C. Alternatives

This section provides an overview of the alternatives screening process and the methodologies used when considering or eliminating an alternative based on CEQA criteria as well as a summary of the information presented in the Alternatives Screening Report (Appendix 2 to this EIR). Appendix 2 contains the details and locations of all alternatives suggested for consideration in the EIR analysis for the proposed Miguel-Mission 230 kV #2 Project (Proposed Project).

This section is organized as follows: Section C.1 provides an overview of the alternatives screening process; Section C.2 describes the methodology used for alternatives evaluation; Section C.3 presents a summary of which alternatives have been selected for full EIR analysis and which have been eliminated based on CEQA criteria; Section C.4 describes the alternatives that have been retained for full EIR analysis within each individual issue area in Section D; and Section C.5 presents descriptions of each alternative that was eliminated from EIR analysis and explains why each was eliminated. Section C.6 describes the No Project Alternative.

C.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that would potentially avoid or minimize the impacts of a proposed project, including a "No Project" Alternative (CEQA Section 15126.6(e)(1)). This requirement is emphasized in the CEQA Guidelines, Section 15126.6(a), which states:

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

Section 15126.6(b) further states that the alternative analysis shall include alternatives capable of eliminating or reducing the significant environmental impacts of a project, even if those alternatives would hinder the attainment of the project objectives, or would be more costly to implement. However, CEQA does not require the Lead Agency to evaluate every conceivable alternative, or those that are infeasible on technical, legal, or regulatory grounds.

Section B provides a detailed description of the Proposed Project, which may be used in comparison to the alternatives summarized in this section and detailed in the Alternatives Screening Report contained in Appendix 2. Appendix 2 documents: (1) the range of alternatives that was suggested and evaluated; (2) the approach and methods used to screen the feasibility of these alternatives according to guidelines established under CEQA; and (3) the results of the alternatives screening. For alternatives that were eliminated from full analysis in the EIR, Appendix 2 provides the rationale for this exclusion. "Non-wires alternatives" [1] are addressed in Appendix 2 as well.

Project alternatives analyzed in this EIR and Appendix 2 were developed from comments received from the general public, and federal, State, and local agencies during: a) the Scoping meetings held in the Spring

[1] "Non-wires alternatives" include methods of meeting project objectives that do not require major transmission lines (e.g. baseload generation, distributed generation, renewable energy supplies, conservation and demand-side management, etc.).

Valley and City of Santee on September 15 and September 16, 2003, respectively; and b) the public comment period between September 5 and October 5, 2003. Alternatives were also developed by the Applicant in their 2002 PEA, and by the CPUC based supplemental analysis and field visits. During that process, special consideration was given to EMF impacts and visual/aesthetic impacts because both were priority concerns conveyed by the public.

Alternatives for the Proposed Project were restricted to the San Diego area south of the Sycamore Canyon Substation and west of the Los Coches Substation near Lake Jennings, including several alternatives within and adjacent to the existing ROW. In total, the alternatives screening process has culminated in the identification and screening of approximately 16 potential alternatives or combinations of alternatives and three non-wire alternatives. These alternatives range from minor routing adjustments to SDG&E's Proposed Project ROW, to entirely different transmission line routes, to alternative energy technologies, as well as non-wires alternatives.

C.2 Alternatives Screening Methodology

The evaluation of alternatives to the Proposed Project was completed using a screening process that consisted of three steps:

Step 1: Clarify the description of each alternative to allow comparative evaluation.

Step 2: Evaluate each alternative using CEQA criteria (defined below).

Step 3: Determine the suitability of each alternative for full analysis in the EIR. If the alternative is unsuitable, eliminate it from further consideration. Alternatives deemed infeasible based on CEQA criteria were removed from further consideration.

Following the three-step screening process, the advantages and disadvantages of the remaining alternatives were carefully weighed with respect to CEQA's criteria for consideration of alternatives (see Appendix 2). In order to comply with CEQA requirements, each of the proposed alternatives has been evaluated based on the following criteria:

1. Does the alternative meet most basic project objectives?
2. Is the alternative feasible (legal, regulatory, technical)?
3. Does the alternative avoid or substantially lessen any significant effects of the Proposed Project?
4. Would the alternative result in any significant effects that are greater than those of the Proposed Project?

The Alternatives Screening Report (see Appendix 2) does not consider magnetic fields in the context of CEQA and determination of potential environmental impacts for two reasons: first because there is no agreement among scientists that EMF does create a potential health risk, and second because there are no defined or adopted CEQA standards for defining health risks from EMF. As a result, EMF information is presented as disclosure only for the public and decisionmakers.

C.2.1 Consistency with Project Objectives

In SDG&E's July 2002 PEA (Section 2 – Purpose and Need), SDG&E stated three main objectives for implementing the Proposed Project. The objectives that follow were received in response to an October 20, 2003 data request from the CPUC. This EIR does not endorse, nor is it governed by, the project

objectives as defined by SDG&E; instead it uses these objectives as a baseline for determining the positive and negative benefits of the project as proposed by SDG&E. For purposes of this EIR, the project objectives are:

