or long-term climate change. Because the Volcan Mountains complex supports the headwaters of several watersheds, is part of a large and intact block of natural open space, and provides a landscape linkage, it allows for landscape-scale functions in the region that stretch across ecological gradients, provide species refugia, and link adjacent habitat blocks to maintain viable populations of large-area dependent species, such as mountain lions. This alternative would cross the Volcan Mountain Open Space Preserve and the Santa Ysabel Open Space Preserve.

New Transmission Corridor. This alternative would establish a new transmission line corridor along SR78, which is more traveled than the proposed route, and across Volcan Mountain. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate

transmission line corridors. Because there are no access roads in the area, spur roads from SR78 would likely be required as well.

Visual Resources. This alternative would create visual impacts from the Inajas Overlook on views of SR78 west of Julian and from the recreational hiking trails within Volcan Mountain Preserve and Santa Ysabel Open Space Preserve. Rutherford Ranch, which is located between the Volcan Mountain and Santa Ysabel Open Space Preserves and has a highest elevation of 5,850 ft, is within the viewshed of every park and open space area within at least 12 miles, including the County of San Diego Santa Ysabel Ranch Open Space Preserve, the County's Volcan Mountain Open Space Preserve, San Dieguito River Park open space west of Highway 79, Cuyamaca Rancho State Park, the California Department of Fish and Game (CDFG) San Felipe Creek reserve, William Heise County Park, and the town of Julian. A new transmission line on the southwestern flank of Rutherford Ranch would be visible to the surrounding area and the town of Julian.

Cultural Resources. A report prepared by the Nature Conservancy and Conservation Biology Institute for the Volcan Mountain Preserve Foundation and titled "Conservation Significance of the Volcan Mountains, San Diego County" (VMPPF, 2005) stated that over 60 historic and prehistoric sites have been recorded on public lands in the Volcan Mountains, harboring an abundance of rock architectural structures, unique milling features (called Cuyamaca Ovals), pottery, trade items, and habitation areas (Hector, 2003). Most of the habitation sites are located on the western side of the ridge, overlooking the Santa Ysabel Valley and Julian, and could be impacted by this alternative. Many of the sites are associated with the travel route between the Anza-Borrego Desert, San Felipe Valley, and Cuyamaca Mountains through Arkansas Canyon. The Volcan Mountains have also been the site for an educational and training program for volunteers, called the Volcan Mountain Preserve Archaeological Survey.

Geologic Resources. This alternative would cross the Earthquake Valley Fault and within its Alquist-Priolo Fault Zone at the SR78 and S2 intersection. This crossing would be overhead and so it should not present any significant impacts in the event of a seismic event.

Hydrology and Water Quality. The headwaters of the San Dieguito River, San Luis Rey River, San Diego River, and San Felipe Creek originate in the Volcan Mountains. The Volcan Mountains also support diverse wetland communities, including riparian woodlands and riparian scrub, wet meadows and seeps, and freshwater marshes supported by springs on the ridge. Ironside Spring and Rock Spring, both on Rutherford Ranch, form the headwaters for the San Dieguito River watershed. As a result, ground disturbance and erosion related to construction of this alternative could affect the water quality and hydrology of the watersheds of Santa Ysabel Creek, San Diego River, San Felipe Creek, and two drinking water reservoirs.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible. The route would create a new corridor through Grapevine Mountain Wilderness, which would create regulatory feasibility issues. In addition, a new overhead transmission corridor would be created across Volcan Mountain Open Space Preserve and Santa Ysabel Open Space Preserve. The Volcan Mountains are rich with biological and cultural resources and are important watershed areas. The line would be visible from a portion of SR78, from the preserves, which have many hiking trails, and from the town of Julian. Although the Volcan Mountain Alternative would reduce significant impacts of the proposed route in ABDSP and Santa Ysabel Valley and would be approximately 15 miles shorter, it would simply transfer the significant impacts to the Volcan Mountains. Because this alternative would have regulatory feasibility issues associated with the creation of a new transmission corridor

in Wilderness and would create new significant impacts of its own, the Volcan Mountain Alternative has been eliminated from full consideration in this EIR/EIS.

4.4.8 SDG&E San Dieguito Park Alternative

Alternative Description

This alternative was suggested by SDG&E as PEA Alignment N46-N76-N20B in San Diego County. The alternative would begin at MP 103.5 and would travel south for approximately 5.97 miles through San Dieguito River Valley Regional Open Space Park and east of the Mesa Grande Reservation, following parcel and agency boundaries to rejoin the Proposed Project at MP 110.5 (adjacent to the site of the SDG&E alternative Central South Substation site). This alternative is illustrated in Figure Ap.1-10 and would be 1.03 miles shorter than the Proposed Project.

For this alternative segment, the existing 69 kV transmission line would be relocated to parallel the new 230 kV transmission line. The new 69 kV transmission structures would be tubular steel poles. The existing 69 kV transmission line would be removed from MP 100 to Santa Ysabel Substation (east of MP 108).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E San Dieguito Park Alternative would meet all project objectives.

Feasibility

The Proposed Project would have a total of 36 affected parcels, representing 7 private ownership entities and no publicly owned parcels. The alternative alignment would have a total of 28 affected parcels, representing 4 private ownership entities, in addition to parcels owned by the County of San Diego, San Dieguito River Park Joint Powers Authority, San Dieguito River Valley Regional Open Space Park, and a United States of America Indian Reservation. Crossing two parcels owned by the Santa Ysabel Reservation could create legal feasibility issues since the Tribe would have to issue a ROW grant to cross the reservation land. If the Santa Ysabel Tribe were to approve the project then this alternative would be technically, legally, and regulatorily feasible.

Environmental Advantages

Visual Resources. The proposed route is highly visible within the undeveloped Santa Ysabel Valley from Mesa Grande Road and SR79, and therefore moving the route farther west reduce impacts to sensitive viewers in the area and travelers on the roadways. In addition, the existing 69 kV poles would be removed.

Traffic and Transportation. According to Caltrans during the highest traffic volume month in 2005, at the intersection of San Felipe Road (S2) and SR79 the traffic volume was 3,900, at the junction of

SR76 and SR79 the volume was 3,600, and at the junction of SR78 and SR79 the volume was 3,400 (Online at <http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2005all/docs/rt071-80.htm>). The alternative route would be farther from SR79 and would have less impact on traffic during construction.

Environmental Disadvantages

Wilderness and Recreation. This alternative would traverse through a pristine and publicly protected segment of the San Dieguito River Valley Regional Open Space Park between Lake Sutherland and SR79. The Proposed Project would traverse the San Dieguito River Valley Regional Open Space Park for approximately 1.5 miles and does not traverse any other preserve, reserve, open space, or park. The San Dieguito Park Alternative would traverse the San Dieguito River Valley Regional Open Space Park for approximately 0.8 miles and through the Santa Ysabel Open Space Preserve for approximately 0.6 miles and then would parallel it for approximately 2.7 miles.

Visual Resources. The County of San Diego and San Dieguito River Park staff have serious concerns about visual impacts on recreational users with this route.

Biological Resources. The alternative would be located in less disturbed habitat and thus would have a greater potential to temporarily and permanently disturb sensitive habitat and wildlife.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically feasible. Legal feasibility would hinge on approval by the Santa Ysabel Tribe for a ROW Grant/Easement for the project across their two parcels. This alternative would improve the visual impacts in the Santa Ysabel Valley by moving the line west and away from SR79; however, it would place the transmission line in a new corridor on County Park and preserve lands that is highly visible to recreationists and is located in less disturbed habitat. As a result of potential legal feasibility concerns and transferring of the visual impacts of the proposed route, this alternative would not meet the environmental criteria to carry forward for full evaluation in this EIR/EIS.

4.5 Inland Valley Link Route Segment Alternatives

The Inland Valley Link of the Sunrise Powerlink Transmission Line project generally would consist of a double-circuit 230 kV transmission line between the western boundary of the Central Link (MP 110.8) and the existing Sycamore Canyon Substation (MP 136.3). This portion of the Proposed Project would consist of both overhead and underground segments.

The following section of the Alternatives Screening Report represents a comprehensive summary and assessment of all transmission line (wires) alternatives including those originally developed by SDG&E, alternatives suggested by the public and agencies during review of the NOP and NOI and during public scoping efforts and also includes all alternatives developed independently by the CPUC, BLM and their EIR/EIS team. To date, seven Inland Valley Link alternatives have been developed. Four of the Inland Valley Link alternatives are recommended to be retained for further analysis in the EIR/EIS. Each of the Inland Valley Link Alternatives is described below and all of the Inland Valley Link route segment alternatives are shown in Figure Ap.1-15.

4.5.1 CNF Existing 69 kV Route Alternative

Alternative Description

This alternative was suggested during scoping to avoid scattered single-family residences on SR78 and Deer Canyon Drive in unincorporated San Diego County. At MP 111.3 where the proposed 230 kV and existing 69 kV transmission lines would be routed west for 0.5 miles and then south for approximately 0.5 miles to avoid Cleveland National Forest (CNF), the CNF Existing 69 kV Route Alternative would remain in the existing 69 kV ROW heading southwest through Cleveland National Forest for approximately 0.5 miles to rejoin the proposed route at MP 111.8. Therefore, this alternative would be 0.5 miles shorter than the Proposed Project and the existing 69 kV transmission line would not need to be relocated. The route is shown in Figures Ap.1-15 and Ap.1-16.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The CNF Existing 69 kV Route Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. *Special Use Authorization and Forest Land Management Plan Amendment.* Because the alternative transmission line route would cross approximately 0.5 miles of federal NFS lands managed by the CNF, the project would also require an authorization (i.e., 50-year term Special Use Ease-

ment) from the Forest Service for the portion of the project within a 200-foot-wide easement across NFS land. The Forest Service would have to respond to the special use application through the issuance of a Special Use Easement and to ensure the project is in compliance with the 2005 CNF Land Management Plan (Forest Plan) per 36 CFR 219.10(e). The purposes (objectives) are to minimize adverse impacts on NFS lands and minimize adverse impacts to forest management activities. This action would trigger the National Environmental Policy Act (NEPA) process. In addition, use of this alternative would include issuing one or more temporary Special Use Permits for any ground disturbing activities on NFS lands that would occur during construction activities and would be located outside the 200-foot ROW width and amending the Forest Plan to ensure the project is in compliance.

NEPA mandates that federal agencies consider the environmental consequences of a wide variety of proposed actions. Specifically, NEPA requires federal agencies to prepare an EIS for “proposals for legislation and other major federal actions significantly affecting the quality of the human environment.” When the federal agency determines that a proposed action may “significantly affect the quality of human environment,” an EIS is required (42 U.S.C 4332 (2)(c)). The CNF is a cooperating agency for this EIR/EIS, but it would be determined by CNF whether this EIR/EIS would fulfill its needs as a NEPA document for the short segment across Forest land. However, a Plan amendment would also be required.

After the completion of the Final EIR/EIS, the Forest Service will issue a Record of Decision (ROD), which documents the Forest Service decision on whether to approve authorizing a Special Use Easement (and possibly temporary special use permits for construction) for this alternative route, or deny SDG&E’s application and the rationale for that decision. The ROD will include a decision on Forest Plan amendments if necessary, before Special Use authorizations can be issued to SDG&E for this alternative. This ROD is subject to administrative review and may be appealed under 36 CFR 215. To implement the project, the Regional Director of Natural Resource Management of the Forest Service would authorize a 50-year term Special Use Easement for the construction, maintenance, and use of the 230 kV transmission line along with ancillary improvements on NFS lands. Temporary Special Use Permits would also likely be necessary for any construction work that occurs on NFS lands outside the proposed 200-footwide ROW. As a result the schedule for the project could be delayed, but crossing National Forest land would be potentially regulatorily feasible.

Section 4.8.1 discusses in greater detail the regulatory requirements associated with routes that would traverse Cleveland National Forest.

Environmental Advantages

Shorter Length and Ground Disturbance. This route would be approximately 0.5 miles shorter than the proposed route and it would not require the relocation of the existing 69 kV transmission line. In addition, no new access roads would be needed because the existing 69 kV access roads could be utilized. This will affect the length and intensity of short-term construction impacts and ground disturbance, decreasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Figure Ap.1-15. Inland Valley Link – Alternatives Considered
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Already Disturbed Corridor. Use of this alternative would not create (and disturb) and new transmission line corridor. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Land Use. This alternative would be within CNF and farther from residences along SR78 and Deer Canyon Road.

Visual Resources. The CNF Existing 69 kV Route Alternative would be farther from SR78 within CNF.

Environmental Disadvantages

CNF Land. The CNF Existing 69 kV Route Alternative would be located within a National Forest (see Regulatory Feasibility above).

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and would be potentially feasible. Although the route would be located within Cleveland National Forest and would require a Plan Amendment, the route would be 0.5 miles shorter, within an existing corridor, and no new access roads or relocation of the existing 69 kV transmission line would be required. Therefore, this alternative has been retained for full analysis in this EIR/EIS.

4.5.2 Oak Hollow Road Underground Alternative

Alternative Description

During scoping, comments from the Starlight Mountain Estates Owners (SMEO) suggested that the project be constructed as an underground facility within a 60-foot ROW, following a portion of Oak Hollow Road, in order to avoid existing improvements and follow a route currently agreed among the Starlight Mountain Estates Owners. The purpose of this alternative would be to extend the proposed underground segment of the 230 kV line further so it would be underground through the residential valley area, as is shown in Figures Ap.1-15 and Ap.1-17.

This alternative would require construction of one new tower just outside of but adjacent to the existing 69 kV ROW, then one overhead span to two transition towers (cable poles). The line would go underground at approximately MP 116.7 (around proposed Tower I93) within Mt. Gower Open Space Preserve on a hill approximately 100 feet north of an existing dirt access road. The alternative would enter private property and would travel underground in the dirt road for approximately 1,400 feet before passing between a residence and a fenced pasture to join the residence's paved driveway at its intersection with Oak Hollow Road. The route would turn west and would travel underground in paved Oak Hollow Road for approximately 1,300 feet. When Oak Hollow Road turns into a dirt road, just west of the most western driveway in the SMEO area, the line would continue west-southwest in a maintained dirt and gravel access road (Oak Hollow Road) to exit SMEO private property, traveling under a fenced gate into Mt. Gower Open Space Preserve for approximately 600 feet to west of Structure I125. The alternative would continue into Gunn Stage Road and would rejoin the underground segment of the proposed route at MP 117.3 along Gunn Stage Road.

The alternative transition tower would replace Tower I93, and Towers I92, I91, I90, and I89 and the proposed transition poles would be eliminated. The alternative would require 0.6 miles of additional underground transmission line.

Consolidation Option. The homeowners also suggested an option in which the existing 69 kV facility would be placed underground along with the new 230 kV transmission line. The existing 69 kV line currently serves the Creelman and Santa Ysabel Substations and is independent of the function of the Proposed Project.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Oak Hollow Road Underground Alternative would meet all project objectives.

Feasibility

Technical Feasibility. Oak Hollow Road is 16 feet wide (asphalt or dirt/gravel), within a 60-foot private road easement. According to Starlight Mountain Estates Owners, there are currently no underground utilities (electric, gas, water, cable, etc.) within, adjacent or near the parts of Oak Hollow Road that would be used in this alternative underground alignment. The service road, which travels east from Tower I92 is a maintained 12-foot-wide dirt access road for the existing 69 kV lines. Similarly, the service road does not have any underground utilities within it. There are two 12- to 18-inch underground drainage pipes/culverts that would need to be crossed. One is under a paved part of Oak Hollow Road, and the other is under the fenced pasture just east of where the line would join Oak Hollow Road (it runs between the residence and the fenced pasture). Therefore there should be adequate space to underground in the roadways and this alternative would be technically feasible.

Regulatory Feasibility. This alternative has the potential to be regulatorily feasible.

Legal Feasibility. The Oak Hollow Underground Alternative has the potential to be legally feasible.

Consolidation Option. The 69 kV consolidation option would include undergrounding segments of both the existing 69 kV line and the new 230 kV lines in roadways adjacent to the existing alignment. The 69 kV line is already in place, and thus is part of the environmental setting against which environmental impacts are judged.

Where the Proposed Project or an alternative segment requires modifications to the existing 69 kV line (e.g., upgrading of the existing poles), and those alterations create adverse impacts, an alternative that would entail placing portions of the 230 kV line underground along the current underground alignment of the existing 69 kV line may properly consider collocating the 69 kV line in such an underground alignment to mitigate those impacts. However, with the Oak Hollow Underground Alternative, the objectives of the Proposed Project could be fully met without any change to the 69 kV line.

Figure Ap.1-16. CNF Existing 69 kV Route Alternative
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Figure Ap.1-17. Oak Hollow Road Underground Alternative
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A separate alignment for the 230 kV underground line avoids the adverse impacts of the Proposed Project that are caused by the overhead 230 kV line adjacent to the 69 kV line in its current ROW. None of the impacts of the Oak Hollow Underground Alternative result from the existence, location or operation of the existing 69 kV line which is part of the existing environmental baseline condition.

The Oak Hollow Underground Alternative would meet all project objectives by installing a 230 kV line only. This alternative would create no visual, recreational, or land use impacts along the existing 69 kV corridor. Therefore, the relocation or elimination of the existing 69 kV lines cannot be considered as components of these alternative options.

Environmental Advantages

Visual Resources. Underground construction would eliminate visual impacts associated with the overhead proposed line namely to residences in the valley area and the Starlight Mountain Estates.

Environmental Disadvantages

Ground Disturbance. This alternative would result in approximately 0.6 miles more of underground construction than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native vegetation.

Construction and Repair Time. The installation of an underground transmission line would require more time than construction of an equivalent length of overhead line because of the time required for excavating trenches, constructing the duct banks, fluid reservoirs, and/or stop joints. Construction could be substantially extended due to restrictions on the times of the year available for construction, required to limit the impacts on the environment. In addition, maintenance and restoration time in the event of an outage would also be more difficult and could result in longer outages and repair times. Accessing manholes will require intensive traffic control. In addition, duct bank repair would require rock excavation, traffic control, and possible roadway closure. In addition, the close proximity of the underground circuits will likely cause mutual inductance. To maintain these circuits safely, it may be required to de-energize all underground circuits when doing maintenance on any one circuit. This could cause some problems with service to customers, especially if the 69/92 kV needs to be de-energized on a regular basis. Although electric fields are reduced with increasing burial depth, magnetic fields above underground conductors are generally higher than from overhead lines due to closer proximity to the conductors to the ground.

Biological Resources. Trenching across fenced pasture and up the hill at the eastern end of the alternative would permanently removed habitat as a result of trenching and the required dirt access road on top of the route.

Geological Resources. Underground construction, especially on the steep slopes at the eastern end, could result in increased erosion.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and is potentially feasible. It would reduce visual impacts to the valley area, from Mt. Gower Open Space Preserve, and to residents in the Starlight Mountain Estates, and therefore, it has been retained for full analysis in this EIR/EIS.

4.5.3 San Vicente Transition Alternative

Alternative Description

This alternative has been developed by the EIR/EIS team in response to scoping comments and is shown in Figure Ap.1-15 and in greater detail in Figure Ap.1-18. The alternative would move the transition structure from its proposed location along San Vicente Road (MP 121.9) approximately 0.3 miles west to MP 122.2. The underground line would follow San Vicente Road within a 60-foot ROW for an additional 2,100 feet and would cross under an existing 69 kV transmission line, before it would turn north and would travel through open space for approximately 200 feet to the overhead transition point. The line would transition overhead south of Structure I85 and would travel west-northwest for 2,200 feet slowly converging with the proposed route at Structure I83. Both the proposed and alternative transition poles would be within Barnett Ranch Open Space Preserve.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The San Vicente Transition Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Visual Resources. This alternative would minimize visibility of the transition from San Vicente Road and nearby residences because it would not be visible on a direct sightline, as the Proposed Project would be. It would also eliminate the visual impacts of three overhead towers.

Land Use. This alternative would minimize visibility of the transition from San Vicente Road and would thereby reduce land use disturbance in the surrounding area.

Wilderness and Recreation. This alternative would eliminate the operational visual impacts on recreationists of an overhead transmission line for 0.3 miles (3 total structures) within Barnett Ranch Open Space Preserve.

Environmental Disadvantages

Transportation and Traffic. An additional 2,100 feet of underground construction would occur in San Vicente Road, which is a heavily traveled and narrow roadway in this section. Increased short-term disturbance to traffic and lane closures would occur during underground trenching in the roadway.

Ground Disturbance. Trenching and construction would occur within paved roadway and across open space, which would result in greater erosion potential and ground disturbance. This alternative would also result in 2,100 feet more of underground construction than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native vegetation.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and would be potentially feasible. It would increase construction impacts, especially to traffic along San Vicente Road, associated with 2,100 additional feet of underground construction and trenching. However, the alternative would minimize visibility of the transition from San Vicente Road and would thereby reduce land use disturbance in the surrounding area. Therefore, it has been retained for full analysis in this EIR/EIS.

4.5.4 Chuck Wagon Road Alternative

Alternative Description

This route was suggested during scoping and has been slightly modified by the EIR/EIS team to follow existing roads and transmission rights-of-way. The underground transmission line would diverge from the underground proposed route at MP 121.7 (approximately 0.2 miles east of the proposed transition point) and would turn south in Chuck Wagon Road. The alternative route would continue underground south in Chuck Wagon Road for approximately 1.6 miles until it passes existing residences and under the existing Creelman–Los Coches 69 kV line ROW. The route would transition to overhead and would turn west for 1.2 miles to rejoin the proposed route at MP 125.6. The route is shown in Figures Ap.1-15 and Ap.1-19. The underground portion of this route would require a 60-foot ROW.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Chuck Wagon Road Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Visual Resources. This would extend the underground segment of the project for 1.4 miles, reducing the visibility of the new 230 kV line from residences, and would eliminate the visual impacts of the proposed transition poles at MP 121.9. It would also eliminate an overhead crossing of San Vicente Road.

Wilderness and Recreation. The alternative route would avoid the Barnett Ranch Open Space Preserve and thereby eliminate 1.7 miles of project impacts within the Preserve.

Transportation and Traffic. The alternative would eliminate approximately 0.2 miles of underground construction within San Vicente Road, as well as an overhead crossing of San Vicente Road. San Vicente Road is more heavily traveled than Chuck Wagon Road.

Environmental Disadvantages

Ground Disturbance. Trenching, although it would occur in roadways would result in greater erosion potential and ground disturbance. This alternative would also result in 1.4 miles more of underground construction than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native vegetation.

New Transmission Corridor. This alternative would establish a new overhead transmission line corridor for 1.2 miles whereas the proposed route would follow an existing corridor from MP 123.3 to MP 125.6. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and would be potentially feasible. Although the alternative would result in greater construction impacts associated with 1.4 additional miles of construction, the route would avoid Barnett Ranch Open Space Preserve and would reduce the visual and land use impacts of the transition poles and 230 kV line along San Vicente Road. Therefore, this alternative has been retained for full analysis in this EIR/EIS.

4.5.5 SDG&E Segment 10/Inland Valley SR78 Alternative

Alternative Description

This alternative was discussed by SDG&E in PEA Section 3.3.1.2 as part of Segment 10, which was designed to be an alternate route to the existing transmission line in the Ramona to connect the Santa Ysabel Substation area to the existing Creelman Substation.

This alternative would begin at the existing Santa Ysabel Substation or 0.9 miles west at MP 108.3 along the proposed route. The line would parallel SR78 to the west and then south for 16.6 miles to the existing Creelman Substation. It would join the SDG&E Creelman Alternative at this point and continue west and then south for approximately 2.0 miles to reconnect with the proposed route at MP 123.3. The Proposed Project would be 15 miles long and the alternative would be 17.7 miles long (see Figure Ap.1-15).

Figure Ap.1-18. San Vicente Transition Alternative
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Figure Ap.1-19. Chuck Wagon Road Alternative
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Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 10/Inland Valley SR78 Alternative would meet all project objectives.

Feasibility

Legal and Regulatory Feasibility. This route would require a greater amount of new private ROW through agricultural and residential land uses. The negotiating and/or acquiring of ROW could delay the Proposed Project schedule; however, the route would overall has the potential to legally and regulatorily feasible.

Technical Feasibility. This would follow existing roads for part of its length. The roads are windy, which would increase engineering and constructability costs to the Proposed Project. In addition, an additional 125-foot ROW would be required in very steep terrain where constructability would be an issue. Though construction and engineering costs may be greater, this alternative is technically feasible.

Environmental Advantages

Existing SR78 Right-of-Way. The alternative would parallel the existing SR78 ROW. Following an existing transportation corridor, which is considered developed, is preferable, especially for biological and cultural resources, to traversing open space. New access roads would not be required for this alternative since it would parallel an existing roadway.

Environmental Disadvantages

New Transmission Corridor. This alternative would establish a new transmission line corridor along SR78, which is more traveled and accessible than the proposed route. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Visual Resources. SR78 is a major road into Ramona and the addition of a transmission line adjacent to the roadway would be highly visible to travelers and residents in the area.

Biological Resources. This route would pass through some designated critical habitat and a more potential special species habitat areas.

Residential Use. This alternative would include a higher density occurrence of residential land use than the proposed route.

Transportation and Traffic. This alternative would travel along the major road into Ramona and could result in traffic interruption and delays during construction.

Agricultural Resources. This alternative would pass through an agricultural land-use area and could impact farming operations.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially feasible. However, construction would occur on steep terrain, the route would be longer, and there would be greater impacts from a new transmission corridor to visual, biological, and agricultural resources, as well as to traffic along SR78 and nearby residences around Ramona. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS.

4.5.6 SDG&E Creelman Alternative

Alternative Description

This alternative was suggested by SDG&E as PEA Alignment N77-N22-N58-N23-N26-N70-N27 and is illustrated in Figure Ap.1-15.

Underground Transmission Line. This alternative would diverge from the 230 kV double-circuit underground proposed route northeast of Ramona at MP 117.4. The alternative would follow the existing SDG&E 69 kV transmission line ROW and then west in Vista Ramona Road for 2.06 miles to Vista Ramona Road. The route would turn south along an existing trail for 0.4 miles until it would transition overhead at this point.

Overhead Transmission Line. At MP 119.9, the 230 kV transmission line would transition from underground to overhead and would follow the existing SDG&E 69 kV transmission line ROW for approximately 1.15 miles through critical habitat for species, such as the San Diego thorn mint and the coastal California gnatcatcher. The existing 69 kV overhead transmission line would remain. Double-circuit 230 kV tubular steel poles would be used for this segment.

Underground Transmission Line. The 230 kV transmission lines would transition from overhead to underground again and would continue to the west in the Creelman Lane ROW for 0.8 miles passing the existing Creelman Substation and continuing for 1.1 miles until reaching Keyser Road where it would continue south in Keyser Road ROW for 0.26 miles until it would transition overhead again. This segment would be approximately 2.07 miles long.

Overhead Transmission Line. The overhead line would continue south and then southwest for approximately 1.03 miles to rejoin the Proposed Project at MP 123.1. It would be consolidated in the existing 100-foot ROW with the existing 69 kV transmission line. The proposed structures would be double-circuit 230 kV tubular steel poles.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Creelman Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Existing SDG&E Right-of-Way. This alternative would parallel an existing SDG&E 69 kV ROW. This is considered a primary opportunity because areas with existing transmission line corridors are already disturbed by similar use and provide an opportunity for collocating facilities.

Environmental Disadvantages

Ground Disturbance. Construction would occur in a dirt road (as opposed to a paved road with the proposed route), which could result in greater erosion potential and ground disturbance if vegetation has grown in the roadway. This alternative would also result in 0.8 miles more of underground construction than the proposed route and would be approximately 0.6 miles longer, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native vegetation.

Visual Resources. The overhead middle segment across the mountains would be highly visible to residents in the Ramona area.

Agricultural Resources. Spangler Peak Ranch (219 Creelman Lane), a grapefruit and avocado farm that also grows palm trees and other ornamentals, would be adjacent to the route. The overhead transmission line could interfere with cranes moving trees around the farm and therefore an extension of the underground portion of this alternative could be considered.

Biological Resources. This alternative would include designated critical habitat and potential special status species for species, such as the San Diego thorn mint and the coastal California gnatcatcher.

Residential Use. This alternative includes some occurrence of residential land use. Construction in this segment would require blasting and significant grading in close proximity to homes. This construction would be very disruptive to residents.

Cultural Resources. The route would be located along the base of the hill, which could have more sensitive habitat and a greater potential to encounter known and unknown cultural resources. Within this alternative area there are two habitation sites (CA-SDI-5038 and CA-SDI-13247), as well as a large but low-to-moderate density lithic scatter (CA-SDI-11638).

Blasting. Blasting into the hillside may be necessary along the route. This could result in increased erosion, noise impacts to wildlife and nearby residences. There could also be a direct loss of designated critical habitat for species, such as the San Diego thorn mint and the coastal California gnatcatcher.

Alternative Conclusions

ELIMINATED. The SDG&E Creelman Alternative would meet project objectives and would be feasible; however, it would increase the environmental impacts to almost all issue areas without reducing any impacts of the Proposed Project. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS.

4.5.7 West of San Vicente Road Underground Alternative

Alternative Description

This alternative was suggested during scoping to reduce impacts in the area of Ramona Holly Oaks Ranch, which is a housing development that is located just west of San Vicente Road and just west of proposed transmission line as it turns south near MP 124.3.

With the West of San Vicente Road Underground Alternative, the underground segment of the proposed route would continue underground west of MP 121.9 where it is proposed to transition overhead. The line would remain underground in San Vicente Road to MP 123.3 and then would continue underground in SDG&E's 69 kV ROW for 1.0 mile to MP 124.3 where it would transition overhead. The line would then transition overhead at a transition station, would turn south, and would be located in valley and removed from view. The alternative would require 2.4 miles of additional underground transmission line and is illustrated in Figure Ap.1-15. The underground portion of this route would require a 60-foot ROW.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The West of San Vicente Road Underground Alternative would meet all project objectives.

Feasibility

Legal and Regulatory Feasibility. The route has the potential to be legally and regulatorily feasible.

Technical Feasibility. Construction in San Vicente road would be difficult because the road is narrow and windy, but the route should be technically feasible. Underground construction in the steep topography at the western end of the route would be difficult and may present technical feasibility issues. Even if the route were extended underground in dirt roadways west of San Vicente Road, the route would need to transition to overhead at Tower I74 to avoid the steep topography and trenching through the open space, which would not reduce the visual impacts to the residences west of the route and it would include a transition towers at that point as well. Shorter towers or revised tower placement may reduce impacts as a part of visual resources mitigation in Section D.3 of this EIR/EIS.

Environmental Advantages

Visual Resources. Underground construction would eliminate visual impacts associated with the overhead proposed line.

Environmental Disadvantages

Ground Disturbance. Construction of this underground alternative (two 230 kV circuits) would require substantially more construction activity and ground disturbance due to the continuous trenching in a roadway and across Barnett Ranch Open Space Preserve that would be required. In areas where spacing is limited, construction activities may have to occur outside of the existing roadway. Overhead double-circuit 230 kV transmission line construction would result in construction disturbance primarily at individual structure sites, located approximately every 1,000 feet along the alignment. Underground construction and trenching would involve much greater ground disturbance and construction-related impacts (traffic, air quality and dust, and noise). There is also a greater potential to encounter contaminated soils and cultural resources, and to impact biological resources due to the greater ground disturbance. With construction outside of the existing roadway in areas, there would be an incremental increase in disturbance to existing vegetation, including sensitive wetlands associated with San Felipe Creek located immediately adjacent to SR78. Construction of the transition stations would each require a footprint of 1 to 1.25 acres, resulting in temporary and permanent biological, cultural, and visual resources impacts as well.

Biological Resources. Continuous trenching would be required through San Diego County's Barnett Ranch Open Space Preserve, which would temporarily remove vegetation. The Barnett Ranch Open Space Preserve is not yet open to the public because the area is being allowed to recover after the Cedar Fire and the County is waiting for biological surveys to be completed. In addition, construction of a permanent dirt access road along the trench would permanently remove vegetation for the length of the route in open space.

Wilderness and Recreation. This alternative would require a continuous trench through an open space preserve that will eventually be open to the public for recreation purposes.

Transportation and Traffic. This portion of San Vicente Road is a narrow and windy, two-lane and heavily traveled roadway. Construction could result in traffic delay and road closures.

Cultural Resources. Continuous trenching would be required through San Diego County's Barnett Ranch Open Space Preserve, which could encounter and/or impact known or unknown cultural resources. The Barnett Ranch Open Space Preserve is not yet open to the public as the area is being allowed to recover after the Cedar Fire and it is awaiting completion of archaeological surveys of the area.

Geologic Resources. Continuous trenching through open space for an underground transmission line in the steep topography of the western end of the route could result in increased erosion from ground disturbance on the hillsides. In addition, construction of a permanent dirt access road along the trench would remove vegetation and could increase erosion potential.

Construction and Repair Time. The installation of an underground transmission line would require more time than construction of an equivalent length of overhead line because of the time required for excavating trenches, constructing the duct banks, fluid reservoirs, and/or stop joints. Construction could be substantially extended due to restrictions on the times of the year available for construction, required to limit the impacts on the environment. In addition, maintenance and restoration time in the event of an outage would also be more difficult and could result in longer outages and repair times. Accessing manholes will require intensive traffic control. In addition, duct bank repair would require rock excavation, traffic control, and possible roadway closure. In addition, the close proximity of the underground circuits will likely cause mutual inductance. To maintain these circuits safely, it may be required to de-energize all underground circuits when doing maintenance on any one circuit. This could cause some problems with service to customers, especially if the 69/92 kV needs to be de-energized on

a regular basis. Although electric fields are reduced with increasing burial depth, magnetic fields above underground conductors are generally higher than from overhead lines due to closer proximity to the conductors to the ground.

Excavation. Excavation of rock is anticipated during trenching in the underground areas of this route. Limited workspace along San Vicente Road will make trenching and vault installations hazardous and time consuming. Hazardous activities include blasting to perform trenching and deep vault excavations, the use of heavy equipment to break up the rock, and the use of heavier-than normal equipment to remove the rock.

Stockpiling and Removal of Spoils. Due to the limited space within the roadway, spoils from excavations would need to be temporarily stockpiled off the roadway before they could be removed. This stockpiling would create additional ground impacts and potentially impacts to water quality. If space for stockpiling is limited or unavailable, more truck trips will be required resulting in additional impacts.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be legally and regulatorily feasible. Due to the steep topography in the western area and the Barnett Ranch Open Space Preserve, this alternative would require trenching through open space and on steep slopes raising technical feasibility concerns. Continuous trenching through open space and construction of a permanent dirt access road along the route would cause extensive ground disturbance on preserve land with the potential to greatly impact biological and cultural resources and cause serious erosion. Due to technical feasibility issues and greater environmental impact, this alternative has been eliminated from full consideration in this EIR/EIS.

4.6 Coastal Link Route Segment Alternatives

The Coastal Link of the Sunrise Powerlink Transmission Line project generally consists of a single-circuit 230 kV transmission line from the existing Sycamore Canyon Substation located at the Marine Corps Air Station (MCAS) Miramar to the existing Peñasquitos Substation located in the Torrey Hills community of the City of San Diego. Both existing substations will require some modifications to accommodate the project and all improvements would take place within the fences of the existing substations.

The following chapter of the Alternatives Screening Report represents a comprehensive summary and assessment of all transmission line (wires) alternatives including those originally developed by SDG&E, alternatives suggested by the public and agencies during review of the NOP and NOI and during public scoping efforts and also includes all alternatives developed independently by the CPUC, BLM and their EIR/EIS team. To date, 20 Coastal Link alternatives (CLA) have been developed. Four of the Coastal Link alternatives are recommended to be retained for further analysis in the EIR/EIS. Each of the Coastal Link alternatives is described below and all of the Coastal Link route segment alternatives that have been retained are shown in Figure Ap.1-20. The Coastal Link alternatives that have been eliminated are shown in Figure Ap.1-21.

4.6.1 Pomerado Road to Miramar Area North–Combined Underground Alternative and Underground/Overhead Alternative

Alternative Description

This alternative is a hybrid alternative combining two alternatives suggested by the public during the scoping period by multiple commenters including Rancho Peñasquitos Concerned Citizens and Todd Saier.

The majority of this alternative is underground with the exception of the west end where the line is overhead within existing ROW as is shown in Figures Ap.1-10, Ap.1-22a and Ap.1-22b. This alternative would exit the Sycamore Substation at MCAS Miramar overhead westerly within an existing ROW toward Pomerado Road. The line would cross Pomerado Road just north of Legacy Road and would transition underground just east of the roadway and south of a stand of trees on an old road grade that is cut into the hillside. From there the route would travel underground beneath Pomerado Road to the south. The line would be attached to the Pomerado/Miramar Road bridge over I-15 or on an overhead structure crossing I-15. The route would continue westward under Miramar Road, turn north on Kearny Villa Road, west on Black Mountain Road, west on Activity Road to Camino Ruiz. The line would continue underground north under Camino Ruiz, west on Miralani Drive, west on Arjons Drive, south on Trade Place, west on Trade Street, south on Camino Santa Fe, and west on Carroll Road/Carroll Canyon Road to Scranton Road. From this point the line would continue west for approximately 400 feet behind commercial buildings and near to an existing transmission pole. At this location the line would transition to overhead and would be located within the existing 230 kV ROW heading northward into the Peñasquitos Substation. Specific construction techniques at the Pomerado/Miramar Road/I-15 crossing would need to be defined and coordinated with Caltrans.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Pomerado Road to Miramar Area North-Combined Underground Alternative and Underground/Overhead Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative has the potential to be legally and regulatorily feasible.

Technical Feasibility. Research conducted with the City of San Diego regarding buried utilities within the roadways affected by this alternative indicates that adequate space exists to allow the placement of an underground utility duct bank/trench(es) of the size and depth required by SDG&E for a single-circuit 230 kV line for most of the affected roads.

One exception to this would be Miramar Road, which has been identified as having significant congestion of existing utilities occupying the street right-of-way. The presence of these utilities would affect the cost and level of effort to develop, design and subsequently construct a new underground alignment within Miramar Road.

Further, the segment of roadway that crosses Carroll Canyon Creek (between Fenton Road and the El Camino Memorial Park Entry) poses considerable challenges for fitting the powerline in the roadway as the road narrows at this location and an extensive drainage culvert system is present under the roadway to pass the creek flows. Based on information discovered during project research efforts, bedrock is shallow at the creek and there is minimum cover between the roadway surface and the top of the box culvert.

Finally, due to the narrowing of the roadway, several utilities already appear to be at a minimum separation distances within the roadway at the creek crossing. This segment would be considered very heavily congested. Considerable effort would be required to identify a suitable alignment alternative through this pinch point. Some existing facilities may need to be relocated or the alignment may need to be put overhead to avoid potential relocation of other facilities. Despite the presence of these existing utilities, additional research and analysis conducted with the City of San Diego has concluded that this alternative would be technically feasible to construct.

The 200-foot corridor for the overhead segment at the western end is also crowded. There are already a 138 kV line with a vacant circuit, a 230 kV double-circuit line, and a 69 kV line, as well as underground fuel lines and a gas line within the corridor. However, inclusion of an additional 230 kV circuit could be accomplished by:

Figure Ap.1-20. Coastal Link Alternatives Retained
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Figure Ap.1-21. Coastal Link Alternatives Eliminated
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Figure Ap.1-22a. Pomerado Road to Miramar Area North Alternative (East)
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Figure Ap.1-22b. Pomerado Road to Miramar Area North Alternative (West)
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- Collocation of the line with a 69 kV underbuild;
- Switching the 138 kV line to a 230 kV line with a 69 kV underbuild and then moving the 138 kV line to the current 69 kV alignment;
- Staggering the 230 kV tower locations so that they are not aligned with the existing 230 kV double-circuit towers;
- Undergrounding within the ROW; or
- Acquisition of new/expanded ROW.

Therefore this alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Biological Resources. This alternative would avoid impacts to biological resources contained within the Los Peñasquitos Canyon Preserve.

Cultural Resources. This alternative would avoid ground disturbing activities on undeveloped lands, therefore resulting in a reduced potential for to affect subsurface cultural resources within Los Peñasquitos Canyon Preserve.

Geology and Soils. This alternative would reduce ground disturbance of undisturbed land, which would result in a reduction of potential impacts on hydrology and drainage. Impacts within Los Peñasquitos Canyon Preserve would also be avoided with this alternative.

Land Use. This alternative would avoid impacts to residences within the Rancho Peñasquitos community along Park Village Drive and to natural resources within the Los Peñasquitos Canyon Preserve because this alignment would avoid this area entirely. Locating this line within the medians of Pomerado Road/Miramar Road and other roadways, which are wider than Park Village Drive, would reduce the potential for land use incompatibilities and EMF related issues, such as induced currents and shocks and radio/television/electrical equipment impacts, as surrounding land uses are predominantly commercial/industrial. Because the line would be located further away from residential land uses it would also reduce potential corona noise, construction impacts and visual impacts on sensitive land uses.

Noise. This alternative would reduce corona noise impacts to residences along the overhead portions of the proposed route.

Environmental Contamination. The Pomerado Road to Miramar North Alternative is predominantly underground construction and includes underground construction in areas of known environmental contamination from leaking underground fuel tanks and in areas of potential contamination resulting from commercial, light industrial and manufacturing activities.

Environmental Disadvantages

Transportation and Traffic. Traffic impacts under this alternative could be increased due to the complete reliance of this alternative on burial beneath heavily traveled roadways, as compared to Park Village Drive.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and is potentially feasible. It has been retained because it would offer substantial avoidance of potential effects to residents in Rancho Peñasquitos and avoid impacts within Los Peñasquitos Canyon Preserve. The alternative would also have greater land use compatibility due to the presence of surrounding commercial and industrial land uses and undergrounding of the line. Therefore, this alternative has been retained for full analysis in this EIR/EIS.

4.6.2 Los Peñasquitos Canyon Preserve–Mercy Road Alternative

Alternative Description

This alternative was suggested by the West Chase Homeowners Association (WCHOA) during the scoping process. The WCHOA identifies this as Alternative 3. This alternative was also suggested by Rancho Peñasquitos Concerned Citizens (RPCC). This alternative varies from the project route east of the Chicarita Substation. The entire alternative would be underground with transition structures at the eastern and western ends where the line transitions to overhead structures. Under this alternative, the transmission line would bypass the Chicarita Substation and would come from the Sycamore Substation and connect to an existing ROW along Scripps-Poway Parkway in the vicinity of Ivy Hill Drive. From here the line would transition to underground and continue west on Scripps-Poway Parkway/Mercy Road. The line would continue under Mercy Road to its terminus at Black Mountain Road. At Black Mountain Road the line would remain underground heading north then west at Park Village Drive where the line would rejoin the proposed alignment. The route is shown in Figures Ap.1-20 and Ap.1-23.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Los Peñasquitos Canyon Preserve–Mercy Road Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative has the potential to be legally and regulatorily feasible.

Technical Feasibility. Research conducted with the City of San Diego regarding buried utilities within the roadways affected by this alternative indicates that adequate space exists to allow the placement of an underground utility duct bank/trench(es) of the size and depth required by SDG&E for a single-circuit 230 kV line.

However, the segment of Black Mountain Road between Mercy Road and SR56 has moderate to heavy utility congestion in several areas. Many water lines (including the Second San Diego Aqueduct), reclaimed water, sewer, and storm drainpipes run along or cross the road. Near Canyonside Park, there are several

areas congested with underground utilities. The Peñasquitos trunk sewer line crosses the road at this location, and several other sewer lines leading from the south connect to it. Many electrical transformers, vaults, and facilities populate the area west of the roadway. A bridge spans Los Peñasquitos Creek about 1,100 feet north of Mercy Road. It is unknown if the bridge structure includes internal utility conduits although an electrical conduit was observed to be attached to the west side of the structure. Even though Black Mountain Road contains numerous underground utilities with moderate to heavy utility congestion, research conducted with the City of San Diego has concluded that adequate space in the roadway exists and this alternative has the potential to be technically feasible.

Environmental Advantages

Visual Resources. Because a larger amount of this line would be buried, the visual impacts of this alternative would be less than the proposed route.

Land Use. This alternative would avoid impacts to resources within the Los Peñasquitos Canyon Preserve because the alignment would bypass this area by staying within Mercy Road and Black Mountain Road. Because this alternative would bury the line in roadways, potential EMF related concerns such as induced currents and shocks and radio/television/electrical equipment impacts in the vicinity of the existing vacant ROW though Rancho Peñasquitos could be reduced.

Noise. This alternative would reduce corona noise impacts vicinity of the existing vacant ROW though Rancho Peñasquitos because it would be located underground.

Environmental Disadvantages

Transportation and Traffic. This alternative would result in increased impacts to local traffic and circulation, because of increased reliance on burial in heavily traveled roadways.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and is potentially feasible. The route would avoid Los Peñasquitos Canyon Preserve and would thereby reduce land use, EMF-related, noise, and visual issues within a residential area of Rancho Peñasquitos. Therefore, this alternative has been retained for full evaluation in this EIR/EIS.

4.6.3 Black Mountain to Park Village Road Underground Alternative

Alternative Description

This alternative was suggested by the City of San Diego during a meeting conducted with City staff and is shown in Figures Ap.1-20, Ap.1-23, and Ap.1-24. This alternative would deviate from the Proposed Project alignment where the line approaches Black Mountain Road. Under this alternative, the line would remain underground but would be located underneath Black Mountain Road and would turn west onto Park Village Drive, following the project alignment into the Peñasquitos Substation via the Los Peñasquitos Canyon Preserve. This alternative would avoid some of the homes in Rancho Peñasquitos that are located along the existing vacant ROW proposed to be used by the project.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Black Mountain to Park Village Road Underground Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative has the potential to be legally and regulatorily feasible.

Technical Feasibility. Research conducted with the City of San Diego regarding buried utilities within the roadways affected by this alternative indicates that adequate space exists to allow the placement of an underground utility duct bank/trench(es) of the size and depth required by SDG&E for a single-circuit 230 kV line. However, the segment of Black Mountain Road south of SR56 has moderate to heavy utility congestion in several areas. Many water lines (including the Second San Diego Aqueduct), reclaimed water, sewer, and storm drainpipes run along or cross the road. Near Canyonside Park, there are several areas congested with underground utilities. The Peñasquitos trunk sewer line crosses the road at this location, and several other sewer lines leading from the south connect to it. Many electrical transformers, vaults, and facilities populate the area west of the roadway. Even though Black Mountain Road contains numerous underground utilities with moderate to heavy utility congestion, research conducted with the City of San Diego has concluded that adequate space in the roadway exists and this alternative would be technically feasible.

Environmental Advantages

Land Use. This alternative would reduce effects on residents within Rancho Peñasquitos by traversing more roadways rather than a vacant SDG&E ROW which is currently used as an open space by residents. By moving a segment of the alignment into a roadway, this alternative may provide for reduced EMF-related issues such as induced currents and shocks and radio/television/electrical equipment impacts depending on the burial depth.

Recreation. This alternative would use existing roadways and would avoid construction-related disturbance to recreationists and nearby residents associated with trenching through the vacant ROW that is currently used as open space for recreation.

Environmental Disadvantages

Land Use. This alternative does not take advantage of nearby existing vacant ROW that has been designated for utility usage.

Transportation and Traffic. Because this alternative would involve construction under Black Mountain Road, this alternative would be expected to result in increased short-term construction-related traffic impacts.

Figure Ap.1-23. Los Peñasquitos Canyon Preserve–Mercy Road Alternative
[CLICK HERE TO VIEW](#)

Figure Ap.1-24. Black Mountain Road to Park Village Road Underground Alternative
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Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and is potentially feasible. The route would reduce effects on residents within Rancho Peñasquitos by traversing more roadways rather than a vacant SDG&E ROW which is currently used as recreational open space by residents. Therefore, this alternative has been retained for evaluation in this EIR/EIS.

4.6.4 Coastal Link System Upgrades Alternative

Alternative Description

This alternative provides optional approaches to avoid the construction of the Proposed Project's 230 kV transmission line from Sycamore Canyon to Peñasquitos Substation. Three options for this alternative were originally suggested in public scoping comments (RPCC), and RPCC has focused its study on one of the three, which it finds to be the most viable. This alternative originates from the findings of the 2004 STEP report which specified two options for upgrades in the vicinity of Sycamore Canyon in order to accommodate a new 500 kV line into San Diego terminating near Ramona. These were identified in the STEP report as part of an "Option 2" for the studied Imperial Valley-Ramona 500 kV line (Option 3 for a new line into San Diego). Testimony filed by the CAISO on May 14, 2007 and later testimony provided by CAISO in hearings September 26, 2007 in the SRPL general proceeding provides a refined description for the Coastal Link System Upgrades. The area affected by this alternative is depicted in Figure Ap.1-25.

The most viable option under this alternative is analyzed in the EIR/EIS because it is supported by the CAISO as the most economical of the three options, and would be:

- Coastal Link Upgrade Option #1 Alternative, which would be a system modification to install a third 230/69 kV transformer at the existing Sycamore Canyon Substation. Expansion of the Sycamore Canyon Substation would occur within the existing easement of the substation. Additionally, SDG&E would need to provide overload mitigation by either installing a new 230/138 kV transformer at the existing Encina Substation or by upgrading (reconductor) the existing Sycamore Canyon-Chicarita 138 kV circuit using 34 existing⁷ wood frame structures. This would also require the following upgrades: reconductor the existing Sycamore Canyon-Pomerado 69 kV circuit on existing structures; and reconductor the existing Pomerado-Poway 69 kV circuit on existing structures.

Other options for this alternative were also studied by RPCC, but are not analyzed in this EIR/EIS:

- Coastal Link Upgrade Option #2 Alternative would modify SDG&E's existing Miguel-Mission 230 kV lines between the Fanita Junction area west of Santee and the existing Mission Substation and add a third 230/69 kV transformer at Miguel Substation. This would involve rebuilding the existing transmission corridor on MCAS Miramar between Sycamore Canyon and the Mission Substation to replace the two existing 230 kV lines of Miguel-Mission with a new double-circuit 230 kV Sycamore Canyon-Mission transmission line; or
- Coastal Link Upgrade Option #3 Alternative would involve installing new series reactors on the load side of the two existing 230/69 kV transformers expected to be overloaded at Sycamore Canyon Substation and adding a third 230/69 kV transformer at Escondido Substation. Modifications at the Sycamore Canyon and Escondido Substations would occur within the existing substation fence lines.

⁷ SDG&E Response to CPUC Energy Division Data Request No. 9, ALT-81, April 25, 2007.

For any of the three Coastal Link Upgrade options, system modifications would occur within the existing 230/138/69 kV transmission line ROWs north and south of the Sycamore Canyon Substation and within existing substation boundaries.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Coastal Link System Upgrade Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be legally, technically, and regulatorily feasible. The 2004 STEP report identified components of this alternative as an alternative to building a new 230 kV line from Sycamore Canyon to Peñasquitos Substation. RPCC has identified Coastal Link Upgrade Option #1 as the least expensive and best economically performing option, although each of the three options are likely to be potentially feasible.

Environmental Advantages

This alternative would eliminate all potential environmental impacts associated with the Proposed Project 230 kV segment between Sycamore Canyon and Peñasquitos Substations.

Environmental Disadvantages

Depending on which option is pursued, the Coastal Link Upgrade Alternative would result in: expansion of the existing Sycamore Canyon Substation within the existing substation easement and additional towers or replaced poles within the existing SDG&E transmission line ROWs north and south of Sycamore Canyon Substation and between the existing Miguel and Jamacha Substations. The additional towers or poles would be similar to those occurring in the existing transmission corridors. No additional environmental disadvantages have been identified.

Alternative Conclusions

RETAINED FOR ANALYSIS. The Coastal Link Upgrade Option #1 Alternative would be the most economically viable of the three options introduced here, and it would meet project objectives and is potentially feasible. It would eliminate the need to construct the Coastal Link of the Proposed Project between Sycamore Canyon and Peñasquitos Substation and all associated impacts. Therefore, this alternative has been retained for full consideration in this EIR/EIS.

Figure Ap.1-25. Coastal Link System Upgrades
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4.6.5 Northwest Corner Alternative

Alternative Description

This Coastal Link Alternative (CLA) is from SDG&E's PEA and is referenced as Coastal Link Alternative Alignment N56-N75-N30-N71-N52-N33A-N33B and is shown in Figure Ap.1-21. This 2.3-mile alternative was retained in the PEA and is intended to replace a 2.1-mile segment in Rancho Peñasquitos from MP 143.8–146.7. This alternative alignment would impact slightly more acreage compared to the Proposed Project. Under implementation of this alternative, a total of approximately 14 acres could be temporarily impacted during construction. This alternative segment is intended to bypass a Rancho Peñasquitos community and avoid impacts within Park Village Drive and the Los Peñasquitos Canyon Preserve.

This alternative is the same width and approximately the same length as the segment of the Proposed Project that it would replace (up to 300 feet wide and 13.5 miles in length). The first 0.25-mile segment of this alternative would be located underground within an SDG&E vacant ROW. Approximately 0.58 miles would be overhead and located within an existing 150-foot ROW. The next mile of this alternative would follow section lines. This alignment would traverse areas of vernal pools that vary in habitat quality. Due to the presence of vernal pools along the existing ROW between N30-N33A-N33B, this alternative has been sited to the north in order to avoid an area of higher quality vernal pool habitat to the south. The alternative would be parallel to a SDG&E ROW with an existing double-circuit 230 kV transmission line on lattice towers, which would remain intact. The existing 138 kV transmission line on wood H-frame structures would be removed, consolidated, and relocated to the proposed 230 kV double-circuit tubular steel poles.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Northwest Corner Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. This alternative has an increased potential for impacts on vernal pools and sensitive species (San Diego fairy shrimp) contained in these pools. The habitat quality of the vernal pools varies along this route. Opposition by the County of San Diego, CDFG and USFWS along with inconsistency with the County Multiple Habitat Conservation Plan/Multiple Habitat Planning Area (MHCP/MHPA) may make this Alternative infeasible from a regulatory standpoint.

Environmental Advantages

Visual Resources. This alternative may provide for reduced visual change as well as a reduction in the number of people who would be able to see the transmission towers and powerline. Due to the transmission line consolidation that is proposed under this alternative, visual effects of existing lines would also be reduced.

Biological Resources. This alternative would reduce impacts on biological resources contained within the Los Peñasquitos Canyon Preserve due to reduced ground disturbance in this area that results from the avoidance of some undergrounding.

Cultural Resources. This alternative would result in less ground disturbance therefore resulting in a reduced potential for adversely affecting subsurface cultural resources with Los Peñasquitos Canyon Preserve in particular.

Geology and Soils. Because the line would be overhead, this alternative would have less ground disturbance compared to trenching/burial of the line for the same distance. Reduced ground disturbance correlates to potentially reduced impacts on soils, erosion and water quality effects.

Ground Disturbance. This alternative would have less ground disturbance, because it would be overhead. This would decrease impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction as well as the removal of less native vegetation.

Hydrology and Drainage. This alternative would have less ground disturbance, because the line would be aboveground. Reduced ground disturbance directly correlates to reduced impacts to groundwater resources, surface water features and water quality effects.

Land Use. This alternative offers reduced effects on residents and communities of Rancho Peñasquitos by traversing to the north of existing residential communities along and within proximity to Park Village Drive. Distance to Park Village Elementary School and users of the Los Peñasquitos Canyon Preserve would also be increased, which would reduce construction disturbances and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts on these sensitive receptors.

Traffic and Circulation. Because this alternative would avoid construction within Park Village Road, this alternative would be expected to result in decreased short-term construction-related impacts to residents.

Environmental Disadvantages

Visual Resources. This alternative may provide for an increased visual change for people with views to the north of the Rancho Peñasquitos community. This alternative may also shift the visual effects of the project resulting in an increase in the number of people who would be able to see the line as this aboveground segment would replace a portion of the project that is proposed to be located underground.

Biological Resources. This alternative could result in increased impacts to biological resources contained within the vernal pool complex through which this alternative would traverse. These impacts may not be fully mitigable.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible. However, it has been eliminated from further analysis in the EIR/EIS due to the potential adverse impacts on vernal pools, likely opposition by the County of San Diego, CDFG and USFWS and due to inconsistency with the County MHCP/MHPA, which could make this alternative regulatorily infeasible.

4.6.6 Mannix-Dormouse Road Alternative

Alternative Description

This alternative is from SDG&E's PEA and is referenced as Coastal Link Alternative Alignment N30-N33A-N33B and is shown in Figure Ap.1-21. This alternative consists of an overhead segment that follows a straight line, and is the shortest route among the alternatives, between MP 143.8 to 146.7. This alternative follows a path north of and adjacent to single family residences along Mannix and Dormouse Roads in Rancho Peñasquitos. SDG&E retained this alternative in their PEA because it offers an Alternative to undergrounding in Park Village Drive and avoids a vernal pool complex located to the north which would be potentially affected by the Northwest Corner Alternative described above. This alternative would connect to the SDG&E vacant ROW. This segment would include an overhead transmission line on double-circuit 230 kV tubular steel poles.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid.

However, this alternative would traverse designated Critical Habitat and would potentially affect Special Status Species and would thus require coordination with USFWS and CDFG, which could delay the project timeline. The Mannix-Dormouse Road Alternative would meet most project objectives.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. This alternative would traverse designated Critical Habitat and would potentially affect Special Status Species and would thus require coordination with USFWS and CDFG, which could delay the project timeline but the alternative would likely be regulatorily feasible.

Environmental Advantages

Visual Resources. This alternative may provide for reduced visual change as well as a reduction in the number of people who would be able to see the transmission towers and power line. Due to the transmission line consolidation that is proposed under this alternative, visual effects of existing lines would also be reduced similar to the project.

Biological Resources. This alternative would reduce impacts on biological resources contained within the Los Peñasquitos Canyon Preserve due to reduced ground disturbance in this area that results from the avoidance of a portion of the proposed undergrounding.

