

In the Matter of the Application of San Diego  
Gas & Electric Company (U-902-E) for a  
Certificate of Public Convenience and Necessity  
For the Sunrise Powerlink Transmission Project

Application No. 06-08-010  
Exhibit No.: \_\_\_\_\_

**CHAPTER 2**  
**SCOPE OF THE PROJECT AND ALTERNATIVES**

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

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## TABLE OF CONTENTS

|  | <b>Page</b> |
|--|-------------|
| I. SDG&E’S PROPOSED PROJECT .....  | 2.2         |
| A. Overview of the Proposed Project .....  | 2.2         |
| B. The Proposed Route .....  | 2.4         |
| 1. The Imperial Valley link .....  | 2.6         |
| a. Imperial Valley transmission line .....   | 2.6         |
| b. Imperial Valley substation .....  | 2.7         |
| 2. The Anza-Borrego link .....   | 2.7         |
| a. Anza-Borrego transmission line .....  | 2.8         |
| 3. The Central link .....  | 2.9         |
| a. Transmission line     10  |             |
| b. Central east substation .....   | 2.11        |
| 4. The Inland Valley link .....  | 2.12        |
| 5. The Coastal link .....  | 2.13        |
| a. Transmission line .....   | 2.13        |
| b. Substations .....   | 2.15        |
| 6. Other transmission line and substation upgrades .....   | 2.15        |
| C. Construction methods .....  | 2.17        |
| 1. 500 kV and 230 kV overhead transmission line construction .....   | 2.17        |
| 2. Underground construction .....  | 2.19        |
| 3. 500/230 kV substation .....   | 2.20        |
| 4. Helicopter construction .....   | 2.20        |
| D. SDG&E’s Proposed Project Meets the Project Objectives of Ensuring<br>Reliable Electric Service, Providing Access to Imperial Valley Renewable<br>Energy, and Reducing Above-Market Costs of Maintaining Reliability in<br>San Diego ..... | 2.21        |
| II. SDG&E'S ENHANCED NORTHERN ROUTE .....  | 2.23        |

|  |      |
|--|------|
| A. By Staying Within Its Existing ABDSP Transmission Corridor, SDG&E’s Enhanced Northern Route Avoids Lands that State Parks Has Administratively Designated as Wilderness and Reduces Impacts ..... | 2.23 |
| 1. FTHL eastern alternative .....  | 2.24 |
| 2. West main canal – Huff Road alternative .....   | 2.25 |
| 3. Overhead 500 kV ABDSP within existing 100-foot ROW alternative .....  | 2.25 |
| 4. CNF existing 69 kV route alternative .....  | 2.26 |
| 5. Oak Hollow Road alternative.....  | 2.26 |
| B. The Enhanced Northern Route is Similar to the Proposed Route but with Reduced Impacts.....  | 2.27 |
| C. SDG&E’s Enhanced Northern Route Meets All Project Objectives.....   | 2.28 |
| III. ASPEN’S “ENVIRONMENTALLY SUPERIOR NORTHERN ROUTE ALTERNATIVE” .....   | 2.28 |
| A. The Aspen Northern Alternative Is Marked by Undergrounding Through ABDSP.....   | 2.28 |
| 1. Flat Tailed Horned Lizard alternative.....  | 2.29 |
| 2. West Main Canal-Huff Road alternative .....   | 2.29 |
| 3. All underground 230 kV ABDSP SR78 to S2 alternative.....  | 2.30 |
| 4. Santa Ysabel SR79 all underground alternative .....   | 2.31 |
| 5. CNF existing 69 kV route alternative .....  | 2.32 |
| 6. Oak Hollow underground alternative.....   | 2.32 |
| 7. Chuck Wagon Road alternative .....  | 2.33 |
| 8. Coastal link system upgrade alternative .....   | 2.34 |
| B. The Aspen Northern Alternative Undergrounds through ABDSP at an Unnecessarily Huge Expense.....   | 2.34 |
| 1. Substantial undergrounding in ABDSP to avoid visual effect adds huge cost. ....   | 2.34 |
| C. The Aspen Northern Alternative Does Not Meet the Project Objectives.....  | 2.37 |

|  |      |
|--|------|
| IV. ASPEN’S “ENVIRONMENTALLY SUPERIOR SOUTHERN (SWPL) ALTERNATIVE” .....   | 2.38 |
| A. The Aspen Southern Alternative Puts Sunrise Through Cleveland National Forest and Across Indian Reservations.....   | 2.38 |
| B. The Aspen Southern Alternative is Infeasible and has More Impacts.....  | 2.41 |
| 1. Other portions of the Aspen southern alternative .....  | 2.41 |
| C. The Aspen Southern Alternative Does Not Meet Project Objectives Because It is Not Feasible.....   | 2.42 |
| V. SDG&E'S MODIFIED SOUTHERN ROUTE.....  | 2.42 |
| A. SDG&E’s Modified Southern Route Is Contingent on Necessary Forest Service Approvals and Overcoming Other Route Constraints. ....  | 2.42 |
| B. The Modified Southern Route Poses More Construction Limitations Than Other Routing Options.....   | 2.44 |
| C. Assuming Forest Service Approvals Can Be Obtained, Construction of Sunrise Along SDG&E’s Modified Southern Route Still Does Not Meet Project Objectives .....                 | 2.44 |
| VI. ASPEN’S “IN-AREA, ALL-SOURCE GENERATION ALTERNATIVE” .....   | 2.46 |
| A. Aspen assumes the future construction of numerous new generation projects.....  | 2.46 |
| 1. Fossil-fuel fired central stations.....   | 2.46 |
| 2. Peaking generation.....   | 2.48 |
| 3. Non-renewable distributed generation.....   | 2.48 |
| 4. In-area renewable generation.....   | 2.48 |
| B. Assuming Such New Generation Plants Are Built, SDG&E Would Need to Mitigate Reliability Criteria Violations to Its Transmission System to Accommodate the New Generation..... | 2.49 |
| 1. Results of the Analysis for the Fossil-Fuel Fired Central Stations.....   | 2.50 |
| 2. Results of the Analysis for the Peaking Generation .....  | 2.53 |
| 3. Results of the Analysis for the In Area Renewable Generation .....  | 2.54 |

|  |      |
|--|------|
| C. The In-area All-source Generation Alternative Would Not Meet Project Objectives Because It Is Infeasible and, Even if New Generation Is Assumed, It Would Not Interconnect Renewable Energy in Imperial Valley..... | 2.57 |
| VII. ASPEN’S “IN-AREA RENEWABLE GENERATION ALTERNATIVE”.....   | 2.58 |
| A. Aspen Assumes the Future Construction of Numerous New Renewable Generation Projects.....  | 2.58 |
| 1. Solar Thermal.....  | 2.58 |
| 2. Solar photovoltaic .....  | 2.59 |
| 3. Biomass/Biogas.....   | 2.60 |
| 4. Wind.....   | 2.60 |
| B. Assuming Such New Renewable Generation Plants Are Built, SDG&E Would Need to Upgrade Its Transmission System to Accommodate the New Generation. ....  | 2.61 |
| 1. Upgrades required for the solar thermal generation .....  | 2.62 |
| 2. Upgrades required for the solar photovoltaic generation.....  | 2.63 |
| 3. Upgrades required for the Biomass/Biogas generation .....   | 2.64 |
| 4. Upgrades required for the wind generation .....   | 2.64 |
| C. The In-area Renewable Generation Alternative Would Not Meet Project Objectives Because It Is Infeasible.....  | 2.67 |
| VIII. ASPEN’S “LEAPS TRANSMISSION-ONLY ALTERNATIVE” .....  | 2.67 |
| A. TNHC’s Proposed Transmission Project is an Incomplete Application Pending before the Commission.....  | 2.67 |
| B. For the TE/VS Interconnect to Achieve Necessary Import Capability, SDG&E Would Need to Construct Numerous Upgrades to SDG&E’s Transmission System. ....   | 2.69 |
| 1. SDG&E transmission upgrades will be necessary to achieve varying levels of import capability from the TE/VS Interconnect.....   | 2.69 |
| a. The Import Capability Assumed by the Aspen’s TE/VS Interconnect Alternative is Unsupportable. ....  | 2.70 |
| b. The TE/VS plan of service is incomplete. ....   | 2.73 |

C. TNHC Has Applied To Construct Both the TE/VS Interconnect and the LEAPS Generation Project as One Single Project.....2.74

D. Assuming that the LEAPS Generation and Transmission Alternative Were Constructed, SDG&E Would Need to Construct Other Upgrades to SDG&E’s Transmission System For the TE/VS Interconnect to Achieve Necessary Import Capability.....2.75

## CHAPTER 2

### **THE PROPOSED ROUTE, SDG&E'S "ENHANCED" ROUTES, THE DEIR ALTERNATIVES AND ASSOCIATED TRANSMISSION UPGRADES**

In this Chapter, SDG&E first describes the Sunrise Project, identified in the DEIR as the Proposed Project, the construction methods that would be used in its construction consistent with the Proposed Project route and design, and the project objectives Sunrise is designed to meet. SDG&E then describes its "Enhanced Northern Route," which includes several routing and design changes intended to mitigate some of the environmental impacts identified in the DEIR, the relevant construction methods, and how it meets the Project objectives.

SDG&E then describes and discusses two alternatives set forth in the DEIR that would construct the Sunrise Project on different routes with different design, the "Environmentally Superior Northern Route Alternative" ("Aspen Northern Alternative") and the "Environmentally Superior Southern (SWPL) Route Alternative" ("Aspen Southern Alternative"), followed by a description and discussion of SDG&E's "Modified Southern Route," which makes various routing changes to the Aspen Southern Alternative to mitigate both environmental impacts and a feasibility problem.

SDG&E then describes and discusses two "non-wires" generation alternatives identified in the DEIR that are ranked "environmentally superior" to any transmission project. Finally, SDG&E describes and discusses an alternative transmission option, the "LEAPS Transmission-Only Alternative," that also is ranked "environmentally superior" to any of the Sunrise alternatives. For each of the non-Sunrise alternatives, this Chapter also identifies the transmission upgrades that would be necessary to accommodate either the new generation or to accommodate a 1000 MW increase in import capability for the LEAPS Transmission Alternatives.

This Chapter provides foundation for discussion in later Chapters.

## **I. SDG&E'S PROPOSED PROJECT**

### **A. Overview of the Proposed Project**

SDG&E's Sunrise Project, as set forth in its Application and its Proponent's Environmental Assessment ("PEA") (the "Proposed Project" or "Proposed Route") consists of new electric transmission lines between the existing Imperial Valley and Peñasquitos Substations, a proposed new Central East Substation, and other system modifications in order to reliably operate the new lines. Collectively, the proposed transmission line, substation and system modifications are known as the Sunrise Powerlink Transmission Project ("Sunrise"). The total length of the Proposed Project to be constructed in Imperial County is 57 miles, while another 93 miles would be constructed within San Diego County. Woldemariam, Ex. SD-6 at V-2. The location of the Proposed Project is illustrated in Figure B-1 in the DEIR. The new transmission line would be capable of handling the electricity needs of over 650,000 customers and will help ensure a safe and reliable supply of energy for the region.

The Proposed Project includes the following new transmission lines:

- A new overhead single-circuit 500 kV (approximately 2,000 megavolt-ampere ("MVA") continuous) transmission line, approximately 91.3 miles in length, beginning at the Imperial Valley Substation and terminating at a new 500/230 kV substation referred to as the Central East Substation.
- A new double circuit 230 kV (approximately 900 MVA continuous per circuit) transmission line, approximately 45.3 miles in length, beginning at the new Central East Substation and terminating at the existing Sycamore Canyon

Substation. This project component consists of both overhead and underground segments.

- A new single circuit 230 kV (approximately 900 MVA continuous) transmission line, approximately 13.4 miles in length, beginning at the existing Sycamore Canyon Substation and terminating at the existing Peñasquitos Substation. This project component consists of both overhead and underground segments.
- Relocation of an existing 69 kV transmission line to parallel the proposed 230 kV overhead transmission lines between the junction of State Route (“SR”) 76 and SR 79 and a point near the existing Santa Ysabel Substation. To accommodate the proposed relocation, this segment would also include removal of the existing 69 kV structures, and placement of new towers along a nine mile segment to accommodate the relocated 69 kV line.
- Relocation of existing 69 kV and 92 kV transmission lines to the Proposed Project Right of Way (“ROW”) between the eastern boundary of Anza-Borrego Desert State Park (“ABDSP”) and the proposed Central East Substation. This segment would include placing portions of the existing 69 or 92 kV lines underground within the adjacent SR78 roadway and placing other portions of the existing 69 or 92 kV lines onto the 500 kV towers.

The Proposed Project includes the following new substation and modifications to existing substations:

- Construction of the proposed new Central East Substation capable of accommodating termination of one 500 kV transmission line from the Imperial Valley Substation and two 230 kV transmission lines that would extend to the

Sycamore Canyon Substation. The proposed new Central East Substation would encompass 40 acres of fenced area, located on private property in an undeveloped rural area, west of S2 and approximately 1.5 miles south of the intersection of S2 and S22 in northern San Diego Country.

- The existing Imperial Valley Substation would be modified to accommodate termination of one new 500 kV transmission line.
- The existing Sycamore Canyon Substation would be modified to accommodate termination of three new 230 kV transmission lines: two lines from the proposed Central East Substation and one line to the Peñasquitos Substation.
- The existing Peñasquitos Substation would be modified to accommodate termination of one new 230 kV transmission line from the Sycamore Canyon Substation.

The Proposed Project also includes other system upgrades:

- Reconductoring the existing 69 kV overhead transmission line from the existing Sycamore Canyon Substation to the existing Elliott Substation.
- Modification of the San Luis Rey Substation to add a 230 kV shunt capacitor.
- Modification of the South Bay Substation to add a 69 kV shunt capacitor.

## **B. The Proposed Route**

To conveniently communicate detail about the project facilities in its PEA, SDG&E divided Sunrise into four “links” according to geographic area: the Desert Link, Central Link, Inland Valley Link, and Coastal Link. In the DEIR, the Desert Link was further divided into the Imperial Valley Link and the Anza-Borrego Link, and SDG&E uses that terminology herein.

Imperial Valley Link and the Anza-Borrego Link, and SDG&E uses that terminology herein. The Links are shown in the DEIR Figure B-2. To provide a consistent frame of reference, the proposed Sunrise ROW has been assigned mileposts (“MP”), which range from the Imperial Valley Substation (MP 0) to the Peñasquitos Substation (MP 149.9).

Through the Imperial Valley and Anza-Borrego Links, the 500 kV transmission line would consist of a combination of a single circuit, self supporting tubular steel poles and lattice steel towers and be designed for thermal powerflow capability greater than 2000 MW in anticipation of future needs. Although the preferred route follows the existing transmission corridor and linear features to the extent possible, new rights-of-way and access roads will be required in the Imperial Valley Link, and expanded rights would be required within ABDSP. Outside of ABDSP, the proposed line will be located within a new 200 foot right-of-way. Within ABDSP, the proposed right-of-way is narrower than 200 feet, and would largely follow the route for the existing 69 kV and 92 kV transmission lines, which predate ABDSP and utilize a transmission corridor that is 100 feet in width. Woldemariam, Ex. SD-6 at V-5. Additional details for the transmission lines are included in PEA Chapter 2, Project Description, Ex. SD-9.