- **Reduce Transmission Constraints on Electric System.** The first project objective is to reduce constraints on SDG&E's existing electrical transmission system in accordance with Assembly Bill 970 (AB 970). AB 970 directed the California Public Utilities Commission (CPUC) to "undertake and identify those actions necessary to reduce or remove constraints on the State's existing electrical transmission and distribution system . . ." (CPUC, 2000). Reducing system constraints in SDG&E's service territory would allow electric generation to meet demand by increasing statewide and regional access to new merchant generation capacity. In addition, system congestion costs would be reduced and SDG&E and California Independent System Operator (CAISO) consumers would realize potentially significant economic benefits. In fact, on February 27, 2003, the CPUC made a finding of need for the Proposed Project citing these benefits (see Decision 03-02-069 in docket No. I.00-11-001)(CPUC, 2003). The Commission further provided that its need determination in that decision would be conclusively established for purposes of this CPCN proceeding.
- **Provide Reliability Benefits and Operational Flexibility for SDG&E's Service Territory.** The second project objective is to improve the existing SDG&E transmission system infrastructure in order to ensure that the electric system can safely and reliably serve the SDG&E service territory. The project has the potential to prevent overloads and on various 138 kV and 69 kV circuits in the SDG&E service territory, and eliminate various remedial action schemes (RAS) that limit the ability of Miguel Substation to accept and transfer power from new generation sources into the existing transmission system. Elimination of existing RAS would allow for greater system reliability, greater operational flexibility, and more frequent maintenance of existing transmission facilities.
- **Improve Transmission System Infrastructure.** The third project objective is to improve the existing transmission system infrastructure in order to ensure that the electric system can safely and reliably serve the San Diego area, the State of California, and the Western Electric Coordinating Council (WECC) area. Infrastructure improvements would allow the reliable transfer of power from new merchant generating facilities south and east of Miguel Substation, increasing local, statewide, and regional access to additional generating capacity and improving the overall reliability of the State's integrated transmission grid.

CEQA guidelines require consideration of alternatives capable of reducing or eliminating significant environmental effects even though they may impede attainment of project objectives (Section 16126.6(b). Therefore, each potential alternative evaluation would not necessarily need to meet all of SDG&E's objectives.

C.2.2 Feasibility

CEQA Guidelines (Section 15364) define feasibility as:

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

The alternatives screening analysis is largely governed by what CEQA terms the "rule of reason," meaning that the analysis should remain focused, not on every possible eventuality, but rather on the alternatives necessary to permit a reasoned choice. Furthermore, of the alternatives identified, the EIR

is expected to fully analyze those alternatives that are feasible while meeting most of the project objectives.

In determining the feasibility of alternatives, the factors that may be taken into account are site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and site access/control (CEQA Guidelines Section 15126.6(f)(1)). Other factors that can affect the feasibility of an alternative can include:

- **Legal Feasibility:** Does the alternative have the potential to avoid lands that have legal protections that may prohibit or substantially limit the feasibility of permitting a 230 kV transmission line?
- **Regulatory Feasibility:** Does the alternative have the potential to avoid lands that have regulatory restrictions that may substantially limit the feasibility of completing the construction of a 230 kV transmission line?
- **Technical Feasibility:** Is the alternative feasible from a technological perspective, considering available technology, the construction, operation, and maintenance or spacing requirements of multiple facilities using common rights-of-way, and the potential for common mode failure?

The above feasibility considerations were assessed for the Proposed Project in the alternatives screening analysis. For each alternative considered, a determination was made as to whether there was anything about the alternative that would be infeasible on technical, legal, or regulatory grounds.

C.2.3 Potential to Eliminate Significant Environmental Effects

A key CEQA requirement for any alternative is that it must have the potential to "avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines Section 15126.6(a)). If an alternative was identified that does not provide potential overall environmental advantages as compared to the Proposed Project, it was eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the Proposed Project with absolute certainty, nor is it possible to definitively quantify or predict project impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

The Alternatives Screening Report (see Appendix 2) presents the preliminary summary of the potentially significant effects of the Proposed Project for the initial screening phase. A final conclusion regarding potential impacts of the Proposed Project and recommendations for mitigating potential impacts is reflected in EIR Section D.

C.3 Summary of Screening Results

This section summarizes the conclusions contained in the alternatives screening analysis. The Alternatives Screening Report in Appendix 2 describes each of the alternatives in detail, and Section 4 of Appendix 2 also presents the full rationale for identifying infeasible alternatives and the rationale for further analyzing the alternatives carried forward for full analysis in the EIR. Largely this determination is based on the three major criteria listed below:

Criterion 1: Project Objectives. Many of the alternatives described in the Alternatives Screening Report are modifications to SDG&E's proposed transmission line route between the Miguel and Mission

Substations. All of these alternatives are weighed against and in some degree meet the project objectives defined by SDG&E.

Criterion 2: Feasibility. The alternatives are also weighed by their ability to meet technical, legal, and regulatory feasibility criteria as described in Section C.2 above.

Criterion 3: Environmental Effects. The preliminary summary of potentially significant environmental impacts of the Proposed Project is shown in the Alternatives Screening Report. The impacts are detailed in full in EIR Section D for those alternatives not eliminated by screening. Each alternative is evaluated by its overall ability to reduce or avoid significant adverse effects of the Proposed Project. In some cases, an alternative may eliminate a significant impact, but may subsequently result in a new significant impact. In these cases, the aggregate environmental impacts associated with Proposed Project are compared with those associated with the alternative to determine whether the alternative meets the overall CEQA requirement.

C.3.1 Alternatives Analyzed in the EIR

The alternatives listed below have been chosen for detailed analysis in this EIR through the alternative screening process:

- Jamacha Valley 138 kV/69 kV Underground Alternative
- Jamacha Valley Overhead A Alternative
- Jamacha Valley Overhead B Alternative
- City of Santee 138 kV/69 kV Underground Alternative
- City of Santee 230 kV Overhead Northern ROW Boundary Alternative

These alternatives are briefly described in Section C.4 and in greater detail in Section 4 of Appendix 2. The preliminary conclusions generated during the screening process are presented briefly below and each of these alternatives is evaluated within each environmental issue area of Section D of this EIR. An overview of all of the alternatives is depicted on Figure C-1 and each individual alternative is illustrated in Figures C-2a through C-6b.

C.3.2 Alternatives Eliminated from Full Consideration in the EIR

The alternatives listed below were eliminated from consideration in the EIR; descriptions of the alternatives and the reasons for their elimination are presented in Section C.5 below and more detailed descriptions are in Section 4 of Appendix 2.

SDG&E Alternatives

SDG&E presented several system alternatives, several route alternatives and the No Project Alternative in its July 2002 PEA. However, these alternatives were determined by SDG&E to be infeasible when compared to the project objectives. The CPUC EIR Team made a similar independent determination. However, segments of these alternatives have been incorporated into the alternatives considered in this EIR; these are described in Section 4 of Appendix 2. The alternatives presented in the PEA fall into five categories described in the following subsections.