Cultural Resources. This alternative would result in less ground disturbance. Therefore, this alternative would have a reduced potential for affecting subsurface cultural resources with Los Peñasquitos Canyon Preserve.

Ground Disturbance (Geology, Hydrology, and Soils). This alternative provides for reduced potential for reducing ground disturbance as the line would be above ground. Reduced ground disturbance directly correlates to reduced soils, erosion and water quality impacts.

Land Use. This alternative utilizes more of the existing vacant ROW. Although impacts are transferred, this alternative offers reduced overall effects on the potential number of residents within Rancho Peñasquitos by traversing to the north of, and along the backside of, existing residential communities along Mannix and Dormouse Roads. This alternative reduces surface disruption impacts to the Los Peñasquitos Canyon Preserve because this alternative would be aboveground. Distance to Park Village Elementary School and users of the Los Peñasquitos Canyon Preserve would also be increased, which would reduce construction disturbances and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts on these sensitive receptors.

Traffic and Circulation. Because this alternative would avoid construction within Park Village Road, this alternative would be expected to result in decreased short-term construction-related impacts to residents.

Environmental Disadvantages

Visual Resources. This alternative may provide for an increased visual change for people with views to the north of the Rancho Peñasquitos community. This alternative may also shift the visual effects of the project resulting in an increase in the number of people who would be able to see the line as this aboveground segment would replace a portion of the project proposed to be located underground.

Biological Resources. A portion of the alternative would cross through Los Peñasquitos Canyon Preserve. A portion would pass through designated open space in the City of San Diego Subarea V Planning Area. The following sensitive vegetation communities have been mapped along this alternative route: vernal pool, southern mixed chaparral, scrub oak chaparral, chemise chaparral, and southern maritime chaparral. A large vernal pool area begins in the vicinity of Structure C27 and continues along the alignment until just past Structure CA21. Endangered species have been mapped in the vernal pools including: San Diego mesa mint, San Diego button-celery, and San Diego fairy shrimp.

Land Use. This alternative would create a potential land use incompatibility due to the presence of a new aboveground transmission line that would be located less than 100 feet from single family homes along Mannix and Dormouse Roads. The proximity of the 230 kV line to homes could also increase

EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible. Regulatory feasibility would be based on consultation with USFWS and CDFG due to impacts to designated critical habitat and special status species. As a result, this route has been eliminated from full consideration in this EIR/EIS, because of potentially significant visual impacts, impacts to vernal pools, critical habitat, and proximity to adjacent residences, which would be greater under this alternative compared to the Proposed Project.

4.6.7 SDG&E Segment 12 Poway Substation to Peñasquitos Substation Alternative

Alternative Description

This CLA is from PEA Section 3.3.1.2 (PEA eliminated) and is shown in Figure Ap.1-21. This route (in combination with either SDG&E Segment 14 or Segment 15 Alternatives, which deviate from the project west of Ramona and are discussed in Sections 4.6.9 and 4.6.10, respectively) is an alternative to the Proposed Project between the existing Poway Substation and the Peñasquitos Substation and would be located entirely aboveground. From the Poway Substation to the Chicarita Substation, this alternative would deviate from the Proposed Project alignment by following an existing transmission line from the Poway Substation to roughly the western municipal boundary of Poway.

From this point, the line would head southwest into the Chicarita Substation. The key difference with this alternative is that it would not include a tie-in to the Sycamore Canyon Substation and the entire segment would be aboveground. This alignment also would diverge from the project alignment in Rancho Peñasquitos area by following the short Mannix-Dormouse Road Alternative segment described above (see Section 4.6.6) following the project route into the Peñasquitos Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 12 Poway Substation to Peñasquitos Substation Alternative would meet all project objectives.

Feasibility

This Alternative would require new ROW but has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Biological Resources. This alternative would avoid Los Peñasquitos Canyon Preserve in the area it would follow the Mannix-Dormouse Alternative (see Section 4.6.6) and would therefore, eliminate all biological impacts within the Preserve.

Cultural Resources. This alternative would result in less ground disturbance therefore resulting in a reduced potential for affecting subsurface cultural resources with Los Peñasquitos Canyon Preserve.

Geology and Soils. This alternative provides for reduced potential for ground disturbance as the majority of the line would be above ground. Reduced ground disturbance directly correlates to reduced impacts on soils, erosion and water quality effects.

Ground Disturbance. This alternative would have reduced ground disturbance, because it would be entirely overhead.

Hydrology and Drainage. This alternative provides for reduced potential for ground disturbance as the line would be aboveground. Reduced ground disturbance correlates to reduced impacts to groundwater resources, surface water features and water quality effects.

Land Use. This alternative would be partially collocated with an existing transmission line ROW and would reduce potential effects on the communities Scripps Ranch and Rancho Peñasquitos. This alternative would eliminate potential effects on the Los Peñasquitos Canyon Preserve through avoidance of this area.

Environmental Disadvantages

Visual Resources. This alignment would be entirely aboveground, resulting in relatively greater potential visual impacts when compared to the Proposed Project, which would have a larger percentage of underground segments.

Land Use. Because this alternative would be above ground for most of its length, greater land use incompatibilities would be expected, particularly in the City of Poway.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and is potentially feasible. It has been eliminated for full consideration in this EIR/EIS because it would require acquisition of significant new right-of-way/transmission corridor in undeveloped areas, would create greater visual impacts with an all-overhead line, and would not offer any real environmental benefits or advantages relative to the Proposed Project.

4.6.8 SDG&E Segment 13 Scripps Ranch Alternative

Alternative Description

This alternative is from SDG&E's PEA Section 3.3.1.2 (PEA eliminated) and is shown in Figure Ap.1-21. This route is an alternative route to the Proposed Project within an existing SDG&E transmission line ROW for its entire length. This alternative would begin at the existing Creelman Substation in Ramona and would extend along an existing SDG&E transmission line ROW to the Sycamore Canyon Substa-

tion. It would continue to parallel this ROW to the Scripps Substation, and then would terminate at the existing Peñasquitos Substation. The portion of the line from Scripps Substation to Peñasquitos Substation would follow Pomerado Road through a narrow and heavily traveled roadway through Scripps Ranch where no existing SDG&E ROW exists. This alternative would diverge from the Proposed Project at the Sycamore Canyon Substation where it would follow a road with schools, residences and commercial land uses. Portions of this alternative would require new ROW and MCAS Miramar lands would be affected similar to the Pomerado Road–Miramar North Alternative (see Section 4.6.1).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 13 Scripps Ranch Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative would require more new private ROW than the proposed route. Acquiring private ROW could require more condemnation and relocation of homes and businesses, which could thus delay the project in-service date. However, this alternative would encounter legal and regulatory issues associated with crossing MCAS Miramar. Coordination with MCAS Miramar representatives has indicated that no alternative transmission path on MCAS Miramar is feasible and none would be permitted due to National Defense Mission capability requirements.

Technical Feasibility. Although technically feasible, the construction phase of this alternative may involve road closures and/or a traffic management program due to the use of narrow and heavily traveled roadways.

Environmental Advantages

Biological Resources. This alternative would avoid impacts to biological resources within the Los Peñasquitos Canyon Preserve.

Cultural Resources. This alternative would result in less ground disturbance, therefore resulting in a reduced potential for affecting subsurface cultural resources with Los Peñasquitos Canyon Preserve in particular.

Geology and Soils. This alternative provides for reduced potential for ground disturbance as the line would be aboveground. Reduced ground disturbance correlates to reduced potential impacts on soils, erosion and water quality effects.

Ground Disturbance. This alternative would have reduced ground disturbance issues due to it being located aboveground for the entire length.

Hydrology and Water Quality. This alternative would reduce ground disturbance as the line would be aboveground. Reduced ground disturbance correlates to reduced potential impacts to groundwater resources, surface water features and water quality effects.

Land Use. This alternative uses existing ROW and connects numerous existing substations along the route possibly enhancing future expansion potential and capability. This alternative would avoid impacts to resources within the Los Peñasquitos Canyon Preserve. This alternative would be collocated with an existing transmission line ROW and would reduce potential effects on certain portions of the communities of Poway, Scripps Ranch and Rancho Peñasquitos although impacts would be shifted to MCAS Miramar and other residential, commercial and industrial land uses. Locating the line in commercial and industrially developed areas would enhance the land use compatibility of this alternative.

Environmental Disadvantages

Visual Resources. This alignment would be above ground resulting in relatively greater potential for visual impacts when compared to the Proposed Project with its underground segments.

Land Use. With this alternative, new ROW would be required through the community of Scripps Ranch and near to Alliant International University, which could result in greater EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts and land use impacts on the residential community and university. This route is also longer than the project resulting in a greater exposure of the line and the potential incompatibilities with surrounding residential land uses.

Hazards and Hazardous Materials. Contamination and/or ordnances may be encountered due to ground disturbing activities on MCAS Miramar. Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically feasible. However the portion of this alternative on MCAS Miramar would not be regulatorily or legally feasible to permit due to statements by MCAS Miramar that alternatives on the base could not be permitted in order to preserve its National Defense Mission capabilities without degradation. In addition, there would be increased residential land use conflicts and visual impacts, as this alternative would shift environmental impacts simply to a new area. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS.

It should be noted that a portion of this alternative is similar to the Pomerado Road to Miramar Area North–Combined Underground Alternative and Underground/Overhead Alternative (see Section 4.6.1), which was retained for analysis, and the Pomerado Road to Miramar Area North–All Underground Alternative (see Section 4.6.12) that was eliminated.

4.6.9 SDG&E Segment 14 Poway Alternative

Alternative Description

This alternative is from the SDG&E PEA Section 3.3.1.2 (PEA eliminated) and is shown in Figure Ap.1-21. This route alternative was considered in connection with SDG&E Segment 15 Warren Canyon Alternative and would connect into SDG&E Segment 12 Poway Substation to Peñasquitos Substation Alternative (see Section 4.6.7). This alternative would vary from the Proposed Project at MP 125.8 to the Chicarita Substation. This alternative would follow a portion of an existing ROW and section lines, but it would also require new and expanded ROW to be acquired. This alternative is essentially a straight

east-to-west alignment that terminates in the City of Poway where it transitions to SDG&E Segment 12 (see Section 4.6.7).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 14 Poway Alternative would meet all project objectives.

Feasibility

This alternative would require more new private ROW than the proposed route. Acquiring private ROW could require more condemnation and relocation of homes and businesses, which could thus delay the project in-service date. This alternative has the potential to be legally, regulatorily, and technically feasible.

Environmental Advantages

This alternative does not appear to substantially reduce any potential environmental impacts of the Proposed Project.

Environmental Disadvantages

Biological Resources. This alternative has the potential for increased biological resources impacts due to the presence of critical habitat with potential effects on special status species. This alternative would also potentially affect natural resources within County of San Diego and local open space and parks, such as County of San Diego's Blue Sky Canyon Ecological Preserve.

Land Use. This alternative has the potential for increased environmental effects relative to the Proposed Project including close proximity to a school. This alternative would also potentially affect County of San Diego open space and parks. With implementation of this alternative, new and/or expanded ROW would be required. In addition, numerous homes and businesses are located along this alignment which would be affected.

Recreation. Construction of this alternative could affect the recreational experience in local open space and parks, such as County of San Diego's Blue Sky Canyon Ecological Preserve.

New Transmission Corridor. A portion of this alternative would establish a new transmission line corridor. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially feasible, however, it would require significant new right-of-way on undisturbed and Preserve lands with sensitive biological resources and it does not appear to offer any environmental benefit relative to the Proposed Project. Therefore, it has been eliminated from full consideration in this EIR/EIS.

4.6.10 SDG&E Segment 15 Warren Canyon Alternative

Alternative Description

SDG&E Segment 15 Warren Canyon Alternative was developed in SDG&E's PEA Section 3.3.1.2 (PEA eliminated) and is shown in Figure Ap.1-21. This route alternative was considered in connection with SDG&E Segment 14 and would connect into SDG&E Segment 12 Poway Substation to Peñasquitos Substation Alternative at or near the existing Poway Substation (see Section 4.6.7 above). This alternative would vary from the Proposed Project from the Creelman Substation to the Chicarita Substation, similar to the SDG&E Segment 14 Poway Alternative described above in Section 4.6.9. This alternative would follow a portion of an existing ROW and section lines and would also require new and expanded ROW to be acquired in the City of Poway and portions of unincorporated San Diego County.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 15 Warren Canyon Alternative would meet all project objectives.

Feasibility

Regulatory Feasibility. This alternative would require more new private ROW than the proposed route. Acquiring private ROW could require more condemnation and relocation of homes and businesses, which could thus delay the project in-service date. In addition, this alternative would traverse designated Critical Habitat and would thus require coordination with USFWS and CDFG, which could delay the project timeline, but the alternative would likely be regulatorily feasible.

Technical and Legal Feasibility. This alternative has the potential to be legally and technically feasible.

Environmental Advantages

The SDG&E Segment 15 Warren Canyon Alternative does not appear to have any obvious environmental advantage or substantially reduce potential environmental effects of the Proposed Project.

Environmental Disadvantages

Biological Resources. This alternative has the potential for increased biological resources and special status species impacts due to the presence of critical habitat in the general vicinity of the alignment. This alternative would also potentially affect natural resources within County of San Diego and local open space and parks.

Land Use. This alternative has the potential for increased environmental effects relative to the Proposed Project including close proximity to a school. This alternative would also potentially affect County of San Diego and local open space and parks. With implementation of this alternative, new and/or expanded ROW would be required. In addition, numerous homes and businesses are located along this alignment and would be affected.

Recreation. This alternative would also potentially affect natural resources within County of San Diego and local open space and parks.

New Transmission Corridor. A portion of this alternative would establish a new transmission line corridor. In general, consolidating transmission lines within common utility corridors is desirable because it minimizes land disturbance, barriers to wildlife movement, and additional visual impacts that typically result from separate transmission line corridors.

Alternative Conclusions

ELIMINATED. This Alternative would meet project objectives and is potentially feasible. However, there is the potential for increased biological resources impacts due to the presence of critical habitat in the general vicinity of the alignment and it could impact County of San Diego and local open space and parks. Because the route would shift impacts and does not appear to offer any clear environmental benefit relative to the Proposed Project, it has been eliminated from full consideration in this EIR/EIS.

4.6.11 SDG&E Segment 16 North of Peñasquitos Alternative

Alternative Description

This alternative is from SDG&E PEA Section 3.3.1.2 (PEA eliminated) and is shown in Figure Ap.1-21. SDG&E Segment 16 North of Peñasquitos Alternative would begin at the proposed Central East Substation site and would follow SR78 westerly toward the existing Felicita Substation near Escondido. At this point the segment would follow an existing transmission line heading west toward San Marcos then southwest to Olivenhain. From here the line would follow a ROW along Del Dios Highway, west of Lake Hodges toward Rancho Santa Fe, Solana Beach and Del Mar. The line would continue south toward a crossing of SR56 and into the existing Peñasquitos Substation. The alternative would reach farther north and west than any other alternative and is longer than the project route. The area traversed by this alternative is densely populated and development in this area is built up close to the existing ROW.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It

would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Segment 16 North of Peñasquitos Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative has the potential to be legally and regulatorily feasible.

Technical Feasibility. This route would have constructability challenges due to steep topography. However, from a future system expandability perspective, this alternative may be useful, because it extends the farthest north towards Escondido Substation (see Section B for a discussion of Future 230 kV Circuits).

Environmental Advantages

Biological Resources. Biological resources impacts within the Los Peñasquitos Canyon Preserve would be avoided with this alternative.

Land Use. This alternative would avoid impacts in the City of Poway and the communities of Scripps Ranch and Rancho Peñasquitos.

Environmental Disadvantages

Longer Length and Ground Disturbance. This route would be substantially longer than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with greater ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Visual Resources. This alternative would create significant visual impacts along SR78.

Biological Resources. This alternative could affect designated Critical Habitat.

Hydrology and Water Quality. Significant portions of this alternative would be located in designated 100-year floodplains.

Land Use. This alternative would be much longer than the proposed route and would require the most new and expanded ROW in highly populated areas with narrow ROW options. The route would impact numerous residential communities and agricultural lands.

Transportation and Traffic. Because this alternative would require construction within or in close proximity to numerous roadways, this alternative would be expected to result in increased short-term construction-related impacts on traffic.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially feasible. This alternative would not substantially reduce potentially significant impacts compared to the Proposed

Project and it would create greater land use impacts in populated areas and would be substantially longer resulting in increased ground disturbance and thus overall greater impacts to all issues areas. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS.

4.6.12 Pomerado Road to Miramar Area North–Combination Underground/Overhead Alternative

Alternative Description

This alternative was developed during the scoping period by the public and has been suggested by RPCC. This alternative would exit the Sycamore Substation at MCAS Miramar overhead west within an existing ROW toward Pomerado Road. The line would transition to underground beneath Pomerado Road in the vicinity of Legacy Road. The line could be attached to the Pomerado/Miramar Road bridge over I-15 or on an overhead structure crossing I-15. The route would continue westward under Miramar Road, turn north on Kearny Villa Road/Black Mountain Road. South of the intersection of Carroll Centre and Black Mountain Road, the line would enter the southeastern end of Carroll Canyon/Fenton Canyon. At Carroll Canyon the line would transition to overhead.

The line would continue west through Fenton Canyon, west of Camino Santa Fe on the south side of the canyon. The line would again transition to underground at Brown Deer Road just south of the canyon edge. The line would continue south on Brown Deer Road and west on Carroll Canyon Road to Scranton Road and would rejoin the existing 230 kV ROW heading north into the Peñasquitos Substation. The route is shown in Figure Ap.1-21.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Pomerado Road to Miramar Area North–Combination Underground/Overhead Alternative would meet all project objectives.

Feasibility

Regulatory and Legal Feasibility. This alternative has the potential to be legally and regulatorily feasible.

Technical Feasibility. Similar to the Pomerado Road to Miramar Area North–Combined Underground Alternative and Underground/Overhead Alternative discussed in Section 4.6.1 above, research conducted with the City of San Diego regarding buried utilities within the roadways affected by this alternative indicates that adequate space exists to allow the placement of an underground utility duct bank/trench(es) of the size and depth required by SDG&E for a single-circuit 230 kV line for most of the affected roads.

However, in addition, this alternative would encroach on an existing operating sand and gravel quarry located in Carroll Canyon and could be technically infeasible if it would disrupt active quarry operations or if excavation in the area could undermine tower footings. Assuming that the route would not significantly obstruct quarry operations, this alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Biological Resources. This alternative would avoid Los Peñasquitos Canyon Preserve, and would therefore, eliminate all biological impacts within the Preserve.

Cultural Resources. This alternative would reduce ground disturbing activities on undeveloped lands reducing potential effecting subsurface on cultural resources in Los Peñasquitos Canyon Preserve. Cultural Resources within Carroll Canyon are presumed to be disturbed/non-existent due to the presence of ongoing mining operations.

Geology and Soils. This alternative would reduce potential ground disturbance and related impacts on hydrology and drainage impacts within Los Peñasquitos Canyon Preserve are avoided with this Alternative.

Land Use. The majority of surrounding land uses are commercial or industrial in nature. This alternative would avoid impacts to residences within the Rancho Peñasquitos community along Park Village Drive and within the Los Peñasquitos Canyon Preserve because this area is avoided. Locating this line within Pomerado Road/Miramar Road, a prime arterial roadway, and other wide roadways reduces the potential for land use incompatibilities, construction disturbance and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts.

Environmental Disadvantages

Biological Resources. Impacts to biological resources, including a blue line stream, within Carroll and Fenton Canyons could occur under this alternative.

Land Use. This alternative would encroach on the existing Vulcan Materials Company Carroll Canyon quarry and would be considered an incompatible land use.

Public Health and Safety. The presence of an overhead 230 kV segment of the line in Carroll Canyon within an area with ongoing heavy industrial activities associated with sand and gravel extraction and processing operations would create potential public safety hazards.

Transportation and Traffic. Traffic impacts under this alternative could be increased due to the complete reliance of this alternative on burial beneath heavily traveled roadways as compared to Park Village Drive. In addition, the sand and gravel quarry located in Carroll Canyon is a highly active and working mine, with consistent and moderately heavy truck traffic traveling to and from the site that would be disrupted.

Geology and Soils. This alternative would encroach on and thus would have the potential to disrupt an existing operating sand and gravel quarry located in Carroll Canyon.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and is legally and has the potential to be regulatorily feasible. There are possible technical feasibility issues as the route could disrupt an existing sand and gravel quarry operating in Carroll Canyon, which resulted in this alternative being eliminated from full analysis in this EIR/EIS.

It should be noted that most of this alternative (except at the eastern and western ends) is the same as the Pomerado Road to Miramar Area North–Combined Underground Alternative and Underground/Overhead Alternative that has been retained for full evaluation (see Section 4.6.1).

4.6.13 MCAS Miramar–All Underground and Underground/Overhead Alternative

Alternative Description

This alternative is a hybrid alternative combining two alignments developed during the scoping period by the public including RPCC and Mike and Jennie Vildibill. This line retains some design flexibility and could be underground or overhead as needed to avoid impacts to important resources or otherwise sensitive areas as identified by MCAS Miramar.

Under this alternative, the line would be located beneath existing roads on MCAS Miramar from the Sycamore Canyon Substation to I-805 staying on the base the entire distance. The line would exit the Sycamore Canyon Substation from the south following the path of a paved road named Spring Canyon. The line would continue underground in a southwest direction following Creek Road/Green Farms Road toward the direction of I-15. The line would cross I-15 south of the Miramar Way overpass on an existing bridge structure. The line would continue underground along the northern side of the base south of Miramar Road. Winding its way west, the line would remain north of the MCAS Miramar runways and continue all the way to I-805 where the line would transition to overhead and join the existing 230 kV ROW east of I-805 heading into the Peñasquitos Substation. The route is shown in Figure Ap.1-21.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The MCAS Miramar–All Underground and Underground/Overhead Alternative would meet all project objectives.

Feasibility

Technical Feasibility. The 200-foot corridor for the overhead segment at the western end is crowded. There is a 138 kV line with a vacant circuit, 230 kV double-circuit and a 69 kV line, as well as underground fuel lines and a gas line. However, inclusion of an additional 230 kV circuit could be accomplished by:

- Collocation of the line with a 69 kV underbuild;
- Switching the 138 kV line to a 230 kV line with a 69 kV underbuild and then moving the 138 kV line to the current 69 kV alignment;
- Staggering the 230 kV tower locations so that they are not aligned with the existing 230 kV double-circuit towers;
- Undergrounding within the ROW; or
- Acquisition of new/expanded ROW.

Therefore, this alternative has the potential to be technically feasible.

Regulatory and Legal Feasibility. This alternative would encounter legal and regulatory issues associated with crossing MCAS Miramar. Coordination with MCAS Miramar representatives has indicated that no alternative transmission path on MCAS Miramar is feasible and none would be permitted due to National Defense Mission capability requirements (Miramar, 2007).

Environmental Advantages

Biological Resources. This alternative would avoid impacts to biological resources within the Los Peñasquitos Canyon Preserve.

Cultural Resources. This alternative would reduce ground disturbing activities on undeveloped lands and the potential for subsurface cultural resources impacts within Los Peñasquitos Canyon Preserve.

Land Use. This alternative would avoid impacts to residences within the Rancho Peñasquitos community along Park Village Drive and within the Los Peñasquitos Canyon Preserve because this alignment avoids this area entirely. Locating this line underground within MCAS Miramar would reduce the potential for land use incompatibilities, construction impacts and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts due to the distance from residences in proximity to the buried line and primarily industrial and commercial land uses along the route.

Noise. This alternative would reduce corona noise impacts to residences along the overhead portions of the proposed route.

Environmental Disadvantages

Biological Resources. Impacts to biological resources within MCAS Miramar could occur under this alternative due to the surface disruption associated with construction of the underground segments.

Land Use. Increased land use incompatibilities may occur with MCAS Miramar due to the ongoing activities, future land use planning efforts and heightened security measures now in place.

Transportation and Traffic. Traffic impacts under this alternative could be increased in the short term for the due to the complete reliance of this alternative on burial beneath MCAS Miramar roadways.

Hazards and Hazardous Materials. Contamination and/or ordnances may be encountered due to ground disturbing activities on MCAS Miramar.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically feasible. However the portion of this alternative on MCAS Miramar would not be regulatorily or legally feasible to permit due to statement by MCAS Miramar that alternatives on the base could not be permitted in order to preserve its National Defense Mission capabilities without degradation. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS.

4.6.14 MCAS Miramar–Combination Underground/Overhead Alternative

Alternative Description

This alternative was developed during the scoping period and has been suggested by RPCC. This alternative is essentially a hybrid, and somewhat redundant, combining a couple of previously suggested routing modifications. Under this alternative, the line would exit Sycamore Canyon Substation to the south and would be located overhead following the alignment of existing roads on MCAS Miramar to Pomerado Road where the line would transition to underground. Under this alternative, the rest of the alignment could then follow either Pomerado Road to Miramar Area North–Combination Underground/Overhead Alternative (see Section 4.6.12) or MCAS Miramar–All Underground and Underground/Overhead Alternative (see Section 4.6.13) approaching the Peñasquitos Substation from the south along the existing 230 kV ROW east of I-805. The route is shown in Figure Ap.1-21.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The MCAS Miramar–Combination Underground/Overhead Alternative would meet all project objectives.

Feasibility

Technical Feasibility. The 200-foot corridor for the overhead segment at the western end is also crowded. There is a 138 kV line with a vacant circuit, 230 kV double-circuit and a 69 kV line, as well as underground fuel lines and a gas line. However, inclusion of an additional 230 kV circuit could be accomplished by:

- Collocation of the line with a 69 kV underbuild;
- Switching the 138 kV line to a 230 kV line with a 69 kV underbuild and then moving the 138 kV line to the current 69 kV alignment;
- Staggering the 230 kV tower locations so that they are not aligned with the existing 230 kV double-circuit towers;
- Undergrounding within the ROW; or
- Acquisition of new/expanded ROW.

This alternative has the potential to be technically feasible.

Regulatory and Legal Feasibility. This alternative would encounter legal and regulatory issues associated with crossing MCAS Miramar. Coordination with MCAS Miramar representatives has indicated that no Alternative transmission path on MCAS Miramar is feasible and none would be permitted due to National Defense Mission capability requirements (Miramar, 2007).

Environmental Advantages

Biological Resources. This alternative would avoid impacts to biological resources contained within the Los Peñasquitos Canyon Preserve.

Cultural Resources. This alternative would reduce ground disturbing activities on undeveloped lands resulting in a reduced potential for affecting subsurface cultural resources within Los Peñasquitos Canyon Preserve.

Land Use. This alternative would avoid impacts to residences within the Rancho Peñasquitos community along Park Village Drive and within the Los Peñasquitos Canyon Preserve because these areas are avoided. Locating this line underground within MCAS Miramar would reduce the potential for land use incompatibilities, construction impacts, corona noise, and EMF-related concerns due to the distance from residences in proximity to the buried line and the primarily industrial and commercial land uses along the route. Portions of the line that are off-base would traverse primarily commercial and industrial land uses resulting in fewer potential land use incompatibilities.

Environmental Disadvantages

Biological Resources. Impacts to biological resources within MCAS Miramar could occur under this alternative due to the surface disruption during construction. Biological resources in Carroll and Fenton Canyons could also be adversely affected.

Land Use. Increased land use incompatibilities may occur with MCAS Miramar due to the ongoing activities, future land use planning efforts, and heightened security measures now in place.

Transportation and Traffic. Traffic impacts under this alternative could be increased in the short term due to the reliance of this alternative on burial beneath roadways both on and off MCAS Miramar property.

Hazards and Hazardous Materials. Contamination and/or ordnances may be encountered due to ground disturbing activities on MCAS Miramar.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially technically feasible. However the portion of this alternative on MCAS Miramar would not be regulatorily or legally feasible to permit due to statement by MCAS Miramar that alternatives on the base could not be permitted in order to preserve its National Defense Mission capabilities without degradation. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS.

4.6.15 Rancho Peñasquitos Boulevard Bike Path Alternative

Alternative Description

This alternative was developed during the scoping period and has been suggested by RPCC and Melody Herbert. This alternative would diverge from the Proposed Project at the Chicarita Substation and it was designed to avoid impacts to a riparian area west of Rancho Peñasquitos Boulevard and I-15. The route would start at the location of the transition tower near the Chicarita Substation and would head north for approximately 200 feet and then would transition underground near the entrance to the bike path at Rancho Peñasquitos Boulevard. This alternative would run along the south side of State Route 56 until the elevation of the bike path meets up with the ROW, approximately 0.25 miles west of Rancho Peñasquitos Boulevard. The transmission line would remain underground rejoining the Proposed Project alignment continuing westward toward its terminus at the Peñasquitos Substation. Under this alternative, the overhead/underground transition structure near Chicarita Substation would be moved south of its currently planned location. The route is shown in Figure Ap.1-21.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Rancho Peñasquitos Boulevard Bike Path Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. The bike path property is currently owned by City of San Diego. The city and Caltrans have a prior agreement to transfer all property acquired by the city for the SR56 project to Caltrans upon completion of the project and intend to complete the right-of-way transfer which includes the bike path right-of-way. Caltrans is generally against longitudinal encroachments and may reject the acceptance of the right-of-way if it contained a longitudinal utility encroachment. Attachment 1B includes the full text of the Caltrans policies and regulations regarding longitudinal encroachments. The City of San Diego opposes placing the project in the property as it could prevent or complicate the right-of-way transfer to Caltrans.

As discussed above, Caltrans' general policy on use of its controlled access roadways does not permit longitudinal encroachments. SDG&E would have to show that there are no other options, in which case Caltrans would work with the applicant through the Exception Permit Process. Given that there are other options (as described throughout this Appendix and with the Proposed Project), the regulatory feasibility of this alternative is very questionable. In addition, it would be difficult or impossible to achieve Caltrans approval within a reasonable period of time, as required by the project objective timeframes.

Environmental Advantages

Visual Resources. Moving the transition structure, near the Chicarita Substation, to the south would reduce the visibility of this structure compared to the Proposed Project in this segment.

Biological Resources. This alternative would reduce impacts on biological resources within the Views West Park, because ground disturbance in this area would be avoided with the line buried under the paved bike path.

Cultural Resources. This alternative would result in less ground disturbance in previously undisturbed areas resulting in a reduced potential for effects on subsurface cultural resources with the Views West Park area.

Geology and Soils. This alternative would reduce ground disturbance in Views West Park, an area with topographic variation and steep slopes, which would thereby reduce potential soils, erosion and water quality impacts.

Hydrology and Drainage. This alternative would reduce ground disturbance in the riparian areas within Views West Park.

Land Use. This alternative would move the line farther from residences along Swath Court, Swath Place, Pine and Manor Court and Las Conicas by traversing an area further to the north and away from homes.

Environmental Disadvantages

Land Use. This alternative may have an increased short-term impact on recreational users of the bike path during construction and increased EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts due to its proximity to residences adjacent to the SR56 bike path.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible. However the portion of this alternative within the SR56 ROW would not be regulatorily feasible to permit due to Caltrans regulations. Therefore, this alternative has been eliminated from full consideration in this EIR/EIS, because it is considered infeasible from a City of San Diego permitting standpoint.

4.6.16 Carmel Valley Road Alternative

Alternative Description

This alternative was suggested by the West Chase Homeowners Association (WCHOA) during the scoping process and is shown in Figure Ap.1-21. The WCHOA identifies this as Alternative 1. This alternative would diverge from the Proposed Project route at the Chicarita Substation. This alternative would follow the path of existing overhead transmission lines heading northwest to Carmel Valley Road, just east of Black Mountain Road. The line would transition to underground and be located within the median of Carmel Valley Road a distance of approximately 2.7 miles. Near the intersection of Via Abertura and Carmel Valley Road, this alternative would again transition to overhead and would travel a distance of 2.2 miles, heading south along an existing transmission line ROW to the west end of Park Village Drive. This alternative would rejoin the Proposed Project route overhead in the Los Peñasquitos Canyon Preserve.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Carmel Valley Road Alternative would meet all project objectives.

Feasibility

Research conducted with the City of San Diego regarding buried utilities within the roadways affected by this alternative indicates that adequate space exists to allow the placement of an underground utility duct bank/trench(es) of the size and depth required by SDG&E for a single-circuit 230 kV line. Therefore, this alternative has the potential to be legally, regulatorily and technically feasible.

Environmental Advantages

Biological Resources. This alternative could reduce impacts on biological resources within the Los Peñasquitos Canyon preserve due to the avoidance of the buried segment in this area.

Cultural Resources. This alternative would result in less ground disturbance on undeveloped lands resulting in a reduced potential affects on subsurface cultural resources in Los Peñasquitos Canyon Preserve.

Geology and Soils. This alternative would reduce ground disturbance within a relatively undisturbed area of Los Peñasquitos Canyon Preserve.

Land Use. This line would take advantage of existing transmission line corridors and city streets. As such, this alternative would avoid impacts to residences within the Rancho Peñasquitos community along Park Village Drive and within the Los Peñasquitos Canyon Preserve because these areas are avoided. Locating this line within Carmel Valley Road, which is wider than Park Village Drive and would be farther from residences, would eliminate potential land use incompatibilities and EMF-related concerns, as well as induced currents and shocks and radio/television/electrical equipment impacts.

Environmental Disadvantages

Longer Length and Ground Disturbance. This route would be substantially longer than the proposed route, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with greater ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of less native desert vegetation.

Transportation and Traffic. Short-term traffic impacts under this alternative could be increased due to the number of total daily vehicle trips on Carmel Valley Road as compared to Park Village Drive.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and is potentially feasible. It has been eliminated from further analysis in the EIR/EIS, because it would be longer than the Proposed Project segment, would have increased traffic impacts on the heavily traveled Carmel Valley Road, and would merely transfer potential environmental impacts from one community to another without any net benefit.

4.6.17 State Route 56 Alternative

Alternative Description

This alternative was suggested by multiple commenters including the West Chase Homeowners Association (WCHOA); Del Mar Mesa Community Planning Board; Melody Herbert; Rajesh and Joyce Dias; Jeff and Kim Gross; and Mike and Jennie Vildibill; Carmel Valley Concerned Citizens; Laura Copic, and the Carmel Valley Community Planning Board during the scoping process. This alternative would diverge from the Proposed Project route starting at the Chicarita Substation.

From the Chicarita Substation, this alternative would continue on an overhead structure transitioning to an underground structure near Rancho Peñasquitos Boulevard at the State Route (SR) 56 overpass. This alternative would locate the powerline under the median of SR56 until it would reach the existing overhead lines north of the western terminus of Park Village Drive. The line would continue south along this existing transmission line ROW on overhead structures until it would rejoin the project alignment near MP 146.5. The route is shown in Figure Ap.1-21.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The State Route 56 Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. Though construction could be difficult in the heavily traveled SR56, this alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. This alternative would be infeasible from a regulatory standpoint as it is inconsistent with Caltrans regulations, which prohibit longitudinal encroachments into Caltrans ROW along limited access roadways, such as State Route 56. Please refer to the Rancho Peñasquitos Bike Path Alternative (Section 4.6.15) for a discussion of Caltrans regulations. Attachment 1B includes the full text of the Caltrans policies and regulations regarding longitudinal encroachments.

Environmental Advantages

Biological Resources. This alternative would eliminate impacts on biological resources contained within the Los Peñasquitos Canyon Preserve due to the avoidance of this area.

Cultural Resources. This alternative would result in less ground disturbance or undeveloped lands resulting in a reduced potential for to disturb subsurface cultural resources in Los Peñasquitos Canyon Preserve.

Land Use. This alternative would avoid impacts to residences within the Rancho Peñasquitos community along Park Village Drive and within the Los Peñasquitos Canyon Preserve, because this alignment would avoid this area by heading to the north along existing ROW to SR56. Locating the line within SR56, which is wider than Park Village Drive, would reduce the potential for land use incompatibilities and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts for residences near the underground line of the proposed route.

Environmental Disadvantages

Transportation and Traffic. Short-term traffic impacts under this alternative would be expected to increase due to the magnitude of the volume of total daily vehicle trips traveling on SR56 between I-15 and I-5. Long-term maintenance of this alternative may also result in circulation impacts to users of SR56.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible, but it has been eliminated from further consideration, due to conflicts with Caltrans regulations for limited access roadways, which would make it regulatorily infeasible.

4.5.18 MP 146.5 to Peñasquitos Substation Underground/Consolidation Alternative

Alternative Description

This alternative was suggested during the public scoping process for the project by Carmel Country Highlands Owners; Joanne Fogel; Carmel Valley Concerned Citizens; Carmel Valley Community Planning Board; Todd Saier; Nbild; and Dwight and Cara Baker. Under this alternative the line would follow the project alignment but would remain underground from Chicarita Substation all the way to the Peñasquitos Substation. In addition, this alternative would include undergrounding/consolidation of all existing electrical 69 kV and 138 kV transmission lines along the segment from MP 146.5 to the Peñasquitos Substation (and unaffected by the project) including H frame structures and lattice towers. No transition structure would be built at the west end of Park Village Drive as the line would remain buried. The route is shown in Figure Ap.1-21.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow

for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The MP 146.5 to Peñasquitos Substation Underground/Consolidation Alternative would meet all project objectives.

Feasibility

Technical and Regulatory Feasibility. This alternative has the potential to be technically and regulatorily feasible.

Legal Feasibility. Burial of the project transmission lines along with burial of two existing aboveground lines (69 kV and 138 kV) within the Los Peñasquitos Canyon Preserve would not be legally feasible because it would require burial of existing transmission lines not affected by the project. Refer to the discussion under the Oak Hollow Underground Alternative (Section 4.5.2) above for a detailed discussion of the legal feasibility issues associated with moving existing lines that would be unaffected by the Proposed Project.

Environmental Advantages

Visual Resources. All lines would be underground, which would eliminate all visual impacts of the Proposed Project to residences in the area and would improve the baseline environment by undergrounding existing overhead transmission lines.

Environmental Disadvantages

Biological Resources. Additional ground disturbance that would occur under this alternative due to burying all existing transmission lines and structures within an existing ROW would result in greater potential impacts to biological resources within Los Peñasquitos Canyon Preserve.

Cultural Resources. Additional ground disturbance that would occur under this alternative from burying all existing transmission lines and structures within an existing ROW would result in greater potential impacts to cultural resources within Los Peñasquitos Canyon Preserve.

Geology and Soils. Additional ground disturbance within the Los Peñasquitos Canyon Preserve that would occur under this alternative from undergrounding three transmission lines on steep slopes would result in additional impacts to soils and increased erosion.

Hydrology and Water Quality. The additional ground disturbance associated with undergrounding three transmission lines on steep slopes could result in drainage issues and additional impacts to groundwater and water quality associated with erosion.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and regulatorily feasible. However, the alternative would be legally infeasible because it would require burial of existing transmission lines not affected by the project. This undergrounding/consolidation of existing electrical transmission lines, especially on steep slopes within the ROW, would also cause additional ground disturbances to biological and cultural resources, soil, and erosion water quality within Los Peñasquitos Canyon Preserve. Therefore, this alternative has been eliminated from full evaluation in this EIR/EIS.

4.6.19 Scripps-Poway Parkway to State Route 56 Alternative

Alternative Description

This alternative was provided by Melody Herbert, Tom and Laura Mauro and Curt Baldwin during the public scoping process conducted for the project. Under this alternative, the line would exit Sycamore Canyon Substation and would transition to underground beneath Scripps-Poway Parkway. The line would continue in a northwest direction toward the Chicarita Substation and SR56. The line would remain underground and would be located beneath SR56. The line would continue westward under SR56 and could turn south at either of the two existing transmission line corridors that intersect SR56. The route would head south along an existing ROW into the Peñasquitos Substation. The route is shown in Figure Ap.1-21.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Scripps-Poway Parkway to SR56 Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. Though construction could be difficult in the heavily traveled SR56, this alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. This alternative would be infeasible from a regulatory standpoint as it is inconsistent with Caltrans regulations, which prohibit longitudinal encroachments into Caltrans ROW along limited access roadways, such as SR56. Please refer to the Rancho Peñasquitos Bike Path Alternative (Section 4.6.15) for a discussion of Caltrans regulations. Attachment 1B includes the full text of the Caltrans policies and regulations regarding longitudinal encroachments.

Environmental Advantages

Visual Resources. Installing more of the line underground would reduce the visual impacts of this segment of the alignment. However, all existing overhead transmission lines would remain in place, which would essentially result in no visual change over existing conditions along Scripps-Poway Parkway.

Biological Resources. This alternative would reduce impacts on biological resources contained within the Los Peñasquitos Canyon preserve due to the avoidance of this area.

Cultural Resources. This alternative would result in less ground disturbance on undeveloped lands thereby reducing the potential to encounter and/or disturb subsurface cultural resources in Los Peñasquitos Canyon Preserve.

Land Use. This alternative would avoid impacts to residences within the Rancho Peñasquitos community along Park Village Drive and within the Los Peñasquitos Canyon Preserve, because this alignment avoids these areas by heading to the north along an existing ROW to SR56. Locating the line within SR56, which is substantially wider than Park Village Drive and farther from residences, would reduce potential residential land use incompatibilities and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts.

Environmental Disadvantages

Transportation and Traffic. Installing more of the line underground would increase short-term traffic and circulation impacts for this segment of the alignment.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible, but it has been eliminated from further consideration, due to conflicts with Caltrans regulations for limited access roadways, which would make it regulatorily infeasible.

4.6.20 Scripps-Poway Parkway–Pomerado Road Underground Alternative

Alternative Description

This alternative was provided by Mike and Jennifer Vildibill and Tom and Laura Mauro during the public scoping process conducted for the project and it is shown in Figure Ap.1-21. Under this alternative, the line would exit the Sycamore Canyon Substation overhead along the path of the project. At Pomerado Road, the line would transition underground beneath Pomerado Road heading northward to Poway Road. At Poway Road the line would continue underground in a westerly direction where it would rejoin the overhead ROW heading into the Chicarita Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Scripps-Poway Parkway–Pomerado Road Underground Alternative would meet all project objectives.

Feasibility

This alternative has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Visual Resources. The portion of the line east of I-15 would be underground, thereby reducing potential visual effects of the project as experienced by residents in Rolling Hills.

Land Use. This alternative would avoid land use incompatibility impacts to residences within the Rolling Hills community.

Environmental Disadvantages

Visual Resources. Additional transition structures would create additional visual impacts in a residential community. Also, this alternative would provide questionable aesthetic benefit, because the existing lines would remain in place partially offsetting perceived visual benefit.

Land Use. New ROW would be required for this alternative through a highly developed and constrained area.

Ground Disturbance. Increased undergrounding would require increase ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with greater ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction.

Transportation and Traffic. Traffic impacts under this alternative could be increased in the short term due to the reliance of this alternative on burial beneath heavily traveled roadways.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and is potentially feasible. However, it would require new ROW in close proximity to an existing ROW, would cause greater short-term traffic impacts and would result in increased visual impacts from the additional transition structures. Additionally, this alternative would provide questionable aesthetic benefit because the existing lines would remain in place partially offsetting perceived visual benefit. Therefore, the Scripps-Poway Parkway-Pomerado Road Underground alternative has been eliminated from full consideration in this EIR/EIS.

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4.7 Substation Alternatives to Central East Substation

The following section of the Alternatives Screening Report represents a comprehensive summary and assessment of all substation alternatives to the proposed Central East Substation, including those originally developed by SDG&E, alternatives suggested by the public and agencies during review of the NOP and NOI and during public scoping efforts and also includes all alternatives developed independently by the CPUC, BLM and their EIR/EIS team. To date, five site alternatives have been developed. One site, the Top of the World Substation Alternative, has been recommended to be retained for further analysis in the EIR/EIS. Each of the alternatives to the proposed Central East Substation Alternative is described below and all of the alternative sites are shown in Figure Ap.1-10.

4.7.1 Top of the World Substation Alternative

Alternative Description

This site was suggested by the landowner, Vista Irrigation District (VID), during scoping as VID’s preference over other sites on VID land that were under consideration. The site would be located approximately one mile west of the proposed Central East Substation and is shown in Figure Ap.1-26 and in Figures Ap.1-10 and Ap.1-11 in a regional context.

The transmission line routes into the substation would follow the Proposed Project route to the point where the line to the proposed Central East Substation site is proposed to jog southeast (approximately MP 92.7). At this point the alternative 500 kV route would turn west for 1.1 miles to enter the alternative site. Exiting the substation the line would travel southwest for 400 feet and then west and north-northwest to rejoin the Proposed Project around MP 95.

Approximately 3 miles of new access roads would be required between the substation site and Highway S2. Table Ap.1-8 lists the associated earthwork quantities, estimated acreage requirements, and general site development.

Table Ap.1-8. Top of the World Substation Alternative General Site Development

Site Development	Details
Earthwork	<ul style="list-style-type: none"> • Pad – Cut to Fill – approximately 775K cubic yards without bulking/shrinkage factors. • Laydown Yards – Cut to Fill – approximately 350K cubic yards without bulking/shrinkage factors. • Schematic grading will require elevation adjustment to balance cut/fill. Adjustment will depend on actual site soil conditions. • Laydown Yards are located at Central East Property.
Access Road	<ul style="list-style-type: none"> • Approximately 3 miles of new road between substation and SR2. • Impact area approximately 16 acres.
Pad & Laydown Yard	<ul style="list-style-type: none"> • Pad – approximately 37 acres • Pad Impact area – approximately 69 acres • Laydown Yards (Central East Property) – approximately 15 acres • Laydown Yards Impact area (Central East Property) – approximately 30 acres
Terrain/Geology discussion	<ul style="list-style-type: none"> • Site mostly occupies a bench near the top of a hydrologic basin – drainage volumes are likely low. • Site appears to be a bench, surrounded by sloping rocky terrain. Presence of subsurface rock may impact grading to greater degree than other sites. • Maximum cut/fill slopes appears to be on the order of 80-100 feet

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Top of the World Substation Alternative would meet all project objectives.

Feasibility

Technical and Legal Feasibility. This alternative has the potential to be technically and legally feasible.

Regulatory Feasibility. There may be U.S. Army Corps of Engineer and California Department of Fish and Game jurisdiction in the site's southern corner at the upper end of two small canyons and in the site's northeastern corner at the upper end of a blue-line stream. This agency and permitting coordination could delay the project timeline, but the alternative has the potential to be regulatorily feasible.

Environmental Advantages

Visual Resources. This alternative would reduce significant impacts of the transmission line into the proposed Central East Substation and the Central East Substation itself from the San Felipe and Earthquake (Shelter) Valley.

Land Use. There would be no adjacent land use conflicts because it would be located on Vista Irrigation District land and farther from residences. In addition, this site is preferred by the landowner, Vista Irrigation District, over the Mataguay Substation Alternative site.

Biological Resources. This substation site would require less grading and would therefore disturb less habitat. A generalized vegetation map of San Diego County shows the site to support grassland and northern mixed chaparral. It appears, based on a recent aerial photo, that the site is primarily grassland. Two state or federally listed plant species have been reported to the California Natural Diversity Database (CNDDB) for the Warners Ranch quad, upon which the site is located, but based on their habitat and elevation requirements, they do not have potential to occur on the site. According to David Luttrell, VID Project Manager, the site is not occupied by the Stephen's kangaroo rat (*Dipodomys stephensi*), a federally listed endangered species, and habitat on site for the Stephen's kangaroo rat is minimally suitable.

Geologic Resources. Less grading would be required with this alternative, which would reduce the ground disturbance and potential for erosion. In addition, this site would be located west of the Earthquake Valley Fault, which runs directly under the proposed Central East Substation.

Cultural Resources. This substation site would require less grading and would therefore have less of a potential to disturb unknown cultural resources.

Figure Ap.1-26. Top of the World Substation Alternative
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Environmental Disadvantages

Biological Resources. Based on aerial photos, oak trees are present on the site. Oak trees have potential to support raptor nests, which could be impacted by substation construction. According to David Luttrell, VID Project Manager, there is a red-tailed hawk nest in an oak tree on the eastern margin of site. There may be U.S. Army Corps of Engineer and California Department of Fish and Game jurisdiction in the site's southern corner at the upper end of two small canyons and in the site's northeastern corner at the upper end of a blue-line stream.

Visual Resources. The site may be visible at a far distance from Lake Henshaw and SR79, as well as from Mt. Palomar and the Mataguay Boy Scout Camp.

Hydrology and Water Quality. The substation pad and along the access road could possibly cause impacts to waters of the U.S. and wetlands. Construction of the new access road would increase the potential for erosion, which could disturb waterways in the area.

Alternative Conclusions

RETAINED FOR ANALYSIS. This substation site would meet project objectives and would be potentially feasible. This alternative has the potential to reduce impacts to visual, geologic, and biological resources in comparison with the proposed Central East Substation site. In addition, less grading would be required. Therefore, this alternative has been retained for full analysis in this EIR/EIS.

4.7.2 SDG&E Central South Substation Alternative

Alternative Description

This alternative was evaluated by SDG&E in PEA Section 3.5.2 and is shown in Figure Ap.1-10. The Central South Substation Alternative site includes an 80-acre rectangular area (on a parcel that is approximately 20,500 acres), located north of the CNF near the base of the Mesa Grande Reservation east of MP 110.7. In this area the general topography and terrain would allow for a new substation. This location is within the existing SDG&E 69 kV transmission line ROW. A parcel of land approximately 194 acres in size would be required to be purchased or leased to accommodate the required substation, associated drainage, access road, transmission getaway, and buffer zone. Access could be possible from SR78.

The required substation at this location will be similar to the proposed Central East Substation (see Section B for a discussion of substation construction). However, if this site is selected additional substation facilities will be required to consolidate the existing Santa Ysabel Substation into the new substation. The additional facilities include installation of additional transformers, electrical equipment and distribution facilities to supply the 12 kV circuits feeding the Santa Ysabel load. The Santa Ysabel Substation would be dismantled and removed.

It should be noted that a modified Central South Substation Alternative has been retained for full analysis in the EIR/EIS for use with the Route D Alternative. Based on landowner preference, the site would be located approximately three miles south of this site along the proposed route (see Section 4.8.3).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Central South Substation Alternative would meet all project objectives.

Feasibility

Only one parcel owner exists in the area, thus lessening the consultation associated with numerous landowners. This alternative substation site has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Visual Resources. The Alternative Central South Substation Site is set back from the road and not visible to the public. It would allow elimination of the existing San Ysabel Substation which is highly visible along Highway SR78.

Existing Transmission Corridor. The site falls along the existing SDG&E 69 kV transmission line ROW. This is considered a primary opportunity because areas with pre-existing transmission line corridors are already disturbed by similar use.

Removal of Facilities. The existing Santa Ysabel Substation would be removed.

Geologic Resources. This site would be better seismically than the proposed Central East Substation site, which is located within the Alquist-Priolo Fault Zone of the Earthquake Valley Fault, because this alternative site is located southwest of the Elsinore Fault.

Environmental Disadvantages

Longer 500 kV Transmission Line. The 500 kV portion of the project would be over 20 miles longer before it would transition to 230 kV at the Central South Substation Alternative. Towers for a 500 kV line have a significantly larger footprint and are an average of 20 feet taller.

Visual Resources. This alternative would require construction of 20-foot taller 500 kV towers through the Santa Ysabel Valley. Use of this substation would thereby preclude underground alternatives to be considered in the Central Link due to technical feasibility issues associated with undergrounding a 500 kV line for long distances.

Alternative Conclusions

ELIMINATED. This substation would meet project objectives and would be potentially feasible. Use of the SDG&E Central South Substation Alternative with the proposed route has been eliminated from full consideration in this EIR/EIS due to the 20-mile-longer 500 kV line that would be required through the Santa Ysabel Valley.

However, a modified Central South Substation Alternative has been retained for full analysis in the EIR/EIS for use with the Route D Alternative. Based on landowner preference, the site would be located approximately three miles south along the proposed route (see Section 4.8.3).

4.7.3 SDG&E Warner West Substation Alternative

Alternative Description

This alternative was suggested by SDG&E in PEA Sections 3.3.1.3 and 3.3.1.4 as an alternative substation site and it is shown in Figure Ap.1-10. The Alternative Warner West Substation Site is larger (approximately 530 acres), square-shaped area, located to the southwest of the proposed Central South Substation and Lake Henshaw between two boundaries of the Santa Ysabel Reservation. The footprint of the substation and the associated construction activities would be similar to those proposed for the Central East Substation.

The transmission line connection to the Warner West Substation would diverge from the proposed route at MP 100. At the intersection of SR79 and SR76, the 500 kV alternative transmission line segment would follow SR76 and then would cut due west at a point one mile north of the northern Santa Ysabel Reservation boundary. At the western extent of the Santa Ysabel Reservation, the line would turn and head due south and then southwest along the outside of the reservation boundary to the SDG&E Warner West Substation Alternative site.

Exiting the substation, the 230 kV line would travel in a southeastern direction roughly paralleling the south side of Mesa Grande Road to rejoin the proposed route at MP 103.6 in the Santa Ysabel Valley.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The SDG&E Warner West Substation Alternative would meet all project objectives.

Feasibility

This alternative substation site has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

In this area the general topography and terrain would allow for a new substation.

Geologic Resources. This site would be better seismically than the proposed Central East Substation site, which is located within the Alquist-Priolo Fault Zone of the Earthquake Valley Fault, because this alternative site is located west-southwest of the Elsinore Fault.

Environmental Disadvantages

Longer Length of Transmission Line. This route would require at least 6 additional miles of 500 kV transmission line to connect into the substation site than the proposed Central East Substation, which will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of more native vegetation.

Cultural Resources. This site would be located in an area where there is a high density of historical and archaeological sites.

Residential Use. There are a greater number of residences in the substation site area and along the transmission line leading to/from the site.

Biological Resources. This site contains Potential Special Status Species Habitat for the Steven's Kangaroo Rat (SKR).

Alternative Conclusions

ELIMINATED. The Warner West Substation Alternative would meet project objectives and would be potentially feasible. The site was eliminated from full consideration in this EIR/EIS due to increased 500 kV and 230 kV transmission line length that this option would require, the numerous private parcel owners that would have to be consulted, the density of historical and archaeological sites in the area, and residential land-use constraints.

4.7.4 Warner Substation Alternative

Alternative Description

This alternative was suggested during scoping when a commenter suggested to use the existing Substation on Highway SR79 as an alternative to the proposed Central East Substation. The Warner Substation is located at the intersection of SR79 and S2, north of the proposed route and is shown in Figure Ap.1-10.

The Warner Substation would need to be expanded to a 500 kV/230 kV substation, similar to the proposed Central East Substation configuration as described in the Project Description in Section B, which requires a substantially bigger footprint than the existing substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and

beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Warner Substation Alternative would meet all project objectives.

Feasibility

This alternative substation site has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Elimination of Central Substation Construction. This alternative site would be an expansion of the existing Warner Substation that is located adjacent to a paved roadway (SR79) and no new access roads would be needed. Under this alternative, the proposed Central East Substation would not be constructed thereby eliminating impacts of the proposed substation. This alternative would eliminate disturbance of approximately 106 acres and approximately 1.5 to 1.8 million cubic yards of cut and fill earthwork. In addition, one mile of 500 kV transmission line into Central East Substation and one mile of 230 kV transmission line out of the substation to reconnect with the proposed route would be eliminated.

Biological Resources. The site is flatter than the proposed Central East Substation so much less grading and earthwork would be necessary, resulting in less temporary and permanent habitat impacts.

Cultural Resources. With less grading, there is less of a potential to encounter known and unknown cultural and archaeological resources.

Access Roads. SR79 and S2 could be used for access, eliminating the need for 1.07 miles of access road construction associated with the Central East Substation.

Environmental Disadvantages

Visual Resources. This substation is located in flat open space and would be highly visible to travelers on SR79 and for a far distance across the valley.

Longer Length of Transmission Line and Ground Disturbance. In addition to the major expansion at the Warner Substation to convert it to a 500/230 kV substation, both the 500 kV and 230 kV transmission lines would have to extend north and west for five and two miles, respectively, to the intersection of SR79 and S2 to interconnect with each other at the Warner Substation. This will affect the length and intensity of short-term construction impacts and ground disturbance, increasing impacts in air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with greater ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the removal of less native desert vegetation.

VID Preserve Land. The substation is located on Vista Irrigation District land in an area preserved to protect the water supply. Therefore, the surrounding area will never be developed and a large 500 kV/230 kV substation would introduce a significantly larger industrial facilities into otherwise undeveloped open space.

Cultural Resources. A records search has not been performed for that area, but the existing Warner Substation is across SR79 from the site of Camp Wright, a Civil War era military camp and within or adjacent to the former Warner Ranch so there could be cultural resource concerns.

Biological Resources. The open space grassland habitat surrounding the existing Warner Substation and that would be impacted by expansion of the substation supports Stephen's kangaroo rat (*Dipodomys stephensi*), a federally listed endangered species.

Alternative Conclusions

ELIMINATED. This substation site would meet project objectives and would be potentially feasible. Although it would eliminate construction of the proposed Central East Substation and the required grading at that site, the Warner Substation Alternative would be much more visible in the scenic valley, would be located on VID preserve land, and is in a sensitive area for biological and cultural resources. Therefore, due to greater environmental impact, this alternative has been eliminated from full consideration in this EIR/EIS.

4.7.5 Mataguay Substation Alternative

Alternative Description

This alternative would be located east of SR79 near MP 98 on land owned by Vista Irrigation District. The line would exit the substation and would travel for 0.3 miles in a private dirt road that leads to Mataguay Reservation, a Boy Scout camp to connect with the proposed route or an alternative along SR79. The site is shown in Figure Ap.1-10 and Ap.1-11.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative route would maintain reliability of service, provide transmission capability for renewable resources and would reduce energy costs in the San Diego region, which are the three primary objectives. It would also improve regional transmission infrastructure thereby satisfying reliability criteria. It would also provide transmission capability for Imperial Valley renewable resources and would (a) allow for prudent system expandability to meet both anticipated short-term (2010) and long-term (2015 and beyond) load growth through a total San Diego area import capability of at least 4,200 MW (all lines in service) and 3,500 MW (under G-1/N-1 contingency conditions) and (b) support regional expansion of the electric grid. The Mataguay Substation Alternative would meet all project objectives.