Starting in the Central Link, the new Central East Substation will be connected to the San Diego load center via two new 230 kV circuits that connect to SDG&E’s existing Sycamore Canyon Substation. Each of these circuits will be rated at approximately 900 MVA. In addition, a new 230 kV transmission line will be connected between SDG&E’s existing Sycamore Canyon and Peñasquitos Substations. The estimated length of the proposed 230 kV transmission line from the Proposed Central East Substation to its termination at the Peñasquitos Substation is approximately 59 miles. Through this portion of the route, the proposed 230 kV transmission circuits will be attached to a combination of self supporting tubular double circuit steel poles and

lattice steel towers. Some new rights-of-way and access roads will be required for these transmission lines.

### **1. The Imperial Valley link**

The Imperial Valley Link extends from MP 0 at the existing Imperial Valley Substation to MP 60.9 at the eastern boundary of ABDSP. The Imperial Valley Link includes modifications to the existing Imperial Valley Substation and construction of a new 500 kV transmission line that would extend from the Imperial Valley Substation to ABDSP. Within this link, 60.9 miles of 500 kV overhead transmission lines would be supported by a combination of lattice towers and steel poles within a new 200 foot ROW. Refer to DEIR Figure B-3 for details on the 500 kV route through Imperial Valley.

#### **a. Imperial Valley transmission line**

The 500 kV overhead transmission line would originate at the existing Imperial Valley Substation (MP 0) and parallel the existing 500 kV Southwest Powerlink (“SWPL”) for approximately four miles. The proposed Sunrise line would be constructed approximately 400 feet north of the existing SWPL towers. The new Sunrise structures would be constructed parallel to each existing SWPL tower.

At MP 4, the transmission line would turn north and travel through open desert land managed by the U.S. Bureau of Land Management (“BLM”), before crossing Interstate Highway 8 (“I-8”) and continuing through private agricultural land west of the outskirts of the unincorporated town of Seeley. The line would continue north-northeast toward the existing Imperial Irrigation District (“IID”) 161 kV transmission line at MP 20.4.

Between MP 20.4 to MP 37.7, the line would parallel the existing IID 161 kV transmission line to the east as it travels north-northwest toward the intersection of SR78 and

SR86. At MP 37.7, the Sunrise line would diverge from the IID ROW to follow SR78 for 2.5 miles to MP 40.2. The segment of 500 kV overhead transmission line between MP 40.2 and MP 47.3 would continue due west along the south side of SR78, turning due south and bypassing the existing IID Anza Substation (MP 47.2) to follow an existing IID 92 kV transmission line to MP 50. At MP 50, the Sunrise line would turn southwest for one mile, then due west to parallel the southern extent of an existing BLM property line. At this point (MP 54.2), the line would be parallel to the southern edge of the existing IID 92 kV transmission line. From MP 54.2, the Sunrise line would parallel the south side of the existing IID 92 kV transmission line to ABDSP at MP 60.9, passing the existing IID San Felipe Substation (MP 58.8).

#### **b. Imperial Valley substation**

The existing Imperial Valley Substation (MP 0) is located west of El Centro in southern Imperial County (DEIR Figure B-3). SDG&E proposes to modify the existing substation to accommodate the termination of an additional 500 kV circuit. Currently, the 500 kV SWPL passes through the Imperial Valley Substation as it brings power from Arizona to San Diego and the Imperial Valley. The Imperial Valley Substation also interconnects with the IID transmission system and transmission lines importing power from merchant generators at Mexicali and La Rosita to the south. All proposed modifications and all activities associated with staging and access would be located within the previously disturbed area of SDG&E substation property. *See* DEIR Section B.4.2.1 for additional details on construction specifications for the existing Imperial Valley Substation.

## **2. The Anza-Borrego link**

The Anza-Borrego Link extends 22.6 miles through ABDSP from MP 60.9 to MP 83.5. The Sunrise line would travel approximately 22.6 miles through ABDSP. The 500 kV

transmission line would be constructed entirely overhead through ABDSP on lattice towers or H-frame structures. Currently, an existing overhead 92 kV transmission line owned by IID enters ABDSP approximately two miles south of SR78 near the Ocotillo Wells Airport and terminates at the Narrows Substation, located within ABDSP. Additionally, SDG&E owns an existing 69 kV transmission line that enters the western boundary of ABDSP from Grapevine Canyon, passes through the Narrows Substation, and continues north to Borrego Springs. The Proposed Route within the entire Anza-Borrego Link would require replacement and relocation of the existing IID 92 kV and SDG&E 69 kV transmission lines, as described below.

The Sunrise line would follow the existing IID 92 kV or SDG&E 69 kV transmission line within ABDSP. Under the Proposed Project, an additional 50 feet of ROW width would be required. However, as discussed further below, the “Overhead Within Existing ROW Alternative” (incorporated into SDG&E’s Enhanced Northern Route) would keep the new 500 kV line within the existing 100-foot transmission corridor by utilizing narrower transmission structures. Refer to DEIR Figure B-4 for the route of the Sunrise Project within the Anza-Borrego Link.

**a. Anza-Borrego transmission line**

Milepost 60.9 marks the eastern end of the proposed 500 kV line within ABDSP. The 500 kV overhead line would follow the existing IID 92 kV line between MP 60.9 and the existing Narrows Substation (MP 69.7). As part of the Proposed Project, SDG&E would remove the 92 kV conductors from the existing wood poles between MP 60.9 and MP 68.2 and replace them with new conductors underbuilt on the new 500 kV lattice steel towers.

At SR78 (MP 68.2), the 92 kV circuit will transition to an underground transmission line located in the highway right-of-way, and the 500 kV structures will become tubular steel H-

frames located on the north side of SR78. The relocated 92 kV circuit will terminate at the existing Narrows Substation, and a 69 kV circuit will begin, continuing as an underground transmission line within the highway right-of-way. The 500 kV line would not connect with the Narrows Substation. The transmission lines will continue in this configuration until reaching Yaqui Pass Road also known as SR3.

SDG&E's existing 69 kV line to Borrego Springs would intersect the Sunrise ROW just west of the Narrows Substation (MP 69.7). Between MP 69.7 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 SDG&E's existing transmission corridor on the north side of SR78.

At the intersection of S3 and SR78 (MP 74.8), the 500 kV structures will become lattice towers, and the 69 kV circuit would transition back to an overhead configuration and would be attached onto the new 500 kV lattice steel towers in an underbuild position. This segment would traverse through Grapevine Canyon along the north side of Grapevine Canyon Road to the western boundary of ABDSP (MP 83.5) following the existing 69 kV transmission alignment for most of the way until reaching the proposed Central Substation, with the exception of a short diversion into the administratively designated wilderness area to reduce environmental impacts. Woldemariam, Ex. SD-6 at V-3-4. The wood poles that currently support the 69 kV or 92 kV segments that would be underbuilt on the Sunrise structures, or placed underground, would be removed (MP 61.7 to MP 83.5).

### **3. The Central link**

The Central Link of the Proposed Project includes the area between the western boundary of ABSDP (MP 83.5) and MP 110.8, which is southwest of the SR78 and SR79 junction, near

Santa Ysabel. The new Central East Substation is included in this portion of the Proposed Project. The eastern half of the Central Link includes the overhead 500 kV transmission line from the Anza-Borrego Link to the proposed Central East Substation. A new overhead double-circuit 230 kV transmission line would begin at the new Central East Substation and extend to the southwestern edge of the Central Link boundary, near the community of Santa Ysabel. Throughout the Central Link, the overhead line would be supported by lattice towers or steel poles within a new ROW ranging from 200 to 300 feet wide. Refer to DEIR Figure B-5 for the route of Sunrise within the Central Link and Table B-1 “Proposed Structure Configuration” for details on structure locations.

**a. Transmission line**

From the western boundary of ABDSP (MP 83.5), the overhead 500 kV line would continue northwest through Grapevine Canyon to MP 87.6, following SDG&E’s existing 69 kV transmission line ROW. The existing 69 kV circuit would be removed from the wood poles and attached to the 500 kV structures through this segment. The wooden poles that currently support the 69 kV circuit would remain to support existing distribution circuits. Near the proposed Central East Substation (MP 91.0), the 69 kV line would separate from the 500 kV towers and continue northwest to the existing Warners Substation on existing wood poles.

The overhead 500 kV line would end at the proposed Central East Substation and the overhead double-circuit 230 kV lines would begin. From the Central East Substation, the proposed Sunrise line would follow the west side of S2 as it travels north to MP 92.6, then west through Vista Irrigation District (“VID”) property. At MP 97.6, the line would turn southwest to parallel the existing SDG&E 69 kV transmission line. This segment follows the east side of

SR79 before crossing to the west side of the road near the junction of SR79 and SR76 (MP 100.2).

At MP 100.2, the double-circuit 230 kV transmission line would jog first west, then south, adjacent to (but not entering) the eastern boundary of the westernmost portion of the Santa Ysabel Indian Reservation, and then follow other parcel boundaries to MP 103.5. The segment between MP 103.5 and MP 106.1 would traverse southeast along Mesa Grande Road. At this point (MP 106.1), the route would turn due south and travel west of SR79 and cross SR78 before turning roughly southwest to MP 110.8.

The existing 69 kV transmission line that is currently located along SR79 between MP 100.2 and Santa Ysabel Substation would be relocated and placed on new tubular steel poles within the Sunrise ROW, paralleling the proposed overhead double-circuit 230 kV line until MP 109.4, which is approximately 1.5 miles southwest of the Santa Ysabel Substation. At this point, the 69 kV line would deviate from the consolidated Sunrise Project ROW to enter the Santa Ysabel Substation from the south. The existing 69 kV poles would be removed between MP 100.2 and MP 109.4.

#### **b. Central east substation**

The proposed Central East Substation would provide voltage step down from the 500 kV transmission line from the Imperial Valley Substation to the double-circuit 230 kV line exiting toward the existing Sycamore Canyon Substation. The proposed Central East Substation, located within a fenced area of approximately 40 acres in size, would be on 404 acres of SDG&E fee-owned property in an undeveloped rural area of northern San Diego County located west of San Felipe Road, approximately 1 ½ miles south of the intersection of San Felipe Road and Montezuma Valley Road. The electrical facilities of the substation would include 500 kV and

230 kV air insulated electrical buses; one 500 kV transmission line, two 230 kV transmission lines, two 1120 MVA transformer banks, one series capacitor, two 230 kV shunt capacitors and associated breakers, disconnect switches, protective relays, metering, and Supervisory Control and Data Acquisition (“SCADA”) and communication equipment. Other facilities would include two single-story relay/control buildings, a single-story storage building, and a fire prevention system with associated hydrants and water tank.

#### **4. The Inland Valley link**

The Inland Valley Link encompasses the double-circuit 230 kV transmission lines 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. Throughout this link, the transmission line would be located in new and existing ROWs ranging between 60 and 200 feet wide. The overhead line would be supported by lattice towers and steel poles. Refer to DEIR Figure B-6 and B-7 for detail of the Sunrise route within the Inland Valley Link.

From the western boundary of the Central Link (MP 110.8) to the underground transition (MP 117.2), the proposed overhead double-circuit 230 kV transmission lines would generally parallel the existing SDG&E 69 kV overhead transmission line that connects the Santa Ysabel and Creelman Substations. However, near MP 111.3, the proposed 230 kV and existing 69 kV lines would be routed to the west of the existing 69 kV transmission corridor for approximately one mile to avoid Cleveland National Forest. The Proposed Project would then parallel the existing 69 kV line, approximately 125 to 150 feet to the west, to MP 117.2.

At MP 117.2, within Mount Gower Open Space Preserve, the overhead double circuit 230 kV line would transition to underground at two cable poles. The line would then proceed as

an underground transmission line, with each 230 kV circuit contained in a duct bank and the duct banks located approximately 20 feet apart. The underground line would follow an unpaved access road within the Mount Gower Open Space Preserve, then continue south within the Gunn Stage Road right-of-way, and then west in the San Vicente Road right-of-way.

At MP 121.9, to the west of Chuck Wagon Road, the underground line would transition back to overhead at two cable poles. The overhead line would then continue west on double circuit 230 kV tubular steel poles on the north side of San Vicente Road until crossing the road at MP 122 to intercept an existing 100 foot right-of-way and continue west along the north side of San Vicente Road to MP 123.3. Between MP 123.3 and the existing Sycamore Canyon Substation (MP 136.3), the overhead double-circuit 230 kV transmission lines would be built within the existing SDG&E ROW, parallel to an existing 69 kV transmission line, crossing Mussey Grade Road at MP 128 and SR67 at MP 131.9.

## **5. The Coastal link**

The Coastal Link of the Proposed Project encompasses modifications to the existing Sycamore Canyon Substation and construction of a single-circuit 230 kV transmission line between Sycamore Canyon Substation (MP 136.3) and the existing Peñasquitos Substation (MP 149.9). Additionally, the Coastal Link includes proposed modifications to the existing Peñasquitos Substation. The Coastal Link of the Proposed Project would consist of both overhead and underground segments. Throughout this link, the transmission line would be located in new and existing ROWs ranging between 60 and 300 feet wide. The overhead line would be supported by steel poles. Refer to DEIR Figures B-8 and B-9 for detail of the Sunrise route in the Coastal Link.

### **a. Transmission line**

From the existing Sycamore Canyon Substation (MP 136.3), the single-circuit 230 kV overhead transmission line would be located within an existing utility ROW to Chicarita Substation (MP 142.3). The existing utility ROW between the Sycamore Canyon and Chicarita Substations presently contains 230 kV and 69 kV circuits supported by double-circuit steel poles or lattice towers and a 138 kV circuit supported by wood H-frame structures. Under the Proposed Project, the new 230 kV transmission line would be constructed on double-circuit steel poles and the existing 138 kV circuit would be relocated to the new 230 kV poles. The existing 138 kV H-frame structures would be removed. The Sunrise line would not enter the existing Chicarita Substation, and no new construction or modifications are proposed there.

Just outside of the existing Chicarita Substation (MP 142.3), the existing 69 kV, 138 kV, and 230 kV lines would transition from one SDG&E ROW to a connected ROW and the new single-circuit 230 kV overhead line would transition from overhead to underground at a cable pole. This portion of the Sunrise line would be underground within an existing, vacant SDG&E ROW between MP 142.3 and MP 143.9. At MP 143.9, the underground line would deviate from the existing SDG&E ROW to follow Park Village Drive and an existing trail within Los Peñasquitos Canyon Open Space Preserve to MP 146.6. At this point (MP 146.6), the 230 kV single-circuit line would transition from underground to overhead at a cable pole. DEIR Figure B-9 illustrates the underground segment of Sunrise within the Coastal Link.

Between MP 146.6 and the existing Peñasquitos Substation (MP 149.9), the single-circuit overhead 230 kV transmission line would follow existing 69 kV and 138 kV transmission lines that are supported on shared double-circuit lattice towers. The Sunrise line would parallel these circuits on newly constructed support structures. Additionally, there is a second 69 kV circuit within this stretch of ROW that is supported by wood H-frame structures. This second 69 kV

circuit would be removed and relocated to the new 230 kV structures and the H-frame structures that originally supported the 69 kV circuit would be removed. Peñasquitos Substation would be the western terminus of the Sunrise transmission line.

#### **b. Substations**

SDG&E proposes to modify the existing Sycamore Canyon Substation, located on the northeastern side of Miramar Marine Corps Air Station at MP 136.3, to accommodate the termination of three new 230 kV transmission circuits (two 230 kV circuits entering the substation from the new Central East Substation and one single-circuit exiting the substation toward the existing Peñasquitos Substation). All proposed modifications and associated staging and access requirements would be located within the previously disturbed area of SDG&E substation property. *See* DEIR Section B.4.2.3 for additional details on construction specifications for the existing Sycamore Canyon Substation.