- SDG&E Transmission System Upgrades
- SDG&E Other 230 kV Alternatives
- SDG&E Route Design Alternatives
- SDG&E Energy Conservation and Load Management Alternatives
- SDG&E Alternative Technologies: Underground High-Voltage Transmission Alternative

Alternatives Developed by the CPUC

Major Route Modifications Utilizing Portions of the Miguel-Mission ROW

- City of Santee 230 kV Underground Along Southern ROW Boundary Alternative
- City of Santee 230 kV Underground Along Northern ROW Boundary Alternative
- Miguel-Los Coches Alternative
- El Cajon–Mission Trails Alternative
- Miguel–La Mesa Alternative
- El Cajon–Mission Gorge Road Alternative
- City of Santee–Mission Gorge Road Alternative
- Moreno-Santee Regional Lakes Alternative

West of Miguel Substation Alternatives

- Miguel-Main-Mission A Alternative
- Miguel-Main-Mission B Alternative
- West of Miguel Underground Alternative

Non-Wire Alternatives

- Renewable Resource Alternatives (Wind and Solar Technologies)
- System Enhancement Alternatives (Demand-Side Management and Distributed Generation)
- Integrated Resources Alternatives

Figure C-1. Overview of Alternative Routes

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C.4 Alternatives Evaluated in this EIR

C.4.1 Introduction

As discussed in Section C.2, alternatives were assessed for their feasibility, their ability to reasonably achieve the project objectives, and their potential for reducing the significant environmental impacts of the Proposed Project. Based on these screening criteria, the following alternatives were selected for detailed analysis within this EIR. See Appendix 2 of this EIR for the full Alternatives Screening Report.

C.4.2 Alternatives Utilizing the Miguel-Mission ROW With Minor Route Modifications

C.4.2.1 Jamacha Valley 138 kV/69 kV Underground Alternative

This alternative was developed to address the concerns of residents in Jamacha Valley living near or adjacent to the Miguel-Mission ROW regarding potential long-term visual impacts and EMF emissions associated with the Proposed Project. Two underground options were evaluated within Jamacha Valley along Willow Glen Drive. The two options included undergrounding either the proposed 230 kV circuit or the existing 138 kV and 69 kV circuits. Under both options, the existing circuits would transition from a new pole or lattice structure onto a new transition pole immediately south of Willow Glen Drive, transitioning underground and continuing underground for approximately 3.5 miles along the length of Willow Glen Drive to the intersection of Willow Glen Drive and Dehesa Road. The underground circuits would then connect to a new transition pole to be installed west-northwest of Singing Hills Memorial Park and transition back to an overhead configuration in the existing ROW. Figures C-2a, C-2b, and C-2c provide an illustration of this route modification in Jamacha Valley. The two options evaluated are as follows:

- **138 kV/69 kV Underground Option.** Under this option, 14 proposed new poles supporting the 138 kV and 69 kV circuits would not be constructed because both the 138 kV and 69 kV circuits would be placed underground along Willow Glen Drive, rather than relocated to newly constructed poles. Two transition poles would be required at the north and south ends of the segment, within the existing ROW. In this option, the new 230 kV circuit would be placed on existing and modified towers where the 138 kV/69 kV circuits are currently located. No new poles would be constructed in this ROW segment, except for the transition poles.
- **230 kV Underground Option.** In this option, the 138 kV and 69 kV circuits (six new conductors) would remain positioned in the ROW on the existing towers, and the 230 kV bundled circuit (also six conductors) would be installed underground along Willow Glen Drive. Two transition poles would be required (larger than those needed for the 138 kV/69 kV underground option). No new poles would be constructed in this ROW except for the transition towers.

Conclusion Regarding Underground Options. Because the 138 kV/69 kV Underground Option through Jamacha Valley provides better overall benefits to the visual environment (i.e., fewer poles to install, transition poles are smaller) and the public in comparison to the 230 kV underground option, the 138 kV/69 kV underground option was selected as the alternative to be addressed for further evaluation in the screening analysis.

Residences are located intermittently along either side of the existing ROW in the Jamacha Valley. Magnetic field levels along the existing ROW in Jamacha Valley would not be substantially reduced by relocating the 138 kV and 69 kV circuits to an underground route: **they would drop from 21.6 mG with the Proposed Project to 21.5 mG under this alternative (at west edge of ROW) and from 10.2**

mG to 9.4 mG (east edge). Placement of the 138 kV and 69 kV circuits in Willow Glen Drive would introduce field levels of 56.6 mG to locations directly above the duct bank. At either edge of the 70-foot wide road, assuming placement of the duct bank in the center of the road, magnetic field levels would be about 1.7 mG.

Rationale for Full Evaluation

Project Objectives. The Jamacha Valley 138 kV/69 kV Underground Alternative is consistent with SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure.

Feasibility. The CPUC requested that SDG&E evaluate the feasibility of undergrounding the 138 kV/69 kV along Willow Glen Drive in Jamacha Valley. SDG&E stated that:

> ***". . . preliminary review of the route presents several problems, including but not limited to, circuit clearance problems, conflicts with other underground utilities, the requirement to obtain new right-of-way in order to construct a segment of overhead line outside of SDG&E's existing right-of-way and the possibility of increased EMF levels. All these issues could contribute to a delay of the project in-service date, and not satisfy the project purpose and need. The additional cost of this option could be very high, up to $16 million, with the potential added financial impact to customers of possible future costs because the underground portion will be built in "franchise position". In "franchise position" means that SDG&E would be required to pay to move the underground transmission line if, in the future, an existing or a future utility needed SDG&E's position in the roadway." (SDG&E, 2003h)***

Based on this feedback from SDG&E, CPUC requested that an independent engineering firm (Commonwealth Associates Incorporated [CAI]) review the 3.5-mile route and to evaluate the feasibility of this potential alternative (see EIR Appendix 4 for further details on the feasibility assessment). CAI found that it is technically feasible to construct an underground transmission line in this Jamacha Valley segment. However, this alternative may require additional time to construct the underground segment through Jamacha Valley because of the slower pace of trenching.