Feasibility

This alternative substation site has the potential to be technically, legally, and regulatorily feasible.

Environmental Advantages

Elimination of Central Substation Construction. The existing dirt road could be used for access, eliminating the need for 1.07 miles of access road construction associated with the Central East Substation. Under this alternative, the proposed Central East Substation would not be constructed thereby eliminating impacts of the proposed substation. This alternative would eliminate disturbance of approximately 106 acres and approximately 1.5 to 1.8 million cubic yards of cut and fill earthwork. In addition, 1.07 miles of 500 kV transmission line into Central East Substation and 1.07 miles of 230 kV transmission line out of the substation to reconnect with the proposed route would be eliminated.

Biological Resources. The site is flatter than the proposed Central East Substation so much less grading and earthwork would be necessary, resulting in less temporary and permanent habitat impacts.

Cultural Resources. With less grading, there is less of a potential to encounter known and unknown cultural and archaeological resources.

Residential Land Use. Because this substation would be located on VID land, there would be fewer residences in the immediate substation area.

Geologic Resources. This site would be better seismically than the proposed Central East Substation site, which is located within the Alquist-Priolo Fault Zone of the Earthquake Valley Fault, because this alternative site is located between the Earthquake Valley and Elsinore Faults.

Environmental Disadvantages

Longer 500 kV Transmission Line. The 500 kV portion of the project would be approximately 6.5 miles longer than if the Central East Substation is used.

Visual Resources. This substation site would likely be visible from northbound traffic on SR79.

Biological Resources. The site would be located near Portilla, specifically just north of Matagual Creek. The area where this site would be located appears to include one population of Stephens' kangaroo rat, a federally listed species. The open space grassland habitat that would be impacted by substation construction supports Stephen's kangaroo rat (*Dipodomys stephensi*), a federally listed endangered species. Although site surveys were not completed, there is native grassland (a highly sensitive vegetation type) known from this area. The take of 50 or more acres of high quality Stephen's kangaroo rat habitat would be considered a potentially significant and potentially unmitigable impact.

VID Preserve Land. The land on which this alternative would be built is owned by Vista Irrigation District (VID) and it would otherwise never be developed because it has been preserved due to its proximity to the district's water supply and Lake Henshaw. VID has indicated that it prefers the Top of the World Alternative Substation site in this segment as opposed to the Mataguay Substation Alternative site.

Land Use and Recreation. This alternative substation site would be visible to the Mataguay Reservation, a Boy Scout camp that is accessed via a dirt road from SR79 at MP 98.

Alternative Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially feasible. Although this substation site would require less grading, it would be visible from Highway S2 and the Mataguay Boy Scout camp and would create significant impacts to Stephen's kangaroo rat habitat. Based on land-owner preference, this site has been eliminated and the Top of the World site, also on VID land, has been retained for analysis (see Section 4.7.1).

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4.8 Southwest Powerlink (SWPL) Alternatives

The Southwest Powerlink (SWPL) is a 500 kV transmission line that imports power from Arizona to California. The SWPL starts in the Palo Verde area (about 50 miles west of Phoenix), passes through the Yuma (Arizona) area, through El Centro and the Imperial Valley Substation, and ends at the SDG&E Miguel Substation southeast of central San Diego. Its route is south-southwest from Palo Verde to Yuma, Arizona, then generally west parallel to the Interstate 8 corridor, through El Centro (interconnecting at the Imperial Valley Substation west of El Centro, to both the SDG&E and Imperial Irrigation District transmission systems), and into San Diego.

This section discusses several SWPL alternatives, each requiring a different length of new 500 kV transmission line parallel to the SWPL. The SWPL alternatives include routes considered by SDG&E in its PEA and other routes developed subsequent to PEA submittal. Each of these alternatives has in common a number of concerns related to reliability; these are discussed below. Each alternative is described and evaluated separately following this discussion that applies, to some extent, to all routes. The SWPL transmission line and the major alternative considered for EIR/EIS analysis (the Interstate 8 Alternative) is shown on Figure Ap.1-27a (overview of existing SWPL and Interstate 8 Alternative from Imperial Valley Substation to Miguel Substation). Figure Ap.1-27b shows all the SWPL alternatives retained in San Diego County, and Figure Ap.1-27c shows SWPL alternatives eliminated in San Diego County).

General Concerns Regarding SWPL Alternatives

All SWPL alternatives would avoid Anza-Borrego Desert State Park, which is the major reason that they are being considered. However, these alternatives present different challenges, as addressed briefly below and in detail in *Attachment 1A, Effect of Wildfires on Transmission Line Reliability: Collocation of Transmission Alternatives with the Southwest Powerlink*. This attachment is presented at the end of this appendix.

Transmission Line Reliability

The conclusion of the assessment presented in Attachment 1A is that the reliability implications of collocating a second circuit along the existing SWPL are not constant along the entire route. Also, the EIR/EIS does not contemplate a 500 kV line paralleling the entire length of the SWPL. As clearly indicated in data presented in the attachment, the frequency of fires varies significantly along the SWPL corridor. Between MP 0 and 31 there have been no fires over the 25-year period analyzed. However, from MP 49 and west of that point, there have been multiple fires within many one-mile segments of the SWPL. These data clearly indicate that the risk of an outage due to wildfires is minimal along the eastern portion of the SWPL corridor, but increases westward towards the Miguel Substation. The Attachment reaches two conclusions with respect to transmission line reliability:

- Conclusion 1: The Interstate 8, BCD, and Modified Route D Alternatives (paralleling SWPL only from MP 0 to MP 36) would create minimal reliability risk due to fire.
- Conclusion 2: The Route D and West of Forest Alternatives (south of Interstate 8) requiring collocation with SWPL for 52 miles would pose a reliability risk due to fire.

Fire and Smoke Outage

The high fire risk in the area and the history of outages along the existing SWPL due to fire creates an additional reliability concern for two parallel 500 kV lines that would import the bulk of SDG&E's

power. The smoke from wildfires can trip a circuit, causing it to go out of service, or outages can result from emergency line de-rating or shutdowns during a nearby fire in order to prevent thermal damage to the line or a smoke-caused trip.

In order to assess the variation in fire risk along the SWPL corridor, the SWPL corridor was evaluated to identify where along the line the fuel load and other fire risk factors combine to pose a fire hazard. Seven factors were considered related to fire risk and a model to present the aggregate risk along the SWPL route was developed, as shown in Figure Ap.1-28. Not surprisingly, the Imperial County (desert) portion of the route has the lowest fire risk. As illustrated on Figure Ap.1-28, fire risk increases from east to west along the SWPL, becoming consistently *moderate* at MP 37 and becoming *high* at MP 54. Red arrows indicate the two locations where SWPL alternatives would diverge from the transmission line. As a result of this analysis, an effort was made to develop alternatives that would diverge from the SWPL as far east as possible. Route segments that were initially under consideration that would diverge from the SWPL west of MP 37 were eliminated from detailed analysis.

Double Line Outage

As discussed above, constructing a second 500 kV line parallel to the existing SWPL, regardless of fire risk, would create a reliability concern because the possible occurrence of a two-line outage would have to be considered in the line rating. The Western Electricity Coordinating Council (WECC) would require SDG&E to develop Special Protection Schemes (SPS) or Remedial Action Schemes (RAS) before it would approve the new line. These requirements could include the automatic dropping of service to certain numbers of customers (“dropping load”) if the two lines go out of service for any reason, and/or the addition of generation resources in the San Diego area.

In order to minimize the risk of a double line outage, the length of collocated 500 kV lines has been kept to a minimum, and the collocated segment is east of the areas with severe fire risk in San Diego County.

Tower Design

Where parallel transmission lines are to be constructed, transmission line engineers generally recommend that the second line use of the same type of towers that were used for the first line, because visual consistency is improved. The existing SWPL towers east of the Imperial Valley Substation are tubular steel towers (passing through agricultural land), but west of the substation they are steel lattice structures. Therefore, unless otherwise stated in the alternative descriptions below, the new towers located adjacent to the SWPL are assumed to be lattice towers. However, site-specific visual, cultural, or biological impacts may be reduced by use of tubular steel towers.

Location of 500/230 kV Substation

In order to best meet project objectives and to minimize environmental impacts, the new 500/230 kV substation should be as close as possible to the center of the county — not too far south or east. This location would minimize the length of 230 kV lines that serve load. While substation locations along or near the SWPL corridor were initially considered, it was determined that locations further north would ultimately reduce regional environmental impacts. This is because multiple 230 kV lines may need to be constructed from the substation in the future to support regional growth (see discussion about future transmission system expansion in Section B.2.7).

Figure Ap.1-27a. Southwest Powerlink Transmission Line and Interstate 8 Alternative
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Figure Ap.1-27b. Southwest Powerlink Alternatives Retained in San Diego County
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Figure Ap.1-27c. Southwest Powerlink Alternatives Eliminated in San Diego County
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An advantage of converting from 500 kV to 230 kV allows easier installation of line segments underground, so conversion to 230 kV may be required in more developed areas where creation or expansion of overhead corridors may not be possible.

Line Separation

In developing the SWPL alternatives, one factor considered was the distance by which the two 500 kV lines ought to be separated given the fire risk and associated reliability concerns. The installation of major electric system additions, such as the Sunrise Powerlink, would have electric system reliability impacts. A single 500 kV transmission line is capable of carrying so much power that the interruption of only one such line may cause a significant disturbance to the stability of the regional electric system. For the bulk high-voltage transmission additions, there is generally a desire to define new projects so that a credible multiple-line outage cannot occur. To minimize the possibility of a simultaneous outage in the SDG&E service area, it would be desirable to have an adequate separation between the two 500 kV lines such that a concurrent outage caused by a single source would be very unlikely to occur.

Following is a list of separation distances between other pairs of 500 kV transmission lines in California and Arizona:

- Devers–Palo Verde No. 1 (existing) and No. 2 (proposed): 130 feet
- Los Banos–Gates (Path 15): 2,000 feet between the two older circuits and the third (Path 66, completed in 2004)
- Navajo South Transmission Line (Path 51): 130 feet

Because it is the dense smoke, and not the fire itself, that generally causes a line outage during a wild-fire, increasing separation between two lines to even 2,000 feet would be unlikely to reduce the likelihood of a double-line outage from a fire. That greater separation would cause much more significant land use impacts (as well as corona noise and EMF concerns), effectively making the space between the two corridors unusable for residential purposes. In many areas, the SWPL is located within a few hundred feet of the U.S./Mexico border, and given adjacent development, a large separation would not be feasible.

After consideration of the factors discussed above, for the SWPL alternatives considered in this EIR/EIS a 400-foot separation between the new and existing line is recommended. This is the same separation proposed by SDG&E for the first four miles of the Proposed Project where it would parallel the SWPL. SDG&E also used a 400-foot separation in its preliminary design for SWPL alternatives that was provided in data responses. However, there are places along the SWPL where closer spacing (as close as 130 feet, which has been used in several other parallel 500 kV lines) may be recommended in order to minimize land use impacts (in areas where there are existing residences or other structures).

Land Use Issues

Cleveland National Forest. All transmission line routes that would follow a portion of the SWPL would pass through the Cleveland National Forest (CNF). Installation of a 230 kV or 500 kV line in the Forest would require an amendment of the recently approved Forest Plan; this is addressed in Section D.17.

Tribal Lands. The Interstate 8 Alternative would pass through the Campo and one route option passes through the La Posta Reservations as the route parallels Interstate 8 west of Boulevard. If this alterna-

tive is selected and depending on options, SDG&E would have to negotiate easements across one or both of the reservations. Tribal lands are not subject to eminent domain, so successful negotiations would be required.

Future Transmission System Expansion

For the Proposed Project and route alternatives along the Proposed Project route, Section B.2.7 identifies Future Transmission System Expansion routes for both 230 kV and 500 kV future transmission lines. These routes are identified, and impacts are analyzed in Section D of this EIR/EIS, because SDG&E has indicated that transmission system expansion is foreseeable, possibly within the next 10 years. For the SWPL alternatives, 500 kV and 230 kV expansions would also be possible. The potential expansion routes are described in the following paragraphs.

230 kV Future Transmission System Expansion

As described below and in detail in Sections 4.8.1 through 4.8.4, four SWPL alternatives are considered in this EIR/EIS. The 230 kV future expansion route options are as follows.

Interstate 8 Alternative. The first and only complete SWPL alternative is the Interstate 8 Alternative, which would begin at the Imperial Valley Substation and end where it joins the Proposed Project at MP 131 (the Interstate 8 Alternative). The Interstate 8 Alternative would convert to 230 kV at a new substation located southeast of the community of Descanso, so 230 kV expansion would be required west of that substation. Because the Interstate 8 Alternative as defined in the 230 kV segment would continue west through Alpine (underground), the future 230 kV system expansion could be constructed along any of the following routes:

- Additional 230 kV circuits could be installed underground within Alpine Boulevard, with appropriate compact duct banks and engineering to avoid, or possibly relocate, existing utilities.
- Additional 230 kV circuits could follow the Route D Alternative corridor to the north of Descanso, after following the Interstate 8 Alternative 230 kV route from the Interstate 8 Substation. The Route D corridor would connect with the Proposed Project corridor at Milepost 114.5, and 230 kV expansion could follow the 230 kV routes described in Section B.2.7.1 from that point (see Figure B-12a).
- The third option would be to construct additional 230 kV circuits exiting west out of the Interstate 8 Substation Alternative, and then following the Modified Route D Alternative corridor (within the 368 Corridor identified by the Department of Energy's Draft West-wide Corridor Programmatic EIS) to the south for 11 miles to the south to MP MD-26. At this point, new 230 kV circuits could turn west and connect with the West of Forest Alternative⁶ route, following that route south of Alpine and then crossing the Interstate 8 Freeway at the west end of Alpine Boulevard. The 230 kV line would continue to follow the I8 Alternative's overhead 230 kV route past the Sycamore Canyon Substation to the Chicarita Substation. It could then follow the 230 kV Future Transmission Expansion route from Chicarita to the Escondido Substation.

BCD Alternative. This alternative would replace only the middle portion of the Interstate 8 Alternative within San Diego County, so the 230 kV expansion would be the same as that described for the Interstate 8 Alternative.

⁶ The West of Forest Alternative was considered in this EIR/EIS but was not retained for detailed analysis; see Section 4.8.9.

Figure Ap.1-28. Fire Risk Along SWPL
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Route D Alternative. The Route D Alternative's 500 kV segment would end at the Central South Substation Alternative, at approximately MP 114 of the Proposed Project route. If this alternative were constructed, a double-circuit 230 kV line would be constructed southwest from that substation, to the Sycamore Canyon Substation. For future expansion at 230 kV, the same routes would be used as for the Proposed Project, following the proposed corridor either north or southwest from the substation, as illustrated in Figure B-12a (in Section B).

Modified Route D Alternative. The Modified Route D Alternative could use any of the three 230 kV routes that are described in more detail above for the Interstate 8 Alternative:

- Underground within Alpine Boulevard
- Following the Route D Alternative corridor to the north of Descanso, then following the 230 kV expansion routes described in Section B.2.7.1 for the Proposed Project (see Figure B-12a).
- Using a portion of the West of Forest Alternative.

500 kV Future Transmission System Expansion

The 500 kV future expansion for the SWPL alternatives could incorporate the 500 kV future expansion route for the Proposed Project (see Figure B-12b, Section B.2.7.2), but this expansion also offers the potential for expansion in other corridors as described below. Figure Ap.1-29 illustrates the SWPL alternatives and the potential 500 kV system expansion routes that would allow interconnection with the Southern California Edison transmission system.

The **Interstate 8 Alternative** and **BCD Alternative**, which include use of the Interstate 8 Substation Alternative to convert from 500 to 230 kV, would allow future 500 kV expansion using either of two routes:

- The first 500 kV option would continue west (at 500 kV) from the Interstate 8 Substation Alternative. The future 500 kV line could be constructed to parallel the 230 kV line from that substation. It would follow the Route D Alternative through Boulder Creek valley, and then follow the same route as the Proposed Project from MP 114 to the northeast, through Santa Ysabel to the point where the Proposed Project's 500 kV future expansion route would diverge to the northwest, as shown in Figure B-12b.
- The second option would be to construct a new 500 kV line exiting west out of the Interstate 8 Substation Alternative, and then following the Modified Route D Alternative corridor (within the 368 Corridor identified by the Department of Energy's Draft West-wide Corridor Programmatic EIS) to the south for 11 miles to the south to MP MD-26. At this point, a new 500 kV line could turn west and connect with the West of Forest Alternative⁷ route, following that route south of Alpine and then crossing the Interstate 8 Freeway at the west end of Alpine Boulevard. The 500 kV line would continue to follow the I8 Alternative's 230 kV route past the Sycamore Canyon Substation to the Chicarita Substation. It could then follow the 230 kV Future Transmission Expansion route from Chicarita to the Escondido Substation, then north from Escondido Substation to join the 500 kV expansion route that would begin at the Central East Substation.

Expansion of the **Route D Alternative** at 500 kV could be accomplished with construction of an additional 500 kV line heading northeast out of the Central South Alternative Substation, following the

⁷ The West of Forest Alternative was considered in this EIR/EIS but was not retained for detailed analysis; see Section 4.8.9.

Proposed Project route through the Santa Ysabel Valley. The expansion route would then join the route identified for the Proposed Project's 500 kV expansion, heading northwest along existing transmission corridors to the LEAPS transmission line route.

The **Modified Route D Alternative** would have the same two options for a 500 kV future expansion as described for the Interstate 8 Alternative above.

SWPL Alternatives Considered

Following are the SWPL alternatives that are considered in this Alternatives Screening Report, addressed in Sections 4.8.1 through 4.8.9. Alternatives that are fully analyzed in this EIR/EIS include:

- Interstate 8 Alternative (Section 4.8.1)
- BCD Alternative (Section 4.8.2; could replace the Interstate 8 Alternative from MP 39.5 to MP 58)
- Route D Alternative north of the I-8 freeway (Section 4.8.3; could replace the Interstate 8 Alternative starting at MP 70, ending at the Central South Substation Alternative)
- Modified Route D Alternative south of the I-8 freeway (Section 4.8.4; could replace the Interstate 8 Alternative from about MP 47 to MP 70).

SWPL alternatives that are addressed in this Appendix, but eliminated from full consideration in the EIR/EIS, are the following:

- West of Forest Alternative (Section 4.8.5; note that the segment of this alternative north of Interstate 8 has been retained as MP 79 to MP 92.7 of the Interstate 8 Alternative)
- SDG&E Route B Alternative (Section 4.8.6)
- SDG&E Route C Alternative (Section 4.8.7)
- SDG&E Route Segment BC (Section 4.8.8)
- Route D – Otay Segment (Western Origination Segment; Section 4.8.9)

Retained for Analysis

4.8.1 Interstate 8 Alternative

Alternative Description

The Interstate 8 freeway runs on an east-west path across the southern Imperial and San Diego Counties. An alternative that generally follows this freeway was developed in response to numerous public and agency comments requesting consideration of use of the existing linear corridor in which Interstate 8 (I-8) is located, rather than creating a new major linear transmission corridor in less developed areas (especially Anza-Borrego Desert State Park). The route is shown on Figures Ap.1-27a and Ap.1-27b; detailed maps are presented in Section E.1.1.

Figure Ap.1-29. SWPL Alternatives, Future Transmission System Expansion
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Alternative Segments. The I-8 Alternative has three route segment options that are addressed as separate alternatives in this report:

- **BCD Alternative:** This alternative would replace MP I8-39.5 to MP I8-58 of the Interstate 8 Alternative, described in Section 4.8.2 below. This alternative would be entirely at 500 kV, and would require use of the Interstate 8 Alternative Substation.
- **Route D Alternative:** For this alternative, the Interstate 8 Alternative would not be constructed after MP I8-70. It would be replaced by a 500 kV segment that would turn north at MP I8-70 and pass through the Boulder Creek area of the Cleveland National Forest, joining the Proposed Project route at MP 114, and requiring the Central South Substation Alternative to convert to 230 kV.
- **Modified Route D Alternative:** This alternative would not require construction of the Interstate 8 route between MP I8-47 and MP I8-70 or the Interstate 8 Alternative Substation. It would require a 500/230 kV substation south of the I-8 freeway.

Interstate 8 Route Options: Five short options are included in this description of the Interstate 8 Alternative: the Campo North Option, the Buckman Springs Underground Option, the West Buckman Springs Option, the South Buckman Springs Option, and the Chocolate Canyon Option. These options are described after the description of the main route, below.

Route Description. The route of the I-8 Alternative would be located adjacent to the existing 500 kV SWPL, separated by an average of 400 feet, for the first 35.7 miles. This segment generally parallels I-8. The route would begin at the Imperial Valley Substation, paralleling the SWPL to a point about six miles west of the San Diego/Imperial County line. At that point, the 500 kV line would turn northwest, passing less than one mile southeast of the southwest corner of ABDSP and crossing I-8 freeway just west of the BLM Carrizo Gorge Wilderness Area and one mile east of the community of Boulevard.

There are several locations at which an I-8 Alternative could join the I-8 corridor between the Imperial Valley (IV) Substation and the community of Boulevard. The route selected for this alternative was based on the following factors:

- While the existing SWPL crosses I-8 at two points between the Imperial Valley Substation and the San Diego/Imperial County line, following the existing SWPL through Imperial County would minimize disturbance because there are existing access roads. Also, the visual impacts of two separate corridors would be greater than that of the two lines together.
- Another location for a new 500 kV line to join the I-8 corridor would be near the San Diego/Imperial County line because the I-8 and existing SWPL are in very close proximity at that point. However, moving to the I-8 corridor at this point would require that the new transmission line be installed within ABDSP for approximately one mile. Because this location would not completely avoid ABDSP, it was eliminated from further consideration.

Therefore, the collocation with I-8 would begin one mile due south of the southwestern ABDSP boundary and follow a northwesterly route.

Initially, the I-8 Alternative was defined as a 500 kV transmission line within a new 200-foot-wide corridor located immediately outside of the Caltrans ROW in order to consolidate the linear corridors of the freeway and the transmission line. However, based on preliminary assessments of visual impacts, the route was re-defined to be located at varying distances from the I-8, utilizing nearby topography to shield direct views of the transmission line where possible.

After approaching the I-8 from the southeast, the alternative route would cross to the north side of I-8 about a mile east of Boulevard, then turn west following the freeway. The route would cross the freeway several times in order to avoid residential areas and a major wind farm. Following is a route description:

MP I8-0 to I8-23. This alternative would follow the SWPL corridor for over 35 miles. It would follow the SWPL route beginning at the Imperial Valley Substation, located just west of the intersection of Mandrapa Road and Lyons Road in Imperial County, four miles southwest of El Centro. The route would head northwest for approximately 10 miles through BLM land with a very small number of private parcels interspersed, crossing Interstate 8 at MP I8-7 and crossing County Highway S80 (Evan Hewes Highway) and turning west at MP I8-10. The route would follow the SWPL west on BLM land for approximately 3.5 miles, then west-southwest for approximately 5 miles. It would turn southwest for approximately 10 miles, passing through BLM and private land, crossing Interstate 8 again at MP I8-22, and passing adjacent to the Jacumba Federal Wilderness Area.

MP I8-23 to I8-48. The route would be roughly parallel to and outside of the Jacumba Federal Wilderness Area for four miles and cross I-8 eastbound at MP I8-26. It would pass through privately held parcels through its turn due west to follow along the south side of I-8 at MP I8-30. The corridor would continue west on private land for another mile, pass through approximately 1.5 miles of BLM land, and re-enter private land for another approximately 3 miles before turning southwest for approximately 1.5 miles. The I-8 Alternative would diverge northwest from the SWPL corridor at MP I8-35.7. At MP I8-39.5, the **BCD Alternative** diverges from the I-8 Alternative (see description in Section 4.8.2). The I-8 Alternative would generally parallel the interstate through private land for 4.3 miles, being located north of the freeway to avoid residential areas in the vicinity of Boulevard. Still north of the freeway at MP I8-43.8, the line would enter the Campo Indian Reservation, which occupies 15,336 acres both north and south of the I-8. The transmission line would cross to the south side of the freeway at MP I8-44.7 just east of the Kumeyaay Wind Energy Project because the nearest wind turbine is within a few hundred feet of the Caltrans ROW. This route would remain on the south side of the freeway for 1.2 miles. Note that an option is also considered in which the route would remain on the north side of the freeway (see discussion of route options at the end of this section).

The alternative would cross back to the north side of the freeway just east of the Crestwood freeway exit, the location of the Golden Acorn Casino, Truck Stop, and Travel Center (owned by the Campo Band), and would remain on the north (east) side of the freeway for approximately 15 miles. The route would continue northwest and parallel to I-8, and would pass through private land for 1.1 miles before passing through a BLM parcel for 0.71 miles. It would enter the La Posta Reservation at MP I8-48.9.

MP I8-48 – I8-72. The alternative would pass through a portion of the La Posta Reservation which occupies 3,471 acres primarily north of I-8, entering the Reservation at MP I8-48.9 and exiting after 2.0 miles, at MP I8-50.9. Note that the “South Buckman Springs Route Option” (described below) would turn south across the I-8 freeway east of the La Posta Reservation, avoiding direct effects on La Posta land. Note that the “South Buckman Springs Route Option” (described below) would turn south across the I-8 freeway east of the La Posta Reservation, avoiding direct effects on La Posta land.

Just west of the La Posta Reservation, the line would enter the Cleveland National Forest. It would remain on the north/east side of I-8, crossing the Pacific Crest National Scenic Trail at about MP I8-55 and passing directly east of the Boulder Oaks Campground at MP I8-54. It would continue north, located east of the Buckman Springs Caltrans Rest Area and just east of the hang glider/paraglider landing area. Two route options are considered in this area (see “Buckman Springs Route Options” below). Three miles north of the Rest Area, the route would cross to the south (west) side of I-8 at MP I8-58.5. It would

remain on this side of the freeway for about 4.5 miles, in order to avoid the community of Pine Valley. In this area, the route would pass immediately adjacent to and northeast of the Pine Creek Wilderness Area. The route would then cross to the north side of I-8 at a point just east of Pine Valley. The 500 kV route would continue northwest, and into the Interstate 8 Alternative Substation at MP I8-65 where it would convert to 230 kV. From this point, the 230 kV overhead transmission line would continue west for approximately 6 miles. The Route D Alternative would diverge from this alternative west of Pine Valley (see description in Section 4.8.3). At MP I8-70.8, the 230 kV line would cross the I8 Freeway to the south, and transition to underground near the eastern end of Alpine Boulevard.

MP I8-72 to I8-92.8. The 230 kV line would be buried within Alpine Boulevard for approximately 8.8 miles, ending at MP I8-79.6. There, it would convert to overhead and cross Interstate 8, diverging from the freeway corridor. It would head north for one mile, passing through private land and San Diego County land for 0.1 miles. At MP I8-80.7, the route would turn northwest and pass within one mile of El Capitan Reservoir. At MP I8-82, it would cross roads identified by the CNF as “Forest Route 15S32” and then “Forest Route 13S10,” passing through one mile of Cleveland National Forest, 0.3 miles of City of San Diego land, and one mile of BLM land.

At MP I8-82.7 the route would turn west-northwest passing through private land, and at MP I8-84.1 it would turn west-southwest and pass through one mile of BLM land before turning west at MP I8-86.6 through private land. At MP I8-86.8 the route would cross Wildcat Canyon Road, and at MP I8-87.6 it would turn north-northwest through private land. At MP I8-89 it would turn west-northwest, crossing Moreno Avenue within one half mile and passing through 1.4 miles of City of San Diego land, 0.2 miles of San Diego County Water Authority land, and 0.3 miles of San Diego County land.

At MP I8-89.9 it would turn north-northwest, passing by San Vicente Reservoir for approximately two miles. At MP I8-91.3 the route would cross SR67, turning northwest at MP I8-91.6 to parallel SR67 on private land until joining the Proposed Project at its MP 131, just west of SR67.

Appendix 11C includes detailed maps of this alternative, including the location of each tower and other areas of direct impact. The total length of the I-8 Alternative would be 92.8 miles, 38.2 miles shorter than the proposed route to the same point.

Interstate 8 Alternative Substation

The Interstate 8 Alternative Substation would be used if the adopted transmission line route requires a conversion to 230 kV to allow the underground segment through Alpine. It would be located southwest of Descanso on private land adjacent to Cleveland National Forest land. The 500 kV line would enter the substation from the east, and a double-circuit 230 kV transmission line would exit the substation to the west after conversion from 500 to 230 kV.

Interstate 8 Route Options

There are 5 options to the Interstate 8 Alternative that have been identified to reduce specific impacts. Each is described below.

Campo North Route Option

In response to a request from the Campo Tribe, an option is considered in which the route would remain north of the freeway in the vicinity of the wind farm, passing immediately adjacent to the southernmost wind turbine in the Kumeyaay Wind Energy Project (at about MP I8-45) and just north of the

Caltrans ROW. This option would avoid two freeway crossings and shorten the route by about 0.5 miles. This option is illustrated in Figure Ap.1-27b and in detail on Figure E.1.1-4a (Interstate 8 Alternative: Campo North Route Option) in Section E.1.

Buckman Springs Route Options

In the area of Buckman Springs, three route options are considered, two to preserve hang gliding and paragliding opportunities in Horse Canyon and one to utilize an existing transmission line corridor. The I-8 Alternative as defined would be located between the Horse Canyon take off and landing points, presenting a safety risk to glider pilots. These three route options are illustrated on Figure Ap.1-27b and in detail in Section E.1 (on Figures E.1.1-4b for Interstate 8 Alternative: Buckman Springs Options and Figure E.1.1-4c for Interstate 8 Alternative: South Buckman Springs Option).

Option 1 – Buckman Springs Underground Option

This option is illustrated on Figure E.1.1-4b and would require construction of two overhead/underground transition stations for the 500 kV line, and installation of an underground route segment for approximately 1.9 miles. The route would continue north/east of I-8, and then transition to an underground 500 kV line at a transition station located at MP I8-55. The underground route would parallel I-8 just east of the Buckman Springs Caltrans Rest Area, then transition back to a 500 kV overhead line at MP I8-57.

Background on Underground 500 kV Transmission Lines. There are three basic technologies to consider for 500 kV underground circuits: Solid Dielectric (Cross-Linked Polyethylene or XLPE), Gas Insulated Transmission Line (GIL), and Self-Contained Fluid Filled (SCFF). Key features of these technologies are as follows:

- **Solid Dielectric Cable.** Underground transmission using XLPE cable would be installed inside a tunnel or inside a concrete encased duct bank system. SDG&E has approximately 30 years experience with XLPE technologies at 69 kV and 138 kV. SDG&E indicates that it has serious reliability concerns of a relatively new technology being part of a major 500 kV line due to lack of experience and repair/maintenance concerns. However, the reliability concern needs to be balanced against other impact issues. In the case of an existing underground line in Tokyo (TEP), the reliability of 500 kV XLPE was judged adequate for major lines to service the city of Tokyo.

While undergrounding 500 kV using solid dielectric (XLPE) cable is a relatively new transmission line concept in the power industry, the use of XLPE as a reliable cable type for underground transmission is widely accepted in the utility industry. Through continued development of cable manufacturing processes and cable splices the use of XLPE cables has continually progressed from relatively low voltages up to 500 kV. Two examples:

- One installation in Japan in late 1998 was placed in service in late 1999 for a length of 2.3 km (1.4 miles). The particular installation was installed inside of a tunnel.
- In 2000 Tokyo Electric Power (TEP) completed installation of two 500 kV circuits using XLPE cable over a distance of 25 miles. For the Tokyo installation, one portion of the XLPE cable was installed in tunnels (9 miles) and other portions were installed in duct bank, with some short portions suspended below bridges in conduit.

In order to meet ampacity (current carrying) requirements for the proposed transmission line circuit, three cables per phase (for a total of nine cables) would be required. It is assumed for this

alternative that the installation inside a series of concrete duct banks (similar to the construction for underground 230 kV required for the Proposed Project's underground segments) would result in reduced impact to the environment and the surrounding area because the tunnel option would cause much greater ground disturbance.

- **Gas insulated technology** has been primarily used in substation design. GIL does have installations as part of transmission line design but typically only for short distances such as substation or power plant getaways. The large diameter design of this technology would allow the need for only one cable per phase but a fourth cable would be installed as a spare in case of emergency. Typical concerns with GIL installations revolve around the need for gas management, and insulator reliability under certain dynamic site conditions. The flexibility of such technology to adjust to the topography to avoid tunneling would need to be investigated further but the lack of experience and reliability would be even more of a concern than either the XLPE or SCFF cable technologies. While the Lake Elsinore Advanced Pumped Storage (LEAPS) Project is proposing use of a 500 kV Gas Insulated Line (GIL) for a 2-mile underground segment, applications of GIL to date have been for distances less than the 2 miles required for the Buckman Springs Underground Option.
- **Self-Contained Fluid Filled (SCFF)** cables have been used more at the 500 kV level than XLPE but requires fluid pressurization systems to maintain minimum fluid pressure within the cable and allows for flow of fluid into and out of the cable as it undergoes thermal cycling. Three cables per phase would be required and design of the duct package would be similar to the XLPE installation with the exception of the fluid management systems.

Of the three underground technologies considered, SCFF is SDG&E's recommended technology for the Buckman Springs Underground Option due to its greater experience, but SDG&E is also open to consideration of the solid dielectric (XLPE) alternative, pending completion of additional research. SDG&E's suggested design for the underground 500 kV segment focuses on use of a conventional concrete-encased duct bank using SCFF cables. SDG&E notes that all information provided is based on a very preliminary review of feasibility and ground impacts.

While SCFF is described herein as the technology to be used for this alternative segment, the XLPE (solid dielectric) technology should be used if technical or environmental concerns are demonstrated with the SCFF system.

Design. The Buckman Springs Underground Option is approximately 2 miles long and is located just east of Interstate 8 off Buckman Springs Road exit. The following are major components of the underground design:

- Underground 500 kV cable system would consist of three cables per phase (total of nine cables) in order to match the capacity of the overhead transmission line.
- Each set of three phase cables would be installed in a separate duct bank package, resulting in three duct banks. There will be four conduits in each duct bank (three occupied with cable and one spare conduit).
- Concrete encased duct bank packages would be covered with up to 8 feet of thermal backfill (note that it may be possible to install the duct banks at less depth).
- A permanent access road (approximately 14 feet in width) would be graded along the path of the duct bank packages.

- Total construction impact width of the underground duct bank packages with the access road is estimated to be approximately 80 feet in width for the length of the route.
- Splicing of the cable will be required approximately every 1,200 to 1,600 feet. Splicing will be performed inside buried concrete vault structures. Vault dimensions will be approximately 12 feet wide by 40 feet long by 9 feet deep dependent upon the cable manufacturer design requirements.
- Vaults will be covered with 8 feet (or less) of thermal backfill.
- An underground-to-overhead transition station would be required at each end of the underground transmission line segment. Each transition station would be located on a 2- to 3-acre area and would require structures approximately 80 feet in height.

Terrain and Ground Disturbance. Construction of this proposed alternative will require an approximately 80-foot-wide area be cleared of all vegetation and graded for the length of the route (approximately 2 miles). Transition stations on each end of the route will require a cleared and graded pad (approximately 2 to 3 acres.) Table Ap.1-9 presents an estimate of the ground disturbance associated with installation of this underground alternative, if the deepest burial depth (8 feet of cover) is assumed.

Table Ap.1-9. Ground Disturbance Summary

Reason for Disturbance	Grading	Underground Infrastructure
Cut/Excavation (CY)	70,000	43,000
Fill (CY)	69,000	10,000
Net Cut/Excavation (CY)	1,000	33,000

A typical layout of the 500 kV concrete encased duct bank system is assumed to be 3 trenches of 4 conduits each in a 2 x 2 configuration with 20 feet of separation between trenches. The trenches would be approximately centered within the approximately 80-foot-wide construction impact area. Vault layout areas will require larger permanent impact area while the temporary impact area (for construction and repair/maintenance) is estimated. Permanent impact area will be the access road approximately 14-foot-wide along the entire length of the route and the area around the vault manholes. Vegetation on the access roads and around the vault manholes would be cleared annually in order to maintain clear access. Table Ap.1-10 shows the temporary and permanent disturbance resulting from installation of an underground segment.

Table Ap.1-10. Temporary and Permanent Land Impacts

	Temporary Acres)	Permanent (Acres)
Transition Stations	6	6
500 kV UG Route	19	10
Total Impact	24	16

Reliability and Maintenance. SDG&E states that long-term reliability of 500 kV underground transmission in a concrete encased duct bank is a serious concern. When a failure of underground equipment does occur, the repair times on an underground cable can be expected to take more than 2 weeks per segment of cable (even if a spare duct bank and material are readily available) whereas repairs on an overhead segment can be completed much faster. In the event repair of the duct bank itself is needed (as opposed to only replacing the conductors within the duct bank), the time for repairs could extend well beyond one month. SDG&E states that this is a serious concern when considering the overall operational impacts of removing a major 500 kV transmission line from service for any period of time and the risk to large amounts of system load.

Basic maintenance of the transition stations would occur on annual basis, lasting approximately two days each. Operation of the hydraulic systems for pressurization of the dielectric fluids within the cable will require more frequent monitoring and maintenance. Leaking of the dielectric fluids is an obvious concern with fluid filled systems.

Option 2 – West Buckman Springs Option

This option would minimize hang gliding and paragliding impacts by moving the transmission line to a location west of Buckman Springs Valley, rather than east where the route is currently proposed. At MP I8-54, the route would cross to the south side of the interstate heading west and crossing the Pacific Crest National Scenic Trail to follow the west side of Buckman Springs Road north for approximately 4 miles, passing just west of the Boulder Oaks Campground and within two miles northeast of the Morena Reservoir.

Option 3 – South Buckman Springs Option

This option would avoid passing through Backcountry Non-Motorized land use zones within the CNF that occur north and east of Buckman Springs area. The route would use the Modified Route D Alternative route for its first 4 miles (see Section 4.8.4 below). It would follow the southern boundary of the Cleveland National Forest, then continue due west at the point where the Modified Route D Alternative would turn southwest at MP MD-4.5. This option would continue 2 miles to the west and southwest, turn northwest along Buckman Springs Road, and end at the West Buckman Springs Option at about MP BSW-1.7. This route option is shown in detail on Figure E.1.1-4c and regionally on Figure Ap.1-27b.

Chocolate Canyon Option

This 230 kV segment option was designed to minimize visibility of the underground-overhead transition towers at the west end of Alpine Boulevard and also to reduce the visibility of the 230 kV overhead segment along the west side of Chocolate Canyon. It would also reduce ground disturbance because the option would follow an existing road, minimizing the need for construction of a new access road. This option would replace the Interstate 8 Alternative from MP I8-79.0 to MP I8-82.3, and it is illustrated in Figure Ap.1-27b and in detail in Figure E.1.1-4d in Section E.1. The route would run at a much lower elevation in the canyon so it would be less visible from residences west of the canyon. It would be 3.7 miles long.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The Interstate 8 Alternative would meet all three Basic Project Objectives. It would allow import of renewable power from the Imperial Valley, and would reduce congestion costs to SDG&E customers. It would meet reliability objectives because it would provide a new path for import of power into San Diego while diverging from the SWPL east of the point where the highest fire risk exists. This alternative could also provide a transmission path for expansion of wind generation at or near the Kumeyaay Wind Energy Project on the Campo Reservation.

Feasibility

Regulatory Feasibility. This alternative would require a Forest Plan Amendment due to inconsistencies with the Forest Plan of the Cleveland National Forest. Timing for completion of an Amendment has not been determined. This EIR/EIS will serve to provide NEPA compliance for the CNF plan amendments. A Forest Plan Amendment would be required for the following reasons:

- The alternative would pass through areas that are almost entirely identified as Scenic Integrity Objectives (SIO) of High (see Figure D.17-3). A SIO of High is inconsistent with the presence of a transmission line. The Forest Plan would have to be modified to change the SIO in the area of the transmission line.
- The alternative would pass through the following land use zones (see Figure E.1.1-5, which shows Forest Land Use Zones): Back Country, Back Country Non-Motorized, Back Country Motorized Use Restricted, and Developed Area Interface. The Back Country and Back Country Non-Motorized Land Use Zones are inconsistent with the presence of a transmission line, and a Forest Plan amendment would be required.

Legal Feasibility. The I-8 Alternative would require easements through the Campo Reservation and the La Posta Reservation. Easements across these tribal lands would have to be granted by each tribe based on its governing procedures. The Campo Tribe participated in evaluation and development of the Interstate 8 Alternative, and has expressed interest in considering the transmission line through their land because of the benefit to future wind development. Note that the South Buckman Springs Option would not affect La Posta land so no approval by the La Posta tribe would be required for that option.

Technical Feasibility. This alternative is technically feasible. The Buckman Springs Underground Option would require the underground installation of a 500 kV underground transmission line, very uncommon in the United States. This technology is considered to be technically feasible: as of mid-2006 there were over 350 miles of underground cables over 400 kV installed around the world. In addition, the LEAPS Project (Final EIS published in [March, 2007] includes three miles of underground 500 kV transmission line. The LEAPS Project is considered in this EIR/EIS as an alternative to the Sunrise Powerlink Project (see description in Section 4.9.1).

Environmental Advantages

Shorter Length and Less Ground Disturbance. The I-8 Alternative is considerably shorter than the Proposed Project, which would affect the length and intensity of short-term construction impacts and ground disturbance, and decrease impacts to air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife would also be decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction and reduce the potential displacement of native vegetation.

Wilderness and Recreation. The I-8 Alternative would avoid all impacts to the ABDSP, including impacts to State-designated Wilderness areas.

Environmental Disadvantages

Visual Resources. This alternative would have five crossings of I-8 and would be highly visible along that scenic highway corridor for about 40 miles. The alternative would pass adjacent to a portion of the I-8 between Sunset Cliffs Blvd and SR98 near Coyote Wells that is designated as “eligible” for scenic highway status.

Biological Resources. The I-8 Alternative would pass through many miles of the Cleveland National Forest, where diverse habitat exists.

Residential Use. The 500 kV segment passes within a few hundred feet of a few homes adjacent to I-8 near Boulevard. Also, the nearly 9-mile underground 230 kV segment through Alpine would pass sev-

eral miles of residential neighborhoods and within 800 feet of three preschools or daycare centers, two primary schools, one middle school, three medical clinics, and one senior care facility. Table Ap.1-11 lists these sensitive receptors and the distance of each from the underground line (assumed to be located in the center of the roadway).

Cultural Resources. The I-8 Alternative would pass through the Campo Reservation and, if not using the Buckman Springs South Option, through the La Posta Reservation, which extend both north and south of the freeway. It would also pass north of the Pine Creek Bridge, which is considered a nationally significant feature of the Federal Interstate Highway System.

Wilderness and Recreation. This alternative would cross two areas of hang-gliding and paragliding (one area near Buckman Springs, and another just west of the dam at El Capitan Reservoir, at about MP I8-82). It would also be close to (but across the freeway from) the Pine Creek Wilderness Area, and southwest of the community of Pine Creek.

Fire Management and Emergency Response. The Interstate 8 Alternative as an overhead 500 kV transmission line would present potential obstacles to fire fighting along the freeway (where many fires start) and possibly to life-flight helicopters responding to freeway accidents.

Table Ap.1-11. Sensitive Receptors along the I-8 Alternative Underground Segment through the City of Alpine

Receptor Name	Address	Description	Distance from 230 kV Underground Line
Alpine Tender Care	2710 Alpine Blvd	Day Care Center	40 feet
Alpine Country Day School	1508 Midway Drive	Day Care Center	800 feet
Little Pioneers	2225 West Victoria Drive	Preschool & Kindergarten	400 feet
Alpine Christian School	2267 West Victoria Drive	Grades K-8	800 feet
Alpine Elementary School	1850 Alpine Boulevard	Grades 1-5	40 feet
Alpine Community Day School	1328 Administration Way #A	Grades 7-8	600 feet
San Diego Reading Center	2526 Alpine Boulevard	All Ages Reading School	40 feet
Alpine Pediatrics Medical Clinic	1730 Alpine Boulevard #114	Pediatrics Clinic	40 feet
Alpine Special Treatment Center	2120 Alpine Boulevard	Psychological Rehabilitation	40 feet
Indian Health Council Southern	4058 Willows Road	Medical Clinic	800 feet

Note: Distance shown is approximate distance to property line from center of roadway. Underground route has not been specifically located within the roadway.

Alternative Conclusions

RETAINED FOR ANALYSIS. The Interstate 8 Alternative meets all project objectives and is feasible. It would avoid Anza-Borrego Desert State Park and as defined or with any optional segment, it would be shorter than the Proposed Project segment that it would replace. It would also avoid effects on agricultural lands in Imperial County and would follow an established transmission corridor for the easternmost 36 miles. This alternative would pass through sensitive areas of the Cleveland National Forest and would require an amendment to the Forest's Land Management Plan.

4.8.2 BCD Alternative

Alternative Description

This alternative was originally designed by SDG&E as a component of a SWPL alternative that would avoid ABDSP and also avoid the residential areas through which the existing 69 kV lines pass (along SDG&E's routes B, C, and D). Much of this route paralleled the Interstate 8 freeway, so the portions following the freeway have been consolidated into a single route (described in Section 4.8.1 above as the Interstate 8 Alternative). This alternative would replace the portion of that alternative between MP I8-39.5 to MP 58 (18.5 miles) with a route that is one mile longer (19.5 miles long). An overview of the BCD Alternative route is shown on Figure Ap.1-27b, and detailed map is presented in Section E.2 on Figure E.2.1-1a and -1b.

This 500 kV alternative would diverge from the Interstate 8 Alternative southeast of Boulevard, where it would cross I-8 to the north. The route would pass one mile east of the town of Boulevard and, heading north-northwest, would generally parallel McCain Valley Road. It would pass directly adjacent to and west of the Carrizo Gorge Wilderness ACEC from MP BCD-2 through MP BCD-6 on BLM and private lands.

The route would pass within one mile and east of Lark Canyon Campground and OHV Area at MP BCD-4. At MP BCD-6.5 the route would turn northwest for 2.5 miles on BLM land, crossing Lost Valley Road and McCain Valley Road, and passing about three miles southwest of the Carrizo Overlook at MP BCD-8 before heading west through BLM land at MP BCD-9 for approximately five miles. The route would pass within two miles of the Cottonwood Campground at MP BCD-10 and cross Lost Valley Road, Manzanita Cottonwood Road, Canebrake Road, and Old Mile Road.

The route would enter the Cleveland National Forest at MP BCD-12.5 and head west for 6.5 miles, crossing Thing Valley Road (La Posta Truck Trail), Fred Canyon Road, and the Pacific Crest National Scenic Trail, and passing within one mile of Cibbets Flat Campground at MP BCD-17. The route would cross Kitchen Creek Road three times and Sheephead Mountain Road once before rejoining Interstate 8 at MP I8-19.5, just east of the freeway.

After passing through the CNF, the route would join the Interstate 8 Alternative at MP I8-58. The 19.5-mile BCD segment of this route would include 6.5 miles within the CNF, 11 miles on BLM land, 0.2 miles on State of California conservation land, and 1.8 miles on private lands. Appendix 11C includes detailed maps of this alternative, including the location of each tower and other areas of direct impact.

BCD South Option

This route segment would eliminate the westernmost 6 miles of the BCD Alternative by turning southwest just one mile after entering the Forest. It would remain within the Backcountry Land Use Zone of the Forest, which allows transmission lines, and it would eliminate effects on the Cibbets Flat Campground and the nearby crossing of the Pacific Crest Trail. This option would also avoid all tribal land, so it could be used if the Campo and/or La Posta Bands decided that a 500 kV transmission line on their land was not appropriate. The route of this option is shown on Figure Ap.1-27b and in detail on Figure E.2.1-2 in Section E.2. The BCD South Option could be used to connect with either the Interstate 8 Alternative, the South Buckman Springs Option of the Interstate 8 Alternative, or the Modified Route D Alternative.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative would meet all major project objectives, allowing import of renewable power from the Imperial Valley, and reducing congestion costs to SDG&E customers. As a component of the Interstate 8 Alternative, this route would meet the reliability objective because, despite collocation with the SWPL for 35 miles, it would diverge from the SWPL east of the point where moderate and high fire risk exists. Attachment 1A to this appendix presents a discussion of fire risk and reliability as it relates to collocation of transmission lines with the existing SWPL.

Feasibility

Regulatory Feasibility. The BCD Alternative would require a Forest Plan Amendment due to inconsistencies with the Forest Plan of the Cleveland National Forest. Timing for completion of an Amendment has not been determined. This EIR/EIS will serve to provide NEPA compliance for the CNF plan amendments. A Forest Plan Amendment would be required for the following reasons:

- The alternative would pass through areas that are almost entirely identified as Scenic Integrity Objectives (SIO) of High and some small areas of Moderate (see Figure D.17-3). A SIO of High is inconsistent with the presence of a transmission line. The Forest Plan would have to be modified to change the High SIO in the area of the transmission line.
- The alternative would pass through the following land use zones (see Figure E.1.1-5 which shows Forest Land Use Zones): Back Country, Back Country Non-Motorized, and Back Country Motorized Use Restricted. The Back Country and Back Country Non-Motorized Land Use Zones are inconsistent with the presence of a transmission line.

Environmental Advantages

Wilderness. This alternative would avoid impacts to the ABDSP including State-designated Wilderness areas.

Shorter Length. With incorporation of the BCD Alternative into the Interstate 8 Alternative, the total length of the I-8 Alternative would be 91.7 miles, 37.3 miles shorter than the proposed route to the same point.

Residential Use. The BCD Alternative avoids residential areas.

Environmental Disadvantages

Land Use. The BCD Alternative would be located within land use designations of the Forest that are not compatible with a transmission line, including Back Country and Back Country Non-Motorized areas. This would require an amendment to the Forest's Land Management Plan. This would require an amendment to the Forest's Land Management Plan. This alternative would also pass several rural residences between MP BCD-0 and MP BCD-12.

Wilderness and Recreational Resources. The BCD Alternative route would pass through BLM land east of the Cleveland National Forest in an area with several recreation areas (Lark Canyon Campground, Lark Canyon OHV Area, Carrizo Overlook, Cottonwood Campground). Within the CNF, the route would pass the Cibbets Flat Campground. This alternative would also cross the Pacific Crest National Scenic Trail.

Visual Resources. The BCD Alternative would be visible from McCain Valley Road, the campground and OHV recreation areas along this road, and from the Carrizo Overlook. Within the Forest, the Scenic Integrity Objective is “High.”

Cultural Resources. The route crosses the Guatay Mountain Research Natural Area, which is considered sacred by local tribes.

Ground Disturbance. Construction of new access roads along much of the length of the BCD Alternative would cause extensive ground disturbance, which may have impacts to air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also increased with more ground disturbance. Increased disturbance and removal of vegetation could increase the chance of noxious weed introduction as well as the displacement of native vegetation.

Alternative Conclusion

RETAINED FOR ANALYSIS because it meets most project objectives and is potentially feasible. The BCD Alternative, as a component of the Interstate 8 Alternative, would also avoid ABDSP.

4.8.3 Route D Alternative (North of Interstate 8)

Alternative Description

The Route D Alternative (north of I-8) was part of SDG&E’s original Route D Alternative which was a route that would avoid ABDSP. As originally defined by SDG&E (see Figure Ap.1-27b), this route would have followed the SWPL for 52 miles, then turned north/northwest just east of the BLM Hauser Mountain Wilderness Area. It would have turned west to join the SDG&E 69 kV line between Cameron and Barrett Substations, then north at Barrett Substation through the west side of Japatul Valley.

The original Route D Alternative that followed that description was eliminated from consideration due to the required 52 miles of collocation with the SWPL, and the associated high fire risk. However, the Route D Alternative has been revised based on public and agency input. Segments of the Route D Alternative are now retained as parts of two different alternatives: the northern portion of Route D Alternative (north of Interstate 8) is described in this section and the Modified Route D Alternative (described in Section 4.8.4) includes a portion of the earlier defined Route D Alternative south of Interstate 8.

The current Route D Alternative north of I-8 would be a 500 kV alternative that would diverge from I-8 Alternative at MP I8-70.3 (see Section 4.8.1 for description of the Interstate 8 Alternative up to MP I8-70). The route is shown on Figure Ap.1-27b, and detailed maps are presented in Section E.3.

The Route D Alternative would pass through the Boulder Creek Valley north of the town of Descanso. It would pass between the Cuyamaca Rancho State Park and the Capitan Grande Reservation. While there is an existing 69 kV line in this area, that line passes through the center of several residential areas with insufficient space for a 500 kV transmission line. As a result, the line would be sited west of these areas and within a new transmission corridor. About two miles of the 500 kV line would still parallel the existing 69 kV line ROW.

Incorporation of the 16.8-mile Route D Alternative into the Interstate 8 Alternative would result in that alternative being 87.1 miles, 26.9 miles shorter than the proposed route to the same point.

Central South Substation Alternative

The Route D Alternative would require use of the Central South Substation Alternative in order to convert from 500 kV to 230 kV. This substation would be located on private land at the north end of the Route D transmission line segment and along the proposed route's 230 kV segment, west of the crossing of the San Diego River gorge. A map in Section E.3 illustrates the location of the substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative would meet all major project objectives, allowing import of renewable power from the Imperial Valley, and reducing congestion costs to SDG&E customers. As a component of the Interstate 8 Alternative, this route would meet SDG&E's reliability objective because, despite collocation with the SWPL for 35 miles, it would diverge from the SWPL east of the point where moderate and high fire risk exists. Refer to Attachment 1A to this Appendix for a discussion of transmission line reliability and collocation with the SWPL.

Feasibility

Technical and Regulatory Feasibility. This alternative is technically feasible. However, approval of this route would require that only existing roads be used through a 1.5-mile segment of the route that would pass through an Inventoried Roadless Area (IRA) northwest of Descanso in the CNF. Construction would have to be completed using existing roads and with helicopter assistance in order to adhere to the Roadless Area Conservation Policy, which prohibits road-building and timber harvesting in IRAs.

Regulatory Feasibility. The Route D Alternative would require a Forest Plan Amendment due to inconsistencies with the Forest Plan of the Cleveland National Forest. Timing for completion of an Amendment has not been determined. This EIR/EIS will serve to provide NEPA compliance for the CNF plan amendments. A Forest Plan Amendment would be required for the following reasons:

- The alternative would pass through areas that are almost entirely identified as Scenic Integrity Objectives (SIO) of High, with some smaller areas identified as Moderate (see Figure D.17-3). A SIO of High is inconsistent with the presence of a transmission line. The Forest Plan would have to be modified to change the SIO in the area of the transmission line.
- The alternative would pass through the following land use zones (see Figure E.1.17-1 which shows Forest Land Use Zones): Back Country, Back Country Non-Motorized, Back Country Motorized Use Restricted, and Developed Area Interface. The Back Country and Back Country Non-Motorized Land Use Zones are inconsistent with the presence of a transmission line.

Roadless Area. The Route D Alternative would also pass through about one mile of a Designated Roadless Area within the Forest. No new roads could be constructed in this segment, so helicopter construction would be required and maintenance would also be via helicopter access. Roadless Area policies are currently under review, and installation of a transmission line within a DRA may require approval of the Forest Service Director.

Legal Feasibility. This alternative is legally feasible.

Environmental Advantages

Wilderness and Recreation. This alternative avoids impacts to the ABDSP including State-designated Wilderness areas.

Shorter Length and Less Ground Disturbance. This alternative is shorter than the Proposed Project, which would affect the length and intensity of short-term construction impacts and ground disturbance, and decrease impacts to air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction and reduce the potential displacement of native vegetation.

Environmental Disadvantages

Wilderness and Recreation. Much of the Route D Alternative route through the CNF is within areas that have been identified for possible future federal Wilderness designation. In addition, this alternative passes through a Back Country Non-Motorized land use zones that would not be compatible with a transmission line (so if approved, a plan amendment would be required). This alternative would also pass through the No-Name and Sill Hill Inventoried Roadless Areas.

Visual Resources. The route would be visible to drivers and residents on Boulder Creek Road, a scenic road passing through a valley surrounded by Forest land. The Forest portion of this route has a Scenic Integrity Objective of "High," and a transmission line could be inconsistent with this designation requiring a LMP amendment.

Biological Resources. This alternative would pass near Eagle Peak, where golden eagles nest. The CNF current has implemented a closure of this area (about 0.5 miles from the alternative route) in order to minimize disturbance of eagle nests.

Duplicate Transmission Corridor. An existing SDG&E 69 kV line passes through the Boulder Creek area, but in several areas it passes through residential areas where a 500 kV line could not be accommodated. Therefore, the 500 kV line has been located to the west, creating a second corridor.

Alternative Conclusion

RETAINED FOR ANALYSIS because it meets all major project objectives and is feasible. The Route D Alternative (in conjunction with the Interstate 8 Alternative) would also avoid ABDSP and would be about 27 miles shorter than the Proposed Project route.

4.8.4 Modified Route D Alternative

This alternative was suggested by the Cleveland National Forest in an April 6, 2007 letter to the CPUC and BLM. It was identified as a route to be evaluated because the alternative transmission line route would be consistent with the Forest Land Management Plan's Land Use Zones and it would diverge from the SWPL at a point east of the area of greatest fire risk. Because this alternative was suggested after the completion of the Second Scoping period (January/February 2007), a separate public notice was mailed and 30-day comment period was held in May/June 2007. As a result of this comment period, the route originally identified by the Forest Service was modified in several places. These route changes and the reasons for them are described below in a separate subsection, History of the Modified Route D Alternative.