The existing Peñasquitos Substation, located northeast of the junction of Interstate Highways 5 and 805 (“I-5” and “I-805”) at MP 149.9, would also be modified to accommodate the termination of one 230 kV transmission circuit from the Sycamore Canyon Substation. All work and associated staging areas and equipment would be located on previously disturbed areas within the boundaries of the existing SDG&E substation property. *See* DEIR Section B.4.2.4 for additional details on construction specifications for the existing Peñasquitos Substation.

### **6. Other transmission line and substation upgrades**

Additional system upgrades are proposed under the Sunrise Project and would be required to accommodate the operation of the transmission line in accordance with state and federal electric system criteria. The existing 69 kV overhead transmission line between the existing Sycamore Canyon and Elliot Substations would be reconductored. *See* DEIR Section

B.2.6.1 and B.4.3.3. In addition, system upgrades would be performed at the existing San Luis Rey and South Bay Substations, as described below. The locations of the proposed system upgrades are shown in DEIR Figure B-10.

Sycamore Canyon to Elliot 69 kV Reconductor: Reconductoring of the existing 69 kV transmission line between Sycamore Canyon Substation and Elliot Substation is required to increase the capacity and reliability of this circuit. Currently, this line traverses 8.2 miles on 84 wood poles. The reconductoring would require improving existing access roads to facilitate entry into individual structure sites, replacement of 11 existing poles, replacement of porcelain insulators with polymer insulators, and replacement of the existing aluminum-clad steel reinforced/aluminum (ACSR/AW) conductors with aluminum-clad steel supported/aluminum (ACSS/AW) conductors. Refer to DEIR Figure B-11 for a map of the proposed reconductoring.

San Luis Rey Substation: SDG&E's original proposal for the existing San Luis Rey Substation included installation of a new third 230/69 kV transformer and a 230 kV, 69 MVAR shunt capacitor within substation property. A new 230/69 kV transformer is now being installed in 2008 as part of another project. One of the existing banks was going to be removed after the completion of this project but will now remain and go in-service as part of the Sunrise Project. The shunt capacitor will be installed as part of Sunrise.

South Bay Substation: To provide system voltage support, modifications would be performed at the South Bay Substation, including installation of a 69 kV, 50 MVAR shunt capacitor. *See* DEIR Section B.4.3.2 for additional description of the proposed modifications to the South Bay Substation.

### **C. Construction methods**

This section provides a general description of the construction activities that are anticipated for each component of the Project. Specifically, the general construction methods would be applicable to both the Proposed Project and the alternatives. To meet the proposed in-service date, construction on most of the Sunrise Project components would occur concurrently. All transmission facilities will be designed and installed in compliance with CPUC General Orders (“GO”) 95 and 128. Further construction details can be found in SDG&E’s PEA Chapters 2 and 3, filed August 2006, Ex. SD-9.

#### **1. 500 kV and 230 kV overhead transmission line construction**

Construction of the 500 kV transmission line would begin with building unpaved access roads to facilitate entry to individual structure sites. Where possible, new access roads would be within existing rights of way and/or close to existing access roads. Access roads not required for future maintenance would be removed and rehabilitated after construction is complete.

After access road construction, clearing of individual structure sites would follow. These cleared areas provide a safe working place for vehicles, equipment, and materials. Foundation work would then begin, typically involving the installation of drilled concrete piers. A rock anchoring or mini-pile system would be used where access to the site is very difficult or where adjacent structures could be damaged from blasting or rock excavation activities. HydroVac, which uses water pressure and a vacuum to excavate material into its storage tank, may be used in areas where sensitivity and impact must to be kept to a minimum.

Typical tangent lattice steel structures would require 45 to 450 cubic yards of concrete delivered to each structure location for tangent structures, 25 to 30 cubic yards for angle structures and 100 cubic yards for dead-end structures. Tangent H-frame and tubular steel poles

would require anywhere from 50 to 100 cubic yards of concrete. Concrete would typically be delivered directly to the excavation in concrete trucks with a capacity as large as 10 cubic yards. In cases where access is limited, concrete can be pumped from several hundred feet away from the excavation. The volume of concrete required for excavated holes of transmission structure foundations is depicted in Table B-6 on page B-55 of the DEIR. For example, 500 kV tangent lattice tower foundations typically require 25-45 cubic yards of concrete.

Lattice tower or steel pole structures would be assembled at each site, erected and bolted to the foundations. Steel members for each structure would be delivered to each location by flatbed truck. Steel structures would be assembled on the ground, facilitated by a small truck-mounted crane. Following assembly, the tower would be lifted onto the foundation with a large crane that would move along the ROW for tower erection purposes.

Once structure installation is completed, conductor, shield wire and fiber optic ground wire stringing would be completed. Conductor, shield wire and fiber optic ground wire stringing would begin with the installation of insulators and stringing sheaves. The initial stringing operation would consist of pulling a “sock line” through the sheaves along the line.

Pulling the sock line is accomplished by either pulling it with a vehicle traveling along the ROW or, at the construction contractor’s option, with a small helicopter flying the ROW. The sock line would then be attached to the hardline and pulled through the sheaves. The hardline would then be attached to the conductor which would then be pulled into place. Pulling and tensioning sites would be required approximately every one to four miles along the line route. The sites are needed to set up the tractors and trailers with reels of conductors, as well as the trucks with the tensioning equipment. To the greatest extent practical, pulling and tensioning

sites would be located within the transmission ROW, however, some pulling and tensioning sites may occur outside of the ROW.

## **2. Underground construction**

The majority of the duct banks would be installed using open-cut trenching techniques. Most of the duct bank would have a vertical configuration with six cables for each circuit. At some locations, transitioning to a flat configuration may be required to clear substructures in highly congested areas or to fan out to termination structures at the transition area. The typical trench dimensions for installation of a duct bank with a vertical configuration would be a minimum of six feet deep and three feet wide, although depth may vary depending on soil stability and the presence of existing substructures. If a flat configuration is required, the trench width would be increased to approximately six feet.

The ductbanks for the 230 kV circuits require two cables per phase (bundled) and there will be two ductbanks. The dimensions of the ductbanks are approximately three feet, six inches wide by three feet, six inches deep with six 8-inch diameter PVC conduits for the electrical cables plus an additional conduit for communication cable. The cable would typically be a copper or aluminum conductor extruded dielectric cable. The ductbanks will be approximately twenty feet apart although this can vary due to terrain or ROW limitations. Separation must be maintained with only short exceptions to avoid de-rating the cable.

Each 230 kV circuit will terminate on a tubular steel pole with an anchor-bolted, drilled pier foundation. For the double circuit 230 kV segments, there will be two cable poles located at each end. The installation of the cable poles and foundations will be similar to the installation of tubular steel transmission poles described above. The structure would support cable

terminations, lightning arrestors, and dead end hardware for overhead conductors. *See* DEIR Figure D.3-21B (photo simulation).

### **3. 500/230 kV substation**

The substation site would require excavation, grading, and other site improvements to accommodate the required equipment. The grading plan will emphasize balanced cut and fill to the extent possible. The finished grade will include class II base material with paved asphalt driveways to the high usage facilities. The drainage plan will take into consideration the storm water flow, with an emphasis on erosion control. The landscaping plan will provide for ground cover for erosion control and visual screening where applicable. An eight foot tall chain link fence topped with barbed wire will enclose the entire substation pad.

### **4. Helicopter construction**

Helicopters will be utilized for lattice tower erection in locations where access is limited, such as areas without suitable access roads, areas with environmentally sensitive habitat that may be impacted with ground construction, or areas with limited pad area to facilitate crane and support vehicle setup and a structure assembly area. Other tasks that would typically be completed using helicopters include the delivery of construction laborers, equipment, and materials to structures sites, concrete placement, structure erection (tubular steel poles are generally installed with a crane due to excessive weight and difficulty in aligning multi-faceted tubular sections), hardware installation and wire stringing operations. The use of helicopters would be considered in other locations if there are benefits to the Sunrise Project schedule or construction budget. It is anticipated that helicopter construction would be utilized for some structure locations in ABDSP, the Central Link, and the Inland Valley Link.

Helicopter construction activities would be based at a Project-material staging area, approximately ten to fifteen acres in size and typically referred to as a “fly yard.” Helicopter support provided in the fly yard would include fueling trucks, maintenance trucks and an operations crew. The fly yards would also be used for the storage of structure material storage and the erection of structure sections. These activities would require that several safety and environmental precautions be implemented at each fly yard including fuel spill containment and dust abatement.

In summary, the construction activities will encounter multiple terrain types across various land jurisdictions. There will also be various city and county restrictions and ordinances to resolve during construction. Construction duration will vary for each route segment but it is estimated that project construction will be completed in 22 to 24 months for the Proposed Route. SDG&E anticipates that construction will be conducted six days a week for ten to twelve hours per day, thus, equipment and vehicle conservative usage will also be ten to twelve hours per day, as shown in the PEA, Ex. SD-9 at 2-39. Realistically, equipment and vehicles will not run for ten to twelve hours per day and certainly not simultaneously. Instead, most equipment is probably running fewer hours per day, stopping for at least lunch and breaks reducing the run time to approximately seven to eight hours. Furthermore, all the equipment is not running at the same time. For example, some vehicles will only be used to transport crews from one site to another.

**D. SDG&E’s Proposed Project Meets the Project Objectives of Ensuring Reliable Electric Service, Providing Access to Imperial Valley Renewable Energy, and Reducing Above-Market Costs of Maintaining Reliability in San Diego.**

In its PEA, SDG&E identified the following eight objectives for the Sunrise Project:

- Ensure that SDG&E's transmission system satisfies required reliability criteria, including avoiding siting the Proposed Route parallel to the existing Southwest Powerlink for long distances and avoiding areas with fire history or fire potential.
- 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 and (b) supports regional expansion of the electric grid.
- Provide transmission capability for Imperial Valley renewable resources for SDG&E customers to assist in meeting or exceeding California 20 percent renewable energy resource mandate by 2010 and the Governor's proposed goal of 33 percent by 2020.
- 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.
- 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.
- Obtain electricity generated by diverse fuel sources and decrease the dependence on increasingly scarce and costly natural gas.
- 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.

- Minimize the need for new or expanded transmission line right-of-way in urban and suburban areas of the SDG&E service territory already transversed by multiple high voltage transmission facilities and, to the extent feasible, assist in implementing local land use goals.

Ex. SD-9 at 2-21 to 22.

The DEIR reduced these eight project objectives to three objectives: (1) maintain reliability in the delivery of power to the San Diego region; (2) reduce the cost of energy in the region; and (3) 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. DEIR ES-20.

The Proposed Project achieves all of these objectives.

## **II. SDG&E'S ENHANCED NORTHERN ROUTE**

### **A. By Staying Within Its Existing ABDSP Transmission Corridor, SDG&E's Enhanced Northern Route Avoids Lands that State Parks Has Administratively Designated as Wilderness and Reduces Impacts**

Since its CPCN filing in August 2006, SDG&E has continued its efforts to work with landowners and agencies to develop further segment modifications along the Proposed Project route. As modifications were developed, SDG&E has provided these modifications to the Commission and BLM. The Commission's Energy Division and BLM have included these modifications as routing alternatives in the DEIR along with modifications developed by Aspen.

In response to concerns and suggestions raised since the August 2006 Application was filed, SDG&E has identified an "Enhanced Northern Route" that consists of SDG&E's Proposed Project with some segments replaced by the following alternative segments analyzed in the

DEIR. Some of these segments are also included in the Aspen Northern Alternative, discussed in the next section. The end result is a complete proposed northern route.

SDG&E's Enhanced Northern Route includes the following modifications to the Proposed Project route:

- Flat Tailed Horned Lizard ("FTHL") Eastern Alternative (Imperial Valley Link);
- West Main Canal-Huff Road Modification Alternative (Imperial Valley Link);
- Overhead 500 kV ABDSP Within Existing 100-foot ROW Alternative (Anza-Borrego Link);
- CNF Existing 69 kV Route Alternative (Inland Valley Link);
- Oak Hollow Underground Alternative (Inland Valley Link);

Each of these modifications is discussed in more detail below.

### **1. FTHL eastern alternative**

The Proposed Project route paralleled the existing Southwest Powerlink for four miles and turned north before heading in a northeasterly direction towards the West Main Canal. The FTHL Eastern Alternative also parallels the Southwest Powerlink, but only for three miles, turning north sooner and taking a more direct route to the West Main Canal. The FTHL Alternative is shorter by 1.4 miles than the Proposed Project. This alternative was proposed as a way to avoid a route through a FTHL Management Area, and thus avoid impacts to this sensitive species. For further detail, *see* DEIR at Ap.1-27.

This alternative will result in some additional impacts to agricultural areas, but these impacts are minimal and manageable when compared to the potential impacts to the FTHL. By locating the transmission line adjacent to agricultural access roads, canals, and property lines, interference with agricultural operations would be nominal, and any interference would be duly

compensated by SDG&E to farmers as appropriate. By avoiding FTHL areas, recovery of this species could be assisted. Because much of the historic FTHL habitat is now farmed, one mitigation strategy if the FTHL Eastern Alternative were not implemented would be to take active farmland out of production to compensate for project impacts to the FTHL. By avoiding these impacts, and locating the transmission line in a way which substantially minimizes farming impacts, there may be a net reduction in impacts to both agriculture and FTHL by this route.

## **2. West main canal – Huff Road alternative**

This suggested modification would diverge from the Proposed Project at MP11, follow the IID West Main Canal to the east-northeast and turn north on Huff Road. It would go north on the east side of Huff Road for 1.5 miles before joining the Proposed Project route at MP 15.9. This alternative segment would avoid direct impacts to the Bull Frog Farms dairy structures and to the Raceway development. This alternative segment does not change the route length of the Proposed Project. For further detail, *see* DEIR at Ap.1-34.

## **3. Overhead 500 kV ABDSP within existing 100-foot ROW alternative**

This alternative keeps the route within the existing 100-foot transmission corridor in ABDSP, eliminating the additional 50 feet of right-of-way needed for the Proposed Route and reduces impacts to administratively designated Pinyon Ridge Wilderness in ABDSP. Delta lattice towers carrying both the 500 kV transmission line and the existing 69 kV and 92 kV circuits would be used for this alternative, and those structures would have an average height of 160 feet compared to an average of 130 feet for the structures in this segment of the Proposed Route. For further detail, *see* DEIR at Ap.1-68.

Even though the Sunrise line would remain within the existing transmission corridor under this alternative, SDG&E would continue its efforts to work with State Parks officials in

making adjustments to minimize impacts to biological, cultural and recreational resources to further reduce impacts to the ABDSP during final design and engineering. To the extent that State Parks would prefer to mitigate certain cultural impacts by routing the overhead 500 kV line around a sensitive cultural resource known as Grapevine Canyon and/or mitigate certain recreational impacts at Tamarisk Grove Campground by routing the overhead 500 kV line east of the Campground, SDG&E would continue its efforts to work with State Parks to implement those mitigation re-routes.

#### **4. CNF existing 69 kV route alternative**

This alternative was suggested during scoping to reduce property and visual impacts to single-family residences on SR78 and Deer Canyon Drive in unincorporated San Diego County. At MP 111.5, where the Proposed Route includes locating the 230 kV and existing 69 kV transmission lines west of the Cleveland National Forest (“CNF”), the CNF Existing 69 kV Route Alternative would remain in the existing 69 kV ROW, traveling southwest through CNF for approximately 0.5 miles and rejoining the Proposed Route at MP 112.5. This alternative would be 0.5 miles shorter than the Proposed Route and the existing 69 kV transmission line would not need to be relocated. For further detail, *see* DEIR at Ap.1-129. This alternative would be contingent on U.S. Department of Agriculture Forest Service approval, but SDG&E believes that this might be achieved with a project specific non-significant Forest Plan amendment in a time frame consistent with SDG&E’s project objectives.