Potential to Lessen Significant Environmental Effects. This alternative has the potential to lessen the adverse environmental effects of the Proposed Project. Impacts that would be reduced include the following:

- **Visual Resources**. This alternative would eliminate 14 proposed 138 kV/69 kV poles, avoiding some of the potentially adverse visual impacts that would result from the Proposed Project. It would substantially eliminate the visual impacts along Willow Glen Drive and from the Cottonwood community near Hillsdale and Vista Rodeo Roads. In addition, this alternative would have a net reduction of three overhead conductors along this segment of the ROW in comparison to the baseline conditions. Six existing overhead conductors (two circuits) would be installed underground along Willow Glen Drive. Unlike the Proposed Project, this alternative would create no new adverse visual impacts to residents adjacent to the existing Miguel-Mission ROW or recreational users at Singing Hills Country Club.
- **Cultural Resources**. Eight identified cultural resources sites are located within the Proposed Project ROW between the intersection of Willow Glen Drive and the Miguel-Mission ROW and Dehesa Road. This alternative would avoid these eight known cultural resources sites.

Figure C-2a. Jamacha Valley 138 kV/69 kV Underground Alternative

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Figure C-2b. Jamacha Valley 138 kV/69 kV Underground Alternative

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Figure C-2c. Jamacha Valley 138 kV/69 kV Underground Alternative

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- **Biological Resources**. This alternative would reduce potential impacts to biological habitat and resources (e.g., coastal sage scrub, southern-willow riparian forest, hermes copper butterfly), since there would not be any new poles installed along this ROW segment. However, the Applicant would still need to modify the 138 kV lattice towers and install the 230 kV circuit along this segment of the ROW. This construction activity would be limited and would disturb fewer biological resources than the Proposed Project.
- **Corona Noise**. In comparison to the Proposed Project, this alternative would decrease corona noise levels along the ROW as a result of undergrounding the 138 kV and 69 kV circuits along Willow Glen Drive.
- **Soil Erosion and Slope Stability**. Reduced construction activity along the slope of the Miguel-Mission ROW would reduce potential impacts to slope stability, a concern identified by Cottonwood residents during the scoping period. This alternative would also minimize soil erosion concerns associated with construction activity along the slopes of this segment of the ROW.

C.4.2.2 Jamacha Valley Overhead A Alternative

Description

The Jamacha Valley Overhead A Alternative was evaluated based on concerns from residents in Jamacha Valley about visual resources and EMF levels. Under this alternative, the 138 kV and 69 kV circuits would be located on new steel mono-poles on the east side of the ROW, from a point near the Herrick Center (Steele Canyon Road and Jamul Drive) to the intersection of the Miguel-Mission ROW and Hillsdale Road. The new alignment of poles would be located 12 feet from the eastern edge of the ROW (see Figures C-3a and C-3b). The 69 kV circuit would be located on the west side of the new alignment of steel mono-poles, and the 138 kV circuit would be positioned on the east side.

This alternative was part of SDG&E's original alignment for the Miguel-Mission 230 kV #2 Project through Jamacha Valley. However, SDG&E modified its alignment along this segment to position the 138 kV and 69 kV circuits in the center of the ROW. SDG&E made this change for the following reasons:

- SDG&E stated it would need to build (or extend) new access roads to get to each new pole site on the east side of the ROW through Jamacha Valley. These new access roads could cause significant environmental impacts, such as impacts to biological resources, cultural resources, soil erosion, and water quality. This alternative would also increase temporary air quality and noise impacts to residents along the ROW from the additional construction requirements.
- Difficult to access and construct on steep terrain along the east side of the ROW.
- Concerns about visual resources and EMF from community members located east of the ROW (e.g., Boxwood Drive, Rodeo Drive) in the northern portion of Jamacha Valley, as well as the residents east of the ROW (e.g., Camino Monte Sombre Trail, Camino de la Sierra) between Jamacha Valley and Interstate 8.

Magnetic field levels along the western edge of the existing ROW in the Jamacha Valley would not be substantially reduced, and levels along the eastern edge of the ROW would be increased by roughly 40 percent because of locating the 138 kV and 69 kV circuits near the eastern edge: **they would decrease from 21.6 mG with the Proposed Project to 21.4 mG under this alternative (at west edge of ROW) and increase from 10.2 mG to 14.7 mG (east edge)**.

Rationale for Full Evaluation

Project Objectives. The Jamacha Valley Overhead A Alternative is consistent with SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure.

Feasibility. CPUC requested that an independent engineering firm (CAI) evaluate the feasibility of this alternative. CAI concluded that it appears feasible to install new 138 kV/69 kV circuits 12 feet from the eastern edge of the ROW. However, additional ROW may be needed (up to approximately 15 feet east of the existing ROW) because of the location of the circuits.

Lessen Significant Environmental Effects. The 138 kV and 69 kV poles would be located on the east side of the ROW, downslope from the proposed location of the 138 kV and 69 kV poles under the Proposed Project. As a result, this alternative would provide an improvement to the viewshed over the Proposed Project for residents in the Cottonwood community, south of Hillsdale Road.

C.4.2.3 Jamacha Valley Overhead B Alternative

Description

This alternative was developed to address the concerns of residents in Jamacha Valley living near or adjacent to the Miguel-Mission ROW regarding potential long-term visual impacts and EMF emissions associated with the Proposed Project. The Jamacha Valley Overhead B Alternative would result in the addition of two steel mono-pole structure alignments and one lattice structure along the Miguel-Mission ROW in Jamacha Valley. At a point near the Herrick Center (Steele Canyon Road and Jamul Drive), the existing 138 kV/69 kV lattice towers would be removed and the existing 138 kV/69 kV circuits would be relocated to new steel mono-pole structures on the west side of the ROW. The new 230 kV circuit would be placed on new steel pole structures between the existing steel lattice structures and the new steel poles for the 138 kV and 69 kV circuits. See Figures C-4a, C-4b, C-4c, and C-4d for an illustration of this alternative.