This 39-mile alternative would replace the Interstate 8 Alternative between MP I8-47 and I8-71 (a 24 mile segment). Figure Ap.1-27b shows the Modified Route D Alternative. Appendix 11C includes detailed maps of this alternative, including the location of each tower and other areas of direct impact. The Modified Route D Alternative would also be within a potential utility corridor identified in the West-wide Energy Corridor Draft Programmatic Environmental Impact Statement (PEIS; published by the Department of Energy on November 9, 2007). Figure E.4.1-1a (in Section E.4) shows the West-wide Corridor and the Modified Route D Alternative.

The Modified Route D Alternative route is described in the following paragraphs.

MP MD-0 to MD-8. The Modified Route D Alternative route would start by diverging from the Interstate 8 Alternative at MP I8-48.7, crossing the freeway and turning southwest on BLM land for most of the first three miles, then entering Forest Service land, following the southern boundary of the Forest for 1.5 miles. At MP MD-4, the route would turn southwest onto BLM land, then entering private land. This segment passes through and adjacent to the BLM land proposed for withdrawal by the U.S. Navy for use as a warfare training site.

MP MD-8 to MD-22.5. The route would leave BLM land and cross Buckman Springs Road to the west, just north of the existing SDG&E Cameron Substation. It would jog to the northwest to avoid the proposed “Father Joe’s Village” development, then turn west to follow the existing 69 kV line and remain south of the southern border of the Forest. It would cross the southern edge of the “Chicken Ranch” property (being evaluated for purchase by Blackwater USA as a training facility), then continue west-northwest, mostly on BLM land generally following SDG&E’s “C-D Route.” This route segment would pass between BLM’s Hauser Mountain Wilderness area and the CNF’s Hauser Wilderness. At MP MD-22.5, the route would pass the existing SDG&E Barrett Substation.

MP MD-22.5 to MD-36. The route would pass immediately east of the existing Barrett Substation, heading north and would re-enter the CNF. This route would diverge from the SDG&E Route D (the existing Barrett-Descanso 69 kV corridor) in places north of the Barrett Substation in order to avoid passing through residential areas. This segment would include the Modified Route D Substation, located on private land about 1.5 miles south of Interstate 8.

The Modified Route D Alternative would be 36 miles long, eliminating about 22 miles of the Interstate 8 Alternative. However, even with this additional 14 miles of length, the Interstate 8 Alternative with the Modified Route D Alternative segment would be 24 miles shorter than the portion of the Proposed Project it would replace.

The Modified Route D Alternative could also be used to connect with the Proposed Project route by remaining at 500 kV (no substation would be constructed), crossing Interstate 8 to the north and connecting with the Route D Alternative. The route would then continue north through the Boulder Creek area to the Central South Substation Alternative.

Modified Route D Substation

As shown in Figure E.4.1-2 (Section E.4.1), the Modified Route D Alternative Substation would be located on private land west of Japatul Valley Road. Overall, it would be the same size (about 40 acres) as the proposed Central East Substation, and it would be sited and designed to accommodate future 230 and 500 kV circuits exiting the substation when/if demand growth justifies the need for additional lines (see Figure E.4.1-2 in Section E.4). In this segment, there would be the Modified Route D Alternative Substation where the 500 kV line would convert to 230 kV. The 230 kV transmission line would exit

the substation overhead, then continue north into the CNF, joining the Interstate 8 Alternative where it transitions to underground at the east end of Alpine Boulevard. Figure E.4.1-2 illustrates the location of the substation and the layout of substation equipment.

Star Valley Option

As an option to reduce the length of underground construction in Alpine Boulevard and to avoid cultural resources of concern, the Star Valley Option would exit the Modified Route D Alternative Substation to the west-northwest (as illustrated in Figure E.4.1-3, Section E.4.1). This option would be an overhead double-circuit 230 kV transmission line, heading west and northwest for 2.2 miles, then north for approximately 0.3 miles to meet Star Valley Road, 0.7 miles east of I-8 Exit 33 for Willows Road. On the southwest side of the bend in Star Valley Road, the route would transition underground and continue north to Alpine Boulevard. This option would join the Interstate 8 Alternative at Alpine Boulevard.

History of the Route D Alternative

The original Route D Alternative was developed by SDG&E in its application and would have followed existing 69 kV lines. The route has been modified a number of times in response to land use conflicts and landowner concerns. The history of route changes is described in the following paragraphs.

SDG&E's PEA identified the Route D corridor following the existing 69 kV line between the Barrett Substation (southwest of Barrett Lake) and the Santa Ysabel Substation, passing through Japatul Valley and Boulder Creek Valley. The route was modified before being presented to the public in the January 2007 Second Scoping Notice in order to avoid many residential areas in which adequate space for a 500 kV transmission line was not available.

During Alternatives Scoping in January/February 2007, many comments were received regarding wildfire risks in the area of the route south of I-8. Therefore, in the March 2007 Alternatives Conclusions Notice, the southern and eastern portions of the Route D Alternative were eliminated from detailed analysis due to the collocation with the existing 500 kV Southwest Powerlink (SWPL) transmission line for over 50 miles, through an area of high fire risk. This would have created a reliability risk because the two 500 kV transmission lines would be at risk for a concurrent outage during a wildfire. In response to the January Second Scoping Notice and the March Alternatives Conclusion Notice, the Cleveland National Forest suggested consideration of a the "Modified Route D Alternative" that would follow a portion of the Route D Alternative and a portion of the Interstate 8 Alternative, diverging from the SWPL line east of the point of high fire risk (east of the community of Boulevard). The Modified Route D Alternative as defined by the Forest was illustrated on a map distributed to the public in mid-May 2007, and a 30-day comment period began. The route would turn off the Interstate 8 Alternative west of the Campo Band tribal land, so would avoid the area of highest fire risk along the SWPL corridor. The Forest stated that this route would be more consistent with the Forest's Land Management Plan.

The route defined by the Forest and published on the May 2007 map resulted in a number of comments that caused the route to be modified in several areas:

- **Eastern Segment/Campo Tribal Land.** Options were evaluated at the eastern end of the route where it diverged from the Interstate 8 Alternative. The Forest's suggested route began just west of Campo tribal land, then turned south to join the route of the existing 69 kV transmission line. The first few miles of this route passed through proposed housing developments, both north and south of the I-8 freeway. Routes were considered to avoid or minimize direct effects on these developments.

The point at which the alternative route diverges from the Interstate 8 Alternative was moved to the west in order to minimize effects on residential developments.

- **Border Patrol.** The existing 69 kV line passes directly through the Border Patrol's new facility. The Border Patrol pointed out concerns due to helicopter use and electronics at this facility. The alternative route was modified to stay south of the Border Patrol facility, along the southern border of the CNF land.
- **Cameron Truck Trail.** The existing 69 kV line follows Cameron Truck Trail in its north-south segment, directly in front of several residences. The alternative was relocated so it would be generally east of Cameron Truck Trail, on BLM land where possible.
- **U.S. Navy Withdrawal of BLM Land.** In order to minimize impacts on the Border Patrol facility and residences along Cameron Truck Trail, the alternative diverged from the 69 kV corridor to stay on BLM land as much as possible. However, in the area of MD MP 4 to 6, the route was relocated to the west to avoid impacts on the Navy's proposed warfare training area.
- **Cameron Substation Area and Father Joe's Village.** The 500 kV Modified Route D Alternative as originally defined (following the 69 kV line) would have passed immediately south of the Cameron Substation, adjacent to residences. The route was relocated to the north to distance it from existing homes. In addition, the original route would have passed through a large agricultural parcel southwest of the substation that is being planned as a home for foster children, to be operated by "Father Joe's Village." The route was modified to the north in order to avoid this parcel and to minimize visibility from Lake Morena Road.
- **Blackwater USA and Back Country Land Trust.** The existing 69 kV line in its east-west segment that runs immediately south of the Forest boundary on BLM land and private land. Small changes in tower placement were implemented in this segment to minimize the need for new access roads, but the 500 kV line would remain adjacent to the existing 69 kV corridor.
- **Modified Route D Alternative Substation.** A substation site on private property had been identified, but it had rare Engelmann Oak habitat and would be visible from the I-8 Freeway. An alternate site about 2,000 feet west was evaluated in order to minimize those impacts.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative would meet all major project objectives, allowing import of renewable power from the Imperial Valley, and reducing congestion costs to SDG&E customers. As a component of the Interstate 8 Alternative, this route would meet SDG&E's reliability objective because, despite collocation with the SWPL for 35 miles, it would diverge from the SWPL east of the point where moderate and high fire risk exists.

Feasibility

Regulatory Feasibility. The Modified Route D Alternative would pass primarily through the following land use zones (see Figure E.1.1-5 which shows Forest Land Use Zones): Back Country Motorized Use Restricted and Developed Area Interface. This alternative avoids the more restrictive designations, Back Country and Back Country Non-Motorized Land Use Zones, which are inconsistent with the presence of a transmission line.

While the Modified Route D Alternative would be installed within land use zones where a transmission line is acceptable, it would still require a Forest Plan Amendment due to inconsistencies with the Forest Plan of the Cleveland National Forest. Timing for completion of an Amendment has not been determined. This EIR/EIS will serve to provide NEPA compliance for the CNF plan amendments. A Forest Plan Amendment would be required because the alternative would pass primarily through areas that are almost entirely identified as Scenic Integrity Objectives (SIO) of High, though there are smaller areas designated as Moderate (see Figure D.17-3). A SIO of High is inconsistent with the presence of a transmission line. The Forest Plan would have to be modified to change the SIO in the area of the transmission line.

Legal Feasibility. This alternative is potentially legally feasible.

Environmental Advantages

Wilderness and Recreation. This alternative avoids impacts to the ABDSP including State-designated Wilderness areas. It would also avoid the Buckman Springs area where the Interstate 8 Alternative would conflict with hang-glider and paraglider landing zones.

Shorter Length and Less Ground Disturbance. This alternative, as a component of the Interstate 8 Alternative, is shorter than the Proposed Project, which would reduce the length and intensity of short-term construction impacts and ground disturbance, and decrease impacts to air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction and reduce the potential displacement of native vegetation.

Visual Resources. The Modified Route D Alternative would allow avoidance of the central segment of the Interstate 8 Alternative, including the scenic Buckman Springs Valley.

Environmental Disadvantages

Visual Resources. The 7-mile route segment paralleling Interstate 8 would be visible from the freeway (which would be a distance ranging from a few hundred feet to a mile from the easternmost route segment). Also, the segment of this alternative between MP MD-24 and MD-39 (north of Barrett Substation) would be in areas with a Scenic Integrity Objective of "High."

Land Use. Similar to the Proposed Project, segments of the route would be in proximity to residences.

Biological Resources. The area east of the Cleveland National Forest and west of the Campo Reservation (south of the I-8 Freeway) has been designated by The Nature Conservancy as an international wildlife corridor.

Alternative Conclusion

RETAINED FOR ANALYSIS. The Modified Route D Alternative meets all project objectives and is potentially feasible. In conjunction with the Interstate 8 Alternative, this route would also avoid ABDSP and would be about 24 miles shorter than the Proposed Project route.

Eliminated from Consideration

4.8.5 West of Forest Alternative

Alternative Description

This route was developed in order to define a non-Forest, non-Park route and to see if such a route would be feasible. It would follow the Route D Alternative, diverging from the SWPL after 52 miles of collocation. It would diverge from the Route D Alternative one mile south of SDG&E's Barrett Substation, using the route from SWPL defined for the Route D Alternative above. The route is shown on Figure Ap.1-27b.

Leaving the Route D Alternative south of Barrett Substation, the route would continue west for three miles, then turn north for 4 miles along the western boundary of the Forest. It would then turn north-northwest, continuing to the southern edge of the community of Alpine. At this point the route would turn west for 2 miles, crossing Harbison Canyon. The route would turn north-northeast for 5 miles, circling the western edge of Alpine and crossing I-8 one-half mile east of the Old Hwy 80 exit (near the community of Dunbar at Chocolate Summit Road and Alpine Blvd).

The West of Forest Alternative would require construction of a 40-acre substation just south of Interstate 8 on private land. At this point the 500 kV transmission line would convert to 230 kV, and the line would continue overhead across the freeway.

The remainder of this route has been incorporated into the Interstate 8 Alternative (MP I8-79 to I8-92.7). North of I-8, the route would be located just east of a residential area along the western edge of Chocolate Canyon, continuing north for about a mile. At this point, it would not be possible to avoid residential areas and still stay outside of the Forest, because this route runs along the eastern edge of suburban San Diego. The residential area could be avoided with a one mile diagonal route through the Forest although this would defeat the goal of avoiding the Forest completely. However, this alternative was designed to avoid the Forest, this routing was not ideal, but the segment of Forest affected would be somewhat separated from the rest of the Forest, and at its far western edge.

After crossing the San Diego River just west of the dam of the El Capitan Reservoir, the route would turn to the west, crossing the SDG&E Miguel-Mission transmission corridor then turning northwest to join the Proposed Project route at MP 131 (near Hwy 67) about four miles east of the Sycamore Canyon Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative would allow import of renewable power from the Imperial Valley, and would reduce congestion costs to SDG&E customers. As defined, diverging from the SWPL after 52 miles of collocation, it would not fully meet SDG&E's reliability objective due to collocation with the SWPL through a high fire risk area.

Feasibility

Technical and Legal Feasibility. The would potentially be technically and legally feasible.

Regulatory Feasibility. This alternative may require a Forest Plan amendment for about 1 mile through the Forest.

Environmental Advantages

Wilderness and Recreation. This alternative avoids impacts to the ABDSP and affects almost no National Forest land.

Shorter Length and Less Ground Disturbance. This alternative is shorter than the Proposed Project, which would affect the length and intensity of short-term construction impacts and ground disturbance, and decrease impacts to air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction and reduce the potential displacement of native vegetation.

Environmental Disadvantages

Residential Use. The SWPL in MP 44-48 (south of the Campo Reservation) passes through a residential area (8-10 residences) that will be difficult to avoid when installing a second 500 kV line. The route passes several residential areas, but should avoid direct effects (“take”) of residences. It would require condemnation of numerous parcels of private land.

Fire Management. The West of Forest Alternative would pass adjacent to developed residential areas in the vicinity of Harbison Canyon where there have been many fires in recent history, and the terrain is rugged so fire fighting is difficult. An overhead transmission line would inhibit fire fighting in this area, putting a large number of homes at risk. In addition, this alternative would be collocated with the SWPL for about 52 miles, including an area with very high risk of wildfire (see Attachment 1A to this appendix for further discussion).

Wilderness and Recreation. This alternative would cross an area of hang-gliding and paragliding (west of the dam at El Capitan Reservoir).

Alternative Conclusions

ELIMINATED. The West of Forest Alternative would be potentially feasible, but would not meet reliability objectives due to collocation with the SWPL through a high fire risk area. Additionally, this alternative was eliminated due to two areas of high fire risk (collocation with the SWPL for 52 miles, and passing through the Harbison Canyon area).

4.8.6 SDG&E Route B Alternative

Alternative Description

This alternative was considered by SDG&E in its Routing Study (Appendix to PEA, 2006) but eliminated by SDG&E from detailed consideration in that document because of the high scenic and recreational value of the corridor. It does not follow existing transmission line corridors, but follows roadways for much of its length. The route is shown on Figure Ap.1-27b.

This route would diverge from the SWPL corridor after 40 miles, three miles west of the location where the BCD Alternative and I-8 Alternative routes would diverge. It would turn north-northwest from the SWPL, passing the community of Boulevard, then crossing the I-8 at MP B-4 and continuing north-northwest approximately 7 miles through the McCain Valley. It would enter BLM land and the McCain Valley Wildlife Management Area, turning west, just north of the Manzanita Indian Reservation. The route would continue across BLM land, entering the CNF at MP B-15.5, then turning north-northwest and continuing through the Forest for approximately 13 miles, and following SR1 for 18 miles into Julian. In this segment, it would cross the Pacific Crest Trail and pass 1 to 2 miles west of Mount Laguna and very near to the following CNF Campgrounds: Wooded Hill, Agua Dulce, Laguna, Horse Heaven, and El Prado Campgrounds.

Leaving the CNF, the route would be within the ABDSP for about 3 miles, closely paralleling both the Pacific Crest Trail, still following SR1, the Sunrise National Scenic Byway, for 12 miles into the community of Julian at MP B-41.1. At this point, the route would follow SR78 west from Julian for about 8 miles to the Central South Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative would meet the renewable power and cost reduction objectives, but not fully meet the reliability objective due to collocation with the SWPL for 40 miles. However, it would diverge from the SWPL east of the point where consistently high fire risk exists.

Feasibility

Technical and Legal Feasibility. This alternative is potentially technically and legally feasible.

Regulatory Feasibility. This alternative would require a Forest Plan Amendment due to effects within the Cleveland National Forest. Timing for completion of an Amendment has not been determined.

Environmental Advantages

Shorter Length and Less Ground Disturbance. This alternative is shorter than the Proposed Project, which would affect the length and intensity of short-term construction impacts and ground disturbance, and decrease impacts to air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction and reduce the potential displacement of native vegetation.

Increased Import Capacity. This alternative could provide a transmission outlet for expansion of wind generation at the Kumeyaay Wind Energy Project on the Campo Reservation.

Environmental Disadvantages

Recreation. This alternative would pass through the heart of the recreation area within the CNF's Laguna Mountains.

Visual Resources. This alternative follows highly scenic roadways, including the Sunrise National Scenic Byway and the PCT. The alternative would be within ABDSP and adjacent to the Cuyamaca Rancho State Park in a very scenic area.

Residential Use and Transportation. The alternative would pass through the town of Julian and follow heavily traveled SR78 between Julian and Santa Ysabel.

Alternative Conclusions

ELIMINATED. The Route B Alternative would be potentially feasible and would meet most project objectives. It was eliminated because it would pass through highly scenic and nationally designated roads (SR79) and passing through Julian, a small community that could not be avoided with this route.

4.8.7 SDG&E Route Segment C

Alternative Description

This alternative segment was included in SDG&E's PEA and Routing Study, but eliminated from detailed consideration by SDG&E due to its potential effect on residences (communities of Campo, Pine Valley, Descanso and scattered residences between these). It would follow 69 kV line corridors for its entire length, except for the 4-mile portion between the SWPL and the Cameron Substation (vicinity of Campo). The route is shown on Figure Ap.1-27b. Note that a 5-mile segment of this route (from Cameron Substation to the north) is now included as a component of the Modified Route D Alternative (see Section 4.8.4).

The alternative would diverge from the SWPL corridor at SWPL milepost 50, just southeast of the community of Campo. It would cross SR94 at MP C-3 at Cameron Corners, the intersection of SR94 and Buckman Springs Road (Highway SR1). It would be entirely on private land for the first 8 miles, then entering the CNF. Starting at MP C-8, the route is in and out of the CNF and private land. At MP C-10, the route meets I-8 and would parallel I-8, somewhat paralleling SR1 into the community of Pine Valley. In Pine Valley, where SR1 turns northeast, the route would turn northwest, following Old Highway 80 (with residential areas along it), into Descanso. The route would enter Descanso from the east, then turn north at the point where the existing 69 kV line from Glencliff Substation (southeast of Pine Valley) meets the 69 kV line existing Descanso Substation. From this point north, the route could follow SDG&E's original D Route, the 69 kV corridor leading north to the Santa Ysabel Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative would meet the renewable power and cost reduction objectives, but not fully meet the reliability objective due to collocation with the SWPL for 50 miles. It would diverge from the SWPL in the eastern portion of the zone of highest fire risk.

Feasibility

Legal Feasibility. This alternative would require SDG&E's acquisition of a large number of private homes along the existing 69 kV corridor in the Pine Valley and Descanso areas.

Regulatory Feasibility. A Forest Plan Amendment would be required due to effects within the Cleveland National Forest. Timing for completion of an Amendment has not been determined.

Technical Feasibility. This alternative is technically feasible.

Environmental Advantages

Consolidation of Transmission Lines. The alternative segment follows an existing transmission corridor.

Environmental Disadvantages

Residential Use. This alternative would result in proximity to many more residences than the proposed route due to the 69 kV route passing in narrow corridors through residential areas in several communities along the I-8.

Recreational Resources. The alternative would pass adjacent to the Boulder Oaks Campground and the Stallion Oaks Campground in the Descanso area.

Visual Resources. The I-8 corridor is highly scenic, especially in the segment between Pine Valley and the Campo Reservation, and the line in this area would be very visible.

Alternative Conclusions

ELIMINATED. The Route C Alternative would be potentially feasible and would meet most project objectives. It is eliminated due to large number of residences affected.

4.8.8 SDG&E Route Segment BC

Alternative Description

This 13.8-mile alternative segment was considered by SDG&E in its Routing Study but eliminated by SDG&E from detailed consideration in that document because of the large number of residences along the I-8 corridor (primarily near Boulevard), through the Campo Reservation, and because of effects on Forest land. It would follow existing 69 kV transmission lines along its entire length, requiring construction of a parallel transmission line along these routes. The route is shown on Figure Ap.1-27b. A 7-mile segment of this alternative (just west of the Campo Reservation) is now incorporated into the Modified Route D Alternative (see Section 4.8.4).

The route would diverge from the SDG&E Route B Alternative four miles north of the SWPL, then turn west, paralleling I-8 at distances ranging from zero to three miles between the communities of Boulevard and the intersection with SDG&E Route C. Much of the route would pass through areas with residential development, following (or within a mile of) Old Highway 80. It would pass through the communities of Boulevard, Manzanita, Live Oak Springs, and would be within the Campo Indian Reservation, in the vicinity of the Golden Acorn Casino, for about 1.5 miles.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative would meet all major project objectives, allowing import of renewable power from the Imperial Valley, and reducing congestion costs to SDG&E customers. As a component of the Interstate 8 Alternative, this route would meet SDG&E's reliability objective because, despite collocation with the SWPL for 35 miles, it would diverge from the SWPL east of the point where moderate and high fire risk exists. Attachment 1A to this Appendix explains the reliability concerns related to collocation of two 500 kV transmission lines in high fire risk areas.

Feasibility

Technical Feasibility. This alternative would be technically feasible.

Regulatory Feasibility. This alternative may require a Forest Plan Amendment due to effects within the Cleveland National Forest. Timing for completion of an Amendment has not been determined.

Legal Feasibility. This alternative would require approval by the Campo Indian Tribe and an easement through the Campo Reservation.

Environmental Advantages

Consolidation of Transmission Lines. This route segment follows a portion of an existing 69 kV transmission line corridor (between Boulevard and Glenciff Substations).

Environmental Disadvantages

Residential Use. This alternative would result in proximity to many more residences than the proposed route due to the 69 kV route passing through residential areas in several communities along the I-8.

Tribal Lands. The alternative would pass through the Campo Indian Reservation in a highly developed area that provides income to the Campo Band.

Visual Resources. The I-8 corridor is highly scenic, especially in the segment between Pine Valley and the Campo Reservation, and the line would be very visible.

Alternative Conclusions

ELIMINATED. The Route Segment BC has been eliminated due to its proximity to residences near the community of Boulevard.

4.8.9 West of Forest – Otay Segment Alternative

Alternative Description

This route segment would create a new transmission corridor and would join the West of Forest Alternative (see Section 4.7.4 above) at MP 17-5.5 just north of the intersection of Lyons Valley Road and Skyline Truck Road. From this point north, it would be the same as the West of Forest Alternative.

This route would maximize the use of the SWPL corridor, collocating with it for 73 miles. However, the segment would require use of the SWPL through areas with many residences along the SWPL cor-

ridor, and it would pass through the portion of the SWPL with the highest fire risk. The route is shown on Figure Ap.1-27b.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This route segment would meet project objectives related to import of renewable power and reducing congestion costs. However it would parallel the SWPL for over 70 miles, so it would not fully meet the reliability objective.

Feasibility

This route segment would be potentially technically, legally and regulatorily feasible.

Environmental Advantages

Wilderness and Recreation. This alternative avoids impacts to the ABDSP and affects almost no National Forest land.

Shorter Length and Less Ground Disturbance. This alternative is shorter than the Proposed Project, which would affect the length and intensity of short-term construction impacts and ground disturbance, and decrease impacts to air quality, noise, transportation and traffic, hazardous materials related to environmental contamination, and geologic resources related to soil erosion. The potential to disturb unknown cultural resources and impact vegetation and wildlife is also decreased with less ground disturbance. Decreased disturbance and less removal of vegetation could decrease the chance of noxious weed introduction and reduce the potential displacement of native vegetation.

Consolidation of Transmission Lines. This alternative maximizes collocation with the existing SWPL (73 miles).

Environmental Disadvantages

Residential Use. Collocation with SWPL would affect numerous residences, south of the Campo reservation, and in several areas west of the town of Campo.

Biological Resources. This segment is located in the Otay Mesa area, an area of concern for numerous sensitive species.

Alternative Conclusions

ELIMINATED. The Otay Mountain segment would be potentially feasible and would meet two of three objectives. However, collocation with the SWPL through its area of highest fire risk would not meet reliability objectives.

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4.9 Full Project Route and System Alternatives

“System Alternatives” rely on different transmission line upgrades and interconnections. Within the project area, these alternatives include upgrades to the existing transmission infrastructure, different voltage configurations of the proposed lines, interconnections to points other than the Imperial Valley Substation, or alternative transmission technologies. Figures Ap.1-30 and Ap.1-31 illustrate all of the system alternatives that were considered.

Two alternatives (both configurations of the LEAPS Project) are retained in the EIR/EIS for detailed analysis and are described in Sections 4.9.1 and 4.9.2:

- **LEAPS Generation and Transmission Alternative.** This includes the pumped storage generation and all transmission upgrades that have been proposed by the developers of the LEAPS Project.
- **LEAPS Transmission Only Alternative.** This alternative involves no pumped storage but includes 500 kV transmission interconnection of the LEAPS Project plus an upgrade to the 230 kV SDG&E Talega-Escondido transmission line.

Two additional transmission upgrades were found to be feasible, but because they provide smaller system benefits and are not capable of replacing the Proposed Project on their own they are considered as part of the No Project Alternative and not as alternatives on their own. Both could provide short-term solutions to SDG&E’s need for additional import capacity, but neither would fully meet project objectives. These two upgrades are described in Sections 4.9.3 and 4.9.4.

- **Mexico Light 230 kV Upgrade**
- **Path 44 Upgrade**

Other classes of alternatives were considered, but eliminated from consideration. These include full project route or transmission system alternatives that have been considered by transmission planning groups or suggested during the scoping process. They are grouped according to their general configuration and location.

- **SWPL No. 2 Alternatives.** These would generally occur between the existing Imperial Valley and Miguel Substations.
- **CFE Alternatives.** These would generally occur between the existing Imperial Valley Substation and Mexico, to improve the transmission capability into San Diego County via Mexico.⁸
- **Valley-Rainbow Alternatives.** These would generally occur between the southwestern portion of the SCE service territory in Riverside County and northern or central San Diego County.
- **Full Loop Alternatives.** These would expand the Proposed Project by continuing the 500 kV transmission line from central San Diego County to the SCE service territory. These would complete a “full loop” of 500 kV transmission infrastructure between San Diego, the SCE service territory, and the Palo Verde Hub in Arizona.
- **Northern Service Territory Alternatives.** These would generally occur between Orange County and coastal San Diego County, to improve the transmission capability into San Diego County via SONGS.

⁸ CFE is the Comisión Federal de Electricidad, which is the Federal entity in Mexico responsible for operating its electric grid.

- **Project System Alternatives.** These would generally occur within or near the corridor of the Proposed Project but would entail different system configurations or alternative transmission technologies.

Although it would not satisfy the objectives of the Proposed Project, a **Green Path Alternative** is also described here (Section 4.9.27). The Green Path Coordinated Projects would generally occur within Imperial County, to deliver renewable energy to the SCE and LADWP service territory with potential indirect benefits to SDG&E customers but no direct connection to the SDG&E territory.

Retained for Analysis

4.9.1 LEAPS Generation and Transmission Alternative

In this section, the LEAPS Project is analyzed as defined by proponent Nevada Hydro Company, Inc. Section 4.9.2 analyzes only the transmission component of the LEAPS Project.

Alternative Description

LEAPS stands for Lake Elsinore Advanced Pumped Storage. The LEAPS Generation and Transmission Alternative is also known as the LEAPS Project as described in SDG&E's PEA Section 3.3.3.10 and in the LEAPS Project Final EIS (published by the Federal Energy Regulatory Commission as Lead Agency, with U.S. Forest Service as a cooperating agency, FERC Project No. 11858, FERC/FEIS-0191F, January 2007). The LEAPS Project is co-sponsored by the Elsinore Valley Municipal Water District, a public non-profit agency, and the Nevada Hydro Company, Inc. (co-applicants). Most components of this alternative would be in Riverside County (Cleveland National Forest, Trabuco Ranger District) and northern San Diego County, including Marine Corps Base Camp Pendleton (MCBCP).

Figures Ap.1-32a and Ap.1-32b illustrate the LEAPS Project. This alternative would fully implement the "preferred alternative" or "staff alternative" identified in the January 2007 LEAPS Project Final EIS, with both pumped storage and transmission components. Note that the transmission component of the LEAPS Project is also considered as a separate alternative (see Section 4.9.2).

The LEAPS Project Alternative would include:

A lined upper reservoir (Decker Canyon reservoir) with a usable storage volume of 5,500 acre-feet, a 240-foot-high main dam, and a perimeter dike up to 50 feet high, with a surface area of about 80 acres at a normal maximum water surface elevation of 2,830 feet mean sea level (msl). The Decker Canyon reservoir dam and dike would have a crest elevation of 2,860 feet msl and a combined fill volume of about 3 million cubic yards.

- Two parallel high-pressure water conduits each consisting of a 9,190-foot-long concrete-lined channel and tunnel transitioning to a 250-foot-long, 12-foot-diameter steel penstock.
- An underground powerhouse (Santa Rosa Powerhouse) with two reversible pump-turbine units capable of generating 500 MW. When pumping water from Lake Elsinore to the new upper reservoir, the facility would consume approximately 600 MW.

Figure Ap.1-30. System Alternatives Retained
[CLICK HERE TO VIEW](#)

Figure Ap.1-31. System Alternatives Eliminated
[CLICK HERE TO VIEW](#)

Figure Ap.1-32a. LEAPS Transmission Only Alternative
[CLICK HERE TO VIEW](#)

Figure Ap.1-32b. LEAPS Generation and Transmission Alternative
[CLICK HERE TO VIEW](#)

- Use of the existing Lake Elsinore as a lower reservoir, with a surface area of 3,319 acres and a storage capacity of 54,504 acre-feet at a normal pool elevation of 1,245 feet msl.
- Two 1,950-foot-long, 20-foot-wide, and 20-foot-high concrete-lined tailrace tunnels.
- 33 miles of new single-circuit 500 kV transmission line forming the Talega-Escondido to Serrano-Valley 500 kV Interconnect line (TE/VS Interconnect or Lake-Pendleton 500 kV Transmission Line). This line would include a new 25-to 50-acre surface switchyard/substation at the proposed Santa Rosa Powerhouse for the LEAPS generators.
- New 500 kV switching station (Lee Lake Substation) to interconnect with SCE's existing Serrano-Valley 500 kV line.
- New 500/230 kV substation (Camp Pendleton Substation) either within Camp Pendleton or at an alternative location along SDG&E's existing Talega-Escondido 230 kV line including two phase-shifting transformers.
- New second Talega-Escondido 230 kV line as needed and determined by CAISO.
- Modification of SDG&E's existing Talega-Escondido 69 kV transmission circuit on new wood and steel poles adjacent to the existing 230 kV poles within the existing Talega-Escondido ROW.
- System voltage support including static synchronous compensators at SDG&E's existing Mission, Miguel, Sycamore Canyon, Talega, and Escondido Substations and possibly similar upgrades at SCE's Valley, Devers, and Serrano Substations as needed and determined by CAISO.
- Other transmission facility upgrades within SCE territory identified in an Interconnection Facilities Study prepared by SCE for LEAPS, December 1, 2006. The study is preliminary and confidential because the upgrades need to be determined by CAISO with a Facilities Study review meeting. SCE requests that CPUC maintain the confidentiality of the Interconnection Facilities Study and submits it under the provisions of Public Utilities Code Section 583 and General Order 66c. The preliminary study recommends that SCE: eliminate line-to-ground clearance restrictions on the existing Etiwanda-San Bernardino 220 kV transmission line; upgrade the Etiwanda Switchyard; and reconductor the San Bernardino-Vista 220 kV transmission line.
- Other transmission facility upgrades within SDG&E territory identified in an Interconnection Facilities Study prepared by SDG&E for LEAPS, February 27, 2007. This preliminary study recommends that SDG&E: add the new second Talega-Camp Pendleton and second Escondido-Camp Pendleton, reconductor the existing Talega-Escondido 230 kV line between Talega and Camp Pendleton, and upgrade the circuit breakers at the Escondido and Peñasquitos Substations.

Description of LEAPS Project Components

The following paragraphs provide further detail of the LEAPS Project Alternative as defined by the "preferred alternative" or "staff alternative" in the January 2007 Final EIS.

The proposed Decker Canyon reservoir would be within the Cleveland National Forest, Trabuco Ranger District. Materials for the proposed dam and dike would be obtained from the upper reservoir, powerhouse, and tunnel excavations. Final embankment design could call for a zoned earth and rockfill dam having a central impervious core or a concrete-faced earth and rockfill dam. Overall, the LEAPS Project would achieve a balance between excavation and fill, thereby avoiding the need to haul materials to or from the LEAPS Project site. An exception to the excavation and fill balance would be in the case of an embankment type dam requiring an impervious core requiring low-permeability clay or clay-like

material. The co-applicants have identified the Alberhill area located about 10 miles northwest of the dam site as a likely source of clay; alternatively, the low-permeability material could be manufactured on site, requiring the import of bentonite to mix with on-site soils.

The dam would include a concrete-lined emergency spillway and a low-level outlet. A 20-foot-wide crushed stone roadway would be provided around the crest of the embankment to allow access for maintenance and inspection. An 8-foot-high chain-link fence would be located on the outer side of the crest roadway. The outside (downstream) face of the embankment would be seeded. The total footprint of the Decker Canyon reservoir would be about 120 acres.

The water conduit connecting the Decker Canyon reservoir to the Santa Rosa powerhouse would consist of the following: (1) a gated inlet structure located in the upper reservoir with an inlet at elevation 2,720 feet msl; (2) two 9,190-foot-long parallel high-pressure water conduits each consisting of (a) a 3,270-foot-long concrete-lined horizontal tunnel; (b) a 3,420-foot-long inclined tunnel with a slope of about 25 degrees; and (c) a 2,500-foot-long horizontal tunnel with a slope of about 2 percent; and (3) a 250-foot-long, 12-foot-diameter steel penstock. The tunnel segments would have a finished inside diameter of 15 to 18 feet. The inclined tunnel and the horizontal tunnel segments of each water conduit would be lined or unlined, depending on actual rock and cover conditions.

The underground powerhouse would use a 30-acre site within the Cleveland National Forest, southwest of Lake Elsinore and Grand Avenue at Santa Rosa Drive. The underground powerhouse cavern would be 375 feet long, 85 feet wide, and 175 feet high. The powerhouse would include a 250-foot-long, 85-foot-diameter, concrete-lined vertical access shaft and a 250-foot-long, 8-foot-diameter vent and emergency egress shaft. The powerhouse would contain an overhead bridge crane, galleries for electrical and mechanical services, a transformer gallery, a surge shaft, and two 250-MW (generating)/300-MW (pumping) reversible Francis-type pump turbines operating at 450 revolutions per minute at an average net head (generating) of 1,588 feet.

The inlet/outlet structure for the lower reservoir would be on the southwest shore of Lake Elsinore. The structure would extend from the portal of the tailrace tunnel to a set of trashracks at the lake shore.

In the underground powerhouse transformer gallery, the 16 kV generator voltage would be stepped up to 500 kV, and oil-filled 500 kV cables would run to the surface switchyard/substation. The switchyard/substation would include the following: (1) a switchyard control building; (2) circuit breakers and disconnect switches; (3) switchyard busses and structures; and (4) microwave and telecommunication facilities.

The proposed 33-mile, 500 kV transmission line (referred to as the Talega-Escondido/Valley-Serrano or TE/VS Interconnect and also as the Lake-Pendleton line) would connect the LEAPS Project to two existing transmission lines: one a 230 kV SDG&E line to the south in San Diego County called the Talega-Escondido transmission line and the other a 500 kV SCE line to the north called the Valley-Serrano transmission line. The proposed transmission alignment would originate at the surface switchyard/substation above the powerhouse and head uphill underground generally in line with the underground high-pressure water conduit (about two miles).

The northern segment of the transmission line would interconnect with SCE's 500 kV transmission system at a new substation (Lee Lake Substation), north of Interstate 15 (I-15), about 20 miles west of SCE's Valley Substation. The overhead line would run south from the proposed Lee Lake Substation and cross I-15 to the Cleveland National Forest boundary, then it would cross and run roughly parallel to the Orange County line. The overhead line would cross back into Riverside County, then cross over

Ortega Highway (SR74) and South Main Divide Road (Killen Trail) within the Forest. West of South Main Divide Road, the 500 kV line would transition underground for about 2.1 miles from just north of the Decker Canyon upper reservoir site along South Main Divide Road. To avoid back-country areas in the Cleveland National Forest, the “staff alternative” transmission alignment would be located eastward of the alignment originally proposed by the co-applicants. This transmission alignment would also avoid crossing private inholdings in the Cleveland National Forest. The underground transmission segment would avoid hang gliding launch areas.

The southern portion of the “staff alternative” transmission line would be about 18.9 miles long with almost its entire length located within the Trabuco Ranger District of the Cleveland National Forest or on other federal lands (i.e., Camp Pendleton and/or BLM lands). Once beyond the primary hang gliding launch sites, the underground segment would transition overhead and run eastward, downhill and generally southeasterly until it approaches the Cleveland National Forest boundary. The overhead alignment would then extend southwest inside the Cleveland National Forest boundary southward past the Tenaja Ranger Station, swerving southeast out and around the wilderness boundary east of Miller Mountain. Then it would meander south, avoiding designated wilderness areas until it reaches the Cleveland National Forest’s southern boundary. From there, it would turn and follow the Forest boundary west and connect with SDG&E’s 230 kV system at a new interconnecting substation located within or adjacent to Camp Pendleton, near the intersection of the Cleveland National Forest boundary with Camp Pendleton. At the Camp Pendleton Substation, there would be two phase-shifting transformers. These transformers would help to regulate the flow of capacity from south to north along the transmission line. This new 500 kV transmission line would have a designed capacity of 1,300 to 1,600 MW.

The transmission alignment of the “staff alternative” is shown in Figure Ap.1-32a.

Construction Sequence for LEAPS Project Components

Construction of the LEAPS Project construction phase would require about 4.5 years. Construction would begin with the development of a temporary access road from South Main Divide Road to the upper reservoir site and access roads from Ortega Highway (SR74) and Grand Avenue to the powerhouse access portal and the intake/outlet structure in Lake Elsinore. Upper reservoir embankment locations would be cleared to receive excavation spoil, and excavation would then begin on the underground features. Also, transmission line corridor clearing, development of temporary access roads, and transmission line and switchyard installation would begin, as would construction of the cofferdam at the Lake Elsinore inlet/outlet structure. In steeply sloped areas, helicopters would be used to place equipment and install transmission towers.

During the second year of construction, excavation would continue on the tailrace tunnels, power tunnel, and powerhouse. Placement of materials for the upper reservoir embankment would continue. Installation of the transmission line and switchyards would be completed, and installation of the powerhouse crane and pump-turbine embedded parts would commence.

Construction of the intake/outlet structure at Lake Elsinore, excavation of the upper reservoir, construction of the upper reservoir inlet structure, and placement of the upper reservoir liner system would all occur during the third year of the construction period, as would installation of powerhouse equipment and development of recreational areas. The initial powerhouse unit would be commissioned near the end of the third year of construction.

During the final year of the construction period, powerhouse equipment installation would be completed, the second unit would be commissioned, and landscaping and clean-up would occur.

Laydown areas would be required during construction for the placement, storage, and staging of construction equipment, trailers, materials, and worker vehicles. At the upper reservoir, there would be a 20- to 40-acre construction laydown area immediately adjacent to (northeast of) the reservoir. At the powerhouse, the construction laydown area would be located on a privately owned 20-acre site immediately northeast of the powerhouse location.

The spoil materials from the excavations would be brought to the surface and stockpiled for use in the upper reservoir embankment or, if unsuitable, for disposal. The total quantity of material produced from excavations, exclusive of the upper reservoir, would be about 776,000 cubic yards (cy), including 173,000 cy from the high-head water conduit tunnels including construction shafts/adits and power shaft intake; 4,500 cy from the penstock excavation; 207,000 cy from the powerhouse cavern; 35,000 cy from the transformer gallery; 32,000 cy from the surge shaft; 53,000 cy from the powerhouse access shaft; 500 cy from the vent shaft; 6,000 cy from the draft tube tunnel excavation; 65,000 cy from the tailrace tunnel; and 200,000 cy from the lower reservoir intake excavation.

The co-applicants indicate that the fill quantities would total about 2,839,000 cubic yards, including 2,653,000 cy for the upper reservoir embankment and 186,000 cy for intake backfill at the lower reservoir. To achieve the proposed balance between excavation and fill, approximately 2,063,000 cubic yards of excavated material would be needed from the upper reservoir footprint to complete the embankment. To the extent that excavated materials are unsuitable for backfill or embankment construction, the amount required from the upper reservoir excavation would increase. For reference, the 2,063,000 cubic yards of embankment material needed from the upper reservoir equates to an excavation about 11 feet deep over a 120-acre reservoir footprint.

Project construction would be accompanied by drilling and blasting. All construction activities would be limited to daylight hours.

Proposed Boundary of LEAPS Project

The boundary for the LEAPS Project defined by its FERC license would include sufficient lands for the construction and operation of an upper reservoir in Cleveland National Forest, a powerhouse on private lands within the Congressional boundary of the Cleveland National Forest, Lake Elsinore, which would serve as the lower reservoir, and linear corridors for the water conduits and transmission lines. The co-applicants propose a shoreline buffer zone around Lake Elsinore between elevations 1,240 and 1,263.3 feet msl and indicate that they would cooperate with Riverside County and the city of Lake Elsinore to identify any changes in existing land use regulations that may be appropriate to establish and maintain a shoreline buffer zone. No shoreline buffer zone is proposed for the upper reservoir, which would be located on National Forest System lands and would be fenced to prevent public access.

Description of LEAPS Project Operations

The LEAPS Project would operate primarily as an energy storage facility by pumping water out of Lake Elsinore (the lower reservoir) in the storage mode and allowing the water to flow back into Lake Elsinore in the generating mode.

The LEAPS Project also would be capable of operating in various secondary modes to benefit the regional electrical system. The LEAPS Project would be operated from a control room in the powerhouse, and load dispatching would be coordinated with participating utilities and the California Independent System Operator.

In its primary energy storage operating mode, the LEAPS Project would pump water from Lake Elsinore to the upper reservoir during nights and weekends using off-peak, less valuable energy and would generate high-value energy to meet peak system demands during weekdays. This cycling operation would be accompanied by typical upper reservoir water-level fluctuations of about 40 feet on a daily basis and by water-level fluctuations of 75 feet during the course of a full-week cycle. In Lake Elsinore, the typical daily water-level fluctuation would be 1 foot, with the lake level fluctuating about 1.7 feet during the course of the full-week cycle.

The precise operating scenario would depend on market conditions, contract requirements, and owner preferences. The co-applicants have identified two normal operating scenarios. Both are based on a weekly generation cycle, as described above, and would result in similar daily and weekly water-level fluctuations. One scenario (Time of Use Operation Scenario) would involve 16 hours of on-peak generation each weekday using one unit, supplemented by the second unit during a two-hour super-peak period. Both units would pump for 8 hours at night to refill. This scenario would result in generation of about 22,500 megawatt-hours (MWh) per week. The second operating scenario (Maximum Generation Scenario) would involve using both units for 12 hours each weekday, with both units pumping to refill. This scenario would result in weekly generation of about 30,000 MWh.

The maximum pumping load to refill the upper reservoir would be about 600 MW with typical operation closer to 500 MW, generally consumed during off-peak periods at night and on weekends. Pumping energy requirements would exceed generation, resulting in a projected average annual net generation deficit of about 312,000 MWh. In the Maximum Generation Scenario, the LEAPS project would be used to provide regional electrical system benefits, including reactive compensation, rapid load change capability, system load and frequency control, and emergency startup capability during blackout conditions.

Role of FERC in LEAPS Project Safety

As part of the FERC licensing process, FERC staff would inspect the licensed LEAPS Project both during and after construction. Special articles would be included in any license issued, as appropriate. FERC inspection during construction would concentrate on adherence to FERC-approved plans and specifications, special license articles relating to construction, and accepted engineering practices and procedures. Operational inspections would focus on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, any license issued would require an inspection and evaluation every 5 years by an independent consultant and submittal of the consultant's safety report for FERC review.

Environmental Measures included with the LEAPS Project

Numerous environmental protection, mitigation, and enhancement measures would be included as part of the co-applicants' proposal as modified by the FERC staff "preferred alternative" for the LEAPS Project as in the January 2007 Final EIS. These measures are presented in Appendix 12, following the mitigation measures for the Proposed Project and other alternatives.

Conditions Established under Section 4(e) of the Federal Power Act

Because the proposed LEAPS Project would occupy lands of the Cleveland National Forest and lands administered by BLM and the DOD, the USFS, DOD, and BLM have authority to impose conditions under Section 4(e) of the Federal Power Act (FPA). The USFS provided final license conditions for the LEAPS Project March 21, 2007. The FERC "staff alternative" for the LEAPS Project would include all of the site-specific Section 4(e) conditions specified by the USFS, which are also presented in Appendix 12.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The LEAPS Project Alternative would provide a new second extra-high voltage (EHV) interconnection into the SDG&E system. This would substantially satisfy two of the major project objectives: to maintain reliability in the delivery of power and reduce the cost of energy in region. It also avoids the “common corridor” concern expressed by SDG&E for alternatives that would follow the path of the existing 500 kV Southwest Power Link (SWPL) between the Imperial Valley and Miguel Substations.

SDG&E has raised concerns about the regulatory and legal hurdles which must be overcome by the LEAPS Project proponents (PEA Section 3.3.3.10). Of principal concern is the proposal by the LEAPS proponents to transfer to the CAISO control of both the transmission and pumped storage components of the project. However, the LEAPS Project proponents have indicated that if the transfer of the generation becomes a barrier to the project’s acceptance by the CAISO, then they would bifurcate the project and only seek to transfer the transmission component (see the LEAPS Transmission Only Alternative in Section 4.9.2). It is not clear when the LEAPS Project proponents and FERC will act on this matter.

The LEAPS Project Alternative would only partially achieve the objective to accommodate delivery of renewable energy from the Imperial Valley because it would be principally dependent upon the completion of other transmission upgrades between the Imperial County and SCE system, namely the proposed Green Path Coordinated Projects (addressed in Section 4.9.27). The Green Path Coordinated Projects would eventually include 500 kV connection between the IID transmission system and the Devers Substation. Green Path as proposed in conjunction with SCE’s second Devers-Valley 500 kV line (approved by CPUC in January 2007) would provide a path for importing renewable power from the Imperial Valley and other locations, such as Tehachapi and San Geronio wind resource areas, into SDG&E territory. SDG&E raises concerns about the ability of the LEAPS Project to provide economical access to renewable generation, such as that previously contracted by SDG&E in the Imperial Valley.⁹ These concerns could be mitigated in light of the access to low cost generation that should be provided by the second Devers-Palo Verde and Devers-Valley 500 kV lines. The combination of these two recently approved 500 kV lines in SCE territory, with the LEAPS Project Alternative, could allow for the importation of low cost conventional generation from the Blythe area or the Palo Verde hub in Arizona, thereby freeing capacity on the existing SWPL to import renewable power from the Imperial Valley.

By providing a second 500 kV interconnection to San Diego, along with 500 MW of pumped storage generation, the LEAPS Project Alternative would help address SDG&E’s concerns regarding the potential for in-basin generation to exercise market power, improving the regional transmission system, and obtaining electricity from diverse fuel sources. When addressing this alternative’s ability to diversify fuel sources, SDG&E raises the concern that the pumped storage facility could actually increase the total use of natural gas. However, it should also be noted that the pumped storage facility could also increase the utilization of renewable resources. Since much of the proposed renewable generation is non-dispatchable the LEAPS pumped storage facility could utilize renewable power to pump during off-peak periods.

⁹ See CPUC Resolution E-3965, December 15, 2005 and Resolution E-4073, March 15, 2007 where procurement of renewable power is made contingent on SDG&E being able to license and construct a new 500 kV line from the Imperial Valley area to San Diego by 2010.

Feasibility

The LEAPS Project is nearing the final stages of obtaining the necessary Federal licenses and permits required to begin construction. LEAPS Project sponsors believe the remaining permitting process may be completed in 2007. If permitting is successful, the transmission component of the LEAPS Project could be in service by 2009, and the generation component could be in service by 2010. Thus, it appears that the LEAPS Project Alternative is technically, legally, and regulatorily feasible.

Environmental Advantages

If the LEAPS Project Alternative is constructed, most of the impacts of the 150-mile Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon. Impacts to private land would be minimized with most LEAPS Project components confined to federal lands.

Environmental Disadvantages

This alternative would result in the construction-phase and permanent impacts of a new 500 MW pumped storage facility and a new 500 kV transmission corridor, primarily in Riverside County. No existing transmission facilities or other utilities presently exist along the 33-mile corridor between Lee Lake and Camp Pendleton. Therefore, this alternative would create substantial new disturbance and visual impacts. This alternative is fully analyzed in Section D of this EIR/EIS, so detailed information on environmental impacts is presented in that section for each environmental issue area.

Alternative Conclusions

RETAINED FOR ANALYSIS. The LEAPS Project Alternative is retained for further analysis. The transmission component of this alternative would meet most of the Sunrise Powerlink Project Objectives and the pumped storage component would provide important ancillary services to help support SDG&E's transmission system.

4.9.2 LEAPS Transmission Only Alternative

Alternative Description

The LEAPS Transmission Only Alternative is an optional alternative to the LEAPS Generation and Transmission Alternative. The LEAPS Transmission Only Alternative would include a new 500 kV line known as the Talega-Escondido/Valley-Serrano (TE/VS) Interconnect, and this alternative would be similar to the Serrano/Valley-North (or Northern) Alternative that was considered in SDG&E's Transmission Comparison Study (TCS) and carried forward as one of the final four alternatives in that study (SDG&E, 2005a). The Serrano/Valley-North 500 kV Alternative is also described in SDG&E's testimony supporting the Purpose and Need for the Sunrise Powerlink Project CPCN.

This alternative would involve only the transmission components of the LEAPS Project (see Section 4.9.1) and modifications to the existing SDG&E Talega-Escondido 230 kV transmission lines to accommodate the interconnection of the new 500 kV line and northern substation. The new 500 kV transmission line would be constructed along the same corridor as the LEAPS Project, but no reservoir or pumped storage generation would be built. Most of the transmission line right-of-way would be within the Cleveland National Forest, Trabuco Ranger District (see Figure Ap.1-32a).

This alternative would include:

- 33 miles of new single-circuit 500 kV transmission line forming a Talega-Escondido to Serrano-Valley 500 kV transmission interconnection between SCE and SDG&E. This is also called the Lake-Pendleton 500 kV Transmission Line in Section D of the EIR/EIS.
- New 500 kV switching station to interconnect with SCE's existing Serrano-Valley 500 kV line (also called Lee Lake Substation).
- New 500/230 kV Northern Substation either within Camp Pendleton or at an alternative location along SDG&E's Talega-Escondido 230 kV line (also called Camp Pendleton Substation) including two phase-shifting transformers.
- Modifications to loop SDG&E's existing Talega-Escondido 230 kV line into the new Northern Substation, forming Talega-North #1 230 kV line and Escondido-North #1 230 kV line.
- New Talega-North #2 230 kV line (30.4 miles, second circuit on existing structures).
- New Escondido-North #2 230 kV line (20.6 miles, second circuit on existing structures).
- Modification of SDG&E's existing Talega-Escondido 69 kV transmission circuit on new wood and steel poles adjacent to the existing 230 kV poles within the existing Talega-Escondido ROW.
- System voltage support including static synchronous compensators at SDG&E's existing Mission, Miguel, Sycamore Canyon, Talega, and Escondido Substations and possibly similar upgrades at SCE's Valley, Devers, and Serrano Substations as needed and determined by CAISO.

This alternative would include a phase angle regulator to regulate flow on the new 500 kV line and new 230 kV lines, which would establish a robust connection to SDG&E's 230 kV system, as was proposed as part of the Valley-Rainbow Project (described in Section 4.9.10 of this Appendix). The phase shifting transformers would help to regulate the flow of capacity from south to north along the transmission line. The new TE/VS Interconnect 500 kV transmission line would have a designed capacity of 1,300 to 1,600 MW.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would substantially satisfy the objectives to maintain reliability in the delivery of power to SDG&E territory and reduce the cost of energy in the region, but it would be less likely to meet objectives related to delivery of renewable energy. The ability to facilitate import of renewable energy to San Diego depends on whether other proposed transmission system upgrades are actually completed, as described for the LEAPS Project Alternative (Section 4.9.1). Although this transmission alternative would not provide direct access to renewable generation to be developed in the Salton Sea or Imperial Valley, this alternative may provide SDG&E with access to renewable generation developed in the Tehachapi and San Geronio wind resource area and improved ability to low cost conventional generation from the Palo Verde hub in Arizona, which would free capacity on the existing SWPL to import renewable power from the Imperial Valley.

Feasibility

This alternative is technically, legally, and regulatorily feasible. However, SDG&E notes in the TCS that there are technical concerns associated with this alternative. Without the insertion of some form of regulating device such as phase angle regulators the flow on this circuit could be limited to about 250 MW

under peak import conditions. This could exacerbate flow into the Miguel Substation which worsens congestion problems in the southern portion of SDG&E's system. Insertion of a phase-shifting transformer, or other regulatory device, could force additional power to flow across this new circuit, but would pose additional transmission system problems such as increased system losses. SDG&E's technical analysis of this option also noted problems associated with system stability performance and voltage. However, these issues could likely be addressed with system augmentations similar to those identified by SDG&E for the Valley-Rainbow project (described in Section 4.9.10).

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon. Impacts to private land would be minimized with most of the LEAPS Transmission Only Alternative alignment confined to federal lands of the Cleveland National Forest. In addition, there would only be a second circuit added to the Talega-North #2 and Escondido North # 230 existing structures.

Environmental Disadvantages

This alternative would result in the construction-phase and permanent impacts of a new 500 kV transmission corridor, primarily in Riverside County. No existing transmission facilities or other utilities presently occur along the 33-mile corridor, therefore, this alternative would create new disturbances and visual impacts. This alternative is fully analyzed in Section D of this EIR/EIS, so detailed information on environmental impacts is presented in that section for each environmental issue area.

Alternative Conclusions

RETAINED FOR ANALYSIS. This alternative has been retained for further analysis. It serves as an option to the LEAPS Project Alternative, which also includes the generation component. This alternative is being retained because it would implement the "transmission only" option of the proposed LEAPS Project. In addition, even though it has its own environmental impacts, it would avoid all impacts of the Proposed Project including crossing through ABDSP.

Eliminated from Consideration

4.9.3 Mexico Light 230 kV Alternative

Alternative Description

This alternative was described in the UCAN memo to CAISO dated April 11, 2006 regarding CAISO's analysis of the "Sun Path Project" or CS RTP-2006. Scoping comments from UCAN and Community Alliance for Sensible Energy also suggest consideration of this alternative as a means to defer the need for the Proposed Project. As described by the CAISO in the August 2006 CS RTP report, this transmission upgrade would be a short new 230 kV transmission line in Mexico between circuits that are normally disconnected, to provide an optional transmission path for export-designated generators through the Comisión Federal de Electricidad (CFE) grid rather than through the existing SWPL (Imperial Valley-Miguel 500 kV line). The natural gas-fired generators in La Rosita, Mexico (3.8 miles south of the U.S./Mexico border) currently export power into the U.S. over two double-circuit 230 kV transmission lines to the Imperial Valley Substation, about 6 miles north of the border. Figure Ap.1-31 illustrates the location and components of this alternative.

This alternative would include the following:

- Add approximately 4,000 feet of new 230 kV transmission line, normally opened¹⁰ to connect Mexican generators [either the Sempra-owned Termoeléctrica de Mexicali (TDM) and/or the Intergen-owned La Rosita Power Complex] to the CFE grid. Currently, there is a 230 kV connection between the La Rosita 1 to La Rosita 2 generating plants. The circuit breaker on the 230 kV line is currently opened, separating La Rosita 1 from La Rosita 2.
- Reconductor 2.3-miles of the two existing 230 kV lines connecting La Rosita generators to CFE's La Rosita 230 kV Substation to increase the thermal capacity.
- Close the circuit breaker to connect the short 230 kV line to the CFE system in the event of an outage on the SWPL (Imperial Valley–Miguel 500 kV line) with a special protection system (SPS) cross-tripping the Imperial Valley–La Rosita 230 kV line. In this instance, the TDM and/or Intergen exporting generation would become connected to the CFE system and deliver power to SDG&E via CFE transmission network through the existing La Rosita–Tijuana 230 kV lines to the Miguel Substation. Presently, an outage on the SWPL causes the exporting generation in Mexico to be “tripped off-line” or shut down to avoid overloading the Imperial Valley Substation.

The August 2006 CS RTP report showed that this configuration could increase the Non-Simultaneous Import Limit (NSIL or G-1/N-1 import capability) for SDG&E by about 300 MW, and SDG&E identified conditions where this alternative could allow an increase of NSIL by about 165 MW (SDG&E, Supplemental Testimony, January 26, 2007). This would increase SDG&E's existing G-1/N-1 import capability from 2,500 MW to 2,665 MW. There would be no change to the existing 2,850 MW maximum import capability into San Diego with all lines in service (N-0).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would only partially achieve one the three major project objectives, to maintain reliability in San Diego by increasing the non-simultaneous import capability (during an outage of SWPL). It would not meet the objectives to accommodate delivery of low cost and renewable imports.