#### **5. Oak Hollow Road alternative**

This alternative was developed to reduce property and visual impacts to Starlight Mountain Estates. The double circuit overhead 230 kV line would transition underground as a 230 kV double circuit line in parallel duct banks at approximately MP 116.7 at transition poles within Mount 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 Starlight Mountain Estate Owners ("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 Project route at MP 117.3 along Gunn Stage Road. For further detail, *see* DEIR at Ap.1-133.

The modifications proposed by SDG&E in its Enhanced Northern Route reduce impacts and render the route more feasible, by potentially reducing the regulatory obstacles associated with State Parks,<sup>1</sup> while still meeting the project objectives – including access to Imperial Valley renewable energy resources and ensuring system reliability and expandability.

**B. The Enhanced Northern Route is Similar to the Proposed Route but with Reduced Impacts.**

The construction methods for the Enhanced Northern Route will be very similar to that described for the Proposed Route in Section I-C above. Construction methods in ABDSP would differ from the Proposed Project in that the Enhanced Northern Route would limit permanent

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<sup>1</sup> SDG&E notes that State Parks has recently asserted that a General Plan amendment will be necessary even if Sunrise remains within SDG&E's existing transmission corridor. SDG&E does not agree with that assessment as discussed *infra*. In all events, SDG&E believes that many of State Parks' concerns may be addressed by keeping Sunrise in the existing transmission corridor.

construction impacts to the existing 100-foot transmission corridor. Construction impacts outside of the ABDSP right-of-way would only be temporary and would only occur where absolutely necessary to construct the transmission line. For the FTHL Alternative, additional steel pole structures may be installed for the FTHL Alternative as compared to the original Proposed Project in this segment. Steel poles will help reduce the environmental impacts to agricultural lands along this alternative.

**C. SDG&E’s Enhanced Northern Route Meets All Project Objectives.**

Like SDG&E’s Proposed Route, construction of Sunrise along SDG&E’s Enhanced Northern Route would achieve all project objectives.

**III. ASPEN’S “ENVIRONMENTALLY SUPERIOR NORTHERN ROUTE ALTERNATIVE”**

**A. The Aspen Northern Alternative Is Marked by Undergrounding Through ABDSP**

The DEIR identifies an alternative route and design for Sunrise that is entitled the “Environmentally Superior Northern Route Alternative” (“Aspen Northern Alternative”). The DEIR states that the Aspen Northern Alternative is the “Proposed Project (75 miles) plus 8 alternatives (64 miles) replacing proposed segments, with 85 miles overhead and 54 miles of underground 230 kV transmission line.” DEIR at ES-3.

As described in the DEIR, the Aspen Northern Alternative is comprised of segments that are the same as the Proposed Route and eight alternatives that replace segments of the Proposed Route. The eight alternatives are identified in the DEIR as:

- Flat Tailed Horned Lizard (FTHL) Eastern Alternative (Imperial Valley Link);
- West Main Canal-Huff Road Modification Alternative (Imperial Valley Link);
- All Underground ABDSP SR78 to S2 Alternative (ABDSP Link);
- Santa Ysabel SR79 All Underground Alternative (Central Link);

- CNF Existing 69 kV Route Alternative (Inland Valley Link);
- Oak Hollow Underground Alternative (Inland Valley Link);
- Chuck Wagon Road Alternative (Inland Valley Link);
- Coastal Link System Upgrade Alternative (Coastal Link)

DEIR at ES-40. In addition, the DEIR proposes a Top of the World Substation in lieu of the Central East Substation, neither of which would be required under the Aspen Northern Alternative if the Partial Underground ABDSP SR78 to S2 Alternative with the All Underground Option is selected. DEIR at ES-54. The following only describes the eight alternatives since the description for the unchanged segments of the Proposed Route are provided above.

### **1. Flat Tailed Horned Lizard alternative**

This alternative was developed by Aspen to avoid almost two miles of impact to the FTHL Management Area. This would be accomplished by diverting north from the Proposed Route at MP 3, following section lines of agricultural lands, crossing I-8 and rejoining the Proposed Route at MP 8.8. The 500 kV line for this segment would be constructed on lattice tower structures and when close to roads and agricultural areas on steel pole structures.

### **2. West Main Canal-Huff Road alternative**

This alternative was suggested by SDG&E to avoid directly impacting Bullfrog Farm dairy operations and the Raceway development. This segment is a 4.9 mile long segment that travels in a northeast direction along the IID Westside Main Canal, and then turns north on Huff Road in the area just north of Interstate 8 and west of El Centro. The route would diverge from the Proposed Route at MP 11, follow the IID Westside Main Canal to the northeast, turn on Huff Road heading north along the east side of the road, and reconnect with the Proposed Route at MP

15.9. The 500 kV line in this segment would be constructed mostly using steel pole structures to minimize impacts across agricultural areas.

**3. All underground 230 kV ABDSP SR78 to S2 alternative.**

Following the West Main Canal-Huff Road Modification Alternative, the Aspen Northern Alternative again joins the Proposed Route until the site of the existing San Felipe Substation. Here, a new San Felipe 500/230 kV Substation would be required, which would eliminate the need for the Proposed Central East Substation. At the new San Felipe Substation, the Proposed Route would be replaced by the All Underground 230 kV ABDSP SR78 to S2 Alternative. With this alternative, the route would consist of a double circuit 230 kV transmission line, located entirely underground through ABDSP.

Instead of an overhead single circuit 500 kV line through ABDSP as in the Proposed Route, this alternative would place an underground double circuit 230 kV through ABDSP along SR78 and S2. At a new San Felipe Substation (MP 58.8) just outside of ABDSP, the 500 kV line would transition underground as two 230 kV circuits. As proposed in the DEIR and as shown in Figure Ap.1-6, the two 230 kV circuits would be in a single duct bank with a future duct bank roughly parallel and about 8 feet apart. SDG&E requires the two 230 kV circuits to be installed in separate duct banks ideally with 20 feet of separation. See further discussion below regarding impacts to cable performance with reduced separation. The underground line would follow Split Mountain Road for 2.6 miles and then follow along SR78 for 8.2 miles before joining the Proposed Project at MP 68.2. It would then continue along SR78 for 13 miles before coming to the SR78/S2 intersection. It would then continue underground along S2 for 8.8 miles and would transition overhead at two cable pole structures 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).

This alternative would place the proposed 500/230 kV substation east of ABDSP instead of west of ABDSP as the proposed Central East Substation. It would be located adjacent to the existing IID San Felipe Substation. The proposed facilities and general arrangement would be identical to that of Central East Substation.

#### **4. Santa Ysabel SR79 all underground alternative**

From where the All Underground 230 kV ABDSP SR78 to S2 joined the Proposed Project route and transitioned overhead near MP 90 to MP 100, the transmission line would continue overhead on double circuit 230 kV structures. The route would then diverge from the Proposed Route at the intersection of SR76 and SR79 by following the Santa Ysabel All Underground Alternative,<sup>2</sup> which travels along SR79 through portions of the Santa Ysabel Indian Reservation, continuing south until just past the Santa Ysabel Substation where the route reconnects with the Proposed Route.

This 8.9 mile alternative would underground double circuit 230 kV within SR79 through the community of Santa Ysabel. The underground double circuit 230 kV line then would continue east of the existing 69 kV ROW. It would then turn east for 1500 feet across a drainage area that would require a horizontal directional drill and existing hay fields then intersecting SR79. South of Mesa Grande, this alternative continues underground in SR79 for 3.5 miles to intersect with SR78. A bridge crossing SR79 south of Mesa Grande would require Caltrans

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<sup>2</sup> If the Santa Ysabel All Underground Alternative is determined to be infeasible, the DEIR states that the Mesa Grande Alternative with the Santa Ysabel Partial Underground Alternative would be environmentally superior after the Santa Ysabel All Underground Alternative. DEIR at ES-40 n.3.

approval in order to install a self-support bridge on both sides and attach the 230 kV underground circuits to the sides of the bridge. The underground line would turn east, work its way around the existing Santa Ysabel substation turning southwest along a dirt road. It would rejoin the Proposed Route at MP 109.4 and transition overhead there at cable poles similar to those shown in the DEIR Figure B-18.

#### **5. CNF existing 69 kV route alternative**

This alternative was suggested during scoping to reduce property and visual impacts to single-family residences on SR78 and Deer Canyon Drive in unincorporated San Diego County. At MP 111.5, 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 the CNF, the CNF Existing 69 kV Route Alternative would remain in the existing 69 kV ROW heading southwest through CNF for approximately 0.5 miles to rejoin the proposed route at MP 112.5. 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. For further detail, *see* DEIR at Ap.1-129. This alternative would be contingent on Forest Service approval, but as noted, SDG&E believes that this could be achieved with a project specific non-significant Forest Plan amendment in a time frame consistent with SDG&E's project objectives.

#### **6. Oak Hollow underground alternative**

The Oak Hollow Underground Alternative is a 0.6 mile segment of additional underground 230 kV transmission line through a residential area. This alternative would require construction of one new tower just outside of, but adjacent to the existing 69 kV ROW, as well as 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 Starlight Mountain Estate Owners ("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 Project at MP 117.3 along Gunn Stage Road.

#### **7. Chuck Wagon Road alternative**

The Chuck Wagon Road Alternative would eliminate the Proposed Route's overhead segment through the Barnett Ranch Open Space Preserve by creating a new corridor of both underground and overhead transmission line. 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 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 at cable poles and would turn west for 1.2 miles to rejoin the proposed route at MP 125.6. The underground portion of this route would require a 60-foot ROW.

## **8. Coastal link system upgrade alternative**

The Coastal Link Upgrade Alternative 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 existing wood frame structures. Additional system upgrades not identified within this Chapter of testimony may be required.

Aspen also identified a substation alternative to the proposed Central East Substation – the Top of the World Substation Alternative, which would be located approximately two miles west of the proposed Central East substation, southeast of the intersection of S22 and S2, at the north end of San Felipe Road. Neither substation would be required, however, if the Partial Underground 230 kV ABDSP SR78 to S2 Alternative with the All Underground Option is selected.

### **B. The Aspen Northern Alternative Undergrounds through ABDSP at an Unnecessarily Huge Expense**

#### **1. Substantial undergrounding in ABDSP to avoid visual effect adds huge cost.**

The feasibility of this alternative is questionable due to construction difficulties. The difficulty and challenge in construction related safety concerns, rock excavation, traffic impact and limited work space escalates the construction cost. It is highly likely that SDG&E would encounter hard rock and boulders at hard rock surfaces during trenching and manhole excavations. The steep slope of the rocky hill above the trenching area makes safety hazard of high concern since vibration from the hard rock removal will result to falling rocks from above. In addition, traffic control and limited work space impacts the work activities tremendously.

Challenges in construction technique are anticipated due to the limited work space. In addition, temporary closure of highway and road may be required for manhole construction and installation.

- **Intensive Traffic Control (for entire route)**

The entire route consists of two travel lanes with one lane for each direction with relatively narrow shoulders. In order to maintain traffic flow in Hwy 78 and San Felipe Road during construction, one lane shall be maintained for traffic flow for both directions. This requires extensive traffic control with flaggers and radio communication. During manhole construction and installation, traffic control shall be maintained for a 24-hour period until manhole installation is complete, or additional efforts required for bridging the steel plates on top of the manhole excavation, opening for traffic. This intensive traffic control escalates the construction cost. The alternative of closing HWY 78 and San Felipe Road was evaluated. Because Hwy 78 and San Felipe Road is the main thorough fare in the desert area, highway closure is unlikely.

- **Limited Work Space**

As mentioned earlier, the entire route consists of two traffic lanes with narrow shoulders. One lane will be kept open for traffic flows while another one will be closed. Due to the narrow shoulder, the work space along the entire route is limited and impacts the construction activities. For instance, after trench is excavated, there is not sufficient space for equipment along the trench (off loading conduits, concrete placement, FTB placement, or steel plates shall be removed and replaced to facilitate the conduit, concrete and FTB installation). This sequence of construction would impact the work progress tremendously, and escalate the construction cost. Construction activities will be most likely be restricted to stay in the roadway and shoulder area. Encroachment to the desert is prohibited. This means that the contractor will be limited to as much as 12 feet to 16 feet width of work space for the entire route because the other lane is required for traffic control. In the section of both sides being a steep upslope and/or down slope rocky hills, the areas available working space is as narrow as 12 feet which is proposed to be kept open for traffic. Trenching activity and manhole installation at this area requires closure of HWY 78. If traffic has to be maintained with one lane open, construction activities are limited to one lane of work space. Productivity and work efficiency is impacted tremendously and construction cost may be escalated 10 times or even more.

- **Hard Rock Excavation**

Field visit reveals hard rocks and boulders on both sides of the route for a distance of approximately 2.25 miles on Hwy 78 (please see areas indicated in the route map). Rock excavation and removal will be anticipated during trenching and manhole construction. Due to the limited work space, it makes trenching activity and manhole installation more time consuming and challenging. Work activities (AC removal, rock excavation and removal, conduit installation, concrete placement and FTB

placement, AC paving restoration) will be in one lane width of work space, while the other lane is kept open for traffic. In addition, falling rock from the steep upslope hill above the work area will be anticipated as well. This potential safety hazard shall be revised and evaluated, and requires a job hazard analysis prior to start of work. This job hazard analysis shall identify the hazard and proposed solution to mitigate or eliminate the hazard of falling rocks.

- **Creek Crossing**

Near the west entrance of the Anza-Borrego Desert State Park, the route would cross an existing creek via a bridge attachment. Other specialty methods like Jack & Bore method or Horizontal Directional Drilling method would not work because of the hard rock and boulders in the area. It is very obvious that the area near the existing bridge consists of hard rock and boulders. Bridge attachment is the easiest alternative crossing the creek. However, this bridge attachment alternative requires review and approval of CALTRANS and the County of San Diego. If the bridge attachment design is granted, the duct systems would be installed at the bottom of the sidewalk deck on both sides of the bridge. The design engineer would review the bridge design and obtain a permit from CALTRANS and the County of San Diego.

- **Remote Work Area**

The project site for this route alternative is considered a remote area. The nearest bigger town, Ramona, is approximately of 45 minutes drive. The proximity of the project site requires a longer drive for material/equipment delivery, daily commute of the crews and disposal haul off. This situation would limit the progress tremendously. For instance, it may take the whole shift for a water truck to deliver one truck of water to the site because of the driving times. The closest concrete batch plant may be too far. One concrete truck may only deliver one load of concrete per day, which will jeopardize the quality of the concrete and FTB. On-site batch plant shall be required, and batch plant site near the project shall be considered.

- **Equipment/Material Staging Area**

It is most likely that all material and equipment staging shall be out side of the Anza-Borrego Desert State Park. Equipment and material storage in the park during the off work hour is not likely to be granted. Equipment and material staging areas may be set up at both ends of the state park. However, due to the length of the route in the park, it will take longer times to mobilize to the work area in the central park areas. This will shorten the work window during the construction in the central park area.

- **Turn Around Area**

The Hwy 78 and San Felipe Road are long stretch roads with less turn around area. This means the trucks or construction equipment requires longer time to drive to the turn around area. This impacts the turn around time of the trucks, equipment and escalates the construction cost.