This alternative would involve the installation of approximately 19 steel mono-poles (Towers #675975 through #675957, see maps in EIR Appendix 1) to accommodate the relocated 138 kV/69 kV circuit from the Herrick Center through Jamacha Valley, terminating northwest of the intersection of Dehesa Road and Willow Glen Drive. Seven of the 19 lattice structures are proposed to be replaced under the Proposed Project; this leaves a net of 12 additional steel lattice structures that would be replaced under this alternative. Upon relocation of the 138 kV and 69 kV circuits to new alignment of steel mono-poles, the existing 138 kV lattice tower structures would be removed. Under this alternative, it is assumed that the new 138 kV steel mono-pole structures would be located approximately 12 feet from the western edge of the Miguel-Mission ROW. The 69 kV circuit would be located on the west side of the pole and the 138 kV circuit on the east side.

Magnetic field levels along the western edge of the existing ROW in the Jamacha Valley would be reduced by roughly 10 percent, and magnetic field levels along the eastern edge would be increased by roughly 20 percent because of the 230 kV circuits being closer to that edge: **they would decrease from 21.6 mG with the Proposed Project to 19.0 mG under this alternative (at west edge of ROW) and increase from 10.2 mG to 12.5 mG (at the east edge)**.

Figure C-3a. Jamacha Valley Overhead A Alternative

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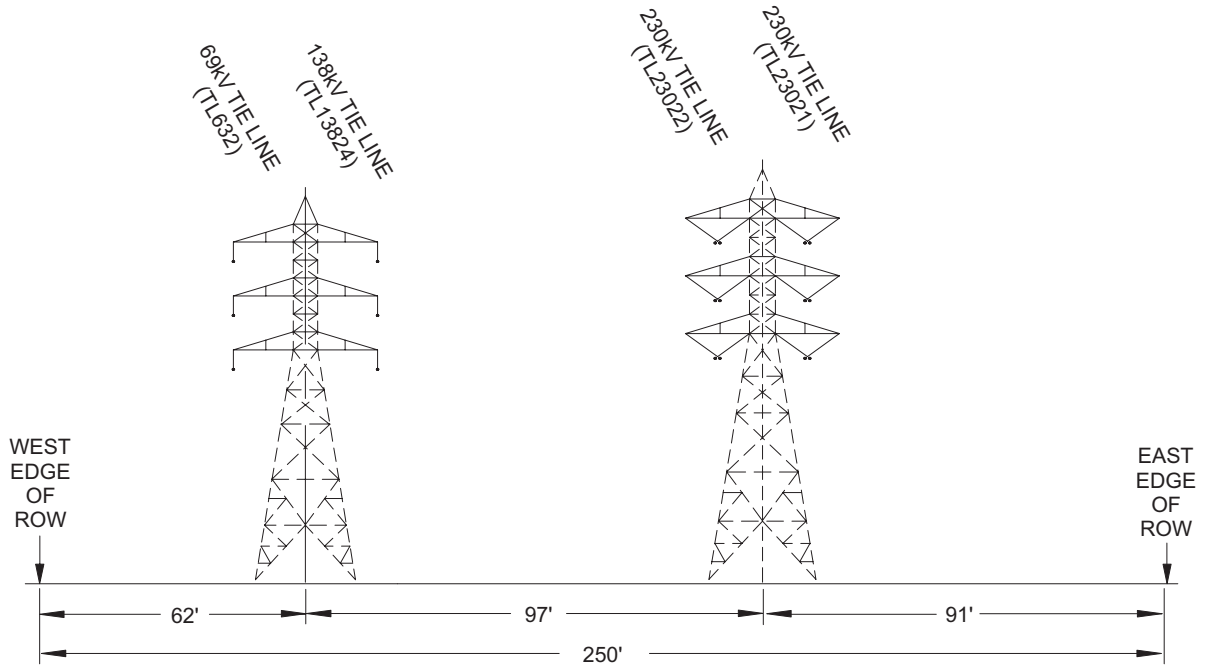
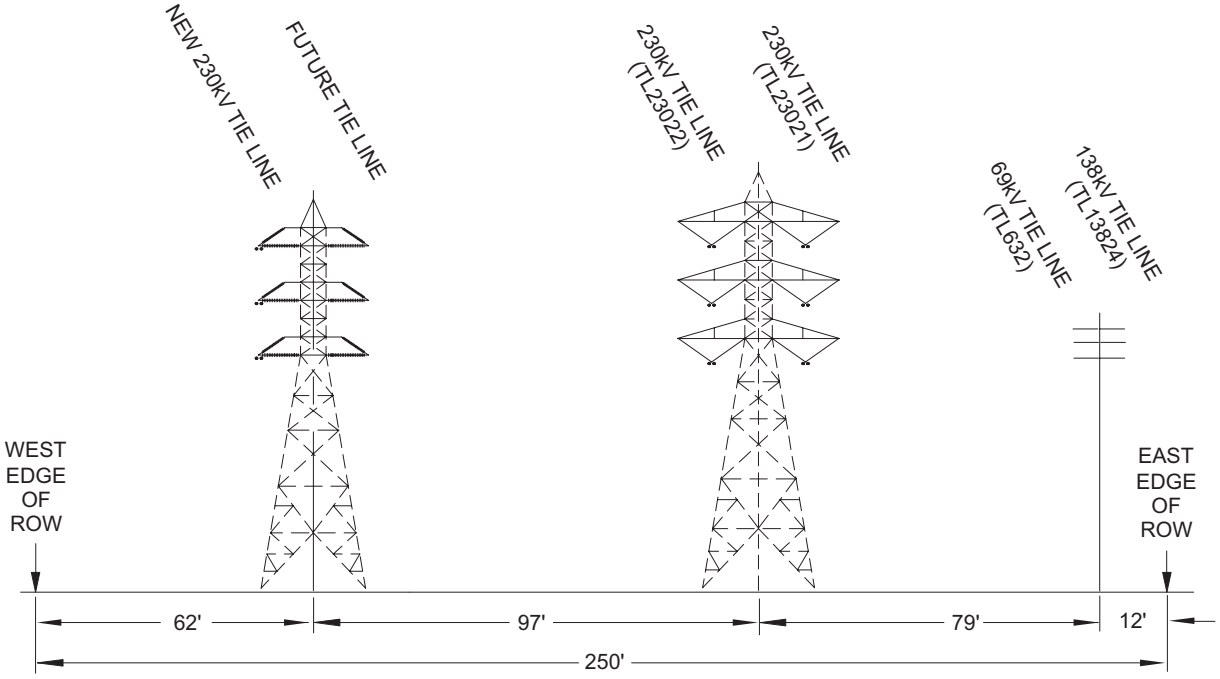
View: South to North