Feasibility

This alternative is technically feasible. It consists of upgrades to existing transmission lines with approximately three miles of new facilities in Mexico. Its legal and/or regulatory feasibility is uncertain due to the need to implement procedures and reach operating agreements with the CFE. Cost recovery would be uncertain since these facilities would probably be owned and operated by the CFE rather than SDG&E or the CAISO. Amenable conditions would need to be reached with the CFE regarding ownership and operation of the associated facilities.

Environmental Advantages

Impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

¹⁰ A circuit breaker when “open” does not allow power to flow, so it would need to be closed to transmit electricity.

Environmental Disadvantages

Construction disturbances would occur at the La Rosita generating plants and at CFE's La Rosita 230 kV Substation in Mexico.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from consideration as a separate alternative, but included as a component of the No Project/No Action Alternative (see Section C.8). This alternative has been retained only as part of the No Project Alternative because it would not meet project objectives. It would provide only an incremental increase of approximately 165 MW, which would provide only a short-term solution to SDG&E's need for additional import capacity.

4.9.4 Path 44 Upgrade Alternative

Alternative Description

The Path 44 Upgrade Alternative would involve upgrading existing transmission corridors in SCE territory to increase the import rating of a set of transmission lines called Path 44 (also known as the South of SONGS path) into SDG&E territory by approximately 300 MW. UCAN is working with CAISO to study such options for upgrades within Orange County that could benefit SDG&E. The South of SONGS transmission path currently serves as the only major path for San Diego to import electricity during an outage of SWPL. The existing rating on this path is 2,850 MW (with SWPL in service) and 2,500 MW (G-1/N-1). CAISO and SDG&E found that in order to increase the South of SONGS path rating, upgrades to SCE's Barre-Ellis 230 kV line would be needed (CAISO, CSRTP-2006, July 28, 2006; and SDG&E, Supplemental Testimony, January 26, 2007), but the specific upgrades needed within SCE territory have not been identified. Figure Ap.1-31 illustrates the location of this alternative.

Path rating studies would need to be conducted by CAISO with SCE and SDG&E with WECC oversight in order to fully determine the scope of the Path 44 Upgrade Alternative. As such, the expected components cannot be identified in detail, but modifications would be needed on SCE's existing Barre-Ellis and Del Amo-Ellis lines, primarily in Orange County. The components of this alternative would likely occur within existing transmission line ROWs owned by SDG&E or SCE and within existing substation properties: the existing Barre Substation in the City of Stanton, the Del Amo Substation in southern Los Angeles County, and the Ellis Substation in Huntington Beach.

This alternative would likely include:

- Loop SCE's existing SONGS-Viejo-Chino 230 kV line into SDG&E's Talega Substation, creating a new SONGS-Talega and Talega-Viejo line. This would transfer one of SCE's four existing North of SONGS paths to South of SONGS, and allow import of power from SCE to SDG&E's Talega over a line from Chino instead of through Ellis. This would involve construction of possibly several additional towers between the existing SONGS-Viejo 230 kV line and the Talega Substation.

- Upgrade SCE's existing 13-mile Barre-Ellis 230 kV line to improve its thermal performance, potentially by reconductoring with high-temperature low-sag (HTLS) conductors and/or conductors on new "inter-set-towers" that would increase the physical weight bearing capability of the tower-line within the existing Barre-Ellis ROW, but the number of additional towers needed is not known.¹¹ SCE would need to conduct engineering studies to determine if HTLS or composite conductors would provide ratings increases greater than upgrading to higher-capacity ACSR conductor.
- Modify SCE's existing Del Amo-Ellis 230 kV line and adjacent 66 kV subtransmission lines to accommodate the reconductoring on the Barre-Ellis 230 kV line.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would partially achieve SDG&E's objectives to improve the import capability and maintain reliability in San Diego because it would increase the capacity of Path 44, the path South of SONGS. It would not meet the objectives to accommodate delivery of low cost and renewable imports except by means of displacing capacity on the SWPL, which could be used to import Imperial Valley renewable generation.

Feasibility

This alternative is technically, legally, and regulatorily feasible.

Environmental Advantages

Impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

Construction disturbances would occur in densely populated areas along SCE's existing Barre-Ellis and Del Amo-Ellis lines, primarily in Orange County. Construction activity would also occur at the existing Barre Substation in the City of Stanton, the Del Amo Substation in southern Los Angeles County, and the Ellis Substation in Huntington Beach. With higher capacity lines installed in these existing corridors, there could be increases in corona noise in residential areas along the existing ROW.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from consideration as a separate alternative, but included as a component of the No Project/No Action Alternative (see Section C.8). Project objectives would not fully be met by this alternative because an incremental increase of approximately 300 MW would provide only a short-term solution to SDG&E's need for additional import capacity. However, this alternative is included in the No Project/No Action Alternative scenario.

¹¹ SCE February 15, 2007 Response to CPUC Data Request SCE-2 and SCE Exhibit SCE-5 for the SONGS Steam Generator Replacement Project, A.04-02-026, p. 25, February 2004.

4.9.5 SDG&E Southwest Powerlink (SWPL) No. 2 Alternative

Alternative Description

The SWPL No. 2 Alternative is described in the SRPL Purpose and Need, Section 3.3.3.6 of the SRPL PEA, and Section III of SDG&E's Transmission Comparison Study (TCS) (SDG&E, 2005). This alternative is also known as the Imperial Valley–Miguel 500 kV #2 Alternative, and it is identified in the STEP report as Option 5 for a new line into San Diego. The SWPL No. 2 Alternative would include construction of a new 500 kV transmission line between the existing Imperial Valley Substation and the existing Miguel Substation, forming a second Imperial Valley–Miguel 500 kV transmission line within a new right-of-way parallel to the existing line. This alternative would include 83.5 miles of new 500 kV line immediately adjacent to the existing SWPL between the existing Imperial Valley and Miguel Substations (see Figure Ap.1-31).

This alternative would create part of a second SWPL, because the existing 500 kV line from Imperial Valley to Miguel Substations is the westernmost section of SWPL, which runs from Arizona's Hassayampa Substation to North Gila to Imperial Valley and finally to Miguel Substation. Arizona utilities are presently planning the eastern segment of a second SWPL between Hassayampa and North Gila.

Substation modifications and other system upgrades would likely be necessary, because there is presently no available position within the Miguel Substation for a second 500 kV line. The Miguel Substation and the lower voltage lines out of Miguel Substation would need to be expanded. SDG&E has recently been working to increase the capability of the transmission system north of Miguel to relieve this congestion point. The necessary new transmission north of Miguel would likely require SDG&E to acquire new rights-of-way, because existing corridors are fully occupied by multiple transmission lines.

In this alternative, the new 500 kV transmission line would parallel the existing SWPL from the Imperial Valley Substation to the Miguel Substation. As discussed in Attachment 1A to this appendix, the collocation of two 500 kV lines for over 80 miles through an area with extremely high fire risk would create a likelihood for the occurrence of a common mode failure or outage. A "common mode outage" refers to the potential for a single event to cause multiple transmission lines to be taken out of service. In the case of two transmission lines in a common corridor between the Imperial Valley and Miguel Substations, a common mode outage would most likely be caused by a wildfire.¹² Many outages on the existing Imperial Valley–Miguel portion of SWPL have been caused by wildfires, which are especially frequent along the western half of the SWPL route. These fires typically occur during the summer and autumn periods when SDG&E's system demand is high. The reason that high voltage transmission lines are taken out of service during vegetation fires is that thick smoke can conduct electricity. This could result in a short between two phases of the line resulting in damage to the transmission line and possibly interconnected facilities.

The required separation between transmission lines, in a common corridor, is dependent upon the "credible" events that might cause an outage of the circuits. If the credible event is the collapse of a tower then the required separation would be approximately equal to the height of the towers. If the credible event is a wildfire then the required separation would need to be sufficient to minimize the potential for a single fire to necessitate the simultaneous outage of the circuits in that corridor. In this area, that separation would have to be several thousand feet in order to avoid the risk of a single fire causing a concurrent

¹² See Attachment 1A to this appendix for detailed discussion of fire and other risks related to a collocated 500 kV transmission line following the existing SWPL.

outage of the two lines. Even if such a separation were feasible, fires in this area are almost always associated with high winds that could cause the smoke to impact both circuits. SWPL alternatives that are analyzed in detail in this EIR/EIS include collocated portions only in areas where fire and smoke hazards would be lowest, as described in Section 4.8 of this Appendix.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative potentially meets the major project objective of providing transmission capability to import renewable energy. The other two major objectives would not be met. The high costs of power in San Diego because of transmission congestion would not be reduced with this alternative, because of the high import and congestion inherent in terminating a second bulk power transmission line at Miguel Substation. System reliability would not be improved because placing the line in the same corridor as the existing SWPL would expose the system to the risk of a single event resulting in the loss of both Imperial Valley–Miguel 500 kV lines, which would likely trigger the need for SDG&E to drop a significant amount of load in the San Diego Area. Although it would be possible to develop a load dropping scheme, because of the relatively high probability of a double line outage in this corridor,¹³ NERC/WECC planning criteria may disallow load dropping as an option.

This alternative would not meet the objective of reducing energy costs because congestion at the Miguel Substation would be exacerbated. Upgrading transmission facilities north and west of Miguel would involve the ROW alignments of the Otay Mesa Powerloop and Miguel-Mission #2 projects, which SDG&E recently completed with new transmission lines to accommodate existing congestion. These projects increased the capability to accommodate power flows north of Miguel and have relieved some congestion. However, the existing transmission corridor north of Miguel has a high density of transmission lines, with up to nine transmission lines on various sections and up to five distribution circuits. Adding more transmission lines north of Miguel would substantially increase the risks of a single event causing a loss of multiple critical transmission lines, and the corridor north of Miguel has little or no space for additional lines without a very costly and high impact redesign of the entire corridor.

Feasibility

Construction of the SWPL No. 2 Alternative would be technically, legally, and regulatorily feasible. However, numerous technical issues would need to be addressed. High congestion costs for transmission into and through the Miguel Substation would occur, and additional transmission upgrades on the 230 kV system emanating from the Miguel Substation would need to be developed. Space for these additional facilities is limited. Additional facilities or measures may also need to be developed to achieve the desired transfer capability under this alternative because the SWPL No. 2 Alternative would probably be deemed a single contingency for reliability purposes. As such, SDG&E and CAISO believe that this alternative would not be capable of increasing system import capability under the CAISO's G-1/N-1 reliability criteria.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided because no new transmission facilities would be built in ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

¹³ October 12, 2006 CAISO filing; Comments of the California Independent System Operator Regarding the Alternative Route Proposals Submitted by San Diego Gas & Electric Company.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 83-mile 500 kV transmission line in a new or expanded right-of-way in southern San Diego County and possibly more transmission lines north of Miguel Substation through densely populated areas. While portions of the SWPL corridor pass through undeveloped open space, other portions pass immediately adjacent to low density residential areas, and a second SWPL would likely require the taking of homes along the corridor west of Campo.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further consideration because of a failure to meet two of the three major project objectives. This alternative would not improve reliability because there would be few options to prepare for a simultaneous loss of the two lines. The inability of this alternative to address system reliability issues and the probable exacerbation of congestion problems and costs around the Miguel Substation pose serious concerns about this alternative.

4.9.6 Convert SWPL to DC Alternative

Alternative Description

This alternative was suggested at one of the public scoping meeting conducted in the initial phase of the CEQA review of the Sunrise Project (by Mussey Grade Road Alliance). Technically, this alternative would entail conversion of the existing Imperial Valley–Miguel 500 kV line from alternating current (AC) to direct current (DC).

Accomplishing this conversion would require the placement of what are called “converters” at both the Imperial Valley and Miguel ends of the SWPL. Converter stations at both ends of the SWPL would involve installation of large new structures on a land area of approximately 20 to 40 acres each. The structure housing each converter station would be approximately 70 to 100 feet tall, and the footprint of the building would be approximately 400 to 600 feet on each side. This would introduce a new industrial land use to the Imperial Valley and Miguel Substations.

The existing conductors on the SWPL could be utilized in the DC conversion. Two of the three conductors would be used as the positive and negative poles, and the remaining conductor would act as the ground return.

To provide the maximum value of changing the existing line from AC to DC the converter stations would need to be sized to accommodate the emergency rating of the existing conductor, but the line would be operated up to the continuous thermal rating except in the case of a system emergency. In response to the CPUC’s Data Request No. 1, Alt-8, SDG&E stated that the emergency rating of the existing conductor is 2,727 MW. This same response lists the continuous thermal rating at 2,364 MW. Conversion to DC operation would also permit bypassing the series capacitor bank on the Imperial Valley–Miguel segment of the SWPL. This capacitor bank is the current limiting element on the line with a thermal rating of approximately 2,000 MW. An alternative to upgrade this capacitor bank is identified as the Upgrade Series Capacitor on SWPL Alternative (Section 4.9.7).

Once converted to DC operation the rating of the SWPL would be based upon the capacity of the converter stations. The actual flow on the line would be controlled by the CAISO. Similar to the SWPL No. 2 Alternative (Section 4.9.5), one ancillary consequence of this alternative would be the need to sub-

stantially upgrade and/or add additional transmission facilities emanating from the Miguel Substation. Studies have not been conducted to describe the specific facilities that could be overloaded by this alternative or identify what other transmission facilities would need to be expanded to accommodate this alternative.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would potentially meet the project objective to provide transmission capability for renewable energy, assuming that the necessary upgrades to the transmission system emanating from the Miguel Substation can be accomplished economically. SDG&E has stated that it is uncertain if these upgrades could be accomplished. The inability to easily expand transmission facilities north and west of Miguel would escalate project and congestion costs to a point where the second of three project objectives (reduce congestion costs) would not likely be achieved. This alternative also would not enhance system reliability, the third objective. Rather, it would exacerbate the implications of an outage on the SWPL which would include substantial amounts of load dropping in the San Diego area.

Feasibility

Assuming space exists around the Miguel Substation to accommodate the converter station and the transmission upgrades around Miguel could be accomplished, this alternative would be technically, legally, and regulatorily feasible.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided because no new transmission facilities would be built in ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of new DC converter stations at the Imperial Valley and Miguel Substations. These massive structures would introduce new visual impacts and possibly impacts to biological resources and cultural resources adjacent to the two substations. Also, it would require construction of more or upgraded transmission lines north of Miguel Substation through densely populated areas.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further consideration because of a failure to meet two of three major project objectives. This alternative would not improve reliability because there would be few options to prepare for a loss of an expanded SWPL. This alternative would likely result in the exacerbation of congestion problems and costs around the Miguel Substation.

4.9.7 Upgrade Series Capacitors along SWPL

Alternative Description

This alternative would involve modifications to the existing SWPL (Imperial Valley–Miguel 500 kV line) to improve its transfer capability. This alternative would be an expansion of modifications that were identified in the STEP report as part of the Miguel Area Improvements, including a series capac-

itor upgrade on the existing Imperial Valley–Miguel 500 kV line. This capacitor bank is the current limiting element on the line with a thermal rating of approximately 2,000 MW. The thermal capacity of the series capacitors could be upgraded to the emergency rating of the existing conductor. This alternative would upgrade the thermal capacity of the series capacitors along SWPL to the emergency rating of the existing conductor (2,727 MW). This would allow the line to be operated at the conductor's continuous rating of 2,364 MW, 364 MW above the current capacitors' limitation. Each series capacitor bank would involve about 2 acres of new permanent electrical infrastructure along the existing SWPL, and two locations would likely be needed.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purposed and Need

This alternative would not achieve two of the three major project objectives: improving reliability criteria and reducing costs of energy delivery. It would provide the capability for only a marginal increase in capacity on the existing SWPL, compared to the Proposed Project increase of 1,000 MW, with no ability to expand beyond that marginal increase without reconductoring the entire circuit. Since this alternative would utilize an existing circuit, there would be no increase to system reliability or import capability under G-1/N-1 conditions. The additional capacity afforded by this alternative would be delivered to the Miguel Substation thereby exacerbating the existing congestion problems.

Feasibility

This alternative is technically, legally, and regulatorily feasible.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided because no new transmission facilities would be built in ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

This alternative would cause the construction-phase impacts of installing series capacitors along SWPL. In addition, it would likely require the construction-phase and permanent impacts of possibly more transmission lines north of Miguel Substation through densely populated areas where corridors are already at capacity.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further consideration because of a failure to meet two of three major project objectives. This alternative would not improve reliability because there would be few options to prepare for a loss of an expanded SWPL and congestion problems and costs around the Miguel Substation would be exacerbated. The incremental transfer capability on SWPL, afforded by this alternative, would provide only a short-term solution to SDG&E's need for additional import capacity, and it would not improve SDG&E's import capability during N-1 conditions.

4.9.8 SDG&E 230 kV CFE Alternative

Alternative Description

The 230 kV CFE Alternative is briefly described in Section 3.3.3.7 of the PEA. This alternative is also known as SDG&E's Imperial Valley–Miguel 230 kV via Mexico Alternative. This alternative has been considered by SDG&E in its analysis of Purpose and Need for the Proposed Project and by the STEP group as Option 6 in the 2004 STEP report for a new line into San Diego. Scoping comments including those from Mussey Grade Road Alliance urge consideration of this alternative. The 230 kV CFE Alternative would be an expansion of the Mexico Light 230 kV Alternative described in Section 4.9.3. Figure Ap.1-31 illustrates the location of this alternative.

This alternative would include:

- 9.5 miles of a new double-circuit 230 kV lines from Imperial Valley to CFE's La Rosita Substation
- 85 miles of two new double-circuit 230 kV lines from CFE's La Rosita to CFE's Tijuana Substation
- 13 miles of three new 230 kV circuits from CFE's Tijuana to Miguel Substation

A more detailed description of this alternative can be found in SDG&E's Transmission Comparison Study (SDG&E, 2005). The basis for this alternative is the use of existing transmission corridors in Mexico, just south of the border, to provide for additional capacity to serve SDG&E's loads. Specifically, new 230 kV circuits would be constructed south from the Imperial Valley Substation to an existing La Rosita Substation, west to CFE's existing Tijuana Substation, and then north to SDG&E's Miguel Substation.

As described in the TCS, two new 230 kV circuits would be constructed to interconnect the Imperial Valley Substation to CFE's La Rosita Substation following an existing 230 kV corridor. Each circuit would be approximately 9.5 miles in length. From La Rosita four new 230 kV circuits would be constructed heading west to the Tijuana Substation. Each of these circuits would be approximately 85 miles in length. From the Tijuana Substation three new 230 kV circuits would head north to the Miguel Substation. Each of these circuits would be approximately 13 miles in length.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The 230 kV CFE Alternative would meet only one of the Proposed Project's three major project objectives, because it would help access Imperial Valley renewable resources. SDG&E believes that sufficient technical studies have not been performed to determine whether this alternative could feasibly satisfy minimum reliability criteria or provide sufficient transfer capability to meet short and long-term load growth. SDG&E's TCS showed that this alternative had "poor technical performance." Specific reference is made to numerous overloads on existing system components under contingency analysis (N-1 and credible N-2 outages). Similarly, it is not clear whether this alternative would reduce power costs due to the exercise of local market power because SDG&E claims it would not increase G-1/N-1 import capability since the 230 kV lines would be in a common corridor (PEA Section 3.3.3.7). However, this claim cannot be verified without sufficient technical studies. The basis for using four 230 kV circuits between La Rosita and Tijuana would be to replicate the transfer capability of a single 500 kV circuit, which should increase the G-1/N-1 import capability. An outage of a 500 kV circuit or the four

230 kV circuits passing through Mexico should have similar implications to an outage of a 500 kV line located in Imperial or San Diego County.

SDG&E would need to conduct additional technical studies and hold discussions with CFE to identify the potential mutual benefits of this alternative, in order to definitively determine whether this alternative could achieve the objective of maintaining reliability. One additional problem is that the additional import capacity afforded by this alternative would be delivered into the already congested Miguel Substation.

Feasibility

This alternative is technically feasible. The fact that the facilities under this alternative would be interconnected with the CFE system should not pose a technical problem since the existing CFE facilities in this area are already interconnected with SDG&E's system. With regard to system stability and overloads, SDG&E acknowledges that additional studies would need to be performed to fully determine the extent of these problems and the potential solutions (PEA Section 3.3.3.7). However, as previously mentioned, a significant technical concern is that the capacity imported via this alternative would be delivered to the overly congested Miguel Substation.

With regard to regulatory feasibility, SDG&E cites several valid concerns regarding the ownership and control of this alternative. The CFE system is owned and operated by the Mexican government. Ownership of facilities, and the corresponding cost recovery, would need to be negotiated with at least SDG&E, CFE, CPUC, and CAISO. In addition, SDG&E would most likely be required to file with the FERC for approval of the terms and conditions of the resulting transmission agreements. The length of time required for these negotiations and filings could substantially delay the in-service date well beyond SDG&E's desired 2010 timeframe. The legal and financial solutions necessary to control construction and operation of this alternative have yet to be fully explored by all parties, but SDG&E believes that CAISO cannot control lines within Mexico and that electricity transmission is a dedicated function of the Mexican national government and that concession of the line to SDG&E may be constitutionally prohibited (SDG&E's Purpose and Need, Chapter VI, p. VI-9 and 10). The legal feasibility of this alternative is therefore doubtful.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be built in ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

This alternative would require substantial construction in Mexico and would create permanent impacts of new high voltage transmission lines. In addition, this alternative would require expansion of the transmission system north of Miguel Substation through densely populated areas in San Diego County where corridors are already at capacity.

Alternative Conclusions

ELIMINATED. This alternative is eliminated from further analysis due principally to the uncertainty of the timing and outcome of the required regulatory and legal negotiations. Although technically feasible, since the CFE 230 kV system is already interconnected with SDG&E's system, the regulatory and legal feasibility issues may be insurmountable. CFE is not subject to the FERC so there would be no overriding authority to direct the outcome.

4.9.9 Serrano/Valley-Central 500 kV Alternative

Alternative Description

The Serrano/Valley-Central 500 kV Alternative would be similar to the LEAPS Transmission Only (TE/VS Interconnect or Serrano/Valley-North 500 kV) Alternative (Section 4.9.2) with a new 500/230 kV substation at the location of the Proposed Project's Central East Substation instead of at Camp Pendleton in northern San Diego County. However, this alternative would involve an expansion of the TE/VS Interconnect 500 kV line to extend it and 500 kV infrastructure into central San Diego County.

This alternative would establish a new 500 kV interconnection from the SCE service territory along SDG&E's existing Talega-Escondido 230 kV corridor, then to the Rincon area and parallel SR76 to the Warner Springs area (see Figure Ap.1-31). This 500 kV route would avoid the Anza-Borrego Desert State Park by approaching the proposed Central East Substation from the north of Lake Henshaw.

This alternative would include:

- New Serrano/Valley 500 kV Switching Substation (also called Lee Lake Substation)
- New 500/230 kV Central East Substation (a component of the Proposed Project)
- New Serrano/Valley-Central 500 kV line
- All of the other 230 kV Proposed Project components located west of the Central East Substation.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would substantially meet the objectives to maintain reliability and reduce the cost of energy in SDG&E territory. It would enhance system performance under G-1/N-1 contingency conditions and improve the regional transmission system by adding a second connection into the SDG&E system. This additional import capacity would also help reduce above-market power costs in SDG&E's service area and allow import of power from diverse fuel sources. In combination with the proposed Green Path Coordinated Projects (Section 4.9.27) and the approved second Devers-Valley line, this alternative would only partially achieve the third major project objective, to increase access to renewable energy sources.

Feasibility

This alternative is technically, legally, and regulatorily feasible. Technical studies would be required to determine the transmission system benefits of extending the TE/VS Interconnect from the SCE system to the location of the proposed Central East Substation. If extending the interconnection provided system benefits then specific line routing studies would be required to determine the need for right-of-way and identify any properties that would need to be taken.

Environmental Advantages

All impacts of the Proposed Project in ABDSP and Imperial County would be avoided because no new transmission facilities would be built east of the proposed Central East Substation.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor from Riverside County across northern San Diego County. No existing transmission facilities or other utilities presently occur along the 30-mile corridor between Lee Lake and Camp Pendleton, and the impacts of a major new 500 kV ROW would occur between Camp Pendleton and the proposed Central East Substation through rural northern San Diego County. This alternative would create substantial new disturbances and visual impacts. Note that the environmental impacts of the transmission line segment that is a component of the LEAPS Project Alternatives (including the TE/VS Interconnect or Lake-Pendleton 500 kV Transmission Line) are fully analyzed in Section D of this EIR/EIS.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further analysis because although it would meet most of the Proposed Project's objectives and is likely feasible, it would have environmental impacts as severe as those of the Proposed Project.

4.9.10 Valley-Rainbow 500 kV Alternative

Background

This alternative is based on the Valley-Rainbow Interconnect Project developed by SDG&E before 2001 but disapproved by CPUC in December 2002. This alternative was later studied in the 2004 STEP planning group report as Option 1 for a new line into San Diego, and it has been suggested for consideration by many public comments during scoping. The Valley-Rainbow Interconnect Project with additional improvements was also identified as one possible alternative to SCE's Steam Generator Replacement Project at SONGS (A.04-02-026).

SDG&E prepared a filing for a CPCN and a PEA for the Valley-Rainbow Interconnect Project and submitted it to the CPUC on March 23, 2001. The document described a scenario where a new 500 kV transmission line would be developed by SDG&E to interconnect the SCE and SDG&E territory. It would provide an interconnection between SDG&E's existing 230 kV transmission system at a new substation near the unincorporated community of Rainbow in San Diego County and SCE's existing Valley Substation on Menifee Road in unincorporated Romoland in Riverside County.

The CPUC denied the CPCN for SDG&E's Valley-Rainbow Project (D.02-12-066) with the view that a reliability need had not been demonstrated. At that time, the CPUC concluded that SDG&E would have sufficient capacity to reliably meet its needs through the five-year planning horizon in use at the time, or until at least 2008 or 2009. The Valley-Rainbow Project also faced extreme opposition from the communities and Indian Tribes that would have been affected by the routes under consideration at the time. Subsequent to the decision, SDG&E developed and CPUC approved the 2004 Long-Term Resource Plan, which included plans for a new 500 kV transmission project to interconnect San Diego with either Riverside County or Imperial County.

Alternative Description

The Valley-Rainbow 500 kV Alternative described here would be essentially identical to SDG&E's original Valley-Rainbow Interconnection Project (see Figure Ap.1-31). It would differ from the LEAPS Project Alternative (Section 4.9.1) because it would not involve pumped storage generation and it

would terminate directly at SCE's Valley Substation rather than at a new connection on the Serrano-Valley line. The Valley-Rainbow 500 kV Alternative would include transmission system upgrades and support throughout SDG&E's service area to address some of the system stability and voltage issues associated with establishing a robust interconnection with SCE.

This alternative would include:

- New single-circuit Valley-Rainbow 500 kV transmission line, approximately 30 miles long.
- New 500/230 kV Rainbow Substation including two transformers each rated at 1,120 MVA.
- Modifications to loop SDG&E's existing Talega-Escondido 230 kV line into the new Rainbow Substation, forming Talega-Rainbow #1 230 kV line and Escondido-Rainbow #1 230 kV line.
- New 230 kV Talega-Rainbow #2 230 kV (second circuit on existing structures).
- New 230 kV Escondido-Rainbow #2 230 kV (second circuit on existing structures).
- Modification of SDG&E's existing Talega-Escondido 69 kV transmission circuit on new wood and steel poles adjacent to the existing 230 kV poles within the existing Talega-Escondido ROW.
- System voltage support including static synchronous compensators at SDG&E's existing Mission, Miguel, Sycamore Canyon, Talega, and Escondido Substations and possibly similar upgrades at SCE's Valley, Devers, and Serrano Substations.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would substantially satisfy two of the major project objectives: to maintain reliability in the delivery of power to SDG&E territory and to reduce the cost of energy in the region. The addition of this 500 kV interconnection with the SCE system would enhance system reliability, provide for additional import capacity to meet load growth, reduce the cost of local reliability and improve the regional transmission system.

The third major project objective, to accommodate delivery of renewable energy, would only partially be met, requiring proposed transmission system upgrades to be completed by other parties. As described under the discussion of the LEAPS Project Alternative (Section 4.9.1), these other system upgrades include SCE's second Devers-Palo Verde and Devers-Valley 500 kV lines (approved by CPUC in January 2007) and LADWP's proposed 500 kV connection between the IID's system and the Devers Substation (the Green Path Coordinated Projects, Section 4.9.27). The combination of these projects would allow for the scheduling of low cost power and Imperial Valley renewables through the SCE system into SDG&E's service area, which would enhance access to diverse fuel sources.

Feasibility

The Valley-Rainbow 500 kV Alternative is technically feasible. It was thoroughly studied by SDG&E in advance of the 2001 CPCN and PEA filing, and it has been studied extensively as a means of achieving the system reliability and import goals of SDG&E. Because it would partially implement SDG&E's 2004 Long-Term Resource Plan that was approved by the CPUC, it is reasonable to expect that the CPUC could issue a successful "need" determination for Valley-Rainbow or a similar alternative today.

The ability of this alternative to succeed in the regulatory and permitting process, however, is doubtful. The Valley-Rainbow corridor that was presented to the CPUC in 2001 faced opposition from land-owners and jurisdictions including communities and Indian Tribes in Riverside County. In the vicinity of the City of Temecula, the Great Oak Ranch property, and the Pechanga Indian Reservation, a feasible route does not exist. There appears to be a higher feasibility of successfully permitting a new 500 kV transmission line along the route of the LEAPS Project Alternatives (Sections 4.9.1 and 4.9.2) than along the Valley-Rainbow route.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor between the Inland Empire of Riverside County and Rainbow in San Diego County. No existing transmission facilities or other utilities presently occur along the 30-mile corridor. Therefore, this alternative would create substantial new disturbances and visual impacts. Due to potential land use impacts in the vicinity of Temecula, the Great Oak Ranch property, and Indian reservations, the Valley-Rainbow corridor is no longer available.

Alternative Conclusions

ELIMINATED. This alternative would meet most project objectives, but it is eliminated because it is not considered feasible because a viable transmission corridor is no longer available in the Valley-Rainbow area.

4.9.11 V-R Devers-Pala Alternative

Alternative Description

This alternative is identified in the November 2002 Interim Preliminary Report on Alternatives Screening for the SDG&E Valley-Rainbow 500 kV Interconnect Project (the V-R Alternatives Report). This alternative is based on the description in Section 3.3.1 of the V-R Alternatives Report, based on the past efforts to identify a feasible alternative to the Valley-Rainbow Interconnect Project (described in Section 4.9.10).

This alternative would provide an interconnection between SCE's existing Devers Substation and SDG&E's Pala Substation. Alternative routings between the Devers and Pala Substations were suggested during SDG&E's preparation of the Valley-Rainbow PEA in 2000, and during the CPUC and BLM public scoping period in the summer of 2001. Three possible 500 kV routes were considered in the analysis, but each would occur along the route of the Valley-Rainbow Interconnect Project in the vicinity of Temecula and the Pechanga Indian Reservation. The following three routes were considered.

V-R Devers-Pala Alternative Route 1. Follow existing transmission line corridors between SCE's Devers and Valley Substations (approximately 40 miles through the northern portion of the Santa Rosa and San Jacinto Mountains National Monument and along the northern boundary of the Potrero ACEC). From the Valley Substation this route would continue to the area of the Rainbow Substation and SDG&E's Pala Substation along a new corridor for approximately 40 miles. The new corridor would pass through

portions of the Southwestern Riverside County Multi-Species Reserve and continue south to SR79 where it would turn southwest toward the Great Oak Ranch, just west of the Pechanga Indian Reservation. From there the new corridor would extend south to Pala.

V-R Devers-Pala Alternative Route 2. Follow the existing 500 kV transmission line corridors approximately 15 miles west from Devers Substation, and then establish a new approximately 35-mile north south transmission corridor, parallel to the western edge of the SBNF, to a new approximately 10-mile-long east-west corridor that would pass north of Vail Lake and then connect to the route of Devers-Pala Alternative Route 1 approximately 1.5 miles northeast of where it would cross SR79.

V-R Devers-Pala Alternative Route 3. Follow existing 500 and 230 kV transmission line corridors approximately 10 miles southeast from the Devers Substation, establishing approximately 70 miles of new utility corridor across the Santa Rosa and San Jacinto Mountains National Monument. The alternative route would connect to the route of Devers-Pala Alternative Route 1 approximately 1.5 miles northeast of where it would cross SR79.

These three routes are shown on the map of System Alternatives Eliminated (Figure Ap.1-31). Alternative Routes 1 and 2 would each be approximately 65 to 70 miles in length, and Route 3 would be approximately 80 miles in length.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would substantially satisfy two of the three major project objectives: to maintain reliability in the delivery of power to SDG&E territory and to reduce the cost of energy. The addition of this 500 kV interconnection with the SCE system would enhance system reliability, provide for additional import capacity to meet load growth, reduce the cost of local reliability, improve the regional transmission system and allow access to electricity generated by diverse fuel sources. The third major project objective of importing renewable power would only partially be met, requiring the second Devers-Valley and the proposed Green Path Coordinated Projects (Section 4.9.27) to be completed.

Feasibility

Feasibility of this alternative would be similar to that of the Valley-Rainbow 500 kV Alternative described above (Section 4.9.10). The ability of this alternative to succeed in the regulatory process is doubtful due to the challenges of identifying a specific corridor for the 500 kV line. This alternative would follow the general Valley-Rainbow corridor where a feasible route does not exist.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor between the Inland Empire of Riverside County and Pala in San Diego County. No existing transmission facilities or other utilities presently occur along the 40-mile corridor and rapid residential development has occurred in the area. Therefore, this alternative would create substantial new disturbances, visual impacts, and land use impacts to Indian reservations.

Alternative Conclusions

ELIMINATED. This alternative is rejected because it would occur in a rapidly developing corridor where a viable transmission corridor is not available.

4.9.12 V-R Devers-Ramona Alternative

Alternative Description

This alternative is identified in Section 3.3.2 of the November 2002 V-R Alternatives Report. Based on the past efforts to identify a feasible alternative to the Valley-Rainbow Interconnect Project (Section 4.9.10 above), this alternative would provide a new 500 kV interconnection between SCE's Devers Substation and a new major substation located in an unincorporated area of San Diego County near Ramona.

This alternative would include the following:

- 90 miles of new 500 kV line within a new utility corridor between the Devers Substation and a new substation near Ramona.
- New 500/230 kV substation facility near Ramona.
- 12 miles of new 230 kV line between the new 500 kV Ramona Substation and SDG&E's existing Sycamore Canyon Substation.
- 17 miles of new 230 kV line between the 500/230 kV Ramona Substation and SDG&E's Escondido Substation.

Two different 500 kV corridor routes between the Devers and Ramona Substations were considered in the V-R Alternatives Report and are shown on the map of System Alternatives Eliminated (Figure Ap.1-31).

V-R Devers-Ramona Alternative Route 1. The northern portion of this alternative would follow the V-R Devers to Pala Alternative Route 2 above (Section 4.9.11), and the southern portion would travel southward along SR79, from the Riverside County line via Santa Ysabel to SR78 and Ramona.

V-R Devers-Ramona Alternative Route 2. The northern portion of this alternative would follow the V-R Devers to Pala Alternative Route 3 above (Section 4.9.11), and the southern portion would travel southward along SR79, from the Riverside County line via Santa Ysabel to SR78 and Ramona.

Both routes would cross SR371 just west of the Cahuilla Indian Reservation and travel south along the western boundary of the Beauty Mountain Wilderness Study Area into San Diego County, parallel to SR79. In San Diego County, the 500 kV line would generally pass north-south to the Warner Springs and Lake Henshaw area parallel to SR79. From Santa Ysabel, the 500 kV line would run along SR78 to enter a new substation near Ramona. For this analysis, the location of the 500/230 kV substation could be at either the proposed Central East Substation or at the Central South Substation Alternative site. The double-circuit 230 kV line to Sycamore Canyon would pass through the Ramona area as it would with the Proposed Project, and the 230 kV line to Escondido would parallel SR76.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would substantially satisfy two of the three major project objectives: to maintain reliability in the delivery of power to SDG&E territory and to reduce the cost of energy. The addition of this 500 kV interconnection with the SCE system would enhance system reliability, provide for additional import capacity to meet load growth, reduce the cost of local reliability, improve the regional transmission system and allow access to electricity generated by diverse fuel sources. The third major project objective related to delivery of renewable energy would be only partially met, requiring the proposed Green Path Coordinated Projects (Section 4.9.27) to be completed.

Feasibility

Feasibility of this alternative would be similar to that of the Valley-Rainbow 500 kV Alternative (Section 4.9.10). The ability of this alternative to succeed in the regulatory process is doubtful. This alternative would partially follow the highly developed Valley-Rainbow corridor a feasible route does not exist.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor between the Palm Springs area of Riverside County and Ramona. No existing transmission facilities or other utilities presently occur along major portions of the 90-mile corridor, therefore, this alternative would create new substantial disturbances and visual impacts. Due to potential land use impacts to national monuments, Roadless Areas on national forest lands, and the Beauty Mountain Wilderness Study Area, no corridors are available that would reduce impacts in comparison to those of the Proposed Project.

Alternative Conclusions

ELIMINATED. This alternative would meet two of three objectives but may not be feasible. It is rejected because it would occur in a corridor where the prospects of regulatory approval are remote and environmental impacts would be at least as severe as those of the Proposed Project.

4.9.13 V-R Coachella-Ramona-Miguel Alternative

Alternative Description

This alternative is identified in Section 3.3.3 of the November 2002 V-R Alternatives Report. Based on the past efforts to identify a feasible alternative to the Valley-Rainbow Interconnect Project (Section 4.9.10 above), this alternative would provide a new 500 kV interconnection between SCE's Devers Substation and a new substation located in the unincorporated area near Ramona.

This alternative would entail constructing a new 90-mile 500 kV transmission line from SCE's existing Devers-Palo Verde 500 kV line or IID's existing Coachella Valley Substation southwest to a new substation in the area of Ramona and then south to SDG&E's existing Miguel Substation.

This alternative was suggested as a means of providing for bulk power transfers between the SDG&E and SCE systems, as well as facilitating power transfers from generation sources under development in Arizona. According to the 2002 V-R Alternatives Report, the new transmission line would need to be initially operated as a 230 kV line because there is no source of 500 kV power at Coachella Valley, but projects planned by IID may bring 500 kV service to a new 500 kV substation at nearby Indian Hills, which could be interconnected in the future (as a result of Green Path Coordinated Projects, Section 4.9.27). The Coachella-Ramona corridor would cross through portions of the Santa Rosa and San Jacinto National Monument, Anza-Borrego Desert State Park, and possibly portions of the Santa Ysabel and Mesa Grande Indian Reservations. This alternative is illustrated on Figure Ap.1-31.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet the reliability objective. The addition of this 500 kV interconnection would enhance system reliability, provide for additional import capacity to meet load growth, reduce the cost of local reliability, improve the regional transmission system and allow access to electricity generated by diverse fuel sources. This alternative would not fully meet the second project objective (to reduce costs) because it would exacerbate the costs of congestion at the Miguel Substation (see discussion of SWPL No. 2 Alternative under Section 4.9.5). The third objective related to delivery of renewable energy would be partially met if the proposed Green Path Coordinated Projects are completed.

Feasibility

The legal and regulatory feasibility of the route of this alternative is highly questionable due to the sensitive and protected land uses that it would encounter. Additionally, numerous technical issues related to the delivery of additional power at Miguel Substation would need to be addressed (see discussion of SWPL No. 2 Alternative under Section 4.9.5).

Environmental Advantages

Major impacts of the Proposed Project would be avoided but relocated to other equally sensitive areas.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor through portions of the Santa Rosa and San Jacinto National Monument, ABDSP, and possibly portions of the Santa Ysabel and Mesa Grande Indian Reservations. In addition, this alternative would require more transmission lines north of Miguel Substation through densely populated areas of San Diego County.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further analysis because although it could meet most of the Proposed Project's objectives, it would have substantially more severe environmental impacts than the Proposed Project. Even if a ROW could be obtained through the various national monuments, state park, and Indian reservation along the proposed route, termination of this alternative at the Miguel Substation would only add to the existing congestion problems.

4.9.14 V-R Devers-Miguel via Northern San Diego County Alternative

Alternative Description

This alternative is identified in Section 3.3.4 of the November 2002 V-R Alternatives Report. Based on the past efforts to identify a feasible alternative to the Valley-Rainbow Interconnect Project (Section 4.9.10 above), this alternative would provide a new 500 kV interconnection between SCE's Devers Substation and SDG&E's Miguel Substation in southern San Diego County.

The V-R Devers-Miguel via Northern San Diego County Alternative would include:

- 30 miles of new 500 kV line within a new utility corridor from Devers Substation to IID's Coachella Valley Substation.
- 100 miles of new 500 kV line within a new utility corridor from Coachella Substation to Miguel Substation via the Ramona area.

This alternative would follow the route of SCE's existing Devers-Palo Verde 500 kV transmission line from Devers Substation to the vicinity of the Coachella Valley Substation before turning southwesterly to follow the route of the V-R Coachella-Ramona-Miguel Alternative (see Section 4.9.13) through the Santa Rosa and San Jacinto Mountains National Monument and Anza-Borrego Desert State Park. However, rather than connecting with a new substation in Ramona, the new 500 kV line would continue directly to the Miguel Substation. The total length of this new line would be approximately 130 miles. This alternative is shown on Figure Ap.1-31.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet two of the basic project objectives, improving reliability and providing access to renewable resources. This alternative would not fully meet the objective to reduce the cost of energy because it would exacerbate the costs of congestion at the Miguel Substation (see discussion of SWPL No. 2 Alternative under Section 4.9.5).

Feasibility

The legal and regulatory feasibility of the route of this alternative is highly questionable due to the sensitive and protected land uses that it would encounter. Additionally, numerous technical issues related to delivery of additional power at the highly congested Miguel Substation would need to be addressed (see discussion of SWPL No. 2 Alternative under Section 4.9.5).

Environmental Advantages

Major impacts of the Proposed Project would be avoided but relocated to other equally sensitive areas.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor through portions of the Santa Rosa and San Jacinto National Monument, ABDSP, and possibly portions of the Santa Ysabel and Mesa Grande Indian Reservations, and possibly more transmission lines north of Miguel Substation through densely populated areas of San Diego County.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further analysis because although it could meet most of the Proposed Project's objectives, it would have substantially more severe environmental impacts than the Proposed Project.

4.9.15 V-R Devers-Miguel via Imperial County Alternative

Alternative Description

This alternative is identified in Section 3.3.4 of the November 2002 V-R Alternatives Report. Based on the past efforts to identify a feasible alternative to the Valley-Rainbow Interconnect Project (Section 4.9.10 above), this alternative would provide a new 500 kV interconnection between SCE's Devers Substation and SDG&E's Miguel Substation in southern San Diego County via the Imperial Valley.

The V-R Devers-Miguel via Imperial County Alternative would include:

- New 500 kV line from Devers Substation to Imperial Valley Substation (155 miles).
- New 500 kV line from Imperial Valley Substation to Miguel Substation.

As described in Section 3.4.1 of the Valley Rainbow Alternatives Report, with this alternative, a 500 kV line would be constructed from SCE's Devers Substation to the Imperial Valley Substation, parallel to IID's existing 230 kV corridor (passing by the existing Mirage, Coachella, Niland, Midway, and High-line Substations). Additionally, a second 500 kV line would be built from the Imperial Valley Substation to the Miguel Substation. This second line would parallel the existing SWPL 500 kV line along Imperial Valley-Miguel as described for the SWPL No. 2 Alternative (Section 4.9.5). The route of this alternative is shown conceptually on the map of System Alternatives Eliminated (Figure Ap.1-31).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative potentially meets one of the three major project objectives related to accommodating delivery of renewable energy. The other two objectives are not met either because of the high import and congestion inherent in terminating a second bulk power transmission line at Miguel Substation or because of the reliability risk of placing the line in the same corridor as the existing SWPL for its entire length (see discussion of SWPL No. 2 Alternative under Section 4.9.5).

Feasibility

This alternative would be technically, legally, and regulatorily feasible. However, numerous technical issues related to delivery at along a path parallel to the existing SWPL and terminating at the highly congested Miguel Substation would need to be addressed (see discussion of SWPL No. 2 Alternative under Section 4.9.5).

Environmental Advantages

Major impacts of the Proposed Project in ABDSP and northern San Diego County areas of Santa Ysabel, Ramona, and Rancho Peñasquitos would be avoided.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a much longer new 500 kV transmission corridor through the entire Imperial Valley and along southern San Diego County. It would also require more transmission lines north of Miguel Substation through densely populated areas of San Diego County.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further analysis because it would not meet most of the Proposed Project's objectives, and it would have substantially more severe environmental impacts than the Proposed Project by causing a much longer new transmission corridor through the entire Imperial Valley and southern San Diego County.

4.9.16 V-R Serrano-Talega Alternative

Alternative Description

This alternative is identified in Section 3.4.6 of the November 2002 V-R Alternatives Report. Based on the past efforts to identify a feasible alternative to the Valley-Rainbow Interconnect Project (Section 4.9.10 above), this alternative would provide a new 500 kV interconnection along the existing transmission corridor between SCE's existing Serrano Substation in Orange County to SDG&E's coastal 230 kV system at the existing Talega or SONGS Substations.

This alternative would establish a new 500 kV line along the route of the 230 kV lines from the Serrano Substation in the Anaheim foothills south of SR91 through Orange County to SDG&E's Talega Substation just north of Camp Pendleton. This alternative would utilize SCE's existing 220 and 500 kV rights-of-way for its entire 35-mile distance, through rural and urban parts of Orange County. Existing rights-of-way vary from 200 to 580 feet and contain existing 66 kV, 220 kV and 500 kV lines along various stretches.

The northernmost portion of the Serrano-Talega corridor would be adjacent to SCE's existing Serrano-Valley 500 kV line, and space would be available in the corridor further south, until the Lake Forest and Mission Viejo areas. Existing double-circuit 220 kV and 66 kV facilities between SCE's Viejo Substation and SR73 in Laguna Niguel would need to be rebuilt to accommodate the 500 kV line. South of SR73, substantial reconstruction would also be needed to place SCE's existing 220 kV circuits underground from Laguna Niguel through recent housing developments in Ladera to Talega. In some areas, the existing ROW could be expanded, but in the southernmost portions, at least one 220 kV circuit and up to three 138 kV circuits would need to be placed underground to avoid condemnation of homes in surrounding communities. The route of this alternative is shown on the map of System Alternatives Eliminated (Figure Ap.1-31).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The analysis of the V-R Serrano-Talega Alternative in the V-R Alternatives Report found this alternative to have significant technical issues that would prohibit meeting project objectives. The inability of earlier technical studies on this alternative to demonstrate that it clearly provides additional import

capability to the SDG&E system places in question its ability to meet any of the Proposed Project's objectives. It is also not clear if this alternative would create possible congestion issues within SCE's system which could require additional upgrades beyond the alternative description above. Additionally, the risk of a common corridor outage would be increased with this alternative because it would place the new 500 kV line in a corridor with SCE's existing transmission system.

Feasibility

This alternative is technically, legally, and regulatorily feasible. However, substantial regulatory and permitting hurdles would need to be overcome to permit the route in urban corridors. This alternative would occur in highly developed portions of Orange County where a feasible route does not exist. Reconstruction of the existing corridor appears to be technically feasible, but at substantial costs for placing various existing SCE circuits underground and expanding the ROW.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor within the urban areas of Orange County. It is not clear whether these upgrades could be accomplished within the existing SCE and SDG&E ROWs, so new corridors might be required.

Alternative Conclusions

ELIMINATED. The ability of this alternative to succeed in the regulatory process is doubtful. The existing urbanized corridor has little or no space for addition of new 500 kV towers at reasonable cost, and the ultimate scope of transmission upgrades needed to achieve basic project objectives is uncertain. Placing the line in a common corridor with SCE's existing transmission system also would not be consistent with project objectives. The uncertainty of being able to obtain the necessary additional ROW, plus associated environmental implications of the new facilities, places in doubt the ability to pursue this alternative.

4.9.17 Valley-Central 500 kV Alternative

Alternative Description

This alternative would introduce a new 500 kV interconnection in a new corridor between SCE's Valley Substation in unincorporated Romoland in Riverside County and the Warner Springs area of San Diego County where it would continue to the Central East Substation that is part of the Proposed Project. The northern part of the route would follow that shown in the PEA for the Valley-Rainbow Interconnect Project developed by SDG&E before 2001, and the southern part would head eastward north of the Pechanga Indian Reservation and Agua Tibia Wilderness Area. It would be similar to the Valley-Rainbow Interconnect Project north of SR79 in Riverside County but would take the new 500 kV line eastward along a route generally parallel of SR79 from Temecula, north of the Agua Tibia Wilderness Area. From the Temecula area, this alternative would follow SR79 via Aguanga and Sunshine Summit and Warner Springs to the location of the Proposed Project's Central East Substation. This alternative would include:

- New single-circuit 500 kV line from SCE's Valley Substation to the Proposed Project's Central East Substation, approximately 50 miles long.
- Other Proposed Project components west of the Central East Substation.

This alternative would need to avoid Indian Tribal lands, the Agua Tibia Wilderness Area and the Southwest Riverside County Multi-Species Reserve, as well as the communities of Winchester, Murrieta, Temecula, and Warner Springs. It is illustrated on Figure Ap.1-31.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would substantially satisfy two of the basic project objectives: to maintain reliability in the delivery of power to SDG&E territory and to reduce the cost of energy in the region. The third objective, to accommodate delivery of renewable energy, would only partially be met, requiring other proposed transmission system upgrades to be completed by other parties (such as the Green Path Coordinated Projects) to provide access to renewable resources.

Feasibility

The Valley-Central 500 kV Alternative appears to be technically and legally feasible. The ability of this alternative to succeed in the regulatory and permitting process, however, is unknown. This alternative would occur in highly developed portions of southern Riverside County where a feasible route does not exist.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be built in Imperial County or ABDSP.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor, possibly causing land use impacts to Southwest Riverside County Multi-Species Reserve and Riverside County communities of Winchester, Murrieta, Temecula, and Warner Springs. No existing transmission facilities or other utilities presently occur in this corridor, therefore, this alternative would create new disturbances and visual impacts.

Alternative Conclusions

ELIMINATED. This alternative would meet two of three objectives but may not be feasible. It is rejected because it would occur where no feasible corridor is available, where the prospects of regulatory approval are remote and environmental impacts would be at least as severe as those of the Proposed Project.

4.9.18 SDG&E 500 kV Full Loop Alternative

Alternative Description

The 500 kV Full Loop Alternative is briefly described in Section 3.3.3.9 of the PEA, and it is also known as the Imperial Valley-Central-Serrano/Valley 500 kV Alternative, as in SDG&E's TCS. There were

seven Full Loop alternatives studied during SDG&E's TCS. In these planning studies for grid reliability, access to renewable resources, and economics, the best-performing alternative was the 500 kV Full Loop Alternative that provided a 500 kV transmission line from the existing Imperial Valley Substation to the Proposed Project's new Central East Substation to a new substation in SCE's territory between the existing Serrano and Valley Substations in southwestern Riverside County. This alternative would join the proposed Sunrise Powerlink Project (Imperial Valley-Central 500 kV) with transmission similar to that of the separately proposed LEAPS Project Alternatives (Sections 4.9.1 and 4.9.2).

The route of the 500 kV Full Loop Alternative would follow that of the Proposed Project from the Imperial Valley Substation to the proposed Central East Substation. Then it would continue to a new substation in SCE's service territory between the Serrano and Valley Substations (possibly near Lee Lake), as shown on the map of System Alternatives Eliminated (Figure Ap.1-31). This alternative would include:

- New Imperial Valley-Central 500 kV line of Proposed Project
- New 500/230 kV Central East Substation of Proposed Project
- New Serrano/Valley-Central 500 kV line
- New Serrano/Valley 500 kV Switching Substation (also called Lake Substation)
- Other 230 kV Proposed Project components west of the Central East Substation.

The combination of the Proposed Project and the TE/VS Interconnect would encompass most of the components of the 500 kV Full Loop Alternative. Beyond the combination of the Proposed Project and the LEAPS transmission facilities, a 500 kV connection from the proposed Central East Substation to the vicinity of the southern terminus of the LEAPS transmission would need to be built.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet all objectives because it would include the Proposed Project as well as additional facilities. It is unclear whether the 500 kV Full Loop Alternative would provide any economic benefits beyond what the combination of the Proposed Project and the separately proposed LEAPS Project would bring.

Feasibility

This alternative is technically, legally, and regulatorily feasible. However, as with the Proposed Project, substantial regulatory and permitting hurdles would need to be overcome. This alternative would require permitting within the Cleveland National Forest and Indian Lands.

Environmental Advantages

This alternative offers no environmental advantages because all of the impacts of the Proposed Project would occur, along with the additional impacts of a new 500 kV line across northern San Diego County.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor from Imperial Valley across northern San Diego County to Riverside County. Significant land use impacts could occur with acquisition of new rights-of-way in northern San Diego County and

Riverside County. The acquisition would be in areas where SDG&E has very limited existing ROW or none at all. This alternative expands the potential environmental impacts from the areas affected by the Proposed Project to northern San Diego County and to Riverside County. Note that the environmental impacts of the transmission line segment that is a component of the LEAPS Project Alternatives are fully analyzed in Section D of this EIR/EIS.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further consideration because it does not pose an option to the Proposed Project, but rather an expansion of the Proposed Project. By expanding the Sunrise Powerlink Project to include an interconnection with the SCE system, this alternative would enhance the Proposed Project's ability to meet several of the project objectives. However, this alternative would not avoid or minimize any of the Proposed Project's environmental impacts, but rather it would add impacts due to the additional construction and ROW required.

4.9.19 500 kV Full Loop North Alternative

Alternative Description

This alternative is briefly described in Section 3.0 of the IVSG Report as Alternative 3b, and it is also known as the Imperial Valley–North-Serrano/Valley 500 kV Alternative. This alternative would be similar to the 500 kV Full Loop Alternative described above (Section 4.9.18) with the addition of a new substation in northern San Diego County instead of in central San Diego County. This alternative would involve an expansion of the Imperial Valley–Rainbow (or Imperial Valley–North) 500 kV Alternative (Section 4.9.21) to join it with transmission similar to that of the separately proposed LEAPS Project Alternatives (Sections 4.9.1 and 4.9.2).

The route of the 500 kV Full Loop North Alternative would follow that of the Proposed Project from the Imperial Valley Substation to a new 500/230 kV North Substation that would likely be located near the unincorporated community of Rainbow or within Camp Pendleton. Instead of connecting to a new Central East Substation, this alternative would differ from the Proposed Project by establishing a new 500 kV route north of the Santa Ysabel area to Rainbow. The route of the 500 kV line would follow that of the Proposed Project through the Anza-Borrego Desert State Park, then via the Warner Springs area, north of Lake Henshaw. The route would then parallel SR76 to the Rincon area where it would continue west to join SDG&E's existing Talega-Escondido 230 kV corridor, where it would head north to a new 500 kV substation in Camp Pendleton. From there, the new 500 kV transmission line would continue to a new substation in SCE's service territory between the existing Serrano and Valley Substations (one option for this substation would be the Lee Lake Substation proposed as part of the LEAPS Project) , as shown on Figure Ap.1-32a.

This alternative would include:

- New Imperial Valley–North 500 kV line along Proposed Project alignment and SR76 west of Lake Henshaw
- New 500/230 kV North Substation (also called Camp Pendleton Substation)
- New North-Serrano/Valley 500 kV line (similar to TE/VIS Interconnect or Lake-Pendleton 500 kV)
- New Serrano/Valley 500 kV Switching Substation (also called Lee Lake Substation)
- Upgrades to SDG&E's Talega-Escondido 230 kV line to loop into the North Substation and add a second 230 kV circuit on existing poles.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet all objectives because it would be similar to and expand the scope of the Proposed Project. Objectives related to cost and the delivery of reasonably priced energy supplies would likely be met, but it is unclear whether the 500 kV Full Loop North Alternative would provide any economic benefits beyond what the combination of the Proposed Project and the separately proposed LEAPS Project would bring. The IVSG studies concluded that this alternative would provide a greater reduction in production costs while also providing a greater reduction in transmission congestion when compared to the Proposed Project.

Feasibility

This alternative is technically, legally, and regulatorily feasible. However, as with the Proposed Project, substantial regulatory and permitting hurdles would need to be overcome. This alternative would require permitting within the Cleveland National Forest and Indian Lands.

Environmental Advantages

This alternative offers no environmental advantages because all of the impacts of the Proposed Project would still occur along with the additional impacts of a new 500 kV line across northern San Diego County.

Environmental Disadvantages

Similar to the disadvantages of the 500 kV Full Loop Alternative (Section 4.9.18), this alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor from Imperial Valley across northern San Diego County to Riverside County. Replacement of the Proposed Project's Central East Substation with a northern substation would relocate some impacts related to the proposed Central East Substation, but these effects would be offset by construction of additional transmission infrastructure across the northern part of the county. Note that the environmental impacts of the transmission line segment that is a component of the LEAPS Project Alternatives are fully analyzed in Section D of this EIR/EIS.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further consideration because it does not pose an option to the Proposed Project, but rather an expansion of the Proposed Project. As a result, it would have greater impacts than the project as proposed.

4.9.20 Imperial Valley–Ramona 500 kV Alternative

Alternative Description

The Imperial Valley–Ramona 500 kV Alternative is identified in the STEP report as Option 3 for a new line into San Diego. This alternative would provide a 120-mile 500 kV line between the existing Imperial Valley Substation and a new 500/230 kV substation in the area of Ramona and a double-circuit 230 kV line between Ramona and the existing Sycamore Canyon Substation. As such, this alternative would include many features similar to the Proposed Project or the Proposed Project with the Central South Substation Alternative, which would be about 15 miles east of Ramona.