- **Transition Station & Loss Compensation**

Due to the length of the underground transmission, the riser pole at the west end of this route may require a transition station (switching and shunt reactors requirement)

to compensate for the energy loss due to its length. A detail study to confirm the requirement of the loss compensation shall be considered during the design phase of the project.

- **Two 230kV Circuits in Close Proximity**

The project in this route alternative consists of two 230kV circuits with two cables per phase in separate duct banks. Due to the limited width of the route, the two duct banks will be placed approximately 12 feet apart, center to center. In some areas, due to the steep down slope terrain in one side, the center to center distance between the two duct banks may be only 6 feet. This may result into two concerns: Heat dissipation from the circuits may de-rate each other, and reduce the cable ampacity ratings; Induce current from the energized circuit on the de-energized circuit when performing maintenance.

### **C. The Aspen Northern Alternative Does Not Meet the Project Objectives.**

Construction of Sunrise along the Aspen Northern Alternative does not meet the project objectives for a number of reasons. First, as discussed in Chapter 9, construction of Sunrise along the Aspen Northern Alternative appears infeasible because (a) it crosses the Santa Ysabel Indian Reservation without the Tribe's consent, (b) it repeatedly crosses in an underground configuration both in the Earthquake Valley Fault and in the Elsinore Fault, and (c) it proposes underground construction in a roadway too narrow to accommodate two duct banks without de-rating the cable ampacity and which Caltrans will not allow to be closed for construction. Because it is infeasible to construct, it does not meet any project objectives. In addition, as discussed in Chapter 9, the seismic risk to Sunrise constructed along the Aspen Northern Alternative means that it does not provide reliable electric service for SDG&E's customers. Finally, as discussed in Chapter 3, the \$3.168 billion cost of constructing Sunrise along the Aspen Northern Alternative means that it substantially provides less economic benefit to CAISO's customers than SDG&E's proposed Northern routes.

If the San Felipe substation becomes the transition point between 500 kV and 230 kV with 230 kV underground lines brought through ABDSP, then ultimately as many as four additional 230 kV circuits would be required through ABDSP, for a total of six 230 kV circuits.

Environmentally and economically, it is better to have one 500 kV transmission line through ABDSP than to have six 230 kV transmission lines through the park. 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 Sunrise in 2010. This is similar to additional 230 kV circuits which have been brought out of the Miguel Substation following construction of the existing Southwest Powerlink and additional 230 kV circuits which are planned by SCE for west of Devers, following completion of Palo Verde – Devers 500 kV #2.

If additional 230 kV circuits could not be put through the state park, then one of the objectives of Sunrise—expandability—would not be met with Aspen’s Northern Route. It makes no sense from a CAISO ratepayers’ perspective to significantly increase the cost of Sunrise --which an additional 23 miles of underground double circuit 230 kV transmission (through ABDSP) would surely do--while foreclosing (probably forever) future expansion of the 230 kV portion of the project.

Other considerations include increased environmental impacts from installing two, let alone six underground 230 kV circuits as opposed to one 500 kV circuit. These increased environmental impacts would come through digging up the road for the initial two circuits, diverting traffic for installation, as well as the subsequent impact from additional underground circuits in the future. There would also be significant transportation impacts during construction, and to address possible outages on the underground segments of the line, which could potentially take the entire road out of service at times.

#### **IV. ASPEN’S “ENVIRONMENTALLY SUPERIOR SOUTHERN (SWPL) ALTERNATIVE”**

##### **A. The Aspen Southern Alternative Puts Sunrise Through Cleveland National Forest and Across Indian Reservations.**

Aspen considered four transmission alternatives along a southern route and selected the 110-mile so-called “Environmentally Superior Southern (SWPL) Alternative” (“Aspen Southern Alternative”) from those four alternatives. The route primarily follows the DEIR-identified I-8 Alternative and the Modified Route D Alternative, with the Campo North, Star Valley and Chocolate Canyon Options substituting for segments of those alternatives, and the Coastal Link System Upgrades rather than the Coastal Link of the Proposed Route. The 500 kV structures would generally be lattice tower structures except potentially in areas near roads or in order to reduce impacts to agricultural lands. The 230 kV structures would be a combination of lattice towers and steel poles.

The Aspen Southern Alternative begins as a 500 kV overhead line at Imperial Valley Substation and parallels the existing Southwest Powerlink for 35.7 miles with 400 feet separation for the majority of the route. The alternative follows the Proposed Route until the point where the Proposed Route would travel north. Instead, the Aspen Southern Alternative continues first in a northwest direction to Plaster City, then due west, then southwest through Ocotillo, following SDG&E’s existing Southwest Powerlink to a point approximately six miles west of the border between San Diego and Imperial Counties (near MP 18-36). At that point, the 500 kV line would turn northwest, passing less than one mile southeast of the southwest corner of ABDSP and crossing the I-8 freeway at MP 18-39 just west of the BLM Carrizo Gorge Wilderness Area and one mile east of the community of Boulevard, until entering the Campo Indian Reservation just east of MP 18-44.

This route would continue through the Campo Indian Reservation, and includes the Campo North Route Option, which would locate the line north of I-8, instead of south of the highway, in the vicinity of a wind farm on the Reservation for just under 1.5 miles. After this

segment, the Aspen Southern Alternative would again follow the I-8 Alternative through the Campo Indian Reservation, exiting the western boundary of the Reservation at MP 18-47 and traveling northwest along I-8 until reaching the southern boundary of the La Posta Indian Reservation. The route would enter the La Posta Indian Reservation at MP 18-48 by locating at least one transmission structure and associated access roads and pull sites within the La Posta Reservation, before turning south to follow the Modified Route D Alternative.

The Aspen Southern Alternative would then follow the Modified Route D Alternative in a southwest direction for approximately 2 miles, turn west for 2.5 miles, following the southern boundary of the Cleveland National Forest, then turn south-southwest passing east of residences on Cameron Truck Trail. After approximately 3.5 miles, the route would continue west along the southern boundary of the forest, crossing Lake Moreno Drive and Big Potrero Truck Trail just west of MP MRD-11. After passing the Barrett Substation, the route would head north and enter the Cleveland National Forest near MP MRD-22. The transmission line would parallel areas where there are existing 69 kV lines diverting away in areas to avoid residences.

The Modified Route D Alternative segment used by the Aspen Southern Alternative would terminate at a new Modified Route D Substation, located on private land west of Japatul Valley Road. The substation would be approximately 40 acres in size and would accommodate four potential future 230 kV circuits and one future 500 kV circuit.

Exiting this proposed substation at MP MRD-34, the Aspen Southern Alternative would follow the Modified Route D Alternative: Star Valley Option. This overhead double-circuit 230 kV transmission line option would travel in a west-northwest direction for approximately 2.2 miles, then head north for 0.3 miles to meet Star Valley Road, 0.7 miles east of I-8's Exit 33 for Willows Road. On the southwest side of the bend in Star Valley Road at MP SVO-2.5, this

option would transition underground at cable poles and continue north to Alpine Boulevard to rejoin the I-8 Alternative.

Near the southwestern corner of the Viejas Reservation (but not within it), the Aspen Southern Alternative would rejoin the I-8 Alternative at MP 18-74, but would be located underground for approximately 8.8 miles in Alpine Boulevard, south of the I-8. At that point, the route would follow the I-8 Alternative's Chocolate Canyon Option for approximately three miles, before rejoining the I-8 Alternative just north of MP 18-82.

The route would continue to follow the I-8 Alternative in a west-northwest direction until joining the Proposed Route just west of SR67 near MP 18-87. The route would terminate at the Sycamore Canyon Substation, replacing the remainder of the proposed Coastal Link transmission facilities with system upgrades.

## **B. The Aspen Southern Alternative is Infeasible and has More Impacts.**

### **1. Other portions of the Aspen southern alternative**

Construction for this alternative will be similar to the construction methods discussed above for the Proposed Route. However, there will be significant increase in new access road construction approximately 150 miles compared to approximately 83 miles of access roads for the Proposed Route. There will be areas where the Forest Service will restrict installation of permanent access roads, making future transmission maintenance very difficult.

The terrain is more challenging along this route so it will involve more construction by helicopter. Helicopter construction will be dependent on wind conditions and weather, which may delay the schedule. Landing zones will be more complicated due to the terrain and weather.

Underground construction along Alpine Boulevard will be challenging. Existing underground facilities will have to be avoided within a narrow road. Alpine Boulevard is a main

thoroughfare for the community so businesses and traffic will be impacted during construction in that area.

The numerous overhead crossings along the I-8 will pose yet another challenge. I-8 is a busy highway with stretches of the highway including a wide median. Overhead lines will not only have to cross east and west-bound lanes but also the median.

**C. The Aspen Southern Alternative Does Not Meet Project Objectives Because It is Not Feasible.**

As discussed in Chapter 10, the Aspen Southern Alternative does not meet the Sunrise project objectives because it is infeasible to construct. The Campo Band of Kumeyaay Indians has denied SDG&E permission to enter the Campo Indian Reservation even to survey the proposed route for the Aspen Southern Alternative, thus rendering this route infeasible to construct. Thus, it cannot meet project objectives.

**V. SDG&E'S MODIFIED SOUTHERN ROUTE**

**A. SDG&E's Modified Southern Route Is Contingent on Necessary Forest Service Approvals and Overcoming Other Route Constraints.**

SDG&E is proposing a segment re-route for the Aspen Southern Alternative that would mitigate direct impacts to Cleveland National Forest lands currently designated as Back Country Non-Motorized Zone and that would avoid all Indian Reservations located along Aspen's proposed southern route. This re-route would mitigate the feasibility concerns arising from those impacts, but still would require contingent Forest Service approvals. Other route constraints still remain, such as potential impacts to a very large archaeological district, the significant difficulties associated with undergrounding a 230 kV transmission line in Alpine Boulevard, and the infeasibility of locating any future 230 kV underground through Alpine Boulevard.

SDG&E's Modified Southern Route would follow the Aspen Southern Alternative from the Imperial Valley Substation, using the I-8 Alternative, until the intersection of the I-8 Alternative and the DEIR's BCD Alternative (illustrated in DEIR Figure E.1.1-1) located southeast of the town of Boulevard. SDG&E's Modified Southern Route would follow the BCD Alternative, which crosses I-8 as it travels in a north-northwest direction, passing one mile east of Boulevard and generally paralleling McCain Valley Road. The route would pass directly adjacent to the Carrizo Gorge Wilderness Area, crossing both BLM and private lands.

The route would pass within one mile and east of the Lark Canyon Campground and Off-Highway Vehicle Area at the BCD Alternative MP 4. At BCD Alternative MP 6.5, the route would turn northwest for 2.5 miles on BLM land, crossing Lost Valley Road and McCain Valley Road, and passing approximately three miles southwest of the Carrizo Overlook at BCD Alternative MP 8 before heading west through BLM land for approximately five miles. The route would pass within two miles for the Cottonwood Campground at BCD Alternative MP 10 and cross Lost Valley Road, Manzanita Cottonwood Road, Canebrake Road, and Old Mile Road.

SDG&E's Modified Southern Route would deviate from BCD Alternative MP 12 to go north through BLM lands and around the Cleveland National Forest at Back Country Non-Motorized Zones before rejoining the BCD Alternative at BCD Alternative MP 13.7, located at the crossing of La Posta Truck Trail. The SDG&E Modified Southern Route would then turn south, primarily following Aspen's BCD South Option, although, as noted below, the line may need to be located slightly to the west to avoid placing a structure in the middle of the I-8 right-of-way. After crossing I-8 and the La Posta Valley, the Modified Southern Route would rejoin the Aspen Southern Alternative along the Modified Route D Alternative near Modified Route D Alternative MP 2.5. After joining the Modified Route D Alternative, SDG&E's Modified

Southern Route would follow the Aspen Southern Alternative until reaching Sycamore Canyon Substation. After this point, this alternative would be the same as the Coastal Link of the Proposed Route.

**B. The Modified Southern Route Poses More Construction Limitations Than Other Routing Options**

In general, the construction methods will be similar to the Proposed Route discussed previously, however, there will be more helicopter construction required for this alternative. Compared to the Proposed Route, this alternative includes more areas with poor access, such as Mountain Springs Grade (MP I8-23 to I8-29), BCD Alternative (MP BCD-0 to BCD-19.5), the area near the existing Barrett Substation and the area north of Chocolate Canyon Alternative to Highway 67. Additionally, in the Cleveland National Forest, new access road construction will not be allowed in areas where there are no existing roads, so construction in these areas will also be by helicopter. This will require landing pads near structures to allow personnel and equipment to be flown in.

Construction for the numerous I-8 crossings with this alternative presents additional challenges. The I-8 crossings will be over the eastbound and westbound lanes with an island in the middle along most of the I-8. The I-8 crossing associated with the BCD South Alternative requires a structure in the island between the eastbound and westbound lanes. This will require both Caltrans and Forest Service approval.

**C. Assuming Forest Service Approvals Can Be Obtained, Construction of Sunrise Along SDG&E's Modified Southern Route Still Does Not Meet Project Objectives**

Even with the route changes SDG&E proposes as part of the Modified Southern Route that make this alternative somewhat more feasible, it still does not meet two main project objectives. First, SDG&E's Modified Southern Route does not resolve all the routing

infeasibility issues. For instance, there remain significant challenges with any southern route given the existence of important cultural sites in the Jacumba area, the McCain Valley area where the BCD Alternative is proposed, and along Alpine Boulevard. Moreover, the feasibility of undergrounding two 230 kV circuits along Alpine Boulevard and installing duct banks for two future 230 kV circuits is questionable. Additionally, this alternative does not meet the reliability objective. Although this alternative is not proposed adjacent to the existing Southwest Powerlink line in the most fire prone areas, it is closer to the Southwest Powerlink than the Proposed Route. Thus, this alternative is more susceptible to fires that could simultaneously put the Proposed Route and the Southwest Powerlink out of service. In fact, the WECC Reliability Committee has opined the need to put in place a load shedding scheme after analyzing the common failure risk.

Finally, the Modified Southern Route also fails to meet the future expansion project objective. Although the timing for the need for future transmission lines out of the proposed Modified Route D Substation has not yet been determined, prudent planning suggests that this alternative be sited where future transmission expansion is possible. The potential routes for future transmission expansion associated with the Aspen Southern Alternative routes have questionable feasibility. *See* DEIR at E.1.1-22 (Figure E.1.1-6).

For instance, one of Aspen's potential future expansion routes is proposed following the Route D Alternative. As proposed, it traverses through CNF Back Country Non-Motorized Zones, through inventoried roadless areas and through proposed wilderness areas. The Forest Service has already indicated that a special use authorization will not be approved for any route that follows the Route D Alternative.

Aspen also identified another potential future expansion route that would traverse through developed communities and along already congested transmission ROW. As a result,

this future route alternative will likely directly impact homes and businesses in order to expand that ROW.