Existing Alignment



Alternative Alignment

Miguel-Mission 230 kV #2 Project

Figure C-3b

Jamacha Valley Overhead A Alternative Alignment Profile

Aspen Environmental Group

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Figure C-4a. Jamacha Valley Overhead B Alternative

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Figure C-4b. Jamacha Valley Overhead B Alternative

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Figure C-4c. Jamacha Valley Overhead B Alternative

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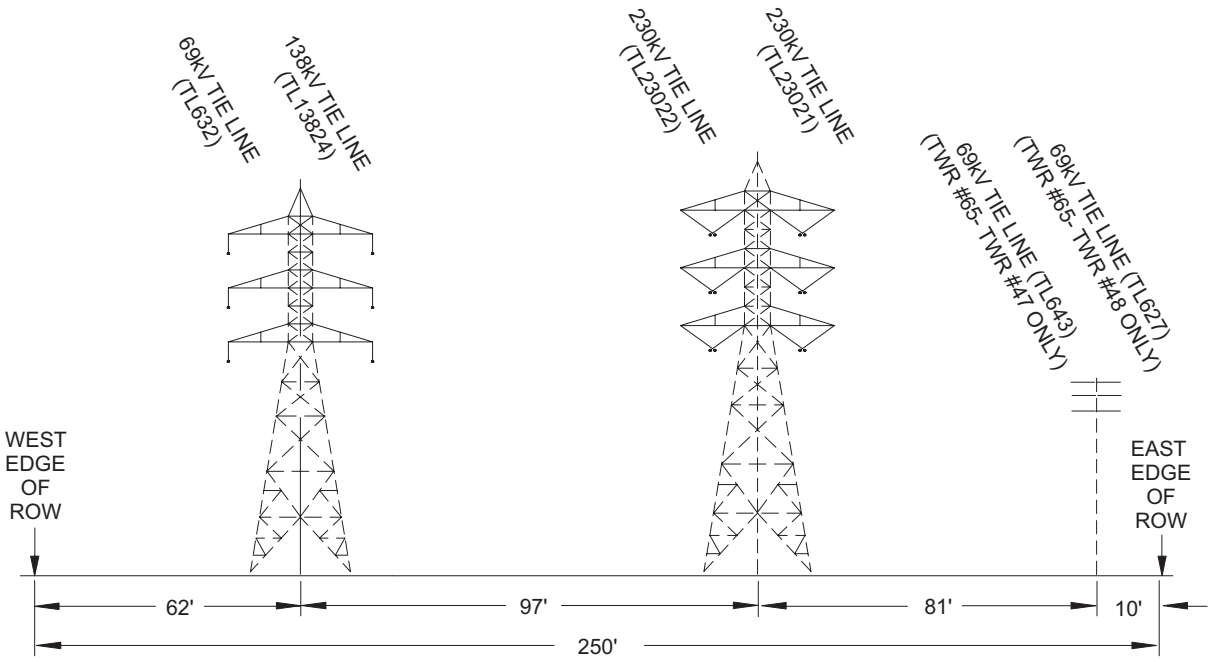
View: South to North



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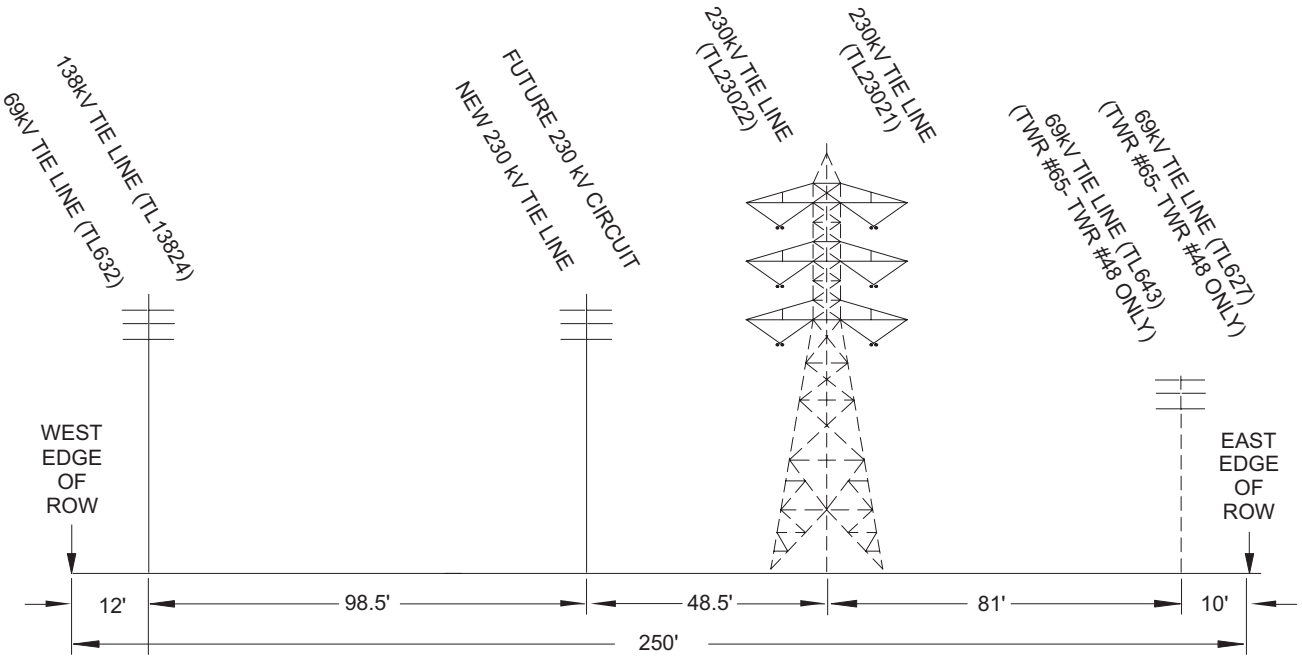