The 500 kV line would follow the route of the Proposed Project from Imperial Valley Substation through Anza-Borrego Desert State Park. Instead of connecting to a new Central East Substation, this alternative would differ from the Proposed Project by following the route of the Proposed Project at 500 kV through the Santa Ysabel area to connect to a new 500/230 kV substation near Ramona or San Diego Country Estates. All of the transmission and substation modifications west of Ramona that are associated with the Proposed Project would also occur under this alternative. This alternative is shown on Figure Ap.1-31.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet all major project objectives because it would include very similar transmission upgrades as those required for the Proposed Project.

Feasibility

This alternative is technically feasible, but legal and regulatory feasibility challenges would be similar to those of the Proposed Project.

Environmental Advantages

The environmental impacts of the proposed Central East Substation would not occur, but similar impacts would occur in order to develop a new 500/230 kV substation near Ramona or San Diego Country Estates.

Environmental Disadvantages

This alternative would relocate impacts of the construction and operation of a new 500/230 kV substation to near Ramona or San Diego Country Estates. Since this alternative would entail continuing the 500 kV circuit into the Ramona or San Diego Country Estates area, additional ROW may be required through the urban areas around Ramona. This alternative would also require about 15 miles of additional 500 kV overhead transmission lines due to the likely infeasibility of undergrounding long segments of a 500 kV circuit.

Alternative Conclusions

ELIMINATED. This alternative is eliminated from further consideration because it would not provide any benefits beyond those afforded by the Proposed Project, and it would cause greater environmental impacts related to the additional length of 500 kV transmission line near Ramona.

4.9.21 Imperial Valley–Rainbow 500 kV Alternative

Alternative Description

The Imperial Valley–Rainbow 500 kV Alternative is identified in the STEP report as Option 2 for a new line into San Diego. This alternative is also known as the Imperial Valley–North 500 kV Alternative, which is identified in Section 3.0 of the IVSG Report as Alternative 3a. This alternative would include a new 188-mile 500 kV line from the existing Imperial Valley Substation to a new 500/230 kV substation near the unincorporated community of Rainbow in northern San Diego County along with construction of a second 230 kV circuit on SDG&E's existing Talega-Escondido 230 kV corridor.

Instead of connecting to the Central East Substation of the Proposed Project, this alternative would differ from the Proposed Project by establishing a new 500 kV route north of the Santa Ysabel area to Rainbow. The route of the 500 kV line of this alternative would follow that of the Proposed Project and the 500 kV Full Loop North Alternative (Section 4.9.19) through the Anza-Borrego Desert State Park, then via the Warner Springs area, north of Lake Henshaw. The route would then parallel SR76 to the Rincon area where it would continue west to join SDG&E's existing Talega-Escondido 230 kV corridor, where it would head north to a new Rainbow Substation. This alternative is shown on Figure Ap.1-31.

This alternative would include:

- New Imperial Valley–Rainbow 500 kV line along Proposed Project alignment and SR76 west of Lake Henshaw
- New 500/230 kV Rainbow Substation
- Upgrades to SDG&E's Talega-Escondido 230 kV line to loop into the North Substation and add a second 230 kV circuit on existing poles.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet all major project objectives to improve reliability, access renewables, and reduce above-market costs. However, the Imperial Valley–Rainbow (or Imperial Valley–North) 500 kV Alternative was eliminated for detailed study in the IVSG report because expanding it to include a connection to the SCE service territory would provide better electrical performance. The better performing alternative was found to be the Imperial Valley–North-Serrano/Valley 500 kV Alternative, also known as the 500 kV Full Loop North Alternative (described in Section 4.9.19).

Feasibility

This alternative is technically, legally, and regulatorily feasible.

Environmental Advantages

The environmental impacts of the proposed Central East Substation would not occur, but similar or greater impacts would occur in order to develop a new 500/230 kV substation near Rainbow and a new 500 kV transmission line from the area of the Central East Substation to Rainbow.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor from Imperial Valley across northern San Diego County to Rainbow. Replacement of the Proposed Project's Central East Substation with a new substation near Rainbow in northern San Diego County would offset the environmental advantages of avoiding the Central East Substation.

Alternative Conclusions

ELIMINATED. This alternative meets all project objectives and is feasible. However, it has been eliminated from further consideration because it does not provide any benefits beyond those achieved by the Proposed Project, but it would cause additional environmental impacts related to the additional length of 500 kV transmission line into the northern part of SDG&E's service area.

4.9.22 East of Escondido 500 kV Alternative

Alternative Description

The Imperial Valley–East of Escondido 500 kV Alternative is identified in the STEP report as Option 4 for a new line into San Diego. This alternative would provide a new 500 kV line between the existing Imperial Valley Substation and a new 500/230 kV substation east of the existing Escondido Substation and a new double-circuit 230 kV line from the new substation to the existing Escondido Substation. No location has yet been identified for the East of Escondido Substation under this alternative. The 500 kV line under this alternative would be about 15 miles longer than the Imperial Valley–Ramona Alternative, but the STEP analysis found there would be improved electrical performance due to fewer impacts on the underlying system. SDG&E believes that the 500/230 kV substation would need to be located outside of the existing Escondido Substation because it could not be expanded to accommodate a 500 kV termination. This alternative is shown on Figure Ap.1-31.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet all three major project objectives: improving reliability, accessing renewables, and reducing above-market costs.

Feasibility

This alternative is technically, legally, and regulatorily feasible.

Environmental Advantages

The environmental impacts of the proposed Central East Substation would not occur, but similar impacts would occur in order to develop a new 500/230 kV substation near Escondido and a new 500 kV transmission line from the area of the Central East Substation to Escondido.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new 500 kV transmission corridor from Imperial Valley across northern San Diego County to Escondido. Replacement of the Proposed Project's Central East Substation with a new substation near Escondido would offset the environmental advantages of avoiding the Central East Substation.

Alternative Conclusions

ELIMINATED. This alternative would meet all project objectives and would be feasible. However, it has been eliminated from further consideration because it would not provide any benefits beyond those achieved by the Proposed Project, and it would cause additional environmental impacts related to the additional length of 500 kV transmission line into the Escondido area.

4.9.23 Northern Service Territory Upgrades Alternative

Alternative Description

This alternative would provide system modifications to establish a coastal 500 kV interconnection and create a reinforced 230 kV interface between SCE and SDG&E territories. In 2004, components of this alternative were described by SCE as a possible transmission configuration in the case of SONGS shutdown (i.e., an alternative to the then-proposed SONGS Steam Generator Replacement Project, A.04-02-026, approved by CPUC December 20, 2005, D.05-12-040). Components of other alternatives identified by UCAN in 2006 (i.e., SONGS Light and SONGS Heavy) would also be grouped into this alternative. Scoping comments also suggested including a new 500 kV overhead line through Orange County in the existing ROW between SCE's Serrano Substation and the Talega Substation near SONGS. With these changes, the South of SONGS transmission path (Path 44) would be substantially reconfigured under this alternative. This alternative is illustrated on Figure Ap.1-31.

This alternative would occur along existing disturbed ROWs owned by SDG&E or SCE, but expansion of some ROWs may be necessary.

The Northern Service Territory Upgrades Alternative would include:

- New 500 kV line along the route of the 230 kV lines from the Serrano Substation in the Anaheim foothills south of SR91 through Orange County to SDG&E's Talega Substation just north of Camp Pendleton (the V-R Serrano-Talega Alternative described in Section 4.9.16).
- New 500/230 kV transformers at SDG&E's Talega Substation.
- New Talega-Escondido 230 kV #2 line on existing poles within the existing 230 kV corridor.
- New 230 kV line from Talega or SONGS to San Luis Rey Substation to create a fourth South of SONGS 230 kV line (SONGS-San Luis Rey 230 kV # 4).
- Loop one of SCE's four existing North of SONGS 230 kV lines into SDG&E's Talega Substation. This would transfer one of the North of SONGS paths to South of SONGS, and it would require transferring ownership of the 230 kV line from SCE to SDG&E.
- Modifications and voltage support at SCE's Serrano, Valley, and Devers Substations and SDG&E's Talega, Escondido, San Luis Rey, and Imperial Valley Substations.
- Other system modifications within SCE's territory including reconductoring SCE's existing 13-mile 230 kV Barre-Ellis transmission line, potentially with HTLS conductors, and upgrading towers for the Del Amo-Ellis 230 kV transmission line within this transmission corridor in Orange County.

The "SONGS Light" and "SONGS Heavy" options are part of the Northern Service Territory Upgrades Alternative, and these were originally described in a UCAN memo to CAISO dated April 11, 2006 regarding CAISO's analysis of the "Sun Path Project." At that time, UCAN predicted that SONGS Light would provide an increase the Non-Simultaneous Import Limit to San Diego by 350 MW from 2500 MW to 2850 MW. CAISO found that in order to increase the South of SONGS path rating under this alternative, upgrades to SCE's Barre-Ellis 230 kV line would be needed (CAISO, July 28, 2006, CS RTP-2006). The CAISO concluded their study of SONGS Light by reporting that SCE's Barre-Ellis 230 kV line is built to its maximum capacity for the towers in the corridor. UCAN predicted that SONGS Heavy would increase the Non-Simultaneous Import Limit to San Diego by 1,000 MW from 2,500 MW to 3,500 MW, but as with SONGS Light, CAISO found that upgrades to Barre-Ellis would

be needed without identifying how the upgrades could occur. The CAISO study did not consider HTLS conductors as an option for Barre-Ellis and/or Del Amo–Ellis. The Path 44 Upgrade Alternative, described in Section 4.9.4 would include the necessary Barre-Ellis upgrades.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The alternative has not been fully evaluated with transmission system studies, but the V-R Serrano-Talega Alternative (Section 4.9.16), which would be the major component of this alternative was found in the V-R Alternatives Report to have significant technical problems. It is not clear whether this alternative would meet the three major project objectives, and possible congestion problems within SCE's system could require additional upgrades beyond the scope contemplated above.

Feasibility

This alternative is technically, legally, and regulatorily feasible. However, substantial regulatory and permitting hurdles would need to be overcome to permit the route in urban corridors.

Environmental Advantages

Most major impacts of the Proposed Project would be avoided. No new transmission facilities would be constructed in Imperial County or ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon.

Environmental Disadvantages

This alternative would create the construction-phase and permanent impacts of a new 500 kV transmission corridor within the urban areas of Orange County. It is not clear whether these upgrades could be accomplished within the existing SCE and SDG&E ROWs. Due to potential land use impacts to the surrounding urban areas, using the Serrano-Talega corridor would not reduce impacts in comparison to those of the Proposed Project.

Alternative Conclusions

ELIMINATED. This alternative is feasible, although it is not clear if it would meet most project objectives. The ability of this alternative to succeed in the regulatory process is doubtful. The existing urbanized corridor has little or no space for addition of new 500 kV towers at reasonable cost, and the ultimate scope of transmission upgrades needed to achieve basic project objectives is uncertain. The uncertainty of being able to obtain the necessary additional ROW, plus associated environmental implications of the new facilities, places in doubt the ability to pursue this alternative.

4.9.24 SDG&E Imperial Valley-Central 230 kV ("Four 230 kV Circuits") Alternative

Alternative Description

The Imperial Valley-Central 230 kV Alternative is described in Section 3.3.3.8 of the PEA, and it is analyzed conceptually in Section 3.0 of the IVSG Report as Alternative 1. This alternative would involve construction of new 230 kV lines from the existing Imperial Valley Substation to a new Central East Substation in San Diego County. In order to achieve a similar level of thermal power transfer

capability as the Proposed Project's single 500 kV circuit and to allow for SDG&E's goal of expandability for the proposed Central East Substation, SDG&E includes four 230 kV circuits (rather than one 500 kV circuit) along the Imperial Valley-Central segment under this alternative. Thus, this alternative is also known as the Four 230 kV Circuits Alternative. The analyses of this alternative by SDG&E and IVSG concluded that this alternative resulted in less future expansion capability and higher ongoing transmission costs from line losses and higher construction costs when compared to the Proposed Project. It is included here in response to scoping comments from Community Alliance for Sensible Energy (CASE).

This alternative would include:

- Approximately 90 miles of two new double-circuit 230 kV transmission lines from the existing Imperial Valley Substation to the proposed Central East Substation.
- Other Proposed Project components west of the Central East Substation.

This alternative would involve a combination of overhead and underground 230 kV lines along the Imperial Valley-Central segment. Two sets of structures or underground facilities would largely follow the route of the Proposed Project from Imperial Valley Substation through Anza-Borrego Desert State Park. Overhead portions would require more than twice as many overhead structures as the Proposed Project because the span lengths for 230 kV lines are shorter than those for 500 kV lines. In areas with high levels of aesthetic impacts, the 230 kV lines could be placed underground, at approximately six to ten times the cost of a similar overhead configuration.

This alternative, like the Proposed Project, would include an option to follow portions of SR78 to Borrego Springs Road and the Northern Borrego Springs route via S22 (Section 4.3.3) in an underground position then go into an overhead position outside the park. From the Ocotillo Wells area, one or both of the two double-circuit 230 kV lines could be underground in SR78 then overhead around Borrego Springs then underground again through ABDSP along S22. Under this alternative route, a 230/12 kV substation could be placed in the same location as the Borrego Springs 500/12 kV Substation (Section 4.3.7). This option would allow for removal of all existing 69 kV and 92 kV transmission line facilities in the park, including the existing Narrows Substation and Borrego Substation, as well as the existing 69 kV transmission line traversing Grapevine Canyon. If one of the double-circuit lines follows the Northern Borrego Springs route, then the second could follow SR78 through ABDSP.

Another option under this alternative would be to continue the four 230 kV circuits west of ABDSP along the Proposed Project alignment to the existing Sycamore Canyon Substation, eliminating the need for the Central East Substation. Under this option, the route of the Proposed Project would be followed with four 230 kV circuits over the Central and Inland Valley Links, and these four new circuits would have to terminate at the Sycamore Canyon Substation. However, SDG&E believes that the existing Sycamore Canyon Substation would not be able to accommodate the four new 230 kV circuits because expansion of the substation is constrained by the terrain surrounding the substation and limitations on Department of Defense right-of-way. Because of the constraints at Sycamore Canyon Substation, this option of the Four 230 kV Circuits Alternative is not considered further.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet all of the three basic project objectives: increasing reliability, reducing congestion costs, and accessing renewable energy sources. The four 230 kV circuits under this alternative would actually increase the all-lines-in-service ability to import power into the San Diego area compared to the Proposed Project.

Feasibility

This alternative would be technically, legally, and regulatorily feasible. The four 230 kV circuits would accommodate at least as much, if not a greater amount, of import capacity as the Proposed Project. Although at a substantially greater cost than overhead lines, this option also would accommodate undergrounding of the facilities through environmentally sensitive areas if sufficient right-of-way can be acquired.

Environmental Advantages

Transmission facilities in Imperial County and ABDSP would occur on shorter towers, and aesthetic impacts of the Proposed Project could be avoided by the ability to place the 230 kV transmission lines of this alternative underground.

Environmental Disadvantages

Transmission facilities installed underground would introduce greater construction-phase impacts due to trenching, and a greater number of towers would be needed across the agricultural land uses in Imperial County and in the ABDSP area to support the four 230 kV circuits, which would increase construction-phase and permanent impacts along the overhead portions of this alternative. The impacts of the additional towers would be more severe than those of the Proposed Project.

Alternative Conclusions

ELIMINATED. This alternative is eliminated from further analysis. Although this alternative may satisfy all of the major project objectives, albeit at higher construction and operating costs, the greater number of towers across Imperial County and ABDSP would outweigh the environmental advantages of placing portions of the proposed Imperial Valley-Central segment underground. The Partial Underground 230 kV ABDSP SR78 to S2 Alternative (Section 4.3.1) would outperform this alternative because it would reduce significant impacts of the Proposed Project within ABDSP without the environmental disadvantages of placing a greater number of towers across agricultural lands in Imperial County.

4.9.25 HTLS Composite Conductor Alternative

Alternative Description

This alternative would involve a relatively new technology of high-temperature low-sag (HTLS) conductors. This alternative would use HTLS composite material conductors along the Proposed Project alignment instead of the proposed industry-standard aluminum-core steel-reinforced (ACSR) conductors. This alternative is presented in response to numerous comments made during the scoping process by conservation groups. The conductors could also be used in other existing corridors such as the Imperial Valley–Miguel (or SWPL), Miguel–Mission, and Miguel–Sycamore Canyon corridors as a means of increasing the capacity of the existing lines.

To date there are no examples of 500 kV HTLS conductor in use or being installed. However, HTLS conductors could provide slightly greater span lengths and a marginal reduction in the number of towers required. The same ROW width would be required. Although it appears to be technologically possible to produce an adequately sized HTLS conductor, economics has prohibited their development. A major reason for this is that the thermal limitations of standard 500 kV conductors are rarely a limiting problem with existing 500 kV circuits. The usual limitation of a 500 kV system is based on the ratings of the capacitor banks or of the breakers and transformers at the connecting substations.

Using an HTLS conductor could offer an alternative to the Proposed Project in that a single 230 kV circuit, strung with HTLS conductor, could accommodate the Proposed Project's 1,000 MW import capacity. As noted by SDG&E, ACCR can be operated at temperatures of 200 to 250 degree Celsius. These properties allow this conductor to carry up to three times the load of an ACSR, with less sag (SDG&E's response to CPUC Data Request No. 1, ALT-31). However, although 230 kV HTLS conductor may be able to thermally accommodate the 1,000 MW capacity, due to the higher impedance of the 230 kV circuit the same amount of power may not flow on this circuit as compared to its operation at 500 kV. Additional uncertainty is associated with the ability to underground HTLS conductor. If, as an alternative to the Proposed Project's 500 kV line, a 230 kV HTLS line were employed, it would operate at a substantially higher temperature than a standard 230 kV circuit. Examples of composite conductors being put to use as underground cables are unavailable (SDG&E's response to ALT-31, part b).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

Use of 500 kV HTLS conductor, through the Desert and Central Links would allow for this alternative to meet SDG&E's objectives related to reliability and importing of renewable energy. It would also allow for a marginal reduction in the number of structures required due to the reduced sagging characteristics of the HTLS conductor. However, it would not increase the capacity of the circuit or reduce the ROW required.

This alternative would probably also meet objectives if a 345 kV circuit, employing HTLS conductor, were constructed. The main limitation of this option would be in the expansion capability. For this alternative to meet most of objectives, utilizing a lower voltage circuit would probably require the placement of at least two 230 kV circuits employing HTLS conductors. Although a single 230 kV circuit employing HTLS conductor could thermally accommodate the Proposed Project's initial 1,000 MW, it would be limited on the amount of additional capacity it could accommodate. Thus, a single circuit would not allow expandability. However, even with a second circuit, the additional impedance associated with operation of the 230 kV circuits, as compared to a 500 kV circuit, would still limit its expandability. A second 230 kV HTLS circuit would be needed in order for this alternative to meet minimum reliability criteria.

Feasibility

This alternative would be technically, legally, and regulatorily feasible. However, employing HTLS technology would incur a cost substantially higher than that of the Proposed Project. Other than a marginal reduction in the number of towers required, no additional benefits would be achieved to compensate for the higher cost of the HTLS conductor. At least two 230 kV circuits, with HTLS conductor, would be required to meet the project objectives. If on single towers, the height of the double-circuited structures would be similar to those of the Proposed Project. It is uncertain whether these HTLS circuits could be placed underground at a reasonable cost.

Environmental Advantages

This alternative offers no environmental advantages other than a marginal reduction in the number of towers required because all impacts of the Proposed Project would still occur.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of a new transmission line along the alignment of the Proposed Project.

Alternative Conclusions

ELIMINATED. This alternative is eliminated from further consideration because higher costs would make it prohibitive with no notable environmental advantages. The only environmental benefit of employing 500 kV HTLS conductor would be a marginal reduction in the number of towers required. The same ROW would be required regardless of the conductor employed since the required width is determined by the voltage of the line. Employing multiple circuits of a lower voltage would allow this alternative to meet project objectives but would not offer the ability to underground these circuits through environmentally sensitive areas. HTLS conductors could be used elsewhere in the SDG&E system to improve the capacity of existing transmission lines that operate near thermal limits.

4.9.26 All Underground 230 kV or 500 kV Alternative

Alternative Description

This alternative is based on numerous scoping comments requesting that substantial portions of the Proposed Project be built underground (comments from Community Alliance for Sensible Energy, CASE). The All Underground Alternative could be implemented in two optional ways. The first approach would underground all of the Proposed Project transmission line components rated at 230 kV or below, and the second approach would underground all of the components of the Four 230 kV Circuits Alternative so that no overhead transmission would occur.

This alternative would differ from the Proposed Project by putting all proposed 230 kV transmission line segments underground. In contrast to the Proposed Project, which involves undergrounding in selected urban locations, this alternative would place all new 230 kV lines underground. Undergrounding a 230 kV line would require a 3- to 4-foot-wide continuous trench for each bundled double-circuit 230 kV cable along the Proposed Project west of the proposed Central East Substation or along the entire Four 230 kV Circuits Alternative alignment.

Placing a 500 kV circuit underground involves substantially more space and cost than placing a 230 kV circuit underground. In order to construct an underground 500 kV transmission line, insulated power cables could be placed underground along specific high-impact segments or the entire transmission line alignment. Various extra-high voltage technologies are available, but none have been implemented at 500 kV in the United States close to the length of even a portion of the Proposed Project and there has only been limited implementation in other countries. Therefore, the reliability of very long underground 500 kV circuits has not been fully demonstrated. This alternative would not involve undergrounding the 500 kV portion of the Proposed Project because this is generally cost-prohibitive except for very short line segments in areas where ground disturbance impacts would not be severe. The HVDC Light Underground Alternative would involve a more practical application of undergrounding (as discussed in Section 4.3.10).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

This alternative would meet most of the basic project objectives, but undergrounding 230 kV circuits would increase the construction costs of these segments by six to ten times that of overhead construction. This alternative would substantially increase the cost of the Proposed Project thereby reducing the benefits of its ability to import low-cost power into the San Diego area.

Feasibility

Undergrounding 230 kV circuits as part of this alternative would be technically, legally, and regulatorily feasible.

Environmental Advantages

Aesthetic impacts of the Proposed Project west of the proposed Central East Substation or along the entire Four 230 kV Circuits Alternative alignment could be avoided by the ability to place the 230 kV transmission lines underground.

Environmental Disadvantages

The ground disturbance for the underground trench for all proposed 230 kV circuits would create much greater construction, cultural resources, and biological habitat disturbance impacts than with the overhead portions of the Proposed Project or the Four 230 kV Circuits Alternative (Section 4.9.24). There is also a greater potential to encounter contaminated soils and cultural resources due to the greater ground disturbance.

Installing large segments of underground transmission lines would require much more construction time because of the time required for excavating continuous trenches and constructing the duct banks. The duration of construction could be substantially extended due to restrictions on the times of the year available for activities affecting habitat.

Alternative Conclusions

ELIMINATED. This alternative has been eliminated from further consideration because the environmental impacts of undergrounding all of the multiple 230 kV circuits included in the Proposed Project or the Four 230 kV Circuits Alternative would outweigh the environmental advantages. It is not technically or economically feasible to underground very long distances of 500 kV lines. The Partial Underground 230 kV ABDSP SR78 to S2 Alternative (described in Section 4.3.1) would reduce significant impacts of the Proposed Project within ABDSP without the environmental disadvantages of undergrounding all proposed circuits.

4.9.27 Green Path Coordinated Projects Alternative

Alternative Description

This alternative is based on a combination of coordinated projects that would occur as part of the Green Path Transmission Expansion Plan, the Green Path Southwest Project, and Green Path North, which are being jointly sponsored by IID, Citizens Energy Corporation, and LADWP. Figure Ap.1-31.

The IID/Citizens portion of the Green Path Coordinated Projects Alternative would consist of upgrading various existing 161 kV and 230 kV transmission lines within IID's service territory to increase the deliverability of existing and future renewable resources from Imperial County to the west and north. Under the IID/Citizens proposal, the Sunrise Powerlink Project would connect to the IID/Citizens 500 kV system at a new San Felipe Substation, from where the remainder of the Proposed Project would continue west to SDG&E. The alternative described here would include only the upgrades within IID's service territory and those outlined by LADWP. Without the Proposed Project, Green Path would not connect directly to San Diego County.

Green Path sponsors, SDG&E, and CAISO view the Green Path Coordinated Projects as complementary to the Proposed Project, rather than as a stand-alone alternative. Because IID does not operate within the CAISO control territory, the CAISO has not studied the new 230 kV portions of Green Path that would be internal to IID. The 500/230 kV San Felipe Substation, however, was taken by CAISO as an integral component of the "Sun Path Project." The 500/230 kV San Felipe Substation is considered as a component of the Partial Underground 230 kV ABDSP SR78 to S2 Alternative (see Section 4.3.1 of this Appendix). The following upgrades have been described in the 2005 IVSG report and in presentations by the sponsors of the Green Path Coordinated Projects at CAISO-sponsored STEP meetings.

The IID/Citizens components of the Green Path Coordinated Projects Alternative would include:

- New 500/230 kV IID San Felipe Substation.
- New 500 kV line from Imperial Valley to San Felipe Substation.
- New IID Bannister Substation to be located along the existing 161 kV line north of IID's existing El Centro Substation for collecting power from geothermal generation.
- New 230 kV lines between IID's existing Midway Substation and the new Bannister Substation (15 miles) and from Bannister to the new San Felipe Substation (20 miles).
- New IID 230 kV Imperial Valley Substation north of the existing Imperial Valley Substation.
- Add second circuit to IID's existing 230 kV line between the Imperial Valley Substation and El Centro Substation (18 miles).
- New double-circuit 230 kV lines between IID's existing El Centro and Highline Substations (20 miles).
- Upgrade existing 161 kV lines to 230 kV from El Centro to the Bannister Substation (25 miles), then further to the north through the Lake Cahuilla area (IID's existing Cahuilla or Avenue 58 Substation) to IID's existing Coachella Valley Substation.
- Modify and expand IID's existing El Centro, Midway, Cahuilla, and Coachella Valley Substations to accommodate the new connections to Bannister.

The LADWP components of this alternative, called Green Path North, would involve a new 500 kV circuit connecting LADWP's transmission system in San Bernardino County with IID's by adding:

- A new Indian Hills 500/230 kV Substation in Riverside County, east of Palm Springs, along IID's existing Mirage-Coachella Valley 230 kV corridor.
- Two new upgraded 230 kV lines from Indian Hills to the existing Coachella Valley Substation that would be modified by IID/Citizens above.
- New 500 kV line from Indian Hills to a new Devers II Substation which would be located adjacent to SCE's existing Devers Substation, near Desert Hot Springs.

- One new 500 kV line exiting the new Devers II Substation to the existing Devers Substation.
- One new 500 kV line exiting the new Devers II Substation running 85 miles northwest to a new Hesperia 500/287 kV Substation, in San Bernardino County. The new Hesperia 500/287 kV substation would tie into the two existing 287 kV lines between LADWP's existing Victorville and Century Substations.
- Upgrade one of LADWP's existing 287 kV lines between Hesperia and Victorville (17 miles) to 500 kV.

Based on the technical analysis performed by LADWP, the Green Path Coordinated Projects would be capable of importing 1,200 MW into the LADWP transmission system. Based on the current plan-of-service the new transmission line is to be operational sometime in late 2010.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose and Need

The Green Path Coordinated Projects, in the absence of the Sunrise Powerlink Project, would not meet any of the objectives for the Sunrise Powerlink. The Green Path Coordinated Projects are being developed to export power from within the IID service area to points on the periphery of its service area including San Diego and the LADWP system. Export of this power from the IID system to load centers in San Diego or Los Angeles is dependent upon other upgrades such as the Proposed Project, upgrades within SCE's service territory, or LADWP's Green Path North portion of this alternative. By including LADWP's Green Path North, this alternative would partially improve the regional transmission system and allow California customers to obtain electricity from diverse fuel sources. However, this alternative would fail to meet the basic project objectives relevant to San Diego.

This alternative would not improve SDG&E's ability to meet the CAISO's G-1/N-1 reliability requirements, nor would it increase import capacity into the San Diego area. It would also not reduce above-market power costs in the San Diego area. With regards to SDG&E's ability to accommodate delivery of renewable energy, this alternative could provide increased access to Imperial Valley renewable resources if it were combined with an interconnection from SDG&E's territory to SCE or IID, such as the LEAPS Project (see Section 4.9.1) or the Proposed Project.

Feasibility

This alternative would be technically, legally, and regulatorily feasible. IID/Citizens and LADWP are actively pursuing the Green Path Coordinated Projects without CPUC involvement, although the proposed in-service date of late 2010 may be somewhat optimistic. Similar to the Proposed Project, substantial regulatory hurdles would need to be overcome to permit the route; it would pass through protected BLM lands and near residential communities.

Environmental Advantages

No new transmission facilities would be built in ABDSP or in the vicinity of Santa Ysabel, Ramona, or Sycamore Canyon, and Proposed Project would be avoided.

Environmental Disadvantages

New transmission facilities would be constructed in the Imperial Valley, Riverside County, and San Bernardino County. This would introduce construction-phase impacts and the permanent effects of new infrastructure to these areas.

Alternative Conclusions

ELIMINATED. The Green Path Coordinated Projects are feasible. Green Path would improve the deliverability of renewable resources from Imperial County to the Los Angeles area, but absent the Sunrise Powerlink, no facilities would be provided to expand the deliverability of this power to load centers in San Diego County. Any benefits this alternative could provide to the SDG&E service area would be ancillary to its intended purpose and would depend upon other upgrades such as the Proposed Project or upgrades within SCE's service territory. Only in combination with an interconnection from SDG&E territory to SCE or IID might this alternative marginally achieve any of the three basic objectives.

4.10 Non-Wires Alternatives

Several non-wires or non-transmission alternatives to the Proposed Project have been identified. The non-wires alternatives in this analysis and those considered by SDG&E in its Proponent's Environmental Assessment (PEA) can be grouped into supply-side and demand-side alternatives:

- **Supply-side alternatives** include new In-Area generation (both conventional and renewable, including rooftop solar through the California Solar Initiative) and distributed generation (DG).
- **Demand-side alternatives** include energy efficiency and demand response. Some non-wires alternatives involve incremental expansions of resources SDG&E currently pursues to meet state requirements and to respond to the demands of its customers.

The non-wires alternatives would avoid major new transmission projects by focusing on generation as a way for SDG&E to perform its function as a load-serving entity. Generation can provide SDG&E with local-area reliability such as voltage support and black/quick-start, whereas transmission provides access to multiple generators with diverse fuel sources and enhances market competition. For example, SDG&E believes that non-wires alternatives would be unlikely to encourage renewable resource developers to build projects in the desert Southwest, where the Sunrise Powerlink should encourage renewable resource developers to build projects in that region [SDG&E Supplemental Testimony, p. 18, January 26, 2007]. Non-wires alternatives identified here would either involve renewable resource development within San Diego County or involve SDG&E trading Renewable Energy Certificates (RECs) to achieve the renewable energy objectives.

Many of the non-wires options were separately identified by SDG&E as alternatives in PEA Section 3.3.3. Public scoping comments from individuals, conservation groups, and developers of power plants also suggest using In-Area generation and conservation or demand response as alternatives to the Proposed Project.

Non-wires alternatives are grouped into the following broad categories:

- New In-Area generation, both renewable and conventional, including distributed generation (DG)
- Energy efficiency
- Demand response
- New generation combined with expanded demand response programs and the use of Renewable Energy Certificates (RECs) to meet renewable portfolio standard (RPS) requirements.

Individual non-wires alternatives are identified within each broad category. In addition, components of these categories are combined to arrive at viable non-wires alternatives. Non-transmission alternatives are also included as important components of the No Project Alternative, described in Section C.6 of the EIR/EIS. This section begins by presenting background information on renewable energy laws and technologies (Section 4.10.1).

Two alternatives are retained for full analysis in this EIR/EIS:

- New In-Area Renewable Generation Alternative (Section 4.10.2)
- New In-Area All-Source Generation Alternative (Section 4.10.3)

Three other non-wires alternatives were evaluated but not carried forward for full analysis:

- Non-Renewable Distributed Generation (Section 4.10.4)
- Energy Efficiency Alternative (Section 4.10.5)
- Demand Response Alternative (Section 4.10.6)

The New In-Area Renewable Generation Alternative shows how renewable resources could be used to avoid the Sunrise Powerlink by focusing on renewable generation as a way for SDG&E to perform its function as a load-serving entity, and the New In-Area All-Source Generation Alternative shows how renewable and conventional (fossil-fueled) resources could be used instead of the new transmission line.

4.10.1 Background on Renewable Energy

Renewable Resource Laws and Goals

Renewable resources are important because aggressive efforts are now being made to increase the renewable resource component of California's generation supply. In 2005, 8.7% of the state's electricity generation came from renewable sources, excluding large hydroelectric power (CEC, 2007). These efforts are occurring primarily in response to legislation which established a Renewables Portfolio Standard (RPS) for the state.

Senate Bill 1078 (SB 1078). California's RPS was established in 2002 by SB 1078. The RPS requires investor-owned utilities, including retail sellers of electricity such as SDG&E, to increase renewable energy's share of total electricity sales by at least 1 percent per year, achieving a 20 percent share of the generation portfolio by 2017, at the latest. Subsequent to the adoption of the RPS, the CPUC, CEC, and the now-defunct Consumer Power and Conservation Financing Authority adopted the Energy Action Plan (EAP). The EAP established a target whereby investor-owned utilities would supply at least 20 percent of their retail load from renewables by 2010, which is a more aggressive goal than the mandate in SB 1078.

Senate Bill 107 (SB 107). SB 107 was signed into law on September 26, 2006. The bill establishes the EAP's target of 20 percent by 2010 as law, and modifies certain aspects of the RPS program effective January 1, 2007. Updates include consideration for utilities unable to meet RPS requirements due to insufficient transmission capacity, and an exemption for municipal utilities. In addition, the law adopts a statutory definition for renewable energy certificates (or credits), and specifies that such certificates can be traded and used for RPS compliance, subject to certain limitations discussed below. In addition, this legislation allows out-of-state generators to sell to California's investor-owned utilities (IOUs) for RPS compliance. The CPUC has just begun considering this legislation and how it should be implemented.

Key CPUC Decisions on RPS Implementation. The CPUC has adopted a number of decisions since the passage of SB 1078 which address critical procurement-related issues of the RPS. In 2003, the CPUC adopted flexible compliance rules and a methodology for calculating penalties in the event the IOUs fail to satisfy annual procurement targets. In 2004 the CPUC approved an approach for ranking bids in the RPS procurement process using a least cost/best fit methodology. Using this methodology, the IOUs evaluate bids using approved criteria to ensure bids both balance the need for, portfolio fit, and cost minimization objectives.

In July 2005 the CPUC modified the RPS implementation rules and directed the IOUs to allow bids in their RPS procurements for projects that would deliver energy to any point within the CAISO control area (CPUC, 2005). Up until this change, the IOUs had considered projects only that delivered into

each IOU's respective service territory (i.e., SDG&E could only consider a project that delivered energy to a delivery point on the SDG&E system). However, with this change, SDG&E could meet its RPS obligations through purchases anywhere on the CAISO system. For example, SDG&E could contract with wind generators in the SCE system and use that generation for RPS compliance.

Current Status of SDG&E's Efforts to Comply with RPS. In the San Diego region, the technical potential for renewable resources is great enough to supply a substantial portion of SDG&E's capacity and energy needs (SDRRESG, 2005). In 2005 SDG&E's renewable energy portfolio included biomass, biogas, small hydroelectric, solar, and wind (SDG&E, 2006c). Despite the technical potential within the San Diego region, in 2002 renewable energy only served 1 percent of SDG&E's retail sales. By 2005, SDG&E had increased this share to 5 percent, a larger improvement (on a percentage basis) than either SCE or PG&E achieved during this time period (CEC, 2007c). As of November 2006, SDG&E had secured contracts with renewable energy suppliers for delivery of energy by 2010 to meet 16 percent of its retail energy needs (SDG&E, 2006d). SDG&E's 2006 RPS Plan indicated that compliance with the 20 percent RPS target by 2010 is contingent upon the construction of the Proposed Project.

In October 2006 the CPUC reported to the California Legislature on the status of the RPS program and evaluated the IOUs' progress in meeting the 20 percent by 2010 goal. In 2005 renewable energy sources accounted for 17.7, 13.5, and 5.5 percent of the total retail electricity sales by SCE, PG&E, and SDG&E, respectively (CPUC, 2006). However, the CEC recently noted these values show "minimal progress" over 2002 sales — statewide renewable energy sales increased by only 0.6 percent during this period — and "halfway between the 2002 legislative enactment and the 2010 target date, the state has made little progress toward increasing the percentage of renewable energy in the system mix." The California Energy Commission concluded that "statewide renewable procurement is not occurring at a pace that will reach Renewable Portfolio Standard goals by 2010" (CEC, 2007c). This lack of significant progress in meeting RPS targets can be attributed to a number of delayed and cancelled projects, contracts signed for energy to be delivered after 2010, and a widespread inability to deliver renewable energy from remote generators to utilities' load centers because of transmission limitations. Both PG&E and SCE have indicated a lack of optimism that these issues will be resolved prior to 2010 (CEM, 2006).

A key concern recently expressed by the CEC is the significant potential for renewable energy contract failure. A study conducted for the CEC found that a reasonable estimate for minimum overall contract failure rate is 20 to 30 percent when "large solicitations [are] conducted over multiple years." The CEC stated "the likelihood of much higher failure rates is supported by historical experience, especially for projects that use technologies that have yet to be proven commercially or — like many projects in California — are likely to face siting, permitting, resource supply, or transmission barriers" (CEC, 2007c).

Renewable Procurement and Requests for Offers (RFOs). SDG&E periodically solicits offers from renewable energy generators to expand its renewable portfolio. For example, SDG&E issued one Request for Offers on July 17, 2006 and a more recent RFO on March 12, 2007 (the 2007 Renewable RFO). As of the writing of the Draft EIR/EIS, SDG&E had not signed any contracts as a result of the 2006 renewable solicitation. As part of the 2007 Renewable RFO, SDG&E aims to identify generators that meet the RPS eligibility requirements and select successful projects, if any, during 2007 (SDG&E, 2007). The process of selecting renewable projects for power purchase agreements depends somewhat on the location of the generating projects. SDG&E specifies in each of its RFOs that agreements to purchase power from renewables in the Imperial Valley may be made contingent on SDG&E successfully permitting and building the Sunrise Powerlink Project.

SDG&E has previously rejected power agreements with renewable resources that are In-Area based on the cost of permitting and building In-Area transmission. In the application for the Sunrise Powerlink Project, SDG&E shows that when the costs of a new 138 kV transmission line to the Crestwood/Boulevard wind resource area was added to wind-related offers in the 2004 and 2005 RFO process, the cost of the new transmission caused the wind projects to be eliminated from consideration (p. III-3 in Chapter III of the SRPL Purpose and Need, August 4, 2006).

Summary of Renewable Technology Options

There are a number of different renewable resource options in the SDG&E load area. These include solar thermal, solar photovoltaic, wind, and biomass. In addition, geothermal and ocean energy are described, although they are not found to be viable resources in the SDG&E load area.

Solar Thermal

Solar thermal electric power uses reflective materials to concentrate solar energy onto a thermal receiver that absorbs and converts it into heat. Heated fluid in the receiver is then used in a steam generator or engine to produce electricity. Solar thermal plants operating in the U.S. today generally consist of parabolic troughs (a set of curved mirrors known as collectors focus the sun's energy on a pipe that carries a working fluid). The working fluid, typically oil, is circulated through the pipes, heated, and used to transfer heat to a conventional generator, which is used to create electricity.

According to a recent assessment done by NREL, Southern California provides “potentially the best location in the world for the development of large-scale solar thermal power plants” (SDRRESG, 2005). This is due to a strong correlation between electricity demand and solar output during the summer (i.e., both electricity demand and solar output peak coincidentally). NREL found that the gross technical potential for solar thermal power in the San Diego–Borrego Springs area is approximately 6,000 MW. When the amount of available undeveloped and unrestrained land with a recommended land slope requirement of 1 percent or less is taken into account, a more likely technical potential for solar thermal power in this area was estimated to be 2,900 MW.¹⁴ In 2004, SDG&E reported that it received expressions of interest from generators of 200 MW of solar thermal power from San Bernardino County and approximately 76 MW of solar thermal generation located internal to SDG&E’s system (SDG&E, 2004).

Solar Photovoltaic

Additional In-Area renewable resources can be provided by distributed rooftop solar photovoltaic (PV) systems on residential, commercial, or industrial buildings. These systems involve the installation of PV cells which convert sunlight directly into electricity. According to SDG&E, as of mid-2006, SDG&E had a total of 3,756 installed and pending PV units totaling approximately 25.5 MW of nameplate capacity (SDG&E, 2005b). In addition, there are ambitious plans to increase solar PV development in the state in the coming decade. This alternative was identified by SDG&E in PEA Section 3.3.3.5, and numerous parties requested consideration of this alternative during the scoping process.

California Solar Initiative. One of the plans to increase the penetration of solar PV in the state is the California Solar Initiative (CSI), issued by the CPUC on January 12, 2006. In August 2006, the Governor signed Senate Bill 1 (SB 1) directing the CPUC and the California Energy Commission to

¹⁴ Appendix E, p. 22. According to NREL, “siting studies have generally found that land with an overall slope of less than 1 percent [is] the most economic to develop to minimize grading costs.”

jointly implement the CSI program with specific requirements and budget limits. As part of this effort, the CPUC adopted a plan which provides for \$2.8 billion in incentives for solar projects to “displace 3,000 MW of power.” Of this \$2.8 billion, \$2.5 billion is for Commission-managed programs aimed at existing buildings and new commercial buildings and the remaining \$0.3 billion is for programs aimed at new residential construction (with the new residential construction program being managed by the CEC). The CPUC set the initial incentive level at \$2.80 per watt with plans to reduce it annually depending upon market conditions. The CPUC set the funding level in the SDG&E service territory at \$325 million between 2007 and 2016.

The CPUC program requires a minimum of 10% of the funds be used for projects installed by low income residential customers and affordable housing project and that the incentives for these projects to be set at 125% of the prevailing incentives for solar customers. The program covers solar PV, solar thermal, solar water heating, and solar heating and air conditioning technologies.

The California Solar Initiative has a 5 MW size limit for eligible solar PV systems under the program. For comparison, there are two 5 MW PV plants in Germany using between 30,000 and 33,500 panels each, (Wikipedia, “photovoltaics”), and the largest PV installation in the United States is a 3.9 MW installation at Ranch Seco in the service territory of the Sacramento Municipal Utility District (CSC, 2002). A typical residential system may range from 1 to 4 kW (CEC, 2001).

The program is intended to promote retail projects to serve onsite load (as opposed to projects that would sell power at wholesale to entities such as the state’s electric utilities). The program requires energy efficiency audits for existing buildings before receiving any solar PV incentives and will consider whether retrofits will be required. The residential retrofit portion of the program will be administered by a third-party and the utilities and SDREO will administer the commercial and industrial sectors.

There are numerous estimates of the future levels of PV penetration in SDG&E’s service territory. According to the PEA, SDG&E expects the nameplate installed capacity of PV to achieve 20 MW and 300 MW in 2010 and 2016, respectively. Based on the proposed funding and rebate levels set by the CSI, the total target for installation of solar technologies in the SDG&E service territory is 262.5 MW nameplate capacity of which 86.6 MW are from residential retrofits and 175.9 MW are from commercial and industrial facilities (CSIH, 2006).¹⁵ The SDG&E share is about 15 percent of the total 1,800 MW target set for California’s major investor-owned utilities.

In addition to the residential retrofit and commercial/industrial new and retrofit markets, the New Solar Homes Partnership (the CEC-administered part of the CSI) aims to achieve 400 MW of installed solar electric capacity statewide by the end of 2016, which would translate into 60 MW of installed PV capacity assuming 15% is allocated to SDG&E’s service territory (CEC, 2006a). Thus, under the CSI with the New Solar Homes Partnership, the total installed PV capacity in SDG&E would be 322.5 MW, which is higher than SDG&E’s estimate in its PEA.

Another estimation of future PV by 2016 can be derived from the technical potential for PV in SDG&E’s service territory. The San Diego Regional Renewable Energy Study Group calculated the technical potential of PV systems in the San Diego region for residential and commercial PV (SDRRESG, 2005). The group identified the gross technical potential of PV systems in San Diego County for 2010 at about 4,396 MW. This technical potential assumes that all solar PV is installed in all possible locations

¹⁵ By 2010, the targets for SDG&E are 14.9 MW for residential and 30.2 MW for the commercial and industrial sector, or 45.1 MW.

throughout the service territory, regardless of owner willingness, costs, or market availability of PV equipment. More realistic, yet still very aggressive, market penetration targets would be on the order of five to 10 percent of the technical potential for PV installation levels (i.e., between 220 MW to 440 MW, nameplate). This would be a significantly greater level of installed PV than either SDG&E or the CSI predict for 2010.

In order to estimate the effectiveness of PV on responding to peak demand, it is necessary to estimate the generation from the PV facilities that is coincident with the hour of system peak. SDG&E discounts the nameplate rated capacity of solar PV systems by 50 percent to account for the fact that only a fraction of a PV system's rated capacity is available during the utility's hour of peak demand (SDG&E, 2005b). This downward adjustment may be overly aggressive, since it assumes that system peak demand occurs at 3 p.m. and that all PV systems have south-facing orientations. A smaller adjustment may be appropriate assuming some west-facing orientation of PV panels and other factors, especially if future systems are oriented to maximize generation around the time of system peak.

Table Ap.1-12 summarizes the nameplate capacity of rooftop solar facilities anticipated by SDG&E in the PEA and the targets for the CSI and NSHP. As can be seen from the table, the CSI target for 2010 is somewhat higher than SDG&E's base case, although 10 percent of the technical potential is considerably higher than any of SDG&E's estimates or the CSI and NSHP targets. Ten percent of the technical potential would be 420 MW over SDG&E's assumed baseline for 2010 (i.e., an increment of 210 MW firm capacity) and 169 MW above SDG&E's baseline in 2016 (i.e., 84.5 MW firm capacity).

Utility Ownership of Solar PV. Another possibility for PV development is for direct utility (i.e., SDG&E) ownership of customer rooftop PV. SDG&E ownership of the PV equipment would call for a different rate design and customer relationship than if the customer owned the panels. One model for this relationship would be to have the equipment owed by SDG&E and leased back to the homeowner, with the homeowner receiving the power behind the meter. A second model would be for the utility to lease the rights to the customer's roof, keeping the PV on the utility side of the meter. In this model, the utility would pay the customer a fixed amount per year or offer reduced rates to the host homeowner. The lease could consist of fixed or declining payments or be implemented in the form of a rate reduction. Either model could allow the utility to include the equipment in rate base and earn a return on the investment. Either model could also allow the utility to claim credit towards meeting its RPS requirement.

Table Ap.1-12. Projections of Nameplate Installed Solar PV in the SDG&E Service Area¹

	2010	2016
Incremental Growth Anticipated by SDG&E in PEA ²	20 MW	300 MW
Incremental CSI/NSHP Targets for SDG&E Service Territory	45.1 MW CSI 10.3 MW NSHP ³ 55.4 MW	262.5 MW CSI 60.0 MW NSHP ⁴ 322.5 MW
Technical Potential determined by Regional Renewable Energy Study Group for 10% Penetration	440 MW	469 MW ¹⁶
Incremental beyond PEA for 10% Penetration	420 MW	169 MW
Incremental Effective Load Carrying Capability of 10% Penetration	210 MW	84.5 MW

1 SDG&E assumes that a typical south-facing PV panel will generate 50% of its nameplate capacity during its 3:00 pm peak hour.

2 Values that appear in the PEA reflect a 50% adjustment for peak factor, and are therefore half of what are shown here.

3 Estimated based on NSHP and CSI targets for 2016 and CSI target for 2010.

4 This assumes a 15% of the 400MW target occurs in SDG&E service territory.

¹⁶ Technical potential of 469 MW is for 2020. 2005 San Diego Regional Renewable Energy Study Group, "Potential for Renewable Energy in the San Diego Region," August 2005, available from <http://www.renewablesg.org>.

However there are a number of issues that would have to be addressed by both regulators and utility management before such a utility-owned/customer roof PV policy was implemented. First, it would have to overcome the “Bates Bill” (i.e., could these investments be construed to be inhibiting or hampering competition in the solar industry?).¹⁷ If the utility conducted competitive solicitations to choose from a variety of suppliers, it might be seen as addressing the Bates Bill concerns. Multiple providers would be needed, as the scale of a utility program would likely be large enough to greatly enhance the competitiveness of the winner in other solar PV markets.

The current market for solar PV is also predicated upon user-ownership with net metering provisions, with a market driven by declining end-user rebates. This policy is embedded in legislation (Senate Bill 1) and underlies the planned and ongoing implementation of the CSI or NSHP programs to date. At a minimum, SDG&E could not administer either of the programs while also pursuing its own rooftop PV program. In fact, to allow SDG&E ownership of PV would require a careful reconsideration of the current solar PV implementation policy. It is likely that the legislature would have to establish the overall parameters for such a program.

SDG&E would also have to address liability issues. For example: If the utility owns the solar panels or integrated solar roof tiles, who is liable for maintaining the roof? If a roof leaks where the panels attach to the roof, will the utility be responsible for repair and liable for any damages? What if the integrated solar roof tiles leak? Would the utility be responsible, and if not, how would the homeowner go about repair? If the homeowner or a third party damaged the panels, who would be responsible for their repair? These liability issues would have to be addressed before such a program could be undertaken by SDG&E. If these issues could not be overcome, a utility ownership program could be unworkable.

Wind

Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current into the utility grid. Modern wind farms typically use turbines that range in capacity from 700 kW to 3 MW. A single 1.5 MW turbine operating at a 40 percent capacity factor may generate 5,256 MWh annually, but for reliability accounting purposes approximately 24 percent of the nameplate capacity can be assumed to effectively correlate with peak load.

When utility-scale wind turbines are grouped together they are known as a wind farm. Energy production by a wind farm depends on the speed and consistency of wind at the site. Wind speed and wind power are used to determine a site’s “wind class,” which can fall into classes ranging from 1 to 7. Sites with a classification of Class 4 or higher are considered acceptable for wind farm development (SDRRESG, 2005).

In open, flat terrain, a utility-scale wind farm would require about 60 acres per megawatt of installed capacity. However, only 5 percent or less of this area would actually be occupied by turbines, access roads, and related equipment. The remainder of the land could be used for other compatible uses such as farming or ranching. A wind farm located on a ridgeline in hilly terrain will require much less spaces — as little as two acres per megawatt (CPUC, 2006b).

¹⁷ The so-called Bates Bill, passed in the 1970s, codified that a utility solar program cannot “restrict competition or restrict growth in the solar energy industry or unfairly employ in a manner which would restrict competition in the market for solar energy systems any financial marketing, distributing or generating advantage which the corporation may exercise as a result of its authority to operate as a public utility.” California PU Code Section 2775.5.

SDG&E's Transmission Ranking Cost Report for 2006 identified 500 MW of wind "internal" to the SDG&E system. SDG&E also reported in the application for the Sunrise Powerlink Project that it has received bids in past RPS solicitations for several hundred megawatts of wind projects. The bids were tied to projects that would be built in the Crestwood/Boulevard area in eastern San Diego County. According to SDG&E, these projects would require a new 138 kV transmission line to permit delivery of energy into SDG&E's system. Four wind projects with a total capacity of 400 MW proposed for the Crestwood/Boulevard area are currently in the CAISO's interconnection queue (CAISO, 2007).

A CEC evaluation of California's wind energy resources found a potential gross capacity (unconstrained by technical, economic or environmental requirements) between 3,249 and 9,283 MW for San Diego County.¹⁸

In addition to land-based wind farms, offshore sites in relatively shallow water have proven to be viable locations for wind turbines. Advantages of siting turbines offshore include stronger winds, an absence of land-induced air turbulence, eliminated land requirements, potential for larger turbines, and reduced environmental impacts. On the other hand, such projects require immature technology and incur higher costs due to durability and maintenance requirements. A recent study of California's wind resources did not identify any offshore sites with wind speeds suitable for development in the vicinity of San Diego. Significant potential exists west of the Channel Island chain (which can shield Southern California from westerly winds), however these sites are distant and feature water depths problematic for current marine turbine technology (Yen-Nakafuji, 2005).

Geothermal

Geothermal technologies use steam or high-temperature water obtained from naturally occurring geothermal reservoirs to drive steam turbines that turn generators to produce electricity. Geothermal plants must be built at a geothermal reservoir site and typically require about 0.5 acres per megawatt output (CPUC, 2006b). The technology relies on either a vapor dominated resource (i.e., dry, super-heated steam) or a liquid-dominated resource to extract energy from the high-temperature water.

Geothermal plants do not produce contaminants of fuel combustion that are normally associated with natural-gas fired power plants. However, geothermal reservoirs contain varying levels of hydrogen sulfide gas, which smells like rotten eggs and can be toxic at high concentrations. The odor can be a nuisance even at very low concentrations during drilling and plant start-up, but is not an issue during normal plant operations. Geothermal plants also emit very low levels of carbon dioxide and sulfur oxides. Reservoirs with high concentrations of boron have the potential to harm nearby plant life. In addition, mercury and arsenic from a geothermal reservoir can accumulate in scale in plant piping systems in concentrations high enough to require monitoring, special handling and regulated disposal as hazardous wastes. Binary plants, which have closed cycles, avoid many pollution problems because they have virtually no emissions.

Geothermal power is commercially available, but it is limited to areas where geologic conditions result in high subsurface temperatures. Most of the geothermal generation facilities in California were developed prior to 1990. The Geysers projects along the Sonoma and Lake County border and facilities in

¹⁸ These two values represent high wind speed (3,249 MW) and low wind speed (9,283 MW) modeling scenarios. An increase in the number of turbine applications viable at low wind speeds results in a higher capacity estimate. Yen-Nakafuji, D., *California Wind Resources*, Draft Staff Paper, California Energy Commission, May 2005, p. 27.

Imperial County account for the majority of existing geothermal production in the state. Further development of resources in Imperial County and Baja California, Mexico could increase the use of geothermal energy by SDG&E, but these projects would occur outside of the SDG&E territory (SDRRESG, 2005). There is no known potential for geothermal within SDG&E's service area, and there are no existing geothermal power generation plants in San Diego County.

Biomass/Biogas

Biomass used in energy production refers to biologically derived renewable materials that can be used to produce heat and/or power. Principal sources of biomass include agricultural wastes, forestry resources, and municipal wastes. Biogas fuel sources include landfill gas, sewage wastewater facilities, and animal manure. A typical approach for using biomass or biogas for the production of electricity is for the biomass/biogas resource to be burned directly in a boiler to produce steam, which then turns a turbine to generate electricity.

California has diverse biomass resources that can be used to generate electricity. In 2005 solid biomass was used by 28 biomass power plants to generate about 600 MW of electricity. Energy from landfill gas and biogas produced an additional 360 MW. According to a study conducted by the CEC, approximately 15 percent of the "technically recoverable potential of biomass wastes and residues is being used, suggesting that significant room exists for increased [biomass] use" (CEC, 2006b).

Two biomass/biogas sources offer the greatest technical potential for development in the San Diego region. The technical potential for urban wood wastes is estimated to be about 40-100 MW; the technical potential for landfill gas-to-energy is estimated to be 72 MW. Some landfills in the San Diego region already have operational biogas plants; the combined total capacity of these plants is between 17.75 to 18.95 MW (SDRRESG, 2005). SDG&E also received expressions of interest for about 860 MW of In-Area biomass/biogas projects in 2004 (SDG&E, 2004).

Ocean Thermal and Wave

There are three technologies designed to capture the ocean's thermal and mechanical energy: wave energy, tidal energy, and ocean thermal energy conversion systems (OTEC) (USDE, 2005). All three approaches are in research and developmental phases, with some pilot projects underway in various countries.

Wave Energy. Wave energy systems utilize the kinetic energy of ocean waves to drive an electric generator. Pilot technologies include a system of tethered pontoons under development for sites off the coasts of Portugal and the United Kingdom,¹⁹ a stationary offshore wave power plant proposed for locations in Australia and Rhode Island,²⁰ and a network of generating buoys pending approval in Washington and other countries.²¹

Wave conditions on San Diego's coastline are not ideally suited to electricity generation technologies that harness these power sources. A CEC study on California's wave energy potential did not find any immediately economically viable sites in the vicinity of San Diego, partly due to the shadowing effects

¹⁹ Ocean Power Delivery (<http://www.oceanpd.com>) has developed 750 kW generating pontoons, which can be chained together to create wave energy farms. Three pontoons (totaling 2.25 MW) systems are under construction for a site in Portugal, and a 5 MW project is being developed in the United Kingdom.

²⁰ Energetech's (<http://www.energetech.com.au>) stationary plants generate between 1 and 2 MW.

²¹ A cluster of Finavera's (<http://finavera.com>) 250 kW buoys is currently awaiting FERC licensing for a site off the coast of Washington state.

of the Channel Islands. Other factors considered include permitting difficulties, wave intensity, and water depth (CEC, 2005).

Tidal Energy. Tidal energy systems generate electricity by harnessing moving water masses associated with ocean tides. A tidal flow's kinetic energy can be used to drive a generating turbine, and the potential energy associated with the difference in water height (hydraulic head) between high and low tides can be harnessed via dams and barriers. The largest tidal power station in the world, La Rance Tidal Barrage in France, generates 240 MW for approximately ten hours per day (EDF, 2007).