## **VI. ASPEN'S "IN-AREA, ALL-SOURCE GENERATION ALTERNATIVE"**

### **A. Aspen assumes the future construction of numerous new generation projects**

Aspen's "New In-Area, All-Source Generation Alternative" ("In-area All-source Generation Alternative") would include a combination of fossil-fuel fired central station and peaking generation, and non-renewable distributed generation. The capacity provided by the conventional generation projects would include 620 MW from the South Bay Replacement Project "SBRP"), 750 MW from the San Diego Community Power Project ("SDCPP") proposed by ENPEX Corp., or 540 MW from the Encina Power Plant Repowering project (Carlsbad Energy Center Project or "CECP") proposed by NRG Energy, and 250 MW from multiple peaking power plants. *See* DEIR Section E.6.1.1 for a description of the In-area All-source Generation Alternative. The DEIR assumes that either the proposed South Bay Replacement Project, or the San Diego Community Power Project (ENPEX), or the Encina Power Plant Repowering Project and the 250 MW of peakers solicited by SDG&E in the 2008 Peaker RFO can feasibly be built by 2010. DEIR at E.6-2. The alternative would also include 105 MW of solar photovoltaic, 48 MW of wind energy, and 50 MW biomass/biogas projects, for a total of 203 MW of renewable resource generation. DEIR Table E.6.1-1. Each of the generation components of this alternative are described below.

#### **1. Fossil-fuel fired central stations**

**South Bay Replacement Project:** LS Power proposed to construct and operate the SBRP, a nominal 620 MW gas-fired combined cycle power plant, of which 120 MW would result from duct firing. The project would replace the existing South Bay Power Plant, which

has a generating capacity of 700 MW and is operated by LS Power. The intent of the project was to provide sufficient reliable replacement power to the SDG&E system to allow for the removal of the Reliability Must Run status of the existing South Bay Power Plant, which cannot be retired in the absence of Sunrise. DEIR at E.6-5. The project is no longer viable, however, given that LS Power withdrew the SBRP Application for Certification from consideration by the California Energy Commission (“CEC”) in October 2007. In addition, the generator interconnection request for this project has been withdrawn from the CAISO generator interconnection queue. The DEIR nevertheless considers the project as one of two possible baseload power plants that could be constructed in the San Diego Area, concluding that “[i]mpacts of this power plant are considered to be representative of other baseload plants.” DEIR at E.6-1 n.1.

**San Diego Community Power Project:** The DEIR assumes that this project would be constructed by ENPEX Corp. as a nominal 750 MW gas-fired combined cycle power plant located on the Marine Corps Air Station Miramar Property near the city of Santee. DEIR at E.6-11. The project was initially designed as another potential generation option to replace the existing South Bay Power Plant located at a site that would provide access to future San Diego energy demands. The viability of this project is also highly questionable, however, given that the city of Santee opposed the power plant in early 2007, and ENPEX Corp. has not submitted an Application for Certification to the CEC as of the present date. DEIR at E.6-11.

**The Carlsbad Energy Center Project:** The DEIR cites this potential project as another potential source of fossil-fuel fired generation. This project does have an active Application for Certification with the CEC; however, it was filed after the In-area All-source Generation Alternative was defined and analyzed. DEIR at E.61.

## **2. Peaking generation**

The In-area All-source Generation Alternative assumes that 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). The existing transmission capacity in the Borrego Springs area is very limited. It is likely that any new generation in this area would require significant transmission upgrades. The In-area All-source Generation Alternative specifically considers the Pala Peaker, the Margarita Peaker, the Borrego Springs Peaker, and the Miramar II Peaker. DEIR at E.6-1. As described in Chapter 12, both the Pala Peaker and the Margarita Peaker are currently facing delays due to permitting concerns or litigation.

## **3. Non-renewable distributed generation**

The In-area All-source Generation Alternative also includes the proposed installation of small generation facilities at or near consumer sites such as hospitals and industrial facilities in sufficient number to provide 35 MW of reliable capacity by 2016. DEIR at E.6-26. The DEIR contemplates that the distributed generation (“DG”) systems could be located throughout SDG&E’s service territory and might include either renewable or fossil-fuel fired systems. The alternative would involve an expansion of non-renewable DG beyond that contemplated by SDG&E in its PEA. DEIR at E.6-27.

## **4. In-area renewable generation**

Finally, the In-area All-source Generation Alternative assumes the development of all the renewable resources described under Aspen’s In-Area Renewable Generation Alternative, discussed *infra*, but at lower levels. Specifically, the DEIR assumes that (1) an overall

nameplate potential of 300 MW of new solar thermal generating resources would be developed near Borrego Springs by 2016; (2) sufficient individual solar photovoltaic (“PV”) systems would be installed on residential and commercial buildings to total a nameplate capacity of 210 MW by 2010; (3) approximately 200 MW of wind power by 2010 and 400 MW by 2016; and (4) 50 MW of biomass/biogas production must be generated by 2010 and 100 MW by 2016, from new landfill gas-to-energy projects or wood waste projects “at unspecified locations.” DEIR at E.6-27. For the purpose of conducting analysis, the Fallbrook Renewable Energy Center was modeled due to its proximity to the peaking generation defined in this alternative. The renewable generation projects that the DEIR assumes are possible under this alternative are discussed in detail below in describing Aspen’s In-Area Renewable Generation Alternative. This alternative is not feasible and is contrary to Commission precedent, as discussed *infra*.

**B. Assuming Such New Generation Plants Are Built, SDG&E Would Need to Mitigate Reliability Criteria Violations to Its Transmission System to Accommodate the New Generation.**

For the In-area All-source Generation Alternative, SDG&E developed power flow models that were subjected to full contingency analysis, including North American Electric Reliability Corporation (“NERC”) category “A”, category “B”, and category “C” outages. These NERC categories respectively represent the electric power system with all elements in service (“N-0”), one element out of service (“N-1”), and two or more elements out of service (“N-2”). Under the CAISO planning standards, Category A violations require mitigation in planning studies through the proposal of new transmission facilities to ensure no involuntary load interruptions (<http://www.caiso.com/docs/09003a6080/14/37/09003a608014374a.pdf>). CAISO planning standards also dictate that the power system must withstand a category B outage with no involuntary load interruptions, except for radial systems. If it is shown that any category B

outage will result in thermal overloads or voltage drops within the transmission system, these violations must be mitigated either through construction of new facilities, or a Remedial Action Scheme (“RAS”). *Id.* at 3. Category C violations may be mitigated by controlled load drop, and do not require projects or RAS to mitigate the violation. Once criteria violations were identified, then SDG&E determined what transmission upgrades would be required, if any, to mitigate these violations. *Id.* at 3. The discussion that follows describes the results of this modeling.

**1. Results of the Analysis for the Fossil-Fuel Fired Central Stations**

**South Bay Replacement Project: [REDACTIONS AS CONFIDENTIAL IN GREEN]** The studies performed for the SBRP were undertaken as part of an Interconnection Facility Study (“IFAS”), performed under the CAISO Large Generation Interconnection Procedure (“LGIP”). SDG&E’s modeling analysis reflected that for the SBRP, [REDACTIONS AS CONFIDENTIAL IN GREEN]

[REDACTIONS AS CONFIDENTIAL IN GREEN]

[REDACTIONS AS CONFIDENTIAL IN GREEN] These studies were completed in December 2006 based on the SBRP queue position at that time. If this project applies to the queue today, the analysis could result in additional upgrades based on a new queue position.

**San Diego Community Power Project:** ENPEX’s San Diego Community Power Project (“SDCPP”) will electrically connect to SDG&E’s Sycamore Canyon substation via two existing

230 kV transmission lines. These lines will be looped into the SDCPP switchyard upon its completion. The ongoing CAISO IFAS process undertaken by SDG&E at the direction of the CAISO for the SDCPP identified all network facilities and network upgrades necessary to accommodate the interconnection of this project.

The powerflow analysis performed for the SDCPP project showed several category B violations due to overloaded facilities within the SDG&E system, described in Table 2-1.

**Table 2-1**  
**Criteria Violations in The SDG&E System**  
**Due to The Addition of SDCPP to The In-area All-source Generation Alternative**

**This table is not included in the public version**

As summarized in the above table, the criteria violations occurred mainly within the 69 kV system. In order to mitigate these overloads, several system upgrades are proposed in addition to those required for the interconnection of each generator. In order to accommodate the SDCPP, a loop-in of (2) 230 kV transmission lines will be necessary. Both the Miguel - Sycamore Canyon and Otay Mesa - Sycamore Canyon 230 kV lines will be looped in to a new 230 kV switchyard at SDCPP.

For the transmission line violations identified in Table 2-1, reconductors will be required for mitigation. The reconductor of the Sycamore Canyon - Chicarita 138 kV line will require the replacement of approximately 5.75 miles of conductor to achieve a rating higher than 215 MVA. The reconductor of Sycamore Canyon - Creelman 69 kV line will require the replacement of terminal equipment to achieve a rating higher than 75 MVA. The reconductor of the Sycamore Canyon - Elliot 69 kV line will require the replacement of approximately 8.1 miles of conductor to achieve a rating higher than 70 MVA. The reconductor of the Esco - Warren Canyon 69 kV line will require the replacement terminal equipment to achieve a rating higher than 87 MVA.

The transformer violations for both the Sycamore Canyon and San Luis Rey transformers will require the addition of transformers at these respective substations. The overload of the Escondido transformer will require the replacement of substation equipment to increase the emergency rating of the transformer.

**The Carlsbad Energy Center Project:** While Aspen did not select the NRG’s Carlsbad Energy Center Project (“CECP”), this project deserves discussion since it has a pending application before the CEC. The In-area All-source Generation Alternative characterizes the CECP as two “combined-cycle” units, each with one combustion turbine generator, and one heat recovery steam generator. One of these units will connect to the 138 kV bus at Encina substation, and the other will connect to the 230 kV bus at Encina substation. The significance that neither of these buses are electrically connected is described below.

As more fully described *infra*, the CECP is a 540 MW replacement project for the existing Encina Power Plant (“Encina”) units 1-3, which have a combined output of 318 MW. Therefore, for interconnection purposes this project would have a net 222 MW impact on the transmission grid [REDACTED]

[REDACTED] The upgrades described in this testimony, identified in the ongoing studies (IFAS) undertaken by SDG&E under the direction of the CAISO pursuant to the CAISO’s LGIP for this project are

[REDACTED] for a category C violation. Under the CAISO LGIP, mitigation for any violations to a certified WECC Path Rating is considered a Reliability Network Upgrade,

and is required for the Interconnection Customer. There are [REDACTED] for the CECP unit that is connected to the 138 kV system. This is due to the retirement of Encina Units 1-3, the total of which is greater than the capacity of the CECP gas turbine/heat recovery boiler unit connected to the 138 kV bus. Table 2-2 shows the criteria violations that resulted from the addition of CECP to the In-area All-source Generation Alternative.

**Table 2-2**  
**Criteria Violations in The SDG&E System**  
**Due to The Addition of CECP to The In Area All-source Generation Alternative**

**This table is not included in the public version**

**2. Results of the Analysis for the Peaking Generation**

For the following CT peaking generation projects identified in this option, DEIR at E.6-1, SDG&E under the direction of the CAISO has performed studies pursuant to the CAISO LGIP: Pala, Margarita, and Miramar II peakers. The upgrades outlined in this testimony are those that have been identified in the various interconnection studies performed for each project.

This peaking generation consists of 96 MW at Pala substation (“Pala”), 99 MW at Margarita substation (“Margarita”), 15 MW at Borrego substation (“Borrego”), and 49 MW at the Miramar GT substation (“Miramar II”). With the exception of the Borrego peaker, which will be a liquid fuel fired engine, the identified peaking plants will be natural gas fired combustion turbines.

The powerflow analysis for these CTs and for the Fallbrook Renewable Energy Facility performed for the all-source alternative showed two category B violations due to overloaded facilities within the SDG&E system. Table 2-3 shows the criteria violations that resulted from the all-source alternative.

**Table 2-3**

[REDACTED]

As summarized in the above table, the criteria violations occurred within the 69 kV system. In order to mitigate these overloads, system upgrades are proposed in addition to those required for the interconnection of each generator. With the Pala peaker mentioned above and the Fallbrook Renewable Energy Facility described *infra* in service [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**3. Results of the Analysis for the In Area Renewable Generation**

All of the renewable-related upgrades in the In-area All-source Generation Alternative described below address the interconnection of each new renewable power plant. Due to the dispersion of the renewable generation for this alternative, there are no system upgrades identified outside of those for interconnection.

From a transmission perspective, the addition of 210 MW of solar photovoltaic (PV), as proposed in the In-area All-source Generation Alternative and In-area Renewable Generation Alternative, DEIR at 5-12, generation has minimal impact that would not require additional transmission expansion. If spread system-wide, as is expected of such an alternative, PV serves as a simple load reduction scheme.

Adding 100 MW of biomass/biogas generation to the SDG&E system, as proposed in the In-area All-source Generation Alternative and In-area Renewable Generation Alternative, DEIR at E.5-13, will require the construction of approximately 2.5 miles of new 69 kV transmission

lines. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] As described in *infra*, in order to connect the Fallbrook Renewable Energy Facility, as proposed in this option, DEIR at E.5-14, [REDACTED] will be required to address criteria violations. For the Miramar Renewable Energy Facility, as proposed in this option, DRIR at E.5-14, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The substation upgrade work required for each generation source would occur within the existing substation. The 69 kV transmission line reconductors would involve construction activities similar to the reconductor of the Sycamore – Elliott 69 kV transmission line as part of the preferred project described in the PEA.

The following tables summarize the transmission system upgrades required to accommodate the generation additions for the In-Area All Source Generation Alternative. Table 2-4 shows the transmission upgrades required for SDCPP, Table 2-5 shows the transmission upgrades required for the SBRP, and Table 2-6 shows transmission upgrades needed for the

Encina power plant generating alternative. Table 2-7 shows the transmission upgrades required for the addition of peakers and the Fallbrook renewable facility, and Table 2-8 shows the transmission upgrades needed to connect wind generation in east San Diego County.

**Table 2-4**  
**Transmission System Upgrades Required for SDCPP**

**This table not included in the public version**

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**Table 2-5  
Transmission System Upgrades Required for SBRP**

**This table not included in the public version**

**Table 2-6  
Transmission System Upgrades Required for the Encina (CECP) Power Plant**

**This table not included in the public version**

**Table 2-7  
Upgrades to SDG&E System for CTs and Fallbrook Renewable Facility**

**This table not included in the public version**

**Table 2-8  
Upgrades to SDG&E System for Renewable Component to  
In-area All-source Generation Alternative**

**This table not included in the public version**

**C. The In-area All-source Generation Alternative Would Not Meet Project Objectives Because It Is Infeasible and, Even if New Generation Is Assumed, It Would Not Interconnect Renewable Energy in Imperial Valley.**

Assuming such generation was to spring into existence, the DEIR recognizes that this alternative does not meet the project objective of importing renewable power from the Imperial

Valley. As discussed above, it also does not address reliability needs (hypothetical and timing) nor confer an economic benefit.

## **VII. ASPEN'S "IN-AREA RENEWABLE GENERATION ALTERNATIVE"**

### **A. Aspen Assumes the Future Construction of Numerous New Renewable Generation Projects**

Aspen's "In-Area Renewable Generation Alternative" ("In-area Renewable Generation Alternative") assumes the development of various in-area renewable projects for a combined 1,000 MW of renewable generation by 2016. The DEIR assumes that no single project would be likely to provide the necessary capacity to serve as a viable alternative to Sunrise. *See* DEIR Section E.5 for a description of the In-area Renewable Generation Alternative. Additionally, given that most of the potential projects that the DEIR assumes are possible have not yet been proposed by any specific applicant, the DEIR bases its analysis of the project's impacts on "reasonable assumptions about what could be developed." DEIR at E.5-1. The DEIR also notes that since all renewable generation projects require a connection to the electric grid, some of the renewable projects that would be part of this alternative will require potentially major transmission system upgrades in order to transmit generation to load centers. DEIR at E.5-1. Generally, this In-area Renewable Generation Alternative assumes that capacity could be provided from a mix of resources, including 290 MW of solar thermal, 210 MW of solar photovoltaic, 400 MW of wind energy, and 100 MW of biomass/biogas. DEIR Table E.5.1-1. Each of the generation components of this alternative are described below.