Alternative Alignment

Installation of a new 230 kV circuit on steel mono-poles centered in the Miguel-Mission ROW, with new steel or wood poles for 138 kV/69 kV circuits in Jamacha Valley

Miguel-Mission 230 kV #2 Project

Figure C-4d

Jamacha Valley Overhead B Alternative Alignment Profile

Aspen Environmental Group

Rationale for Full Evaluation

Project Objectives. The Jamacha Valley Overhead B Alternative is consistent with SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure.

Feasibility. The Jamacha Valley Overhead B Alternative is considered to be feasible. However, because the applicant would need to remove lattice structures within the Jamacha Valley area, this alternative could cause project delays or extend project duration.

Lessen Significant Environmental Effects. This alternative would remove the existing 138 kV steel lattice structures in the Jamacha Valley and replace them with new steel mono-poles. Instead of two lattice structure alignments and a steel mono-pole alignment in the ROW (as with the Proposed Project), the ROW would contain two steel mono-pole alignments and a steel lattice structure alignment under this alternative. This alternative would involve the installation of approximately 12 steel mono-poles to accommodate the 138 kV and 69 kV circuits. This would be considered a permanent visual beneficial impact to the residents and recreational users within Jamacha Valley. Steel mono-poles are considered less visually intrusive than the steel lattice structures.

C.4.2.4 City of Santee 138 kV/69 kV Underground Alternative

Description

The City of Santee expressed a preference for underground options for the Miguel-Mission 230 kV #2 Project in their scoping comments. As a result, two underground options were evaluated along Princess Joann Road within the City of Santee. The two options included undergrounding either the proposed 230 kV circuit or the existing 138 kV and 69 kV circuits. Both options would follow the same route through this segment of the Miguel-Mission ROW. The circuits would be installed underground for approximately 0.6 miles outside the Miguel-Mission ROW along a water storage tank access road and 0.75 miles along the length of Princess Joann Road. See Figure C-5 for an illustration of the City of Santee 138 kV/69 kV Underground Alternative. The two options are:

- **138 kV/69 kV Underground Option.** Under this option, no additional poles would be installed in the City of Santee, avoiding new and permanent visual impacts that would occur with the Proposed Project. Three proposed 138 kV wood or steel poles associated with the Proposed Project would be eliminated. In addition, the City of Santee 138 kV/69 kV Underground Alternative would eliminate two existing 138 kV poles north of Magnolia Avenue. The residents south of existing ROW would experience a net reduction of three overhead conductors along this segment of the ROW in comparison to the existing baseline conditions.
- **230 kV Underground Option.** Similar to the 138 kV/69 kV underground option, no additional poles would need to be installed in the City of Santee under this option. Three proposed 138 kV wood and steel poles associated with the Proposed Project would be eliminated. However, this route modification would not eliminate the two existing 138 kV poles north of Magnolia Avenue, as described for the 138 kV/69 kV underground option. In addition, the residents along the southern boundary of the existing ROW would not experience a net reduction of three overhead conductors along this segment of the ROW, as described for the 138 kV/69 kV underground option.

Figure C-5. City of Santee 138 kV/69 kV Underground Alternative

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Conclusion Regarding Underground Options. Because the 138 kV/69 underground option through the City of Santee provides better overall benefits to the environment (i.e., visual benefits from reduced number of poles and overhead conductors) and the public in comparison to the 230 kV underground option, the 138 kV/69 kV underground option was selected as the alternative to be addressed for further evaluation in the screening analysis.

The City of Santee 138 kV/69 kV Underground Alternative has several components and is divided into sections to specifically address the 69 kV, 138 kV, and 230 kV circuits.

- **69 kV Circuit.** An aboveground water storage tank/reservoir is located adjacent to the Miguel-Mission ROW approximately 1,450 feet due east of the eastern end of Princess Joann Road (see Figure C-5). A paved access road extends from the water tanks approximately 1,400 feet northwest, then turns southwest and continues for approximately 1,600 feet until reaching the eastern end of Princess Joann Road. Just south of the existing water tanks, the 69 kV circuit would transition from its current location on a new wood or steel pole alignment located 12 feet from the southern edge of the Miguel-Mission ROW onto a new cable pole and transition underground following the route of the paved access road described above for approximately 0.6 miles to the end of Princess Joann Road. The 69 kV circuit would continue underground in a generally east to west direction for approximately 0.75 miles along the length of Princess Joann Road and connect to a new cable pole to be installed in the Miguel-Mission ROW located approximately 800 feet northwest of the western end of Princess Joann Road. At the new cable pole location, the 69 kV circuit would transition back to an overhead configuration and reconnect to the new steel or wood pole alignment located 12 feet from the southern edge of the Miguel-Mission ROW.
- **138 kV Circuit.** The existing 138 kV circuit located in the Miguel-Mission ROW north of the City of Santee connects the Mission Substation with the Santee Substation, which is located along Mast Boulevard in the City of Santee. Currently, the existing 138 kV circuit exits the Miguel-Mission ROW at the top of Magnolia Avenue and heads south along Magnolia Avenue on the west side of the street and then turns east along Mast Boulevard to Santee Substation.