Economic tidal power projects rely on large daily variations in water height, or significant currents caused by tidal flow in confined areas (bay entrances, channels, etc.). The tidal energy available in San Diego is not of the scale that is commonly required to justify investment in these technologies. Construction of a tidal barrage would be an expensive and time-consuming endeavor, and introduces a number of environmental concerns.

Ocean Thermal Energy Conversion. OTEC systems generate electricity by pumping cold ocean water from depth (up to one kilometer) to the surface, where the heat transfer between the pumped water and warm surrounding water powers a heat engine. OTEC pilot projects have been explored over the last 25 years in the United States, Japan, and India, however no commercial plant is functioning today due to OTEC's high cost. OTEC is dependent on a significant temperature gradient in the water column, and is therefore viable only in tropical regions within 20 degrees latitude of the equator. Southern California is not in this region.

Renewable Energy Certificates

Renewable Energy Certificates (RECs) are a way of measuring the environmental, non-energy attributes of electricity produced by a renewable generator or the societal and environmental benefits of renewable power when compared to conventional or fossil-fueled power production. According to a 2004 CPUC definition (D.04-06-014), RECs measure:

“(1) any avoided emissions of pollutants to the air, soil or water such as sulfur oxides (SO_x), nitrogen oxides (NO_x), carbon monoxide (CO) and other pollutants; (2) any avoided emissions of carbon dioxide (CO₂), methane (CH₄) and other greenhouse gases (GHGs) that have been determined by the United Nations Intergovernmental Panel on Climate Change to contribute to the actual or potential threat of altering the Earth's climate by trapping heat in the atmosphere; and (3) the reporting rights to these avoided emissions. . . .”

Senate Bill 107 provides a statutory definition for RECs as: “a certificate of proof, issued through the accounting system established by the Energy Commission . . . that one unit of electricity was generated and delivered by an eligible renewable energy resource.” The bill also authorizes (but does not require) the CPUC to allow utilities to use RECs for meeting RPS obligations. The CPUC will consider the use of RECs for this purpose in the latter half of 2007 (CPUC, 2006c). Current discussions involve the distinction between unbundled RECs (a generator can transfer energy to one load-serving entity and RECs to another; RECs cannot be subsequently transferred) and tradable RECs (a generator can sell RECs to any entity or third party with subsequent resale allowed). After rules governing REC transactions are established, the CPUC proceeding will evaluate how RECs may be used to meet RPS targets.

A necessary component in implementing the RPS program is a system of accurately tracking eligible generation. The Western Renewable Energy Generation Information System (WREGIS) is a voluntary,

independent renewable energy registry and tracking system for the Western Interconnect region. WREGIS is both an information system (database) and an administrative system operating within the WECC. WREGIS is sponsored by the CEC, WECC, and the Western Governors' Association.

Senate Bill 1078 directed the CEC to “design and implement a tracking and verification system to ensure that renewable energy output is counted only once for the purpose of the RPS and for verifying retail product claims in California and other states.” SB 107, signed by Governor Schwarzenegger in September 2006, requires the CEC to determine that the tracking and verification system is operational and capable of independently verifying generation and delivery and ensuring against double-counting by any seller within WECC.

The WREGIS tracking system was launched in June 2007. With WREGIS, generators, retail sellers, power marketers, and others can establish WREGIS accounts. WREGIS will issue one REC with a unique ID number for each megawatt-hour of eligible renewable energy generated. An account holder who owns a REC can retire the REC to comply with a state RPS program or trade the REC with other account holders. Retired RECs cannot be traded or used again for any other purpose.

As of mid-2005, 14 states were planning or already trading RECs. Texas is an example of a state which has experienced rapid growth in renewable generation through RPS and REC programs. Since implementation of the RPS program in 2002, Texas' wind energy capacity has expanded rapidly, leading to recent proposals to raise the state's goal of 2,000 MW of renewable energy by 2009. RECs have played a significant role in this growth, and the market continues to operate smoothly today with stable prices and ample supplies of renewable electricity. RECs provide an alternative to long-term contracts for renewable electricity, which present challenges to non-utility retailers. Most RECs are purchased as part of long-term power contracts with a few large electricity suppliers. RECs can be banked for up to three years, and may be purchased from generators outside of Texas if the first metering is located within the state (Pollack, 2005).

Since 2003 Massachusetts has experienced limited supplies of renewable energy, leading to high REC prices and uncertainty over the future of the RPS program. Reasons for this shortage include difficulty in siting renewable generation projects (e.g., due to aesthetic and habitat concerns, especially around Cape Cod), and electricity procurement practices that do not encourage long-term contracts (thereby making it difficult for renewable projects to obtain financing). RECs from neighboring states are eligible for Massachusetts RPS compliance, and credits from outside of the region must be included with an energy transfer into the regional grid. The Massachusetts Division of Energy Resources states that a busy renewable construction schedule will alleviate this shortage within a few years.

Whether load-serving entities in California should be permitted to use unbundled RECs to meet their RPS obligations is an unresolved issue at this time. SDG&E has placed its support behind REC trading (SDG&E, 2006e). The CPUC will consider this issue in the latter part of 2007 (CPUC, 2006c). With the trading and tracking platform of WREGIS presently in place, parties can trade unbundled RECs well in advance of the Sunrise expected online date of 2010.

4.10.2 New In-Area Renewable Generation Alternative

This alternative includes a combination of renewable resources that are available in the San Diego area.

Alternative Description

The New In-Area Renewable Generation Alternative would involve development of various In-Area renewable projects that together could provide sufficient generation capacity to defer the need for the Proposed Project. No single In-Area renewable generation project would be likely by itself to provide the necessary capacity to serve as a viable alternative to the Sunrise Powerlink Project. By considering the availability of In-Area renewable resources as a whole, this alternative offers a viable scenario of In-Area renewable generation development. The types of resources involved would be solar, wind, and biomass/biogas. Potential project locations are described to the extent possible.

The New In-Area Renewable Generation Alternative would provide capacity from a mix of resources as shown in Table Ap.1-13.

Table Ap.1-13. Capacity Added by the New In-Area Renewable Generation Alternative (MW)

In-Area Renewable Resource	ELCC	Nameplate Capacity under Baseline Conditions		Nameplate Capacity under Alternative		Nameplate Capacity added by Alternative		Incremental Firm On-Peak Capacity	
		2010	2016	2010	2016	2010	2016	2010	2016
Solar Thermal	80%	—	—	—	300	—	300	—	240
Solar PV	50%	20	300	230	469	210	169	105	84.5
Wind	24%	—	—	200	400	200	400	48	96
Biomass/Biogas	100%	—	—	50	100	50	100	50	100
Total	—	20	300	480	1,269	460	969	203	520.5

ELCC = effective load carrying capability. For reliability accounting, the installed nameplate capacity is multiplied by this factor to give the expected firm on-peak output.

Nameplate Capacity = The full-load continuous rating of a generator or device under specific conditions as designated by the manufacturer. Installed generator nameplate rating is usually indicated on a nameplate physically attached to the generator.

Firm On-Peak Capacity = Level of generation expected during the time of the day when the power system experiences its heaviest load, usually during late afternoon.

Solar Thermal

The New In-Area Renewable Generation Alternative would include large-scale solar thermal energy development in the Borrego Springs area. As mentioned above, the gross technical potential for solar thermal power that could likely be generated in the unincorporated Borrego Springs area is approximately 6,000 MW. Between 2010 and 2016, up to an overall nameplate potential of 300 MW of new solar thermal generating resources, or approximately 240 MW for reliability accounting purposes, could be added near Borrego Springs. Although no developers have identified sites in Borrego Springs for such a large solar thermal project, this alternative assumes that development would occur near existing transmission infrastructure, namely the existing 69 kV Borrego Springs Substation.

The existing 69 kV transmission infrastructure would need to be substantially upgraded to deliver the output of this solar development. Although interconnection would be at Borrego Springs, such a large generator in this remote area of the SDG&E grid would require upgrading at least the 69 kV line from Borrego Springs to Narrows and Warners Substations (about 40 miles), and further upgrades between

Warners and the Escondido area or Sycamore Canyon could also be needed. These transmission upgrades would modify the existing 69 kV line to at least 138 kV, requiring 40 miles of new, taller poles from Borrego Springs to Narrows and Warners Substations. Two transmission options are evaluated: (a) an overhead route following the existing 69 kV alignment through ABDSP and Grapevine Canyon, and (b) a partial underground option with the new line installed within roadways, similar to the ABDSP Partial Underground SR78/S2 Alternative. The need for additional transmission upgrades between Warners and the Escondido or Sycamore Canyon areas would also need to be determined with future transmission interconnection studies.

The 70-square mile community of Borrego Springs is situated in northeastern San Diego County and is completely surrounded by Anza-Borrego Desert State Park. The community has a population of 2,592 people (SDDPLU, 2007). Due to its proximity to Anza-Borrego Desert State Park, the community has become a prime location for resort developments.

Solar thermal electricity generation is land intensive. The San Diego Regional Renewable Energy Study Group indicates that for the full 6 GW technical potential to be met in the Borrego Springs area, approximately 32,100 acres (130 km²) of land. The San Diego Regional Renewable Energy Study Group indicates that a typical site for solar thermal generation could range between approximately 370 to 740 acres depending on its configuration, assuming a flat or gentle slope of 0.5 to 1 percent (SDRRESC, 2005). Solar parabolic trough systems typically require approximately five acres to generate one MW. To build 300 MW of solar thermal nameplate capacity, this alternative would involve development of approximately 1,500 acres (or 2.3 square miles) near the Borrego Springs Substation, north of the Borrego Valley Airport.

Issues such as land use, site topography, and existing rights of way would be important considerations for any solar thermal generation site, along with biological, soils, seismic, and geological issues. Hydrologic issues such as soil and drainage would need to be carefully considered in any site evaluation. To avoid the possibility of surrounding topography partially shading the site, the site would need to be set some distance from the mountains in Anza-Borrego Desert State Park. Figure Ap.1-33a shows one potential project site for a 300 MW solar thermal project near Borrego Springs Substation.

Solar Photovoltaic

The New In-Area Renewable Generation Alternative would include solar PV installations dispersed throughout the SDG&E territory and in new production homes after 2011 (SB 1, 2006). This alternative assumes approximately 5 percent of the technical potential solar PV resources would be developed by 2010, and 10 percent of the technical potential would be developed by 2016. This is a level of development that would be above the baseline. No specific locations have been identified, but individual systems would likely be small-scale. As shown in Table Ap.1-13, the New In-Area Renewable Generation Alternative includes adding 105 MW of reliable solar PV by 2010, or 210 MW nameplate capacity, above what SDG&E expects to occur in the baseline conditions.

SDG&E indicates that based on historical data, an average residential PV system is 3.3 kW, and an average commercial system is 65.4 kW; and approximately 17 residential installations occur for each commercial installation. Based on these trends, building about 95 MW of nameplate capacity PV per year would require 26,649 residential and 85 commercial installations per year. SDG&E reports that about 871 residential and 49 commercial installations currently occur each year (SDG&E, 2006a). Although SDG&E assumes that the baseline rate of PV deployment would approximately double under the CSI, the New In-Area Renewable Generation Alternative assumes that an even more aggressive implementation would need to occur.

With an average residential PV system size of 3.3 kW and commercial PV system size of 65.4 kW, developing 105 MW of reliable solar PV by 2010, or 210 MW nameplate capacity, above what SDG&E expects with CSI, would require three years of new system installations in excess of the number of systems that SDG&E expects to be installed. Most intense activity under this alternative would occur by 2010. After 2010, the relative (incremental) level of activity under this alternative would decrease in intensity because the baseline level of PV deployment under CSI should accelerate in the years leading up to 2016. Beyond the level of development expected with CSI, this alternative assumes that an *additional* 20,000 residential and 85 commercial systems would be installed *each year* during 2008, 2009, and 2010 to add a nameplate capacity of 210 MW or 105 MW for reliability accounting by 2010.

Each PV array is made up of PV modules, which are environmentally sealed collections of photovoltaic cells. The most common PV module is 5 to 25 square feet in size and weighs about 3 to 4 lbs per square-foot. Often sets of four or more smaller modules are framed or attached together by struts into a panel. This panel is typically around 20 to 35 square-feet for ease of handling on a roof (CEC, 2001). This allows some assembly and wiring functions to be done on the ground if called for by the installation instructions. Other system equipment includes mounting and wiring systems to integrate the solar modules into the building's structural and electrical systems. Systems require a DC to AC inverter to take the DC power from the PV array and convert it to usable electricity. Finally, meters would be installed to provide indication of system performance and energy flow.

The PV system can either interact with the utility power grid or connect to battery back-ups, and some systems include both the grid connection and the back-up. The grid connection used in California and other states is referred to as "net-metering." The California Public Utilities Code Section 2827 (2006) addresses the requirements for net-metering. With net metering, SDG&E measures the difference between the electricity supplied through the electric grid with that generated by the renewable energy system. California law allows customers to carry-over excess energy from month-to-month with an annual true-up and payment of the electrical bill for any net consumption over the whole year. However, the net-metering law does not require the utility to compensate the customer for excess electricity at the end of that 12-month period. Senate Bill 1 passed August 14, 2006 amended the PUC Section 2827 to require that SDG&E increase the aggregate limit of net-metered systems from 0.5 to 2.5 percent of the utility's aggregate customer peak demand and that sellers of new production homes after January 1, 2011 offer a solar energy system as an option.

Installation of a PV system is sensitive to specific building layouts and roofing type. The energy output of solar PV is directly related to the sun angle and building orientation. Typically solar PV modules are installed on rooftops, but sometimes are mounted in sunny areas to provide a shade structure. Between 10 and 20 percent of new PV installations experience suboptimal performance because of improper installation (CEC, 2001).

An experienced crew can install a 2 kW non-battery PV system in two-to-four person-days. Systems with large solar arrays are relatively less effort per watt of capacity than smaller systems because the installation of the inverter and other hardware required by all PV systems is spread over more solar modules. Systems with battery backup are more labor intensive than non-battery systems because of the additional wiring required for wiring the critical load subpanel. A battery system can add 50 to 100 percent of the time required for the installation (CEC, 2001). Other requirements such as inspections, performance evaluations, and system maintenance are typically required on solar cells during the course of their lifetime, although PV systems are generally low maintenance. Development of 210 MW of nameplate

Figure Ap.1-33a. New In-Area Renewable Generation Alternative, Solar Thermal Component
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capacity would require approximately 500 workers per year installing individual PV systems throughout San Diego County over three years.²²

Wind

The New In-Area Renewable Generation Alternative would include new wind power projects in the San Diego area similar to four projects identified on the SDG&E transmission interconnection queue with the California Independent System Operator (CAISO, 2007). These projects would each be located in the Crestwood area in southeastern San Diego County, west of the Carrizo Gorge, just north of Boulevard along I-8.

A report by the San Diego Regional Energy Study Group identifies the County’s wind resource areas by classifications that range between Wind Classes 3 and 7, depending on relative availability of wind (ranging from 300 to 2,000 watts per square-meter) in this area. Additional wind areas are located to the east of Carrizo Gorge near the Imperial County line, but no projects have been announced for this area. Wind projects under this alternative would likely occur in Class 6 and 7 areas, most likely on BLM or Indian Tribal land. The San Diego Regional Renewable Energy Study Group report shows the land areas within these wind classes in Figure Ap.1-33b and Table Ap.1-14 (SDRRESG, 2005).

Table Ap.1-14. Ownership of Land in Wind Classes 3, 4, 5, 6, and 7 in the San Diego Region (square miles)

Land Classification	Wind Class 3	Wind Class 4	Wind Class 5	Wind Class 6	Wind Class 7	Total
U.S. Forest Service	30.4	9.6	4.6	2.4	2.5	49.6
State Parks	0.0	65.4	39.0	30.0	10.5	144.8
Bureau of Land Management	65.0	37.0	30.1	48.3	22.5	202.9
Privately Owned	96.6	38.7	13.4	6.6	2.3	157.6
Indian Reservation	32.2	16.3	4.7	1.7	1.2	56.1
State	5.7	0.9	0.3	0.1	0	7.1
County of San Diego	3.8	1.5	0.5	0.2	1.1	7.1
Military Reservation	0.6	0.2	0.0	0.0	0.0	0.9
Other Federal	0.2	0.0	0.0	0.0	0.0	0.2
Other Special Districts	0.3	0.1	0.1	0.4	0.0	0.9
Caltrans	0.8	0.7	0.2	0.1	0.0	1.7
Water Districts	4.3	1.0	0.0	0.0	0.0	5.2
Total area per wind class	239.9	171.2	92.8	89.9	40.2	634.0

Source: Land Classification data from SANDAG and land area analysis by SDG&E GIS as provided in the report Potential for Renewable Energy in the San Diego Region, Table F.2, August 2005.

The wind projects under this alternative could be developed within the 2010 to 2016 time frame. The recently operational Kumeyaay project would be included at 46 MW of nameplate capacity, and three other Crestwood-area projects proposing to develop 117 MW, 36 MW, and 201 MW nameplate capacity would also be included. Although these projects are identified on the interconnection queue, specific development information is proprietary, and the exact locations of potential developments are not known. Figure Ap.1-33c shows the Kumeyaay site and the likely areas of the projects needed to achieve 400 MW by 2016.

²² Assuming that 2 person-days would be required to install a one-kW system, and 500 workers would be mobilized, 225,000 kW could theoretically be installed during 900 workdays over 2008 to 2010.

The recent Kumeyaay project was constructed with 25 new 2-MW propeller-type turbines. It is expected that the other Crestwood projects would also employ similar turbines. Under this New In-Area Renewable Generation Alternative, approximately 200 MW of wind power would need to come on line by 2010, and by 2016, the total incremental wind generation would be 400 MW of nameplate capacity. Adding 400 MW of capacity would require 200 additional 2-MW turbines. Wind farms typically require 5 to 17 acres per MW generated. Thus, 400 MW under this alternative would use a minimum of 2,000 acres (3.2 square miles). Wind turbine “footprints,” however, utilize only about 5 percent of the land on which the system is built. This allows dual use of a site, such as for agriculture or ranching. Table Ap.1-14 shows that sufficient Class 6 or 7 land would be available within BLM and Indian Tribe holdings.

Each project would require at least a 69 kV transmission interconnection in order to supply power to SDG&E, and to deliver substantial wind resources from this area, SDG&E has stated that new transmission infrastructure would need to be built.²³ Because SDG&E adds the costs of new transmission to the bid prices of proposed wind projects, the wind projects have not historically been economic (SDG&E, 2006c). The wind included in the New In-Area Renewable Generation Alternative would also involve building expanded transmission capacity from the Crestwood area to either the SWPL or to the load centers.

Biomass/Biogas

A component of the New In-Area Renewable Generation Alternative would be development of new or expanded biomass/biogas projects. The alternative calls for biomass/biogas to be used to fuel 50 MW of capacity by 2010 and 100 MW of capacity by 2016. The biomass/biogas component of the alternative includes three new or expanded facilities: Fallbrook Renewable Energy Facility and Miramar Renewable Energy Facility, Miramar Landfill cogeneration expansion.

Fallbrook Renewable Energy Facility. This facility would be a biomass facility located on approximately 80 acres of Pankey Ranch property on Pala Road, east of the intersection of Pala Road (Highway 76) and Interstate 15 and south of the Luis Rey River in the Pala Mesa Valley. The Fallbrook Renewable Energy Facility would be a new facility developed in an existing orchard.

Figure E.5.1-3a (in Section E.5) provides a simulated rendering of this facility and Figure E.5.1-3b (in Section E.5) shows the site vicinity. Envirepel, Inc. would be the facility owner and has submitted an Application for Certification to the California Energy Commission for project approval. The facility’s three 30 MW steam turbine generators would provide 90 MW of capacity. From these, the facility would be capable of exporting 67 MW of electricity on a continuous basis (Envirepel, 2007 web site; pers comm Tony Arand 2007). Thermal energy not available for electric generation would be captured by a water heating system for use by commercial agricultural facilities that would be located adjacent to the energy facility.

Annually, 600,000 tons of biomass fuel would be delivered to the energy facility from a radius of 50 miles. This would require approximately 15,000 truck trips per year, or approximately 6-7 trucks per hour during a 6-day week. Following processing into a useable size, biomass material would be delivered to bunkers capable of providing four days of storage. The fuel would be fed to 24 combustion units. The facility would deliver power to an existing 69 kV circuit approximately one mile from the site. The existing circuit runs between the Via Monserate and Pala Substations.

²³ This would also be the case for developing potential renewable resources in Imperial Valley, such as the proposed Stirling solar project, which according to the SDG&E power purchase agreement, depends on the new 500 kV transmission line.

Figure Ap.1-33b. San Diego Regional Wind Resources
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Figure Ap.1-33c. New In-Area Renewable Generation Alternative, Wind Component
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Miramar Landfill is a joint public and private facility operated by the City of San Diego on MCAS Miramar. The landfill is located north of Highway 52, at the north end of Convoy Street. It is permitted to dispose of 1.4 million tons of waste annually. Within the landfill property, two fill sites are closed: North Landfill and West Landfill Phase 1. Operations continue at the West Landfill Phase 2 site. Established in 1959, the landfill has had a generation facility since 1997. The cogeneration facility relies on eight Caterpillar 3516 reciprocating engine generators. The current capacity of the facility is 10 MW. Some of the generated power is used for operations, however 3.7 MW is excess to facility needs and is sold to SDG&E. In addition to landfill gas, the generation facility receives about 10% of its gas from the Metro Biosolids Center digesters. Untapped gas in Miramar Landfill reportedly has the potential to permit expand electric generation capacity to 13 MW, providing an additional 3 MW to SDG&E (pers comm Ray Purtee). This expansion would occur adjacent to the existing co-generation facility at the landfill. The site is already developed and sits amid existing structures and paved areas. A connection to the grid already exists at the site.

The Miramar Landfill biogas facility would require erection of a prefabricated metal building to house additional generating equipment. This would occur adjacent to the existing biogas-fueled cogeneration facility. The site is a paved area within a cluster of other structures and facilities on the site. While the work crew may vary in size depending on the phase of construction, it is estimated to be 4-5 persons over approximately 5 months. Additional gas from the landfill would be needed to operate the expanded facility. This would require drilling additional wells and installing additional collecting pipes in the landfill.

The Miramar Landfill biogas facility would operate in a fashion similar to the existing co-generation facility. Landfill gas would be collected from material previously delivered to the site that is undergoing anaerobic decomposition. Relatively little work is associated with the gas collection and processing system once it is installed. The generation facility itself requires one operator, who already operates the existing facility. Therefore, no new staff would be required for operations.

Miramar Renewable Energy Facility would be a new biomass facility developed by Envirepel, Inc. at the existing Miramar Landfill. The biomass-fueled facility would be separate from the landfill's existing biogas-fueled electric generation facility. Biomass materials bound for the landfill would be diverted to the new facility, where they would be processed and combusted. The facility would use a 30 MW steam turbine generator. From the 30 MW capacity installed in the facility, 26 MW would be supplied to the electric grid. The Miramar Renewable Energy Facility would be new construction on the existing Miramar Landfill.

Geothermal

Geothermal energy resources for the region are generally located to the east and south of San Diego County. As a result, geothermal energy is not considered to be a feasible technology within San Diego County under the New In-Area Renewable Generation Alternative.

Ocean Thermal and Wave Energy

Ocean energy is not considered to be a feasible technology for development by 2016 in the San Diego area under the New In-Area Renewable Generation Alternative.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose, and Need

The various components of the New In-Area Renewable Generation Alternative would play separate roles in satisfying the objectives, purpose, and need of the Proposed Project.

- **Reliability.** The New In-Area Renewable Generation Alternative shown in Table Ap.1-13 would provide reliable capacity of 203 MW in 2010 and 520 MW in 2016. This level does not allow SDG&E to meet its local reliability requirements through 2020. Solar thermal and wind resources developed under this alternative would help SDG&E meet the reliability objective, although the effective load carrying capability (ELCC) of solar thermal and wind generators (i.e., the capacity of the power plant that can be considered “firm” for reliability calculations) would be less than the nameplate capacity. New solar photovoltaic installations also can help SDG&E to meet the reliability objective (assuming that the generators are geographically dispersed), because it is technically possible for SDG&E to partially depend on PV systems to maintain system reliability.
- **Low-Cost Power.** The various technologies that would be developed under the New In-Area Renewable Generation Alternative might not reduce costs, since the renewable energy projects might require Supplemental Energy Payments to be financially viable. Additionally, the economic viability of solar thermal and wind projects within San Diego County also depends on the costs of transmission upgrades necessary to interconnect the projects. The cost to achieve the anticipated levels of PV installation related to hundreds of individual PV systems would also likely be prohibitive. Landfill gas plants can generate electricity at competitive prices while electricity generated by biomass plants is generally more expensive. The cost of energy from a biomass plant is directly related to the cost of the fuel source, but the California Biomass Energy Alliance estimates electricity generated by biomass plants can range from competitive 6 cents per kilowatt-hour to as high as 10 cents per kilowatt-hour (SDRRESG, 2005). Although individual projects could involve relatively high development costs, under renewable resource procurement rules, SDG&E’s ratepayers would only be responsible for costs of renewable power up to the Market Price Referent, which is a proxy for the market price of power.
- **Renewables.** The New In-Area Renewable Generation Alternative would meet the objective for promoting renewable energy as part of SDG&E’s generation portfolio.

Feasibility

Solar Thermal. The world’s largest solar thermal power generation facilities are located in Southern California, in the Southern California Edison territory, and there is considerable technical potential for solar thermal located in the Borrego Springs area of San Diego County. Thus, solar thermal is a feasible component of this alternative. Although there are no publicly announced solar thermal projects in this particular area, solar thermal projects could be feasibly developed prior to 2016.

Solar Photovoltaic. Economic, legal, and technical feasibility challenges would need to be overcome in order to develop numerous individual PV installations throughout San Diego County. SDG&E claims that to obtain 394 MW for reliability accounting by 2010 would require incentives of approximately \$1.1 billion (assuming an incentive of \$2.80 per installed watt), and these additional funds would be over and above the \$2.8 billion currently allocated under the CSI program. The level of incentives required to implement the 210 MW contemplated under this alternative is not known. However, the PV rebates funded by the CSI and NSHP programs must decline with time, so it would be difficult, perhaps even

requiring legislation, to increase PV rebates to increase penetration.²⁴ Furthermore, SDG&E does not administer the CSI (the San Diego Regional Energy Office does), so the utility does not have control of rebate policy or other any other programmatic details.²⁵

Wind. Economic and technical feasibility are concerns because developing new wind projects under this alternative could require new transmission infrastructure to bring the energy to the SDG&E. In addition, development of wind projects in the U.S. historically has been closely linked to the availability of a federal production tax credit (PTC). The PTC is subject to Congressional renewal on a periodic basis, and the threat of losing the PTC creates uncertainty for wind project developers and lengthens project development timelines.

Biomass/Biogas. Existing biomass/biogas technologies using urban wood wastes and landfill gas are feasible under this alternative.

Environmental Advantages

Environmental impacts of the Proposed Project would not occur under the New In-Area Renewable Generation Alternative.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of various renewable energy projects throughout San Diego County and in-basin transmission upgrades to access them.

Solar Thermal. The primary environmental disadvantage of solar thermal technologies is the amount of land required and associated impacts to support a utility-scale facility. According to NREL, a solar thermal power plant in a good solar resource region requires approximately five acres per megawatt of capacity (SDRRESG, 2005). This means a facility of 1,500 acres for the goal of 300 MW under this alternative. As a result, the potential exists for disruption of wildlife habitats, hydrologic systems, and existing land uses. In addition, construction of solar thermal plants can lead to habitat destruction and visual impacts.

Solar Photovoltaic. The primary environmental disadvantages to solar PV projects include visual impacts of individual installations and generation of hazardous wastes during the manufacturing process.

Wind. Wind turbines can create the following environmental impacts (AWEA, 2007):

- Birds and bats collide with wind turbines. Avian deaths have become a concern at Altamont Pass in California, which is an area of extensive wind development and also high year-round raptor use. Wind energy can negatively impact other wildlife by fragmenting habitat, both through installation and operation of wind turbines themselves and through the roads and power lines that may be needed.
- Visual impacts of wind power fields can be significant, and installation in scenic and high traffic areas often results in strong local opposition.

²⁴ SB 1, August 21, 2006 calls for the incentives to “decline each year following implementation of the California Solar Initiative, at a rate of no less than an average of 7 percent per year, and shall be zero as of December 31, 2016.” California PU Code Section 2851(a)(1).

²⁵ SDG&E is currently slated to administer the program targeting new residential construction, but this market segment accounts for 15% or less of the overall solar PV program.

- Erosion can be a concern in certain habitats such as the desert or on mountain ridgelines. Standard engineering practices can be used to reduce erosion potential.
- Noise has been an issue with some wind turbine designs, but it has been largely eliminated as a problem through improved engineering. Appropriate use of setbacks from nearby residences also can minimize the effects. Aerodynamic noise has been reduced by changing the thickness of the blades trailing edges and by making machines “upwind” rather than “downwind” so that the wind hits the rotor blades first, then the tower (on downwind designs where the wind hits the tower first, its “shadow” can cause a thumping noise each time a blade passes behind the tower). A small amount of noise is generated by the mechanical components of the turbine.

Biomass/Biogas. Biomass facilities generate substantially greater quantities of air pollutant emissions than natural-gas burning facilities. These emissions vary depending upon the precise fuel and technology used. The collection of biomass fuels can have significant environmental impacts. Harvesting timber and growing agricultural products for fuel requires large volumes to be collected, transported, processed and stored. Biomass fuels may be obtained from supplies of clean, uncontaminated wood that otherwise would be sent to landfills or from sustainable harvests. On the other hand, the collection, processing and combustion of biomass fuels may cause environmental problems if, for example, the fuel source contains toxic contaminants, agricultural waste handling pollutes local water resources, or burning biomass deprives local ecosystems of nutrients that forest or agricultural waste may otherwise provide.

Alternative Conclusion

RETAINED FOR ANALYSIS. The New In-Area Renewable Generation Alternative would satisfy SDG&E’s renewable resource objective. It would also meet the low-cost power objective since SDG&E’s ratepayers would only be responsible for costs of renewable power up to the Market Price Referent. The New In-Area Renewable Generation Alternative would meet SDG&E’s reliability objectives through 2016 but not through 2020. Because the alternative meets most objectives, it is retained for further analysis. The various components of the New In-Area Renewable Generation Alternative could also be part of other non-wires alternatives or the No Project Alternative.

4.10.3 New In-Area All-Source Generation Alternative

Background

New generation within San Diego County provides benefits such as decreased dependence on imported power and reduced transmission system losses internal to the SDG&E territory. The goal of the New In-Area All-Source Generation Alternative would be to provide adequate resources within San Diego County to eliminate any need for the Proposed Project. A “bundle” of conventional resources, renewable resources, and peak capacity (peaking power plants) including distributed generation, with no restriction on demand response is identified. Renewable energy projects occurring under this All-Source alternative are described in Section 4.10.1, and distributed generation under this alternative is described in Section 4.10.2. Other specific conventional projects and locations are also described here to the extent possible.

Capacity Procurement and Requests for Offers (RFOs). SDG&E occasionally solicits offers from conventional power generators to provide adequate resources in the SDG&E territory. In response to CPUC rulings in 2006, SDG&E asked for CPUC authority to add 250 MW of new peaking units to come on-line in 2007 and 2008.²⁶ This led to SDG&E issuing an RFO on October 17, 2006 for 250 MW of

²⁶ Response filed by SDG&E on 08/31/2006, available at <http://www.cpuc.ca.gov/EFILE/RESP/59436.htm>.

peaking capacity (the 2008 Peaker RFO).²⁷ SDG&E also issued an RFO on March 9, 2007 (the 2010-2012 Capacity RFO) for: (1) Demand Response resources, and (2) new, generating capacity resources to be built to support reliability within the SDG&E service territory and meet other portfolio needs; and (3) generation facilities of about 500 MW (local or off-system). As part of the 2008 Peaker RFO, SDG&E proposed to purchase power from peaker plants at the Pala Substation, in northern San Diego County, and at the Margarita Substation in Orange County (application filed May 11, 2007). Under the 2010-2012 Capacity RFO, SDG&E proposed to procure power from El Dorado Energy LLC in Boulder City, Nevada (application filed August 8, 2007), and SDG&E is also evaluating offers from various local bidders throughout 2007 and may negotiate and establish contracts before or during 2008.²⁸

Alternative Description

The New In-Area All-Source Generation Alternative would include a combination of fossil-fired central station generation, renewable generation, and Non-Renewable distributed generation (DG). The capacity provided by conventional generation projects under this alternative could include 620 MW from the South Bay Replacement Project proposed by LS Power,²⁹ 750 MW from the San Diego Community Power Project proposed by ENPEX Corp. or 540 MW from the Encina Power Plant Repowering project (Carlsbad Energy Center) proposed by NRG Energy, and 250 MW from multiple peaking power plants assumed to come online by 2008. Peaking generators could be sited at several locations including: the existing Encina Power Plant; other existing peaking power plant sites in Escondido or Chula Vista; existing SDG&E substations in San Diego and Orange Counties (e.g., the Miramar, Pala, Margarita, and Borrego Springs Substations); or at new sites (e.g., in the Kearney Mesa district of San Diego).

This alternative would also involve renewable projects discussed in Section 4.10.2 and 70 MW of incremental distributed generation by 2015, along with development of various conventional gas-fired generation projects. The conventional generation components of the New In-Area All-Source Generation Alternative are described here.

Summary of Conventional Generation Projects

The conventional generation considered under New In-Area All-Source Generation Alternative includes a range of specific conventional generation projects:

- the proposed South Bay Replacement Project
- the proposed San Diego Community Power Project (also known as “ENPEX”)
- the proposed Encina Power Plant Repowering
- proposed peaking gas turbines that SDG&E could procure in response to the 2008 Peaker RFO
- potential repowering of other existing peaking units in the SDG&E area.

It is assumed that either the proposed South Bay Replacement Project, the Encina Power Plant Repowering Project, or the San Diego Community Power Project (ENPEX) plus the 250 MW of peakers solicited by SDG&E in the 2008 Peaker RFO can feasibly be built by 2010. Other new combined cycle proj-

²⁷ All questions and answers available to all RFO recipients at <http://www.sdge.com/rfocapacity/>

²⁸ All questions and answers available to all RFO recipients at <http://www.sdge.com/2010-2012capacityrfo/>

²⁹ LS Power withdrew the South Bay Replacement Project Application for Certification from consideration by the California Energy Commission in October 2007, after this alternative had been defined and analyzed. The South Bay Replacement Project is retained as one of three possible baseload power plants that could be constructed in the San Diego areas, even though the AFC is no longer active. Impacts of this power plant are considered to be representative of other baseload plants.

ects or peaker projects may not be feasible in the 2010 time-frame because they have not yet submitted applications for permits and/or they do not have power purchase agreements.

Table Ap.1-15 summarizes the ability of the New In-Area All-Source Generation Alternative to provide capacity. In order to meet reliability objectives through 2020, it may be necessary to combine either the South Bay Replacement Project or the San Diego Community Power Project with other In-Area generation resources as shown. Figure Ap.1-34 shows the locations of the generation projects considered under this alternative.

South Bay Replacement Project

LS Power proposes to construct and operate the South Bay Replacement Project (SBRP), which would be a nominal 620 MW gas-fired combined cycle power plant (of which 120 MW would result from duct firing). The current expected online date for the SBRP is January 2010. The SBRP would replace the existing South Bay Power Plant, which is operated by LS Power. The existing South Bay Power Plant, which is more than 50 years old, would be shut down and demolished as a part of successful completion of the proposed SBRP. For purposes of long-term resource planning, SDG&E assumes that the existing South Bay Power Plant will be shut down after 2009.

The intent of the proposed SBRP project is to provide sufficient reliable replacement power to the SDG&E system to allow for the removal of the Reliability Must Run (RMR) status of the existing South Bay Power Plant. Presently, and in the absence of the proposed Sunrise Powerlink Project, retiring the existing South Bay Power Plant is not allowed because of the RMR contracts, which require South Bay to be operable.

The SBRP would allow 115 acres of the Chula Vista Bay Front to be redeveloped. It would also advance in time and enable the relocation of the existing South Bay Substation (an established plan between the City of Chula Vista and SDG&E). The new SBRP would make effective use of a brownfield site and provide generation infrastructure in the vicinity of existing transmission lines, gas pipelines, and sewer lines.

LS Power filed an Application for Certification (AFC) to permit the proposed SBRP with the California Energy Commission (CEC) on June 30, 2006. On August 30, 2006, the CEC deemed that the AFC for SBRP was complete and commenced its permitting review of the project (ECBM, 2006). Decisions in February and March 2007 by the City of Chula Vista and the Port of San Diego indicate that the power plant faces opposition, and LS Power may be forced to consider other locations for the power plant.

Table Ap.1-15. Generation Projects Added by the New In-Area All-Source Generation Alternative (MW)

In-Area Resource	Incremental Firm On-Peak Capacity Added by 2010	Incremental Firm On-Peak Capacity Added by 2016
<i>Conventional</i>		
San Diego Community Power, Carlsbad Energy Center (Encina,) or South Bay Replacement Plant	At least 620	At least 620
New or Expanded Peakers	250	250
Total Conventional	At least 870	At least 870
<i>Renewable</i>		
Solar Thermal	0	240
Solar PV	105	84.5
Wind	48	96
Biomass/Biogas	50	100
Total Renewable	203	520.5
Non-Renewable DG	0	35
Demand Response (Optional)	231	249
Total	At least 1,070	At least 1,420

Figure Ap.1-34. Components of New In-Area All-Source Generation Alternative
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SBRP Location. The SBRP would be located immediately adjacent to and south of the existing South Bay Power Plant in the City of Chula Vista, California. The new SBRP would be constructed on a 12.9-acre site with a new substation on another 6.5 acres. The property is owned by the Port of San Diego and is within the boundaries of the City of Chula Vista, in San Diego County. A 33-acre parcel would be leased from the Port of San Diego. The site is relatively flat, except for a berm surrounding the former LNG storage tanks. The project site is bounded by San Diego Bay on the west and Bay Boulevard and Interstate 5 (I-5) on the east. To the south is a salt production facility and to the north is the existing SBPP. The immediate area around the SBRP site is zoned "General Industrial," with residential housing approximately 1,000 feet to the southeast and east of the project site (ECBM, 2006). The property is also included in the Chula Vista Bay Front Plan, which encompasses over 450 acres of bay front properties. The property is designated part of the roughly 70-acre "Energy/Utility Zone."³⁰ Maps in Section E.6 show the specific location of the SBRP generating facility, electric transmission lines, natural gas supply pipeline, and potable water supply line (see Figure E.6.1-2).

SBRP Major Components. The information included in this description is taken from the SBRP AFC. The SBRP would include two natural gas fired, heavy-duty combustion turbines rated at approximately 170 MW each in a combined cycle arrangement. Each combustion turbine would exhaust into a heat recovery steam generator (HRSG) equipped with supplemental firing. Steam from the HRSGs would be admitted into a condensing reheat steam turbine with an approximate capacity of 310 MW. Nominal base load plant rating would be 500 MW at 62°F. With supplemental HRSG firing, output would be approximately 620 MW at 62°F ambient temperature. Emissions from the combined-cycle system would be controlled by using dry low NO_x combustors, and integral to the HRSG would be a selective catalytic reduction system with ammonia injection for the control of NO_x and an oxidation catalyst system for the control of CO and VOC emissions.

The proposed SBRP would be substantially more efficient than the existing South Bay Power Plant. The heat rate would be approximately 7,000 BTU/kWh, net, in comparison to the existing 10,000 to 12,000 BTU/kWh, net). This would be an increase in thermal efficiency of 30 percent over the most efficient existing unit at South Bay and a 42 percent increase in efficiency over the existing unit with the lowest efficiency.

The SBRP project would completely eliminate the existing South Bay Power Plant's once-through cooling system and the use of San Diego Bay water by including an air-cooled condenser (ACC) or "dry cooling" system. The air cooled condenser would be used to condense the steam turbine exhaust steam, and it would use a small amount of treated potable water as part of a closed loop water circulating system. By retiring and demolishing the existing South Bay Power Plant, the use of once-through cooling water would cease, and no bay water would be used by the proposed SBRP.

Major plant buildings would include an administration/control room building, a water treatment building, a maintenance/warehouse building, combustion turbine generation and steam turbine generation buildings, and other enclosures. The facility would also include pipelines for natural gas, potable water and wastewater.

The SBRP would be constructed on a brownfield site and designed to be much more compact and enclosed than the existing power plant. The SBRP would have architectural elements and landscaped areas that will be used for screening. The HRSG stack height would be 125 feet to comply with air quality standards. The air cooled condenser would also be a major structure and a primary source of noise.

³⁰ California Energy Commission South Bay Replacement Project, Project Description. Available at <http://www.energy.ca.gov/sitingcases/southbay/index.html>

Other Proposed Features of SBRP. The following list summarizes other aspects of the current SBRP proposal.

- **Natural Gas Supply.** SBRP would install approximately 3,700 feet of new 16-inch pipeline to connect to SDG&E's existing 16- and 24-inch natural gas lines that supports the existing South Bay power plant. The connections to these existing natural gas lines would occur within an existing SDG&E easement that parallels the west side of Bay Boulevard. The SBRP would use 112 million scf/day compared to 177 million scf/day used by the existing plant.
- **Water Supply.** SBRP would minimize water consumption by using an air cooled condenser system. Potable water would be supplied through an approximately six-inch-diameter pipeline to an existing Sweetwater Authority water main along Bay Boulevard, approximately 430 feet east of the site. SBRP would use a maximum of 129 acre-feet per year (average daily use of 80 gallons per minute — gpm) of fresh water for process and domestic water needs. Sweetwater Authority provided a "Will Serve" letter dated April 19, 2006.
- **Wastewater Disposal.** Effluent would occur from the oil water separator, discharge from the cycle makeup treatment system including filter backwash and reverse osmosis rejection, and discharge from the plant sanitary system. This combined water would be disposed of via the City of Chula Vista's sanitary sewer system and is estimated at 94 acre-feet/year. An approximately six-inch-diameter sewer line connection would exit the SBRP eastern property line to connect to the City's system about 400 feet away along Bay Boulevard. The City of Chula Vista provided a "Will Serve" letter to SBRP for the connection to the sewer system. It is anticipated that the SBRP would be permitted to discharge a maximum 100,000 gpd, with a 300,000-gallon wastewater storage tank for flow control.
- **Hazardous Materials.** A Hazardous Materials Business Plan/Contingency Plan, a Spill Prevention Control and Countermeasure Plan (SPCC), and a SWPPP would be developed in accordance with applicable regulations and RWQCB requirements. A Risk Management Plan (RMP) would also be required for aqueous ammonia in accordance with the requirements of the California Accidental Release Prevention program.
- **Noise Abatement.** The primary sources of noise would be the air cooled condenser, combustion turbine generator package, the cooling water heat exchanger, and the fuel gas compressors. Noise mitigation strategies would consider both architectural and equipment aspects.

SBRP Construction. SBRP construction would begin with the demolition of existing structures and foundations associated with the former 33-acre Liquefied Natural Gas (LNG) facility, preparations and grading of laydown and parking areas, and grading and construction of the SBRP. The construction phase would affect approximately 20 acres of Port of San Diego property that is leased by LS Power. It would also impact approximately 7.0 and 13 acres on the former LNG site for the temporary laydown and parking areas on property leased from the Port of San Diego by LS Power. Initial site preparation, removal of old foundations on the former LNG site, and construction activities are expected to take approximately 28 months (CEC, 2006c).

Demolition of Existing South Bay Power Plant. The demolition phase of work would occur after the SBRP achieves commercial operation. This phase would include the demolition of the existing power plant facilities and would affect approximately 109 acres of Port of San Diego property leased by LS Power. All existing equipment such as the existing five units ranging in sizes from 15 MW to 222 MW would be demolished and removed. The demolition phase would involve the development of the landscaping zone immediately north of the 33-acre site and this effort would occur within a right-of-way approximately 100 feet by 600 feet (1.5 acres) (CEC, 2006d).

SBRP Transmission Interconnection. Interconnection with the high voltage transmission system would be through a relocated South Bay Substation, which will be on the site of the SBRP and require 400 feet of new transmission lines. On November 13, 2006, the CAISO issued its final approval for the interconnection of the SBRP (CAISO, 2006). Following removal of the South Bay Power Plant, construction of the new substation for SBRP would occur on approximately 6.5 acres of Port of San Diego property leased by SDG&E. Demolition of the existing South Bay Substation (69/138 kV substation) would occur at a later date after SDG&E develops a new 230 kV transmission line and an underground interconnection to the existing South Bay 138/69 kV substation.³¹

The existing South Bay Power Plant is connected to SDG&E's existing 69/138 kV South Bay Substation. System studies have determined that the SBRP should be interconnected at each of the three major voltages (69 kV, 138 kV and 230 kV) in the area. SDG&E plans to relocate their existing 69/138 kV South Bay Substation to a new location adjacent to the site, and incorporate SDG&E's new 230 kV facility. Therefore, the SBRP 230 kV interconnection would occur in a new 230 kV substation located at the site of the future relocated substation.

SBRP Operation. According to the AFC, the current South Bay Power Plant has a capacity rating of 700 MW and consists of four gas-fired steam generation units and a diesel-fired combustion turbine. Thus, if the SBRP (620 MW) replaces the existing South Bay plant, then there would be a reduction in generating capacity at the South Bay site of approximately 80 MW. As a result of the CAISO dispatch instructions, the existing SBPP produced an average of around 1,800 GWh per year during 2004 and 2005, achieving a capacity factor of approximately 30 percent. It is anticipated that the new plant would serve similar electrical loads as those served by the existing plant.

The existing South Bay Power Plant draws water from San Diego Bay, while the proposed SBRP would convert the once-through cooling system to a dry cooling system to alleviate concerns about the potential for marine biological impacts. The SBRP would use only small quantities of potable water. Discharge of wastewater would be also relatively small. Potable water for drinking, safety showers, fire protection, service water, and sanitary use would be served from the local potable water system via a new six-inch-diameter sewer line connected to the City's system about 400 feet away.

San Diego Community Power Project

The San Diego Community Power Project (SDCPP) proposed by ENPEX Corp. would be a nominal 750 MW gas-fired combined cycle power plant. The heat recovery steam generators would incorporate duct burners, designed to burn only natural gas, to provide additional generation capacity during peak demand periods, such as the summer months. SDCPP has been under development by ENPEX since 2000. The project site would be on the Marine Corp Air Station (MCAS) Miramar property near the City of Santee, with a likely electrical interconnection to the SDG&E Sycamore Canyon Substation (SDCPP, 2000).

The proposed SDCPP at Miramar has been designed by ENPEX to serve as another potential generation option to replace the existing South Bay Power Plant. The actual capacity built by ENPEX may be

³¹ SDG&E was granted a Certificate of Public Convenience and Necessity (CPCN) for the Otay Mesa Power Purchase Agreement (OMPPA) Transmission Project. The CPCN is for the construction of two new 230-kV electric transmission circuits to connect SDG&E's Miguel Substation with both the Sycamore Canyon Substation and the Old Town Substation in San Diego County. The circuit to the Old Town Substation is planned to pass within approximately 100 feet of the proposed SBRP. This project is under construction. The SBRP interconnection plan is based in part on interconnecting to this circuit.

500 MW with possible additional capacity to be installed in the future as the need for power increases. The actual capacity constructed could depend on the market for electricity, availability of emission offset credits, and various other criteria that impact plant size determination. ENPEX has indicated that they might seek a permit to construct a larger plant than may be constructed to provide for future expansion capability (SDCPP, 2000).

ENPEX believes that siting SDCPP at MCAS Miramar provides access to future San Diego energy demands. Close proximity to existing transmission lines and natural gas pipelines and reclaimed water sources were other key considerations in evaluating the site at MCAS Miramar. ENPEX believes that MCAS Miramar is attractive from a land use compatibility standpoint because of undeveloped areas that could provide a buffer for populated areas (SDCPP, 2000). The City of Santee, however, opposed the power plant in early 2007 based on a proposal to develop 1,380 homes on land east of the SDCPP site (the Fanita Ranch development).

The SDCPP's development status is unclear, but it is identified in the CAISO transmission interconnection queue (CAISO, 2006). At the present time, the SDCPP has not submitted an application for certification (AFC) to the CEC. The CEC indicates that the AFC filing date for SDCPP is unknown at this time (CEC, 2007b). In April 2006, a Siting and Feasibility Study for the Proposed Electrical Generating Plant at MCAS Miramar was prepared for the Marine Corps (MCASM, 2006).

SDCPP Location. Figure E.6.1-3 in Section E.6 shows the general location of the SDCPP facility; maps in Section E.6 illustrate the specific proposed location of SDCPP adjacent to MCAS Miramar. According to the "Siting and Feasibility Study," the area of MCAS Miramar east of I-15, referred to as East Miramar, includes training areas, rifle/pistol ranges and ordnance storage in addition to proposed military family housing sites. The proposed SDCPP would be located on a 60-acre site owned by Marine Corps Air Station Miramar. Approximately 20 acres of the site would be used to accommodate the plant facilities and 20 acres would be needed to provide a construction laydown area. An additional 20 acres of land would be set aside to support the potential development of a second 750 MW plant to support future energy demands.

SDCPP Major Components. The proposed 750 MW combined cycle power plant would include a power island, switchyard, electrical control rooms, administration buildings, storage tanks, and ancillary facilities (utility and road connections).

The power island would consist of three advanced technology combustion turbine generators, three heat recovery steam generators (HRSG), one steam turbine generator, and an air-cooled steam condenser (ACC) system. The air inlet system for the gas turbines would include evaporative coolers to increase power output during hot weather, and the HRSGs would include duct burners for power augmentation during peak power demand periods. The gas turbines and duct burners would be fueled exclusively with natural gas. Emissions would be controlled by a combination of dry-low NO_x burners in the combustion turbines and post combustion control via ammonia injection and selective catalytic reduction along with an oxidation catalyst system in the HRSG. The stack height would be approximately 150 feet, and the ACC system would be approximately 100 feet tall.

Ancillary utility and road connections would need to be established. Natural gas would be provided via the SDG&E natural gas pipeline system. On-site fuel gas compression may be required to boost the pressure to that required by the combustion turbines. As such, two electric motor-driven gas compressors would be provided along with a sound attenuation enclosure or building.

An existing 14-inch main water line extends to the north end of Strathmore Road in Santee and would be the expected tie for water to the site from City of San Diego Municipal Water District. A new 4-inch-diameter pipeline (PVC material) would be required to deliver up to 200 gpm of water to the proposed SDCPP. The pipeline would be underground for its entire length at a depth of 36 inches.

A new 30-foot-wide, approximately two-mile-long asphalt road would provide access to the site. The road would be designed for the delivery of large and heavy equipment. In addition, it is expected that the north end of Santee Lakes Blvd would be extended to the north end of the Santee Lakes and then run west to the project site. This 20-foot-wide, paved loop road would provide access to the power plant facilities.

Other Proposed Features of SDCPP. The following list summarizes other aspects of the current SDCPP proposal.

- **Natural Gas Supply.** SDCPP would tie into a SDG&E existing 20-inch line along Mast Blvd, near where SDG&E's existing 36-inch pipeline terminates in Santee. The pipeline would be buried within existing roadways/public right-of-way (ROW). One proposed route for the new gas pipeline is under/along the roads that trend North along Fanita Parkway and Santee Lakes Blvd to the north end of the sewer treatment plant. The pipeline would then continue west, buried in the ROW along the new access road to the SDCPP project site.
- **Water Supply.** SDCPP would use water for HRSG boiler makeup, GTG evaporative cooler makeup, water treatment regeneration, HRSG blowdown quench, service/domestic, and miscellaneous plant uses. It is expected that the water line would be buried within the same ROW as the natural gas pipeline route, beneath or along existing and new roads to minimize impact on surrounding land. Gray water would also be used from the neighboring wastewater treatment plant to meet all process water makeup requirements based on an air-cooled plant. An alternative source of graywater would be from the Padre Dam Municipal Water District in Santee. The pipeline location for gray water has not been identified. The average water use would be approximately 117,360 gallons per day (gpd) or 82 gallons per minute (gpm).
- **Wastewater Disposal.** Wastewater would be generated from a number of sources within the plant, including HRSG boiler blowdown and steam cycle drains, water treatment regeneration waste, combustion turbine generator (CTG) evaporative cooler blowdown, oil-water separator discharge, and sanitary drains. The peak combined wastewater stream could reach 171,700 gpd or 119 gpm. All wastewater will be routed to the local sewer for disposal. Approximately, 1 mile of new 6-inch-diameter pipeline (PVC material) would be required to transport up to 120 gpm of wastewater from SDCPP to the Padre Dam Sewage Treatment Facility.
- **Hazardous Materials.** SDCPP would implement accident prevention and mitigation measures regarding the use and storage of hazardous materials. These measures include risk management plans, hazard assessments, release prevention programs, emergency response plans, process management systems, employee training, and adherence to sound design standards and operating procedures. Where choices of materials are available, materials with reduced hazards would be selected and storage would be designed to contain leaks or spills.
- **Visual Elements.** SDCPP would require exterior lighting 365 days per year for normal operations. Typical outdoor lighting would be 10 ft-candles (100 LUX) on the Steam Turbine Generator (STG) deck. Exterior lighting would have overhead hoods to reflect the light downward. Temporary lighting would be installed under the temporary tarp over the turbine enclosure during maintenance operations.
- **Noise Abatement.** SDCPP would be designed to produce noise levels of less than 65 decibels at 400' from the plant site.

SDCPP Construction. Plant construction would occur over a 24-month time period. There would be an average and peak onsite construction workforce of approximately 240 and 350 individuals, respectively. This workforce would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel, and mobile trailers or similar temporary facilities would be used for construction offices. Parking for construction personnel and visitors would be provided on-site and off-site. Temporary construction laydown and storage areas for large equipment and materials would also be on-site and off-site as required. Temporary construction laydown and storage areas for large equipment and materials would be on-site and off-site as space permits. Disturbed areas would be re-vegetated following construction.

Most heavy equipment would be transported by rail or ship to depots near the site and offloaded onto trucks for delivery to the site. Construction would typically occur during 6 a.m. and 5:30 p. m., Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities.

SDCPP Transmission Interconnection. SDCPP would connect to the SDG&E Sycamore Canyon Substation via an existing 230 kV transmission line. Approximately 0.5 to 1.0 miles of new 230 kV line would be required to loop into SDG&E existing 230 kV Miguel-Sycamore Canyon transmission line. This 230 kV line will run through undeveloped land, exclusively within the MCAS Miramar. The SDG&E Transmission System Impact Study for this interconnection is currently being developed.

SDCPP Operation. The plant would be designed to operate as a base load plant, approximately 8,000 hours or more per year. However, the plant would also be designed for cycling operations and thus could be dispatched to meet power demand requirements. Significant load following capability is possible by partial loading the plant in configurations utilizing three, two or one gas turbines. The turn-down capability of an individual gas turbine is about 5 percent. ENPEX estimates approximately 75 starts/stops per gas turbine per year for each turbine. ENPEX proposes to maintain the plant for high availability and reliability. The plant's capacity factor would depend on the provisions of the power sales agreement as well as market prices of electricity, natural gas, and ancillary services. The plant would be designed for operating flexibility to meet changing market conditions.

Encina Power Plant Repowering

NRG Energy owns the existing Encina Power Plant in the City of Carlsbad and has announced plans to construct a large peaking plant on the site. The existing plant has a nominal rated capacity of 965 MW, and consists of five gas-fired steam generation units and one combustion turbine with blackstart capability. NRG has been examining options for redevelopment of the Encina site since it became sole owner of the plant in 2005. The new Carlsbad Energy Center would retire existing steam boilers at the Encina Power Plant and replace them with a more efficient combined-cycle 540 MW power plant. NRG also announced that it is in discussions with a third party (e.g., ENPEX) to develop a 730 MW gas-fired combined cycle plant inland from Encina, but no further information is available on this concept (Burge, 2006).

NRG filed an AFC to the CEC in September 2007 for the 540 MW Carlsbad Energy Center. The NRG project would include a fast-start high-efficiency, combined-cycle 540 MW power plant and shutdown of the existing steam boiler Units 1, 2, and 3. The retirements would occur upon the successful commercial operations of the new Carlsbad Energy Center generating units.

The Encina Power Plant is located at 4600 Carlsbad Boulevard, along the southern edge of Agua Hedionda Lagoon on the Pacific Ocean. The existing Encina Power Plant has been in continual operation for over

50 years. The existing Encina Power Plant site includes: a main power plant building or power generating facility with control rooms, five steam turbines and associated boilers and generators, and one single 400-foot-tall stack; one 16 MW natural gas combustion turbine; a ocean-water cooling system and associated facilities infrastructure; a switchyard for SDG&E interconnection; an administration building; fuel oil storage tanks and onsite stormwater runoff/treatment/water quality facilities. The plant has components such as chemical and chemical waste storage tanks; communication facilities; construction materials storage; fabrication machine shops; vehicle storage areas; shipping/receiving areas; administrative support areas; fire brigade facilities; trash recycling facilities; processing facilities for natural gas; liquid natural gas and water supply; fuel oil pipelines and booster stations; maintenance; storage and operating facilities; railroad access and loading/unloading facilities; seawater desalination demonstration facility; seawater intake; and upland aquaculture operations and processing area. The existing seawater intake would be used by a current proposal for a desalination project on four acres of land adjacent to the existing Encina Power Plant that is currently under review by the City of Carlsbad and the California Coastal Commission.

Land uses surrounding the existing power plant include residential and active and passive recreational uses such as swimming, surfing, walking, bird watching, fishing, and aquaculture facility to the north; residential commercial and industrial uses to the south; Interstate Freeway 5 and railroad tracks to the east; and beyond that open space and agriculture, and the Pacific Ocean to the west. In 2001, the City of Carlsbad created the South Carlsbad Coastal Redevelopment Plan (SCCRP) area, which encompasses portions of SDG&E owned lands. A “Commercial-Visitor Serving” overlay zoning designation has been added to the power plant property per Chapter 21.208 of the Carlsbad Municipal Code.