#### **1. Solar Thermal**

The In-area Renewable Generation Alternative includes the development of a large-scale solar thermal energy development in the Borrego Springs area and assumes that "[b]etween 2010

and 2016, up to 290 MW of overall nameplate potential from new solar thermal generating resources potentially would be added near Borrego Springs.” DEIR at E.5-2. The DEIR notes that no developers have identified sites near Borrego Springs for such a project, but nonetheless assumes that development would occur near existing transmission infrastructure, such as the existing 69 kV Borrego Substation. A solar thermal electric power plant would use one of three primary technologies – parabolic troughs, central receivers (or power towers), and parabolic dish with Stirling engine, any one of which would be land intensive. Solar parabolic troughs, for example, typically require approximately five acres to generate one MW; to produce the 290 MW assumed by the In-area Renewable Generation Alternative would therefore require 1,450 acres. DEIR at E.5-2.

What is particularly odd about this assumed renewable generation is that, as discussed below, it would require construction of a 230 kV transmission line through ABDSP, even though Aspen has diligently sought alternatives for Sunrise that avoid constructing a transmission line through ABDSP.

## **2. Solar photovoltaic**

The In-area Renewable Generation Alternative assumes that sufficient solar PV systems would be installed on residential, commercial, or industrial building rooftops to provide 105 MW of reliable capacity by 2010. DEIR at E.5-12. Because the generated power from these systems must provide reliable, “On-Peak” capacity – the level of generation expected during the day when the system experiences its heaviest load – in reality, sufficient systems would have to be installed that would result in a total of 210 MW. The ability of PV panels to generate sufficient power varies depending on factors such as the orientation of the buildings on which they are installed and the extent to which rooftops are angled to receive sufficient sunlight. To develop

the 105 MW of reliable solar PV electricity assumed by the In-area Renewable Generation Alternative will require the installation of approximately 20,000 residential systems and 85 commercial systems *per year* between 2008 and 2010, for a total of 60,000 residential and 255 commercial PV system installations. DEIR at E.5-12. The DEIR does not identify any specific installation locations for these PV panels, but assumes they would be distributed throughout SDG&E's service territory. DEIR at E.5-12.

### **3. Biomass/Biogas**

The In-area Renewable Generation Alternative also assumes that 50 MW of biomass/biogas projects would need to be developed by 2010, with 100 MW of capacity by 2016. The DEIR identifies three new facilities as part of this Option: (1) Fallbrook Renewable Energy Facility; (2) Miramar Renewable Energy Facility; and (3) Miramar Landfill cogeneration expansion. DEIR at E.5-13. Envirepel, Inc., would be the facility owner of the Fallbrook Renewable Energy Facility, located on approximately 80 acres of the Pankey Ranch property on Pala Road. The DEIR notes, however, that as of the time of the DEIR's printing, Envirepel had not yet filed an Application for Certification to CEC for project approval. DEIR at E.5-14. The Miramar Renewable Energy Facility would be a new biomass facility developed at the existing Miramar Landfill, separate from the landfill's existing biogas facility. Finally, the DEIR assumes that the Miramar Landfill's gas facility would be expanded to produce additional generation. DEIR at E.5-19.

### **4. Wind**

New wind projects are also assumed as part of the In-area Renewable Generation Alternative. The only specific project cited by the DEIR as providing a portion of the needed wind generation under this alternative is the existing Kumeyaay project. The DEIR instead

assumes the construction of other new wind power projects similar to projects identified on the SDG&E transmission interconnection queue with CAISO. Each of the assumed new projects would be located in the Crestwood area in southeastern San Diego County, west of Carrizo Gorge and just north of the town of Boulevard along I-8. The DEIR notes that this alternative's wind component must include a new 230 kV transmission line and 230/500 kV substation to allow the wind energy to be transmitted to San Diego via the existing Southwest Powerlink. DEIR at E.5-19. Under the In-area Renewable Generation Alternative, 200 MW of wind power would need to come on line by 2010, and 46 MW of that has been achieved by the Kumeyaay wind project. By 2016, the total incremental wind generation would have to be 400 MW of nameplate capacity. DEIR at E.5-25. Like solar thermal projects, wind generation projects are also land intensive – 5 to 17 acres of land is typically needed to generate one MW – and the DEIR assumes that sufficient acreage will be available on the Campo, La Posta, and Manzanita Indian Reservations (and that the Tribes would permit such development) and on BLM land. DEIR at E.5-25. The wind component of this alternative would require a minimum of 177 new 2-MW propeller-type turbines, mounted on tubular towers ranging in height from 380 to 440 feet. The DEIR notes that site monitoring and testing activities have not been fully completed for the proposed wind component sites, but it is assumed that sites are viable given the existing Kumeyaay project. DEIR at E.5-26.

**B. Assuming Such New Renewable Generation Plants Are Built, SDG&E Would Need to Upgrade Its Transmission System to Accommodate the New Generation.**

For the In-area Renewable Generation Alternative, SDG&E developed power flow models that were subjected to full contingency analysis, including NERC category “A”, category “B”, and category “C” outages. These NERC categories respectively represent the electric power system with all elements in service (N-0), one element out of service (N-1), and two or

more elements out of service (N-2). Under the CAISO planning standards, Category A violations require mitigation in planning studies through the proposal of new transmission facilities to ensure no involuntary load interruptions. CAISO planning standards also dictate that the power system must withstand a category B outage with no involuntary load interruptions, except for radial systems. If it is shown that any category B outage will result in thermal overloads or voltage drops within the transmission system, these violations must be mitigated either through construction of new facilities, or a Remedial Action Schemes (“RAS”). Category C violations may be mitigated by controlled load drop, and do not require projects or RAS to mitigate the violation. Once criteria violations were identified, then SDG&E determined what transmission upgrades would be required, if any, to mitigate these violations. The discussion that follows describes the results of this modeling.

The In-area Renewable Generation Alternative assumes that by 2016, 1000 MW of renewable generation can be built within the San Diego area. DEIR at E.5-1. The renewable generation assumed in this alternative consists of wind turbine, solar thermal, solar photovoltaic, and biomass/biogas technologies. The net result of the addition of the identified renewable generation is 1000 MW of nameplate capacity and 533 MW of firm capacity by the year 2016. The upgrades required for this alternative are described below.

### **1. Upgrades required for the solar thermal generation**

In order to accommodate the solar thermal generation proposed by the In-area Renewable Generation Alternative, DEIR at E.5-2, SDG&E would build two 230 kV circuits on a single pole line from Borrego Springs to Sycamore Canyon substation. This new 230 kV line would follow the proposed path for Sunrise from Narrows Substation to Sycamore Canyon Substation, and each circuit will have a rating of 456 MVA or greater. This new line would be overhead

construction from Borrego Springs to Sycamore Canyon Substation. Within ABDSP, the structures will be steel poles; outside the park the new circuits would be placed on lattice towers. On each side of the pole or tower will be a single circuit consisting of one 1033 ACSR wire per phase, for a total of six wires on each structure.

This configuration would have several advantages over the proposed single circuit 138 kV line assumed in the DEIR. First, it would provide two ties to the San Diego area load center improving the reliability of the generators. Second, the higher capacity of two 230 kV lines would allow for future expansion of the solar thermal facilities in Borrego Springs, thereby increasing the amount of potential renewable energy in SDG&E's portfolio. Finally, compared to a single 138 kV line, two 230 kV lines will decrease the losses associated with transmission of electric power, increasing the net amount of power delivered to the San Diego area load center. The length of the Borrego Solar Thermal generation ties will cause significant losses, and increasing the voltage at which power is transmitted will decrease the losses between the generation plant and the rest of the system. Specifically, the losses for a double circuit 230 kV line transmitting 240 MW would be approximately 4 MW, versus 22 MW for a single circuit 138 kV line, an increase of 16 MW. Losses totaling 22 MW would result in 7.5-9.5% of the power produced at the Borrego Solar Thermal plant being consumed by the gen-tie. For these reasons, it is prudent to design the transmission line to accommodate the foreseeable growth in generation at Borrego Springs, decrease transmission losses, and improve the reliability of grid resources.

## **2. Upgrades required for the solar photovoltaic generation**

The In-area Renewable Generation Alternative, DEIR at E.6-27, also includes the installation of 105 MW of dependable solar photovoltaic generation capacity. From a

transmission perspective, the addition of 105 MW of PV generation has minimal impact. If spread system-wide, as is expected of such an alternative, PV serves as a simple load reduction scheme.

### **3. Upgrades required for the Biomass/Biogas generation**

In order to accommodate the Biomass and Biogas generation as outlined in the DEIR, a new 69 kV line from the Miramar Biomass Plant to Mesa Heights Substation and a loop-in of 69 kV line TL 698 into the Fallbrook Renewable Energy Center will be required. The new 69 kV transmission line to Mesa Heights Substation will connect the Miramar Biomass plant to the SDG&E system at Mesa Heights. This line will be a single circuit pole line from the Miramar Biomass plant to Mesa Heights that will be rated at 50 MVA. For the loop-in of the Fallbrook Biomass plant, TL 698 will be extended by approximately 1.25 miles to the Fallbrook plant from its existing right-of-way. The loop-in will be a single pole line with two 69 kV circuits, one from Fallbrook Biomass - Pala Substation, and the other from Fallbrook Biomass - Monserate Substation.

### **4. Upgrades required for the wind generation**

The wind generation that is assumed for the In-area Renewable Generation Alternative, DEIR at E.5-20, will connect to a new substation in East County San Diego (called “ECO”) that will be looped into the 500 kV Southwest Powerlink. These wind facilities will have a combined nameplate output of 400 MW of which 200 MW may be available by 2010 and the remainder by 2016. The ECO substation will be a 500/230/69 kV substation, and will have 230 kV gen-ties and/or trunk line that connect the respective wind projects to the existing transmission system and a 69 kV line connecting to the Boulevard substation. Depending upon the siting of the wind generation plants, the 230 kV gen-ties/trunk line will be ten to twenty miles long, consisting of

single circuit pole lines. This substation will be looped into SWPL and have 500/230 kV transformer rated at 1120 MVA, several 230 kV transmission lines connected to various wind generation plants, and a 230/69 kV transformer and 69 kV switchyard with a 69 kV line connecting to Boulevard Substation. The 500 kV substation facilities will include two bays of breaker-and-a-half configuration, including three 500 kV circuit breakers, associated disconnect switches, buswork, and control apparatus. The Southwest Powerlink will consume two circuit breaker positions in the 500 kV switchyard, with the third allocated to the 500/230 kV transformer. The 230 kV substation facilities will include one bay of breaker -and-a-half configuration, three 230 kV circuit breakers, associated disconnect switches, buswork, and control apparatus. One 230 kV line will consume one circuit breaker position in the 230 kV switchyard, and the 500/230 kV and 230/69 kV transformers will connect to the remaining two circuit breaker positions. The 69 kV substation facilities will include two bays of double breaker configuration, three 69 kV circuit breakers, associated disconnect switches, buswork, and control apparatus. The new 69 kV line connecting to Boulevard would involve development of new access roads and installation of new steel poles for a distance of 30 – 60 miles, depending on route and location of ECO substation. This 69 kV line will occupy one single breaker position, and the 230/69 kV transformer will occupy a double breaker position. The 69 kV line will connect ECO Substation to Boulevard Substation, providing a second source to Boulevard Substation, increasing the reliability of the east county 69 kV system.

Construction of this ECO substation would involve construction activities similar to those described in the PEA for the Central Substation in SDG&E's preferred alternative. The new 230 kV transmission line from the ECO substation to the wind generation would involve

construction activities similar to the construction of the inland 230 kV link described the PEA for Sunrise Powerlink.

The transmission system upgrades required for the In-area Renewable Generation Alternative are listed on the following Table 2-9.

[Remainder of page intentionally left blank]

**Table 2-9**  
**Upgrades to SDG&E System Renewable Facilities**

**This table not included in the public version**

**C. The In-area Renewable Generation Alternative Would Not Meet Project Objectives Because It Is Infeasible.**

The In-area Renewable Generation Alternative does not meet the project objective of accessing renewable resources in Imperial Valley. Further, this alternative does not address reliability needs because the components of this option are hypothetical and infeasible. They could not be developed and implemented to meet the project’s in-service date. Moreover, the In-area Renewable Generation Alternative does not confer an economic benefit to SDG&E’s ratepayers.

**VIII. ASPEN’S “LEAPS TRANSMISSION-ONLY ALTERNATIVE”**

**A. TNHC’s Proposed Transmission Project is an Incomplete Application Pending before the Commission.**

Aspen’s TE/VS Interconnect Alternative, DEIR at C-64 and C-67, describes the Lake Elsinore Advanced Pumped Storage project (“LEAPS”) sponsored by TNHC and the Elsinore Valley Municipal Water District as co-applicants for a hydroelectric license under Part I of the Federal Power Act as new 500 MW pumped-storage facility located in the City of Lake Elsinore and in the Cleveland National Forest. The associated 32 mile TE/VS Interconnect is a proposed 500 kV new transmission line between the proposed Lake and Pendleton Substations as well as additional facilities described below.

Aspen further describes at C-68, this TE/VS Interconnect Alternative generally as follows:

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...

This alternative would involve only the transmission components of the LEAPS Project ... 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. The LEAPS Transmission-Only Alternative would traverse Riverside County Cleveland National Forest, Trabuco Ranger District, and northern San Diego County, including Marine Corps Base Camp Pendleton...

The DEIR at C-68 and C-69 describes the TE/VS Interconnect and related new transmission facilities in more detail as follows:

- 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 ...
- 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 ... 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 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 Substation as needed and determined by the 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 .... 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.

The DEIR assumes that its hypothetical TE/VS Interconnect Alternative would be carried out by these project sponsors.

**B. For the TE/VS Interconnect to Achieve Necessary Import Capability, SDG&E Would Need to Construct Numerous Upgrades to SDG&E's Transmission System.**

**1. SDG&E transmission upgrades will be necessary to achieve varying levels of import capability from the TE/VS Interconnect.**

In summary, the TE/VS Interconnect is an inadequate and incomplete plan of service that cannot achieve the import capability claimed by TNHC without substantial network upgrades to SDG&E's transmission system. The cost of the TE/VS Interconnect described by TNHC either in its CPCN application or provided to SDG&E during discovery in this proceeding is unsupported and neglects to include the substantial network upgrades required to increase the import capability limit ("ICL") into SDG&E's system in amounts equal to or in excess of 500 MW. The economic assumptions used by TNHC's consultant are unrealistic. As SDG&E testifies in Chapter 11, a more appropriate set of assumptions, including a realistic set of TE/VS Interconnect costs, indicates that the TE/VS Interconnect standing alone is far less economically advantageous than TNHC claims. Finally, Aspen's TE/VS Interconnect Alternative assumption

stated at Chapter 12 that the TE/VS Interconnect is identical to SDG&E's proposed Valley-Rainbow project<sup>3</sup> is incorrect.

**a. The Import Capability Assumed by the Aspen's TE/VS Interconnect Alternative is Unsupportable.**

The DEIR at C-69, states that the TE/VS Interconnect Alternative would have a designed capacity of 1,300 to 1,600 MW although it makes no assumptions on TNHC's Interconnect Alternative to increase SDG&E's import capability. As described below, SDG&E's studies demonstrate that the TE/VS Interconnect will not result in an increase in SDG&E import capability under G-1/N-1 conditions of either 500 MW or 1,000 MW (increasing from 2,500 MW) unless substantial network upgrades are made within SDG&E's transmission system.

During Phase I testimony for Sunrise, the CAISO testified that with the plan of service described by TNHC for the TE/VS Interconnect, a G-1/N-1 import capability increase of 500 MW was possible, but would require additional system improvements.<sup>4</sup> SDG&E also performed an import capability study for the TE/VS Interconnect, and found no increase in import capability under G-1/N-1 conditions without substantial additional upgrades within the SDG&E transmission system.<sup>5</sup> Both the CAISO's and SDG&E's studies, however, were abbreviated in scope due to time constraints.

SDG&E has performed additional, more detailed analysis to evaluate the following:

- 1) The actual N-0 and G-1/N-1 import capabilities of the SDG&E system with TNHC's TE/VS Interconnect plan of service, as described in TNHC's CPCN.

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<sup>3</sup> Application of SDG&E for a Certificate of Public Convenience and Necessity Valley-Rainbow 500 kV Interconnect Project in Proceeding A.01-03-036.

<sup>4</sup> Second Errata to Initial Testimony, Part II submitted by the California ISO on March 1, 2007 in Proceeding A.06-08-010.

<sup>5</sup> See SDG&E's response to DRA data request #3, question #1, draft report for *LEAPS TE/VS Import Study, Revision 9*.

- 2) Any WECC or CAISO criteria violations (thermal, transient, post-transient, reactive margin) that would occur with TNHC’s TE/VS Interconnect plan of service at G-1<sup>6</sup>/N-1 import levels of 2750 MW, 3000 MW, and 3500 MW.
- 3) SDG&E system network upgrades required for the import capability to reach the levels described above without criteria violations.

The detailed results of the analysis are summarized in the workpapers supporting this testimony. Generally, the results of this analysis demonstrate that criteria violations occur at the minimum G-1/N-1 import level of 2750 MW.<sup>7</sup> This means that there is no inherent increase in SDG&E’s G-1/N-1 import capability with the addition of TNHC’s TE/VS Interconnect plan of service, as described in the TNHC CPCN.

The criteria violations at each G-1/N-1 import level are summarized in the following Table 2-10:

**TABLE 2-10**  
**TE/VS Interconnect Alternative Plan of Service**  
**G-1/N-1 Criteria Violations**

| <b>Table 2-10 – Criteria Violations at each increased G-1/N-1 import level</b> |  |                           |                       |
|--|--|---------------------------|-----------------------|
| <b>250 MW increase (total import of 2,750 MW)</b>                              |  |                           |                       |
| <b>Element</b>   | <b>Contingency</b>                     | <b>Violation (Note 1)</b> | <b>Violation Type</b> |
| Bernardo-Felicita Tap 69 kV (TL689A)   | Numerous                               | >123%                     | Thermal               |
| Encina-Penasquitos 230 kV #1 (TL23012)   | Encina-Penasquitos 230 kV #2 (TL23012) | 106%                      | Thermal               |
| Escondido-Esco 69 kV (TL682)   | Encina Tap 230 kV (TL23011)            | 104%                      | Thermal               |
| San Luis Rey-Encina 230 kV #1 (TL23003)  | Encina Tap 230 kV (TL23011)            | 101%                      | Thermal               |
| Doublett Tap-Penasquitos 138 kV (TL13810)                                      | Penasquitos-Old Town 230 kV (TL23013)  | 109%                      | Thermal               |
| Doublett Tap-Friars 138 kV (TL13810)   | Penasquitos-Old Town 230 kV (TL23013)  | 148%                      | Thermal               |

<sup>6</sup> Both Palomar and Otay Mesa combined cycle plants were studied as the G-1 generator.

<sup>7</sup> Internal generation resources in 2010 are such that the minimum import level under G-1/N-1 conditions is approximately 2,600 MW. The difference between the minimum import and the present 2,500 MW G-1/N-1 import level represents SDG&E’s reliability shortfall in 2010.

|  |   |                           |                       |
|--|---|---------------------------|-----------------------|
| Eastgate-Rose Canyon 69 kV (TL6927)  | Penasquitos-Old Town 230 kV (TL23013)       | 117%                      | Thermal               |
| <b>500 MW increase (total import of 3,000 MW)</b>  |   |                           |                       |
| <b>Element</b>   | <b>Contingency</b>                          | <b>Violation (Note 1)</b> | <b>Violation Type</b> |
| San Onofre-San Luis Rey 230 kV #3 (TL23006)  | San Onofre-San Luis Rey 230 kV #1 (TL23010) | 101%                      | Thermal               |
|  | San Onofre-San Luis Rey 230 kV #2 (TL23002) | 100%                      | Thermal               |
| Encina Tap-Encina 230 kV (TL23011)   | San Luis Rey-Encina 230 kV (TL23003)        | 102%                      | Thermal               |
| Encina-Penasquitos 230 kV #2   | Encina-Penasquitos 230 kV #2 (TL23012)      | 101%                      | Thermal               |
| San Luis Rey 230/69 kV xfmr #1 (SA70)  | San Luis Rey 230/69 kV xfmr #2 (SA71)       | 102%                      | Thermal               |
| <b>750 MW increase (total import of 3,250 MW)</b>  |   |                           |                       |
| <b>Element</b>   | <b>Contingency</b>                          | <b>Violation (Note 1)</b> | <b>Violation Type</b> |
| Warners-Rincon 69 kV (TL682)   | Numerous                                    | >122%                     | Thermal               |
| Encina Tap-San Luis Rey 230 kV (TL23011)   | San Luis Rey-Encina 230 kV (TL23003)        | 102%                      | Thermal               |
| Kettner-B St. 69 kV (TL609)  | Main St. 230/69 kV xfmr #1 or #2            | 103%                      | Thermal               |
| Old Town-Kettner 69 kV (TL604)   | Main St. 230/69 kV xfmr #1 or #2            | 101%                      | Thermal               |
| Penasquitos 230/69 kV xfmr #2  | Penasquitos 230/69 kV xfmr #1               | 100%                      | Thermal               |
| Otay Mesa 230 kV bus voltage   | Otay Mesa combined-cycle plant              | 5.80%                     | Voltage               |
| Talega and Camp Pendleton 230 kV busses  | San Onofre Unit #2 or #3                    | >5%                       | Voltage               |
| Orange County 138 kV system  | San Onofre Unit #2 or #3                    | >5%                       | Voltage               |
| Reactive Power Margin  | San Onofre Unit #2 or #3                    | -                         | Reactive Margin       |
| Reactive Power Margin  | Palomar or Otay Mesa combined-cycle plants  | -                         | Reactive Margin       |
| Reactive Power Margin  | Palomar-Sycamore 230 kV (TL23051)           | -                         | Reactive Margin       |
| <b>1,000 MW increase (total import of 3,500 MW)</b>  |   |                           |                       |
| <b>Element</b>   | <b>Contingency</b>                          | <b>Violation (Note 1)</b> | <b>Violation Type</b> |
| Old Town 230/69 kV xfmr #2   | Old Town 230/69 kV xfmr #1                  | 108%                      | Thermal               |
| Penasquitos-Miramar Tap 69 kV  | Penasquitos-Old Town 230 kV (TL23013)       | 107%                      | Thermal               |
| San Luis Rey-Mission 230 kV #1 (TL23001)   | Penasquitos-Old Town 230 kV (TL23013)       | 103%                      | Thermal               |
| San Luis Rey-Mission 230 kV #2 (TL23004)   | Penasquitos-Old Town 230 kV (TL23013)       | 103%                      | Thermal               |
| Escondido 230/69 kV xfmr   | Palomar-Sycamore 230 kV (TL23051)           | 101%                      | Thermal               |
| Esco-Warren Canyon Tap 69 kV (TL634)   | Palomar-Sycamore 230 kV (TL23051)           | 100%                      | Thermal               |
| Voltage Collapse   | San Onofre Unit #2 or #3                    | -                         | Reactive Margin       |
| Voltage Collapse   | Palomar or Otay Mesa combined-cycle plants  | -                         | Reactive Margin       |
| Reactive Power Margin  | Numerous generators, 230 kV or 500 kV lines |                           | Reactive Margin       |
| Note 1 - Criteria violations are expressed as a percentage of the element's emergency thermal rating, or percent of allowable voltage drop, unless otherwise noted |   |                           |                       |

As the power flow results demonstrate, TNHC's TE/VS Interconnect plan of service, as assumed in the DEIR, is inadequate to provide the same increase in import capability offered by Sunrise.

**b. The TE/VS plan of service is incomplete.**

As described above, TNHC's TE/VS Interconnect plan of service is inadequate to provide any increase in SDG&E's G-1/N-1 import capability, due to numerous and serious thermal and post-transient voltage violations. To address all of the criteria violations in Table 2-10, several significant system upgrades are required, and are summarized in Table 2-11 by import level:

**Table 2-11**

**Upgrades to the SDG&E system required at each level of increased G-1/N-1 import capability with the proposed TE/VS Interconnect plan of service**

**G-1/N-1 import increase of 250 MW**

Upgrade Bernardo-Felicita Tap 69 kV (TL689A) emergency rating to 200 MVA  
Upgrade Encina-Penasquitos 230 kV #1 (TL23012) emergency rating to 1175 MVA  
Upgrade Escondido-Esco 69 kV (TL679) emergency rating to 200 MVA  
Upgrade San Luis Rey-Encina 230 kV #1 (TL23003) emergency rating to 1175 MVA  
Upgrade Doublett Tap-Penasquitos 138 kV (TL13810) emergency rating to 300 MVA  
Upgrade Doublett Tap-Friars 138 kV (TL13810) emergency rating to 300 MVA  
Upgrade Eastgate-Rose Canyon 69 kV (TL6927) emergency rating to 150 MVA

**G-1/N-1 import increase of 500 MW**

Install new San Onofre-Mission 230 kV ckt. #1

**G-1/N-1 import increase of 750 MW**

Upgrade Warners-Rincon 69 kV (TL682) emergency rating to 64 MVA  
Install new Silvergate 230/69 kV xfmr #3  
Install 63 MVAR 230 kV capacitor banks at San Luis Rey and Camp Pendleton substations  
Install new San Luis Rey 230/69 kV xfmr #3

**G-1/N-1 import increase of 1000 MW**

Install new Penasquitos 230/69 kV xfmr #3  
Install new +/- 300 MVAR STATCOM at San Onofre, San Luis Rey, or Encina

As summarized in the above table, increasing SDG&E's import capability with TNHC's TE/VS Interconnect requires numerous upgrades. The cost of these upgrades, as described *infra*

at Section VII.B, will range from \$1,618 million for a 500 MW increase to \$1,858 million for a 1000 MW increase.

### **C. TNHC Has Applied To Construct Both the TE/VS Interconnect and the LEAPS Generation Project as One Single Project**

For the reasons described by SDG&E Witness Thomas, it is appropriate to consider the TE/VS Interconnect and the LEAPS generation project together because there is substantial uncertainty that the TE/VS Interconnect will proceed without the generation project. For this reason, the following discussion deals with Aspen's "LEAPS Generation and Transmission Alternative." This alternative includes all of the components of the actual LEAPS Project, as opposed to the transmission-only components presented in Aspen's LEAPS Transmission-Only Alternative. In its entirety, the LEAPS Project proposes to re-generate power at a new pumped-storage facility located in the City of Lake Elsinore and in the Cleveland National Forest, in addition to the 32-mile new 500 kV transmission line and 48-mile upgraded 230 kV line.

In addition to the transmission-only components of the project, as described in the DEIR at E.7.2.1, the pumped-storage facility component of this alternative would include:

- A lined upper reservoir, the Decker Canyon reservoir, with a usable storage volume of 5,500 acre-feet, a 240-foot-high dam, and a perimeter dike up to 50 feet high, with a surface area of about 80 acres at a normal maximum 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.
- An underground powerhouse, the 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.
- 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.
- A new 40-acre surface switchyard/substation, the Midpoint Substation, above the proposed Santa Rosa Powerhouse for the LEAPS generators interconnecting with the Lake-Pendleton line via a 1.2 mile underground 500 kV line, the Midpoint Interconnection.
- A 1.2-mile underground transmission line to interconnect the Santa Rosa Powerhouse/Midpoint Substation with Aspen’s LEAPS Transmission-Only Alternative, described above.

See DEIR Section E.7.2 for a complete description of the LEAPS Generation and Transmission Alternative.

**D. Assuming that the LEAPS Generation and Transmission Alternative Were Constructed, SDG&E Would Need to Construct Other Upgrades to SDG&E’s Transmission System For the TE/VS Interconnect to Achieve Necessary Import Capability.**

For the TE/VS Interconnect portion of the combined LEAPS project to provide the necessary import capability for San Diego, SDG&E would need to implement the transmission upgrades discussed infra at Section VII.B. In addition it would need to construct the additional facilities that were identified to interconnect this pumped storage project.

These upgrades to SDG&E’s transmission system to accommodate LEAPS alone are listed below and are estimated to cost \$133,000,000.

**Table 2-12**

**Upgrades to the SDG&E System Required  
Only for the Interconnection of LEAPS Generation**

| <b>Type</b>                     | <b>Description</b>                                      | <b>Estimated Cost<sup>8</sup> x \$1,000</b> |
|---------------------------------|---|---|
| Reliability Network Upgrades    | Loop-in of the existing Talega-Escondido 230 kV circuit | 5,200                                       |
| Stand Alone Reliability Network | Proposed Camp Pendleton Case Springs 230 kV Switchyard: | 42,884                                      |

<sup>8</sup> Estimated costs in 2008 dollars, and in thousands of dollars.

**Table 2-12**

**Upgrades to the SDG&E System Required  
Only for the Interconnection of LEAPS Generation**

| <b>Type</b>                              | <b>Description</b>  | <b>Estimated Cost<sup>8</sup> x \$1,000</b> |
|--|---|---|
| Reliability Network Upgrades             | Loop-in of the existing Talega-Escondido 230 kV circuit   | 5,200                                       |
| Stand Alone Reliability Network Upgrades | Proposed Camp Pendleton Case Springs 230 kV Switchyard:   | 42,884                                      |
| Reliability Network Upgrades             | 69 kV Over Stressed Breaker Replacement at the Escondido and Penasquitos Substations  | 4,220                                       |
| Reliability Network Upgrades             | Installation of Fiber-Optic Communications on 230 kV Structures   | 5,951                                       |
| <b>SUBTOTAL</b>                          |   | <b>58,255</b>                               |
| Delivery Network Upgrades                | Escondido Substation: new 230 kV tie position   | 7,666                                       |
| Delivery Network Upgrades                | Talega Substation new 230 kV tie position   | 4,426                                       |
| Delivery Network Upgrades                | Addition of 2 <sup>nd</sup> Talega-Camp Pendleton Case Springs circuit (912 MVA) and 2 <sup>nd</sup> Escondido-Camp Pendleton Case Springs circuit (456 MVA)<br>Install new facilities for loop-in and relocate existing 69kV tie line from existing 230kV towers for 7.6 mile segment of TL6932.<br>Bundle the existing line of the Talega-Proposed Camp Pendleton Case Springs 230 kV #1 line to provide 912 MVA capacity | 62,916                                      |
| <b>TOTAL Estimated Costs</b>             |   | <b>133,263</b>                              |

<sup>8</sup> Estimated costs in 2008 dollars, and in thousands of dollars.