Peaking Power Plants in Response to 2008 Peaker RFO

This alternative would include various peaking power plant projects that could be developed in order for SDG&E to comply with prior CPUC rulings. On August 15, 2006, CPUC President Peevey issued an Assigned Commissioner’s Ruling in Rulemaking R.06-02-013 ordering SDG&E to provide the CPUC with information regarding the need for peaking resources for the summer of 2007. This ruling was in response to the heat storm during the summer of 2006. On August 31, 2006, SDG&E responded to President Peevey’s ruling and indicated that, in addition to an increased level of demand response associated with its air conditioner cycling program, SDG&E would also issue an expedited solicitation (the 2008 Peaker RFO) for new utility-owned peaking resources for 2007 and 2008. SDG&E has since expanded its solicitation to include proposals for 25-year tolling agreements with new power projects. SDG&E issued this solicitation on October 17, 2006 and expects all projects to be online by May 31, 2008.

Figure Ap.1-34 shows the locations of the peaker projects solicited by SDG&E (more detailed maps are presented in Section E.6). These would be turnkey projects at four existing SDG&E substations, each described below. In addition, SDG&E is considering 25-year tolling agreements with third parties but those third parties must give SDG&E the option to take possession of the project at no cost at the end of the 25-year toll. The SDG&E RFO indicated that together the substation sites could provide 262 MW of power to SDG&E during peak periods. The SDG&E RFO solicited offers to develop peaking resources on each of the four sites.

Miramar Substation. SDG&E’s existing Miramar Energy Facility is located at 5875 Consolidated Way in San Diego just north of the Miramar Marine Corps Air Station and south of Miramar Road. The Miramar site presently includes one combustion turbine rated at 47 MW, and a second could be added. The maximum estimated peaking capacity of the site is 49 MW. The available site is 1.5 acres and is graded and paved adjacent to railroad tracks. Natural gas is available on site, and the site offers

potential to interconnect to a 69 kV transmission line. A concrete storage pad of approximately 1,500 square feet would need to be demolished prior to installing any peakers at this site. A soils study is available for this site.

Pala Substation. SDG&E's existing Pala Substation is located in the 10300 block of Pala Road (State Route 76) in Pala which is located in northern San Diego County within proximity to the Pala Indian Reservation. The Pala Substation is located on 15 acres of mildly sloping land. The substation site could be developed to provide 99 MW of peaking power. Natural gas is available approximately 3.0 miles away, and there is access for interconnection to a 69 kV line. A portion of the site proposed for development includes an existing orchard and a fenced in area with a few small structures. Depending on the development of the project, some or all of the structures may need to be demolished. In addition, the site has limited water supply.

Margarita Substation. SDG&E's existing Margarita Substation is located in the 28400 block of Antonio Parkway in Ladera Ranch. The community of Ladera Ranch is located east of Interstate 5 between Mission Viejo and State Route 74 in Orange County. The substation is located on 3.0 acres of undeveloped land, and it could be developed to provide a maximum estimated peaking capacity of 99 MW. The nearest natural gas supply is approximately 1.5 miles away, and the available interconnection is to a 138 kV line. The undeveloped portion of the substation is fairly steeply sloping land that appears to be situated on a concrete pad. This property is immediately surrounded by another concrete pad and undeveloped or agricultural land on the outskirts of Ladera Ranch.

Borrego Springs Substation. SDG&E's existing Borrego Springs Substation is located on Borrego Valley Road in Borrego Springs in northeastern San Diego County. The site is along Borrego Valley Road just north of Palm Canyon Drive. The substation site includes 2 acres of graded but undeveloped desert land that could be developed to accommodate 15 MW of peaking power. Because of limited natural gas supplies, the site has been identified by SDG&E as suitable only for biodiesel (e.g., B20 grade or 20% biodiesel mixed with 80% conventional diesel fuel). This would require on-site fuel storage and fire suppression. The nearest interconnection would be a 12 kV line.

Other New or Expanded Peaking Power Plants

The New In-Area All-Source Generation Alternative would also include other peaking power plants if the four sites identified in the 2008 Peaker RFO are not fully developed to achieve the 250 MW target of this alternative. There are at least two power project owners, NRG Energy Inc. and MMC Energy Inc., that have announced plans to repower their existing peaking facilities that are located in the SDG&E area. It is possible that these resources may be bid into SDG&E's 2008 Peaker RFO described above.

Encina Peaker Repower. NRG has proposed to repower the Encina Power Plant with a fast-start combined-cycle facility that could operate in a peaking mode and provide up to 540 MW. NRG has indicated that they believe that a 10-year agreement for this peaking facility is the "most probable outcome" for Encina (NRG, 2006a). The AFC for the Carlsbad Energy Center was filed to the CEC in September 2007.

Kearney Mesa Peaker. NRG Energy announced that it is proposing a new gas turbine peaker at Kearney Mesa for a total of 144 MW nameplate capacity, and NRG expects to have the project up and running by 2011 (NRG, 2006b). No information is publicly available for this project. The CEC provides no information on the status of the proposal to develop the Kearney Mesa peaker (CEC, 2007b).

Escondido Peaker Expansion. MMC Energy, Inc. announced in November 2006 that it is planning to expand the capacity at its Escondido facility from 44 MW to 100 MW, although no applications have

been filed. No information is publicly available for this project. The CEC provides no information on the status of the proposal to expand the Escondido peaker.

Chula Vista Peaker Expansion. The existing Chula Vista Peaker power plant is owned by MMC Energy. The facility is located on 3.8 acres and has a gross nameplate capacity of 44 MW, powered by two natural gas turbines. MMC Energy indicates that the Chula Vista facility was originally developed with a view towards supporting two distinct generating units and presents an attractive expansion opportunity. MMC has commenced preliminary planning for up to a 100 MW expansion of the site, employing gas turbine technology. Currently MMC is in the process of completing planning and permitting of the facility, and an application to develop the project was filed with the CEC on August 10, 2007.

In-Area Renewable Generation

The New In-Area All-Source Generation Alternative would also involve development of all the renewable resources described under the New In-Area Renewable Generation Alternative in Section 4.10.2. The various renewable power projects would involve solar, wind, and biomass/biogas as follows:

- An overall nameplate potential of 300 MW of new solar thermal generating resources, or approximately 240 MW for reliability accounting purposes, would be developed near Borrego Springs by 2016
- Individual solar PV systems would be installed on residential and commercial buildings totaling up to a nameplate capacity of 210 MW or 105 MW for reliability accounting by 2010
- Approximately 200 MW of wind power nameplate capacity or 48 MW for reliability accounting would need to come on line by 2010, with 400 MW of nameplate capacity or 96 MW for reliability accounting by 2016, most likely in the Crestwood wind resource area
- Approximately 50 MW of new biomass/biogas generation by 2010, with 100 MW of biomass/biogas by 2016, from new landfill gas-to-energy projects or wood waste projects at unspecified locations.

Distributed Generation

This alternative would also include deployment of approximately 70 MW of nameplate capacity DG, or 35 MW for reliability accounting, before 2016 as described under the Non-Renewable Distributed Generation Alternative in Section 4.10.4. These Non-Renewable distributed generation resources could be located anywhere in the SDG&E service territory, but they would likely occur at existing facilities that have a need for cogeneration or combined heat and power. Individual DG projects are likely to vary in size and configuration as well as type.

All-Source Generation with Demand Response

One optional scenario, or “resource bundle,” that could occur in conjunction with the New In-Area All-Source Generation Alternative would be to include 231 and 249 MW of demand response by 2010 and 2016, respectively. These demand response levels would be consistent with the CPUC’s demand response goals and SDG&E’s updated goals in its 2007-2016 Long-Term Procurement Plan filed in late 2006 (SDG&E, 2006e). Including this level of demand response with this alternative would improve the likelihood of this alternative in meeting reliability objectives.

All-Source Generation with Demand Response and RECs

A second optional scenario, or second “resource bundle,” that could occur in conjunction with the New In-Area All-Source Generation Alternative would be to combine the All-Source generation alternative with demand response and the use of Renewable Energy Credits (RECs) for RPS compliance. This would allow SDG&E to avoid congestion costs associated with delivery of renewable energy generated outside of San Diego County. Implementing a RECs program as a part of this alternative should reduce the cost of meeting SDG&E’s renewable goals, since the delivery of renewable energy into the SDG&E load center would not be necessary. With SDG&E using RECs for RPS compliance, the congestion costs associated with purchasing renewable power for San Diego County could be greatly reduced or eliminated.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose, and Need

The various components of the New In-Area All-Source Generation Alternative each play a part in satisfying the objectives, purpose, and need of the Proposed Project, as follows.

- **Reliability.** There would be significant reliability benefits with the New In-Area All-Source Generation Alternative. Adding generation in the SDG&E service territory, near the load center, would contribute toward meeting SDG&E’s reliability objective. SDG&E has acknowledged that if the South Bay Replacement Project (alone) comes online in 2010, it would allow SDG&E to meet its reliability targets through 2016. However, after that time, the South Bay Replacement Project alone would not be adequate to meet the reliability targets without either additional new In-Area generation considered under this alternative. At least 820 MW of new conventional resources described above could be online by 2010, and the additional renewable generation and Non-Renewable DG would allow SDG&E to meet the reliability targets by a wider margin in all years.
- **Low-Cost Power.** It is possible that new In-Area generation could provide SDG&E with low-cost power relative to the current generation fleet in the SDG&E service territory. The two largest generating plants in the San Diego area (i.e., South Bay and Encina) are both more than 30 years old and do not have highly efficient generation equipment. Thus, the replacement of this generation with new modern generation equipment would reduce the variable costs of In-Area generation for SDG&E. New In-Area generation, however, may not be cost-competitive with generation from out-of-state resources. In particular, if major new low-cost generation projects occur in the Desert Southwest area and low-cost transmission access is available, the power provided by these new out-of-area generators may be much less expensive than generation from new All-Source generation located within the SDG&E area.
- **Renewables.** Development of In-Area fossil-fired generation alone would not help SDG&E meet the renewable resources objective, but under the New In-Area All-Source Generation Alternative, certain renewable projects would be developed in San Diego County. Compared to developing strictly fossil-fueled facilities, this All-Source generation alternative would improve SDG&E’s ability to comply with RPS goals. This objective could also be satisfied by SDG&E trading RECs.

Feasibility

Construction of new gas-fired generation within the SDG&E service area is feasible. The new Palomar Energy Center is an example of a gas-fired generating station that has come online since 2005 and another major generating station (the Otay Mesa Power Plant) is under construction now.

Generation projects are subjected to various regulatory processes that must be successfully overcome. Any proposed thermal power plant over 50 MW (or any expansion of a thermal power plant in which the expansion is larger than 50 MW) is under the jurisdiction of the CEC for site permitting.³² While the South Bay Replacement Project is being reviewed by the CEC, it is not certain that it will receive siting approval from the CEC. If the CEC decides to approve the project, the decision could contain conditions that make development impractical. For example, one of the major hurdles facing the developer of any fossil-fired power project in the SDG&E area is the availability of adequate emissions offsets. Some projects, such as the repowering of NRG's Encina plant or LS Power's replacement of the South Bay plant, may have access to sufficient emissions offsets. However, for new development, obtaining offsets would be a challenge because of the lack of available offsets in the San Diego basin (Eastman, 2006).

New large thermal power plant projects competing with the South Bay Replacement Project would also need to submit their applications to the CEC. Preparation of an AFC for the CEC is very costly and often is not undertaken until a project has a Power Purchase Agreement (PPA) with a power purchaser such as SDG&E. For this reason, most developers are unwilling to prepare an AFC "on speculation" of securing a PPA. Because of the uncertainty of securing these approvals and agreements, there can be significant delays in project online dates. For example, the San Diego Community Power Project has been under development since 2000 and has yet to submit an application to the CEC, which has resulted in a persistent delay of this project.

The feasibility of this alternative depends on the actions of SDG&E and third-party developers. There is no single process or agency action that can ensure that new In-Area generation projects would, in fact, be built, or that they would be operational within a certain timeframe. SDG&E may or may not enter into new agreements with developers of the projects under this alternative as a result of procurement efforts. Generally, for now and for the foreseeable future, new generation projects are only built in California if they have a firm power purchase agreement with a creditworthy counterparty, such as SDG&E. Unless the In-Area generation projects receive power purchase agreements to support financing, then the prospect of third-party generation in the SDG&E load center is uncertain. SDG&E could own and operate new In-Area generation (such as the Palomar Energy Center developed by Sempra Energy Resources and owned by SDG&E or other new potential projects from the current Capacity RFO). However, under the CPUC's hybrid market structure, new generation should be owned and operated by both the investor-owned utilities and third-parties.

Environmental Advantages

Environmental impacts of the Proposed Project would not occur under the New In-Area All-Source Generation Alternative.

Environmental Disadvantages

This alternative would cause the construction-phase and permanent impacts of various renewable and conventional energy projects throughout San Diego County and in-basin transmission upgrades to access them.

Conventional generation (i.e., a large fossil-fueled central station power plant) emits significant amounts of pollutants, and conventional power plants typically cause a significant noise and visual impact. Delivering power often requires new or upgraded transmission facilities to interconnect the generation facilities to the existing grid. The environmental disadvantages of In-Area power plants include the localized effects of the pollutants (i.e., air emissions, noise, water usage) and long-term land use consequences associated with industrialized facilities near population centers.

³² California Public Resources Code Section 25120.

This alternative would also involve the environmental impacts of renewable generation projects and distributed generation projects as described in Sections 4.10.2 and 4.10.3, respectively.

Alternative Conclusion

RETAINED FOR ANALYSIS. The New In-Area All-Source Generation Alternative would satisfy reliability and low-cost power objectives. Adding renewable projects and the capability of trading RECs for RPS compliance may also result in a lower-cost power supply to SDG&E than could be supplied without In-Area renewables and RECs. With renewable generation projects, this alternative would enable SDG&E to achieve the renewable power objective. The environmental advantages and disadvantages of this alternative require an in depth comparison with the long-term environmental impacts of the Proposed Project. Therefore, this alternative is retained for analysis.

4.10.4 Non-Renewable Distributed Generation Alternative

Background

Distributed generation (“DG”) refers to small-scale power generation technologies (typically in the range of 3 kW to 10 MW) located close to where electricity is used (e.g., a business or home) to meet onsite power needs in place of (or in conjunction with) traditional grid-supplied power. This is in contrast to generation built to provide power to the grid. DG can be either renewable, such as solar photovoltaics, small wind turbines, and small biofueled generators, or it can be fossil-fueled, such as natural gas powered engines or fuel cells. This section focuses on Non-Renewable technologies that can be used for DG, because the New In-Area Renewable Generation Alternative (Section 4.10.1) encompasses renewable energy facilities that are distributed.

Systems that provide useful heat as well as electric power, known as cogeneration or combined heat and power (CHP) are a common DG technology. DG systems may be owned by the incumbent utility, although the DG systems are more commonly owned by the host facility which utilizes the system’s electric generation or a third party who enters into a contractual relationship with the host facility. Power generated by DG facilities is either consumed onsite or fed into the grid, and generators are compensated or reimbursed for any power delivered to the grid. This alternative was identified by SDG&E in PEA Section 3.3.3.4, and it was suggested in public scoping comments as an alternative to the Proposed Project.

The primary program to promote DG in California is the statewide Self-Generation Incentive Program (SGIP). Pursuant to California Assembly Bill 970, the CPUC approved the SGIP on March 27, 2001 (D.01-03-073). SGIP provides financial incentives for customers who install up to 5.0 MW of qualifying distributed generation equipment onsite.³³ Qualifying equipment must be certified to operate in parallel with the electrical grid and be: solar PV, wind turbines, fuel cells (with either renewable or Non-Renewable fuel), microturbines (with either renewable or Non-Renewable fuel), or internal combustion engines and “large” gas turbines (with either renewable or Non-Renewable fuel). The internal combustion engines and “large” gas turbines must also meet AB 1685 emissions standards.

The San Diego Regional Energy Office (SDREO) is the local administrator of the SGIP. The program runs through December 31, 2007, although some extension or analogous program is likely to continue in 2008 and beyond. Since January 1, 2007, solar PV incentives have been administered through the California Solar Initiative.

³³ Although incentive payments can be received for only the first 1 MW.

Alternative Description

This alternative would involve an expansion of Non-Renewable DG beyond that contemplated by SDG&E in the PEA Section 3.3.3.4, which anticipates a minimal increase in DG. As of mid-2006, SDG&E reports to have a total of 61 installed self-served load DG units totaling approximately 105 MW of nameplate capacity, with six pending DG projects for a total of approximately 5 MW (SDG&E, 2006a). SDG&E expects that with or without the Proposed Project, the use of DG in the San Diego area will grow by adding nameplate capacity of 11 MW in 2010 and 17 MW by 2016. SDG&E discounts the nameplate capacity of DG by 40 to 60 percent to reflect its historic experience that DG systems' outputs at times of system peak are about half of their nameplate rating (SDG&E, 2005b). Renewable distributed generation (solar PV and wind) is considered separately under the New In-Area Renewable Generation Alternative in Section 4.10.1.

A recent study conducted by the Electric Power Research Institute (EPRI) sponsored by the Public Interest Energy Research (PIER) program at the CEC suggests that SDG&E's assessment might understate the potential contribution of DG in general and combined heat and power (CHP) systems in particular (PIER, 2005). The EPRI report assessed the potential of increased application of CHP in the service areas of the three major California IOUs, including SDG&E. The report considered a number of policy options for the promotion of CHP and assessed the impact of these policies on the market penetration of CHP. Three cases of interest here were:

- **Base Case:** The base case was developed based on expected future gas and electric prices, existing incentive programs (Self-Generation Incentive Program and incentive gas rates for CHP), existing and proposed emissions requirements, and existing CHP technology cost and performance with evolutionary improvements over time.
- **Increased Incentives Case:** In the increased incentives case, the base case was modified by expanding the SGIP program to include providing incentives to projects up to 20 MW (but still only on the first 5 MW) and assuming a production tax credit of \$0.01/kWh of CHP output was added.
- **High Deployment Case:** This scenario includes existing incentives, facilitation of the power export market, addition of a T&D support payment, a CO₂ reduction credit, the rapid development and deployment of advanced technology, and an overall improvement in customer acceptance of CHP investment opportunities.

Figure Ap.1-35 compares the assumptions in the PEA to three of the cases from the EPRI study. While SDG&E assumes that approximately 1 MW per year of additional DG would be deployed in its base case, the EPRI base case shows that approximately 15 MW per year of additional CHP-based DG is possible. This alternative would involve deployment of approximately 70 MW nameplate capacity DG by 2016 as projected by the EPRI base case, resulting in a total incremental addition for reliability purposes of about 35 MW.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose, and Need

The ability for the Non-Renewable Distributed Generation Alternative to satisfy the project objectives, purpose, and need of the Proposed Project is described as follows.

- **Reliability.** This alternative would improve In-Area reliability because distributed generation would provide a valuable local resource. As such, it can contribute to maintaining, if not improving reli-

bility, and therefore contributes toward meeting the “maintains reliability” criterion. However, under the scenario of deploying approximately 70 MW of nameplate capacity DG by 2016, these technologies would not alone achieve the reliability goals set for the Proposed Project.

- **Low-Cost Power.** Although the SGIP program does not have any cost-effectiveness requirements as a hurdle for participation, the CPUC clearly stated its intent that any longer-term DG program demonstrates cost-effectiveness (CPUC D.01-03-073). Therefore, one can safely conclude that future DG will be cost-effective relative to SDG&E purchasing or developing supply-side resources to meet the displaced load. Therefore, DG can reasonably be assumed to meet the “reduced energy cost” criterion.
- **Renewables.** The Non-Renewable Distributed Generation Alternative would not further the efforts of SDG&E to expand its portfolio of renewable resources. These technologies do not directly promote renewable energy or directly contribute to SDG&E meeting its renewable portfolio standard obligations. While some DG may be renewable, and the current SGIP program provides greater incentives for renewable technologies, the DG alternative cannot fully meet the “promotes renewable energy” criterion.

Feasibility

Distributed generation would be a feasible alternative for partially meeting load growth. However, the EPRI report may overstate the practical CHP potential in the SDG&E service territory. For example, the study’s Base Case, which assumes status quo incentives and policies, calculates the potential for new CHP to be about 15 MW per year, while SDG&E reports only 5 MW of pending projects. Therefore, while the EPRI study may overstate the practical CHP potential, it suggests that it would be feasible to deploy much more than 1 MW per year assumed by SDG&E.

The DG resource is limited relative to the need for In-Area generation to meet local area reliability tests. Even with the most aggressive alternative considered in the EPRI report, DG alone would not provide as much capacity as the Sunrise Powerlink. Furthermore, achieving DG penetration greater than that currently being achieved (and reflected in the PEA) would require changes to the SGIP program design. The EPRI study suggests that based on raw economics — power, gas, and equipment prices — greater DG penetration should be expected than is currently occurring or is projected. However, since SDREO is the administrator of the SGIP, SDG&E has limited ability to increase DG through programmatic means.

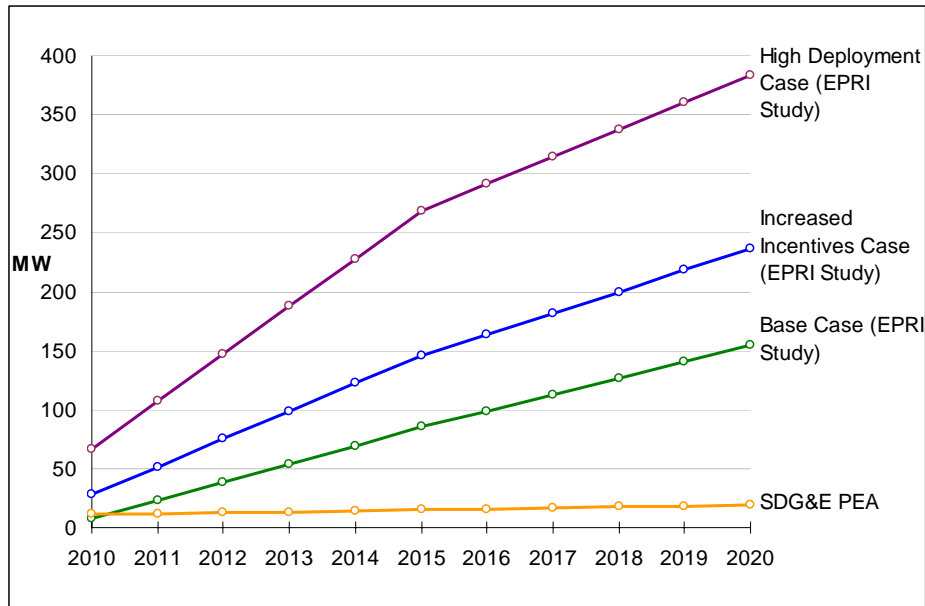
Environmental Advantages

Environmental impacts of the Proposed Project would not occur under the Non-Renewable Distributed Generation Alternative.

Environmental Disadvantages

Potential new impacts created by DG would depend on the type of generation that would be used. Conventional fossil-fueled DG facilities would create air quality and noise impacts in the vicinity of each generating facility.

Figure Ap.1-35. DG Penetration Projections (Nameplate Capacity)



Source: EPRI Report, Tables 7-5 through 7-33

Alternative Conclusion

ELIMINATED. The Non-Renewable Distributed Generation Alternative would involve deployment of DG in the form of many small projects at a pace more aggressive than what SDG&E anticipates. While feasible, the level of DG deployment under this alternative could not provide sufficient In-Area generation alone to satisfy the reliability objective. Because it would be technically and legally feasible to develop approximately 35 MW of additional, reliable DG, this alternative could be part of other non-wires alternatives.

4.10.5 Energy Efficiency Alternative

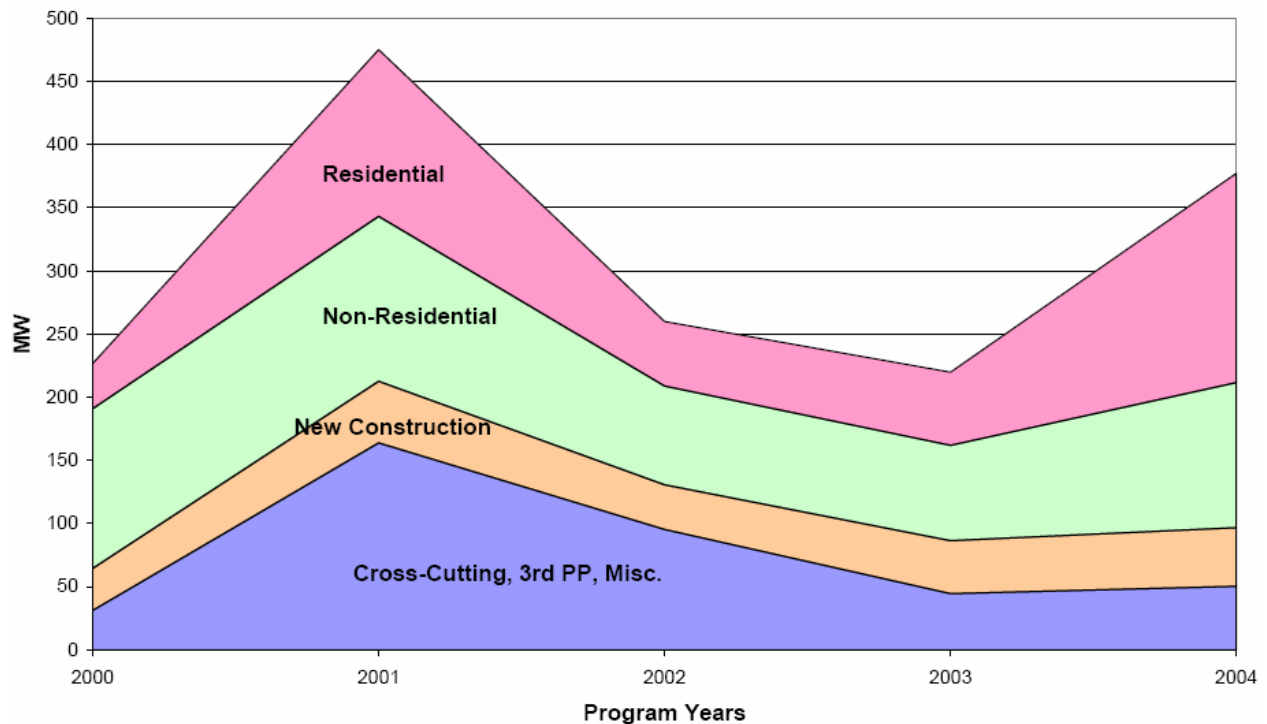
Background

California utilities have been engaged in energy efficiency activities for over 30 years. In 1975, the CPUC announced that it “regard[ed] conservation as the most important task facing utilities today” and that the “vigor, imagination, and effectiveness of a utility’s conservation efforts [would be] a key question in future rate proceedings and decisions on supply authorization” (CPUC D.84902). Soon after, the CPUC “decoupled” the utilities’ allowable rates of return by tying them to the success of their conservation efforts. However, with the fall of oil and gas prices and the surplus capacity generated from California’s new nuclear plants and independent power producers, conservation efforts stalled in the 1980s. The CPUC renewed its focus on conservation in 1989 in response to the reduction in excess capacity, rise in fuel prices, and escalation of concern over the environmental impacts of electricity generation and the competitiveness of American industries in the international markets. It assembled a working group of representatives from the utilities, the CEC, environmentalists, ratepayer advocates, State agencies, agriculture, energy service companies, and energy producers to collaboratively develop proposals to improve energy efficiency at the utilities. In August 1990, the CPUC adopted the recommendation of the working group and approved increased funding for energy efficiency expenditures, shareholder rewards for energy savings, and shareholder penalties for not meeting conservation goals.

With the California power crisis in late 2000, the CPUC stepped in to intensify energy efficiency efforts and shifted its focus from a focus on long-term market transformation to a goal of achieving near-term energy and capacity reductions. The legislature also stepped in to provide funding, including \$10 million to the Department of Consumer Affairs in 2001 to “implement a public awareness program to reduce peak electrical usage” (SB5X, 2001). Out of this funding, the statewide *Flex Your Power* advertising campaign was developed. *Flex Your Power* continues as a statewide public awareness and outreach tool to promote and educate Californians about energy efficiency and conservation. There are practically as many ways to conserve energy as there are ways to use it. Insulating or reflective building materials, such as windows or “cool-roofs,” energy efficient lighting and appliances, and timed power management systems are each examples of technologies in use today.

The effort in 2001 to expand the state’s energy efficiency programs was seen as an emergency measure to reduce supply shortages and was not meant to be a long-term solution. However, notwithstanding the difficulties associated with a quickly implemented, crisis-driven program, the programs instituted during this period contributed to significant energy savings in California. For instance, it is estimated that Californians conserved up to 5,570 MW at peak during the summer of 2001 and that one-third of the population reduced their energy usage by at least 20% over the prior summer (FYP, 2002). The statewide *Flex Your Power* campaign has been seen as a particular success. In 2003, the CPUC granted over twice the funding that it had originally anticipated for marketing and outreach programs “because of [its] confidence in the success of the *Flex Your Power* campaign and the need to underscore the importance of energy efficiency in the minds of the public.” This elevated level of funding was continued for the 2004 and 2005 funding years. The annual statewide first-year peak demand savings from 2000 through 2004 are shown in Figure Ap.1-36.

Figure Ap.1-36. Statewide First-Year Peak Savings of Utility Energy Efficiency Programs



Source: CEC Staff Paper, “Funding and Energy Savings from Investor-Owned Utility Energy Efficiency Programs in California for Program Years 2000 Through 2004,” CEC-400-2005-042-REV. August 2005. Figure 6, page 7.

Current Status

In late 2004, the CPUC began to plan for the next phase of energy efficiency programs, to begin in 2006. It extended the program planning and funding cycle to three years and, in January 2005, returned both program choice and portfolio management back to the IOUs. Under this system, the CPUC sets energy savings targets and retains oversight responsibility for most monitoring and verification studies (CPUC D.05-01-055). The utilities have considerable flexibility to reallocate funding across the three-year program cycle and between programs as necessary to improve the overall program or its cost-effectiveness (CPUC D.04-051).

The CPUC adopted its energy efficiency goals for 2006 and beyond in D.04-09-060. This decision was based on energy savings potential studies conducted jointly by the CPUC and CEC staff, with significant input from the three IOUs as well as other interested parties. SDG&E has incorporated these efficiency goals in its long-term procurement plan as well as in the PEA for the Sunrise Powerlink Project.

With respect to the energy savings goals, D. 04-09-060 notes that:

[W]e believe that our expectations for energy efficiency savings over the next decade are appropriately aggressive and in keeping with the objectives of the Energy Action Plan. At the same time, they recognize that there may be some practical limits to effectively increasing program funding and ramping up programs to capture the full economic potential of energy efficiency at this time” (p.3)

With respect to SDG&E, the decision:

. . . attempts to use the maximum achievable savings potential presented in the disaggregated study to limit the cumulative GWh savings goals for SDG&E creates very anomalous results. . . . Rather than force a result using unrealistic assumptions for future funding or savings yield ratios, we adopt a cumulative GWh savings goal for SDG&E that is somewhat higher than the maximum achievable potential presented in the disaggregated study for SDG&E’s service territory. . . . As a result, our adjustments result in an adopted trajectory of GWh savings goals for SDG&E that is 118% of the cumulative maximum achievable potential presented in the disaggregated Secret Energy Surplus Study. (p 26-27)

Therefore, while the overall savings goals presented in D.04-09-040 in total are “appropriately aggressive and in keeping with the objectives of the Energy Action Plan,” the goals laid out for SDG&E are particularly aggressive, even to the point of exceeding the maximum achievable potential presented in the analysis underlying the decision (p. 3).

This latter conclusion is further supported by a second energy efficiency potential study and the performance of SDG&E’s energy efficiency programs in 2006. The updated energy efficiency potential study, commissioned by SDG&E and conducted by Itron, a San Diego-based consulting group, showed that the D.04-09-060 efficiency goals for SDG&E were roughly consistent with “full market potential” savings (i.e., rebates set at full measure incremental costs), but significantly exceeded the level associated with 2004 rebate and program funding levels.³⁴ These savings projections are shown in Figure

³⁴ “California Energy Efficiency Potential Study,” Submitted to PG&E by Itron Inc, et al. May 26, 2006.

Ap.1-37. Furthermore, SDG&E's reported energy savings through November 16, 2006 from its efficiency programs falls markedly short of its goals: approximately 17 MW saved in 2006 versus the goal of 54 MW.³⁵ While this is a single datum, and one should not necessarily extrapolate from a single point, it supports the two studies that suggest the CPUC-adopted efficiency goals for SDG&E are very aggressive.

Alternative Description

The Energy Efficiency Alternative was identified by SDG&E in PEA Section 3.3.3.1, and various scoping comments indicate a strong public support for energy efficiency and conservation as an alternative to the Proposed Project (for example, Donna Tisdale, Boulevard Sponsor Group).

The applicant's PEA includes the energy efficiency goals laid out by the CPUC in 2004 (D.04-09-060). Therefore, in order to provide an alternative to the Proposed Project, any savings would have to be incrementally greater than the savings already assumed. Because the savings embedded in the PEA are at or above the market potential, no incremental savings can reasonably be assumed.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose, and Need

Energy efficiency in general is an alternative to either new transmission or generation for meeting load growth. It can contribute to maintaining, if not improving reliability, and therefore meets the objective to maintain reliability. Because energy efficiency programs that are overseen by the CPUC are required to meet certain cost-effectiveness standards, namely the "Total Resource Cost" test, one can safely conclude that energy efficiency will be cost-effective relative to SDG&E purchasing or developing supply-side resources to meet the displaced load. Therefore, energy efficiency can reasonably be assumed to meet the objective for reduced energy costs. Increased energy efficiency cannot directly promote renewable energy or directly contribute to SDG&E meeting its renewable portfolio standard obligations, and therefore fails to meet the objective for renewable energy.

Feasibility

Energy efficiency in general is a feasible alternative to meeting load growth. However, the level of efficiency presumed to occur in the baseline condition is already very aggressive, and achieving incremental savings beyond that level is speculative at best. Therefore, energy efficiency alone is not a technically feasible alternative to the Proposed Project.

Environmental Advantages

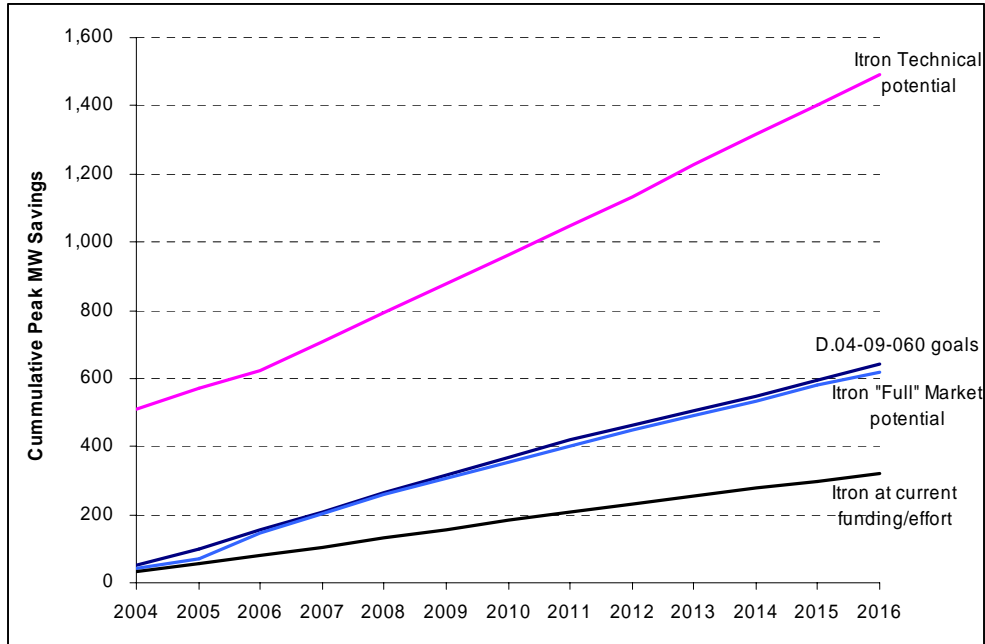
This alternative would reduce energy consumption, and therefore reduce the need for power generation and new transmission lines. All effects of the Proposed Project would be avoided.

Environmental Disadvantages

There would be no environmental disadvantages, as there would be no construction and no new impacts created.

³⁵ Documents emailed to parties in Rulemaking 06-04-010, supporting SDG&E's November 28, 2006 program advisory group (PAG) meeting.

Figure Ap.1-37. Energy Efficiency Peak Demand Reduction Projections



Alternative Conclusion

ELIMINATED. This alternative is not technically feasible because SDG&E is required to achieve aggressive energy efficiency goals laid out by the CPUC in 2004 (D.04-09-060), with the aim of exceeding the maximum achievable potential energy savings defined at that time. Additional energy efficiency beyond that occurring in the baseline condition may be technically possible, but it is speculative to assume such a level of energy efficiency is achievable. Furthermore, even the incremental savings associated with the full technical potential from the 2006 Itron Study — an amount not practically achievable — is still less than the capacity that would be deliverable by the Proposed Project. In addition, the alternative fails to meet the objective to promote renewable energy.

4.10.6 Demand Response Alternative

Alternative Description

Demand response (DR) refers to any number of programs or utility rate schedules targeted at altering customers' usage patterns, usually to reduce load during hours of peak system demand in response to a financial incentive. Demand response programs differ from energy efficiency programs in that (a) they usually, but not always, use altered pricing structures to induce the customer usage change, and (b) by shifting the time of usage they do not necessarily reduce overall energy consumption.

Demand response depends on strategies and technologies that enable demand side management, such as monitoring and remote shutdown of electricity customers. This would be accomplished with real-time and time of use (TOU) metering that involve communication functions to monitoring systems. These technologies would also be components of a "Smart Grid" system that would help to advance the efficiency of power delivery, better integrate distributed generation, reduce outages, and reduce transmission line congestion. The Demand Response Alternative was identified by SDG&E in PEA Section

3.3.3.2, and numerous public scoping comments suggested consideration of demand response as an alternative to the Proposed Project (for example, Dayton Higgins, Robert Staehle, Mussey Grade Road Alliance, and conservation groups).

SDG&E's current demand response programs are summarized in Table Ap.1-16, which shows SDG&E's 12 ongoing programs along with the projected peak savings from those programs in 2007. As Table Ap.1-16 shows, SDG&E expects potential load reductions in 2007 from DR programs on the order of 350 MW, of which approximately 90 MW are purely "emergency" supplies and another 90 MW associated with technical assistance programs.^{36,37}

SDG&E notes in the PEA that it has included in its planning the annual demand response targets established by the CPUC and that these programs meet Resource Adequacy requirements and are deducted from SDG&E's annual system load forecast. For 2007, this goal is 218 MW, which is greater than SDG&E's projections of 170 MW for 2007 (i.e., 170 MW = 350 MW projection for all programs – 90 MW for emergency supplies – 90 MW from technical assistance programs).

Additional demand response peak reductions may be available through SDG&E's Advance Metering Infrastructure (AMI) program (A.05-03-015, approved by CPUC April 12, 2007, D.07-04-043). Advanced or "smart" meters can be read remotely and can provide hourly or demand data for all customers (even for lower use, residential accounts). This provides the opportunity for rate schedules to better reflect the cost of providing power, particularly during peak demand periods through demand response programs, thus sending the right "price signals" to users. It also allows for more efficient and accurate meter reading and enhances the utility's ability to locate outages or other system disruptions.

Under SDG&E's AMI proposal, all customers' meters will be upgraded to communicating solid-state meters by 2011. AMI includes the meters, communication network, and data management systems necessary to implement wide scale demand response rates for all customers, not simply those with peak demands greater than 20 kW. However the implementation of time-based rates akin to the voluntary CPP rates currently in effect requires CPUC support and approval in order to sustain long-term demand response envisioned in the AMI application.

³⁶ Emergency programs are Demand Bidding Program–Emergency Program, Critical Peak Pricing–Emergency Program, and the Clean and Peak Generator Programs.

³⁷ The stated purpose of the technical assistance programs is to identify demand response opportunities (per Mark Gains, "San Diego Gas & Electric Company Proposed Enhancements to 2007-2008 Demand Response Programs," presentation at the Demand Response Expansion 2007 Workshop, September 6, 2006.), which strongly suggests the possibility of double counting if the technical assistance MWs are added to the other DR program's MWs.

Table Ap.1-16. SDG&E's 2007 Demand Response Programs

Program	Target	Projected Peak MW Demand Reduction in 2007	Description
Day-Ahead Programs			
Voluntary Critical Peak Pricing (V-CPP)	Customers with Load > 20kW	20	Offers rate discounts for non-critical peak day periods with much higher rates during critical peak periods. Relies upon customer behavior change (load reduction) in response to higher rates.
Demand Bidding Program (DBP)	Customers with Load > 20kW	37	Upon SDG&E request, participants will "bid" the amount of electric load they can reduce, and the hours at which they are willing to reduce this load. In exchange, the participant will receive the market price plus 10¢/kWh for their reduced consumption during the event.
Capacity Bidding Program (CPA Demand Reserves Partnership)	Customers with Load > 20kW	20	Allows the state to dispatch participating customer curtailments like generation. Participants specify the amount they can reduce their load in exchange for a monthly "reservation fee" plus compensation for actual reductions.
Peak Day Credit (Formerly C/I Peak Day 20/20)	Customers with Load > 20kW	49	Voluntary program that offers customers the ability to earn a bill credit for load reduction during critical peak days. The bill credits range from 10 to 20% off the total bill for 10 to 20% load reduction.
Day-Of Programs			
Demand Bidding Program – Emergency	Customers with Load > 20kW	Combined in DBP	Same basic program structure as the Day-Ahead DBP program, except that the notification period is 60 minutes rather than the day ahead and the incentive is the greater of the actual market price of power or 50¢/kWh.
Base Interruptible Program (BIP)	Businesses that can reduce load the lesser of 15% of monthly average peak demand or 100kW	10	SDG&E can call upon participants to reduce load by an agreed upon amount subject to (a) 30 minute or (b) 3-hour notification. Participants receive a monthly bill credit of \$7 (option a) or \$3.50 (option b) per month per kW reduction. Substantial financial penalties for non-compliance.
Critical Peak Pricing – Emergency	Customers with Load > 300kW	5	Same basic program structure as the Day-Ahead CPP program, except that the notification period is 30 minutes rather than the day ahead.
Smart Thermostat Program	Residential	2	Allows SDG&E to remotely set air conditioner thermostat to a higher temperature during "events"
Summer Saver Cycling Program	Small Commercial and Residential	38	Allows SDG&E to remotely cycle off certain residential appliances, such as air conditioners, electric water heaters and pool pumps, during peak hours.
Clean Generator Program	Commercial customers with qualifying "clean" backup generators.	25	Allows SDG&E to dispatch qualifying clean backup generators during times of system need.
Peak Generation Program (a.k.a. Rolling Blackout Reduction Program)	Commercial customers with qualifying backup generators.	60	Allows SDG&E to dispatch qualifying backup generators during times of system emergency.
Technical Assistance Programs	Customers with Load > 20kW	90	Provides customers with energy audits that identify demand response opportunities and incentives for load control equipment.
Total Projected Reduction		357	

Source: Mark Gains, "San Diego Gas & Electric Company Proposed Enhancements to 2007-2008 Demand Response Programs," presentation at the Demand Response Expansion 2007 Workshop, September 6, 2006.

In the PEA, SDG&E notes the potential of “over 200 MW” of demand response capacity resulting from its AMI proposal. This amount is consistent with the values proffered in SDG&E’s testimony supporting its AMI proposal, which shows demand reductions on the order of 220 MW (2011) to 280 MW (2020) in the expected case.³⁸ SDG&E does not rely upon AMI-related demand response reductions as they are not considered in the CAISO’s reliability analysis and at the time of the PEA, the program had not yet been approved (SDG&E, 2005b).

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose, and Need

The reliability objective would not be satisfied because, as SDG&E notes in the PEA, “[t]o date, the CAISO has been unwilling to count any Demand Response programs as being available to the CAISO grid in the circumstance of an overlapping outage of the largest In-Area generator and the most critical transmission line during an adverse weather heat storm (90/10 peak load condition)” (SDG&E, 2005b). If the CAISO does not change its policy concerning the inclusion of DR in local reliability assessments, then DR cannot be counted towards meeting the reliability goals. As the AMI application strongly argues, demand response offers ample opportunity to reduce costs by curtailing utility purchasing during the highest-cost hours, and therefore can meet the objective of reducing energy costs. Demand response would not contribute to promoting renewable energy.

Feasibility

There are potential concerns regarding the feasibility of DR. The level of reductions associated with the DR and the deployment of AMI involve speculation, relying upon assumptions concerning CPUC approval of the AMI investments, subsequent rate design, electricity price elasticity of demand, and the level of DR program participation by customers. The uncertainty of reductions is particularly relevant for the residential class, which represents approximately half of the projected demand reductions from AMI deployment but whose performance is highly dependent upon the assumption of program participation.

Environmental Advantages

This alternative would reduce peak demand, and therefore reduce the need for power generation and new transmission lines. All effects of the Proposed Project would be avoided.

Environmental Disadvantages

There would be no environmental disadvantages, as there would be no construction and no new impacts created.

Alternative Conclusion

ELIMINATED. For the reasons outlined above, additional demand response beyond that presented in the PEA is speculative at best and could not replace the capacity associated with the Proposed Project. Furthermore, the alternative fails to meet the objective of promoting renewable energy. However, DR could be used as a viable part of any feasible alternative that meets the project objectives.

³⁸ Page SG-13. 2020 value calculated by linearly interpolating between the 2015 and 2020 values shown on the referenced page.

4.10.7 All Solar Alternative

Background

Numerous scoping comments suggested that this EIR/EIS include an alternative in which new local solar photovoltaic (PV) generation would replace the need for importing renewable power from Imperial County. Two local proposals have been put forth that include solar photovoltaics as a major source of new power generation for the SDG&E service territory. The two proposals are included in the following documents:

- “San Diego Smart Energy 2020” (which includes the “San Diego Solar Initiative” as a component), prepared by E-Tech International of Santa Fe, New Mexico in October of 2007 and funded by the San Diego Foundation’s Environment Program (Powers, 2007).
- “Creating a Sustainable Economy and Future on Our Planet: The San Diego/Tijuana Region,” prepared by Jim Bell of San Diego in 2005 as a project of the Ecological Life Systems Institute (Bell, 2005).

San Diego Smart Energy 2020 (SDSE). This document, put forth by E-Tech International, presents a plan for shifting the focus of the energy supply for the San Diego region from a reliance on fossil fuels and imported power to local solutions. The plan would rely upon several existing and future energy elements to reduce greenhouse gas emissions from power generation and increase the electricity supply from renewable resources, while maximizing locally generated power.

The SDSE plan calls for an ambitious reduction of the energy demand and peak load in the SDG&E territory. SDSE prescribes a reduction of energy demand by 20 percent or 4,000 GWh/yr through energy efficiency by 2020. This includes maximizing Demand Reduction through Energy Efficiency upgrades and “smart” meters to reduce peak demand in the region to 3,500 MW. This element of the SDSE would curtail load growth.

To this demand reduction target, the SDSE also calls for developing 300 MW of solar PV systems on rooftops as part of the California Solar Initiative (CSI as described in Section 4.10.1) with an additional 2,040 MW of nameplate capacity solar PV systems including battery storage for peaking duty under a program called the “San Diego Solar Initiative”. The SDSE also involves 700 MW of new combined heat and power energy, and the use of existing combined heat and power plants and existing combined-cycle gas-fired power plants within the San Diego Region (Powers, 2007).

The “San Diego Solar Initiative” program within the SDSE would develop 2,040 MW of solar PV power and battery storage in the San Diego region by 2020. The “San Diego Solar Initiative” would use an incentive structure similar to the California Solar Initiative which provides incentives for commercial PV applications of up to one megawatt and also provides incentives for residential systems. The objective of the incentives is to make PV cost-competitive with purchased utility power. This would be in addition to the 300 MW level of rooftop PV that SDG&E anticipates to occur as part of CSI. The development curve of the “San Diego Solar Initiative” would be similar to the rate-of-growth demonstrated in the solar PV program of Germany, which reached a growth rate of 837 MW per year in 2005 (Powers, 2007). Under the “San Diego Solar Initiative”, the first 40 MW would be installed between 2008 and 2010, with the majority of the 2,040 MW becoming operational in the final few years before 2020.

A critical assumption of the “San Diego Solar Initiative” in the SDSE, as well as the CSI, is that the large market demand for solar PV systems will reduce the cost of PV to the point where PV technology

will be cost-competitive with purchased utility electricity rates by 2017 without incentive payments, although federal and state tax credits are assumed to remain in place. The projected decline of the cost of solar PV systems is backed by the U.S. Department of Energy projections and current industry trends (Powers, 2007). Other assumptions are that the majority of the installed capacity, 75 percent, will be commercial installations over 100 kW and that a high level of standardization will be utilized by a limited number of large contractors to minimize costs through bulk purchasing of PV system hardware.

Creating a Sustainable Economy and Future of the Planet (CSEFP). This proposal was put forth by Jim Bell in 2005 and identifies how the San Diego/Tijuana region could strengthen its economy while becoming self-sufficient in basic resources such as energy, water, and food.

CSEFP details an energy proposal that would cover 18 percent of the 500 square miles of existing roofs and parking lots with solar panels, which the study considers would make San Diego County completely energy self-sufficient (Bell, 2005). The proposal dictates that San Diego County and all its cities, along with the cities of Tijuana, Tecate, Rosarito and Ensenada in Baja California, should partner in issuing a Request For Proposals (RFP) to make the region energy self-sufficient by 2030 or sooner. The RFP would be issued to large solar panel manufacturers and energy service companies to design a cost-effective plan for financing renewable energy self-sufficiency.

The CSEFP energy proposal relies on investors to finance the development of sufficient solar energy to allow the San Diego County region to become self-sufficient. An initial investment of \$500 million for five years, or a total of \$2.5 billion dollars, in solar PV systems would be sufficient to accrue a working capital that would be re-invested in solar PV systems. Under this design, San Diego County would satisfy its energy needs through solar PV systems 30 years from the start date (Bell, 2005). Residents of San Diego County could repay these investments, including interest, through their energy bills with the cost per unit of energy gradually decreasing as local efficiency improvements and renewable energy systems are installed, eventually becoming owners of the solar PV systems.

Relationship to Existing Initiatives. The SDSE and CSEFP proposals would build upon existing renewable energy laws and plans, including the CSI described in Section 4.10.1. As part of the PEA for the Sunrise Powerlink Transmission Project, SDG&E anticipated that 300 MW of nameplate capacity solar PV could be installed by 2016 under the CSI. SDG&E developed but rejected a “Rooftop Solar” alternative because only 50 percent of the 300 MW nameplate capacity could be reliably assumed to be available during peak load hours, thereby contributing 150 MW of reliable on-peak capacity. SDG&E rejected its Rooftop Solar because it would not be able to satisfy the reliability objectives of the Sunrise project. To better achieve the reliability objectives, the SDSE has a goal of 2,040 MW by 2020. Under the SDSE, the “San Diego Solar Initiative” would need to deploy PV much more aggressively than CSI, with an incremental 1,570 MW of installed capacity by 2016 over the 300 MW of PV expected by SDG&E under CSI alone (Powers, 2007).

The costs of the SDSE and CSEFP would be above and beyond the costs of the CSI. Based on the current installed cost of solar PV systems in the Commission’s Self Generation Incentive Program, SDG&E estimated a cost of approximately \$20.6 billion dollars (in 2006 dollars) for 2,000 MW of rooftop PV systems. Developing the SDSE or CSEFP would need to follow an incentive program similar to that of the CSI. CSI projects anticipate installed costs decreasing to \$0.135/kWh for the consumer including incentives with state and federal tax credits (Powers, 2007). The SDSE “San Diego Solar Initiative” would use a similar structure to achieve a reduced energy cost for the consumer. With incentives SDSE may achieve the \$0.135/kWh cost of solar energy. Additional costs could occur if SDG&E needs to procure additional generating capacity to ensure reliability during the hours when

solar PV power is not available. The overall net economic benefits of the SDSE and CSEFP including reliability compliance costs have not been determined.

Alternative Description

The All Solar Alternative would involve development of enough rooftop solar photovoltaic projects to provide sufficient generation capacity to defer the need for the Proposed Project. The All Solar Alternative would depend on incentives similar to those established for the California Solar Initiative, but would greatly expand the CSI program to achieve a level of new solar PV capacity similar to that of the “San Diego Solar Initiative” defined in the SDSE plan (Powers, 2007).

To reliably provide for energy at peak hours, the All Solar Alternative differs from the solar PV component of the New In-Area Renewable Generation Alternative in Section 4.10.2 by including sufficient battery storage to provide a 3-hour daily output of the nameplate capacity compensate for the decline in solar PV generation capability after 3 p.m. Battery systems would add approximately 10 percent to the costs of the PV systems (Powers, 2007). Also, battery systems may increase installation time by between 50 to 100 percent (CEC, 2001). Sufficient capacity would be provided by this alternative to match the capacity that would be added by the New In-Area Renewable Generation Alternative in Section 4.10.2.

In summary, the All Solar Alternative would provide new in-area renewable generation capacity from:

- 406 MW nameplate capacity of rooftop solar PV installations by 2010 with sufficient battery storage to serve as peaking units to achieve at least 203 MW of reliable capacity during peak hours;
- 1,040 MW nameplate capacity of rooftop solar PV installations by 2016 with sufficient battery storage to serve as peaking units to achieve at least 520 MW of reliable capacity during peak hours; and
- 2,040 MW nameplate capacity of rooftop solar PV installations by 2020 with sufficient battery storage to serve as peaking units to achieve at least 1,020 MW of reliable capacity during peak hours.

Consideration of CEQA/NEPA Criteria

Project Objectives, Purpose, and Need

Reliability. The All Solar Alternative would be an alternative to new transmission for meeting load growth. The deployment of rooftop solar photovoltaic and battery installations would provide 203 MW of reliable generation by 2010 and 520 MW by 2016. This level would help SDG&E meet its local reliability requirements by 2010, but the All Solar Alternative alone would not satisfy the CAISO G-1/N-1 reliability objective of the SRPL transmission line through 2020.

Low-Cost Power. Achieving the low-cost power objective would not be possible under the All Solar Alternative. To achieve the sufficient levels of PV installation by 2010 would likely be prohibitive. Both the “San Diego Solar Initiative” and the CSEFP energy proposal assume a large initial investment with the use of tax credits and outside investment as a means of lowering costs for the consumer. A fundamental assumption of the CSI and SDSE is that a large increase in demand for solar PV systems will reduce the cost of these systems to a point where they will be cost competitive (Powers, 2007). However, the earliest date for this cost-competitiveness is 2017 (Powers, 2007). Table Ap. 1-19 compares the estimated cost and completion dates for the various solar programs discussed in the All Solar Alternative.

Table Ap.1-17. Estimate Cost of Solar Programs

Initiative (Source)	Cost in billion of dollars	MW installed	Date of completion
SDSE (Powers, 2007)	\$1.5 (lifecycle cost in 2007 dollars)*	2,040 (with battery storage)	2020
CSEFP (Hall, 2005)	\$2.5	Enough for all energy needs of San Diego County	30 years from start of project
CSI (SB 1)	\$3.35	3,000**	2017
SDG&E (PEA)	\$20.6 (in 2006 dollars)	2,000	2010
SDG&E (PEA)	\$1.1 (in 2006 dollars)	394	2010

* The term "lifecycle costs" refers to the cost over the 13 year period in which "San Diego Solar Initiative" will provide initiatives for solar PV installation.

** CSI has a goal of 3,000 MW for the entire State of California. Approximately 10% of the IOU customer base is served by SDG&E, therefore 300 MW of the entire solar installation is assumed to be in SDG&E service territory.

Renewables. The All Solar Alternative would meet the objective for promoting renewable energy as part of SDG&E's generation portfolio.

Feasibility

Economic, legal, and technical feasibility challenges would need to be overcome in order to develop numerous individual solar PV installations throughout San Diego County. Achieving the reliability goal by 2010 with solar PV requires a much faster deployment than contemplated by the CSI or the "San Diego Solar Initiative" in the SDSE. The proposals under the SDSE and the CSEFP require anywhere from \$1.5 to \$2.5 billion dollars to deploy the target level of solar PV by 2020. Building the initial 406 MW contemplated under this alternative would be a much more aggressive deployment (more than double the rate) of solar PV than the CSI program in the early years, and an unknown level of incentives would be required to meet the 2010 and 2016 targets of the All Solar Alternative. Without additional legislation for these incentives, it would be difficult or impossible to achieve this level of penetration. Because SDG&E does not administer the CSI (the San Diego Regional Energy Office does), the utility would not be likely to control the necessary rebate policies or other any other programmatic details of the All Solar Alternative.

Environmental Advantages

Environmental impacts of the Proposed Project would not occur under the All Solar Alternative.

Environmental Disadvantages

The primary environmental disadvantages to solar PV projects include visual impacts of individual installations and generation of hazardous wastes during the manufacturing process.

Alternative Conclusion

ELIMINATED. The All Solar Alternative is rejected because development of 402 MW nameplate capacity of solar PV installations with sufficient battery storage by 2010 is infeasible given the short timeframe. Development of the levels of solar PV installations needed for reliability purposes by 2010 and 2016 would involve substantial costs and incentives beyond those of existing initiatives. The New In-Area Renewable Generation Alternative (Section 4.10.2), which is retained for analysis would partially implement the All Solar Alternative and a wider range of other renewable resources.

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