  Under this alternative, the existing 138 kV circuit would remain in the same configuration as the Proposed Project between Fanita Junction and a point approximately 800 feet northwest of the western end of Princess Joann Road (see Figure C-5). At this point, the 138 kV circuit would be installed on a new cable pole where the circuit would transition from an overhead alignment to underground route. The 138 kV circuit would continue generally eastward underground for approximately 0.5 miles along Princess Joann Road until reaching the intersection of Princess Joann Road and Magnolia Avenue. At this location, the underground 138 kV circuit would turn north for several hundred feet and transition to an overhead line via a new cable pole. The overhead 138 kV circuit would then turn south and energize the existing 138 kV circuit that continues south along Magnolia Avenue to Santee Substation. The new cable pole installed at this location would replace an existing 138 kV wood pole currently located adjacent to Magnolia Avenue, which is used to support the existing 138 kV circuit between the Miguel-Mission ROW and Santee Substation.
- **Non-Energized 138 kV Circuit.** Within the City of Santee, the existing 138 kV circuit between Tower #576655 (just west of Oak Creek Drive, see Appendix 1 in the EIR) and Magnolia Avenue is currently not energized. This short span of 138 kV circuit was taken offline in order to energize the 138 kV circuit that is located along Magnolia Avenue and provides power to the Santee Substation (located on Mast Boulevard). East of Santee Substation, the existing 138 kV circuit heads north and taps back into the Miguel-Mission ROW at Tower #576655, creating a continuous 138 kV circuit. SDG&E has stated that they may need this short-span (between Magnolia Avenue and Tower #576655) of the 138 kV circuit for reliability purposes in the future. Therefore, this alternative also includes a non-energized 138 kV circuit underground that would follow the same

route as noted above for the 69 kV circuit between Magnolia Avenue and the cable pole location to the south of the water tanks (1,400 feet east of the eastern end of Princess Joann Road). This non-energized segment would enable SDG&E to maintain this non-energized circuit north of the City of Santee.

- **230 kV Circuit.** The proposed 230 kV circuit would continue from east to west on the modified 138 kV/69 kV modified lattice tower alignment through the City of Santee and continue in that alignment to Fanita Junction. North of the City of Santee, the proposed 230 kV circuit would be located on the south side of the modified steel lattice towers. The center of the existing lattice structures is located 50 feet north of the existing southern boundary of SDG&E's ROW.

Residences are located immediately adjacent to the southern edge of the existing ROW in the City of Santee. Magnetic field levels along the southern edge of the existing ROW in the City of Santee would be reduced by roughly 30 percent without substantially reducing levels on the northern edge by relocating the 138 kV and 69 kV circuits to an underground route: **magnetic fields would drop from 39.8 mG with the Proposed Project to 26.4 mG under this alternative (at south edge of ROW) and from 33.3 mG to 32.8 mG (north edge)**. Placement of the 138 kV and 69 kV circuits in Princess Joann Road would introduce field levels of 35.8 mG directly above the duct bank. At either edge of the 40-foot wide road, assuming placement of the duct bank in the center of the road, magnetic field levels would be about 5.0 mG.

Rationale for Full Evaluation

Project Objectives. The City of Santee 138 kV/69 kV Underground Alternative is consistent with SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure.

Feasibility. The CPUC requested that SDG&E evaluate the feasibility of undergrounding the 138 kV/69 kV along Princess Joann Road in the City of Santee. SDG&E stated that:

> ***". . . this alternative also presents several problems, including but not limited to, circuit clearance problems, conflicts with other existing underground utilities and the requirement to obtain new right-of-way for construction of a segment of underground circuit outside of SDG&E's existing right-of-way. All of these conflicts will contribute to a delayed in-service date and thus not meet the project purpose and need." (SDG&E, 2003h)***

Based on this feedback from SDG&E, CPUC requested that an independent engineering firm (Commonwealth Associates Incorporated [CAI]) review the 1.35-mile route and evaluate the feasibility of this potential alternative (see EIR Appendix D for the complete feasibility assessment). CAI found that it is technically feasible to construct an underground transmission line in this segment of the Miguel-Mission ROW. However, this alternative may require additional time to construct the underground segment through the City of Santee because of the slower pace of trenching.

Potential to Lessen Significant Environmental Effects. This alternative has the potential to lessen adverse environmental effects of the Proposed Project. Long-term impacts that would be reduced include the following:

- **Visual Resources**. The City of Santee 138 kV/69 kV Underground Alternative would eliminate the need to install three 138 kV wood and steel poles, which would be required with the Proposed Project. In addition, this alternative would eliminate two existing 138 kV wood poles north of Magnolia Avenue. The residents along the southern border of the existing ROW would experience a net reduction of three overhead conductors along this segment of the ROW in comparison with the existing condi-

tions. Overall, this alternative provides a net visual benefit to the City of Santee residents adjacent to the existing ROW.

- **Biological and Cultural Resources**. This route has the potential to reduce temporary and permanent impacts to biological resources (e.g., coastal sage scrub) and known cultural resources (four identified cultural resource sites are within the existing ROW) because construction would occur in city streets and not within the ROW. With regard to cultural resources, this alternative would avoid the four known cultural resource sites located within the ROW.
- **Soil Erosion.** In comparison to the Proposed Project, soil erosion from construction activities would be reduced because construction would be in city streets and not in the ROW.
- **Corona Noise**. This alternative would decrease corona noise levels along the ROW as a result of undergrounding the 138 kV and 69 kV circuits. Under the Proposed Project, the 138 kV/69 kV circuits would be very close to the residences along the southern boundary of the Miguel-Mission ROW.

C.4.2.5 City of Santee 230 kV Overhead Northern ROW Boundary Alternative

Description

This alternative was proposed based on input from residents of the City of Santee that the circuits should be moved to the northern side of the existing SDG&E ROW, further from the existing residences. As a result, two overhead options were evaluated within the City of Santee. The two options included placing either the proposed 230 kV circuit or the existing 138 kV/69 kV circuits on steel poles on the northern side of the ROW. Both circuits would follow the same route through this segment of the Miguel-Mission ROW. Under both options, the circuits would be moved to the north side of the existing ROW between the water tanks (approximately 1,450 feet due east of the eastern end of Princess Joann Road). In order to transition the circuits to the north side of the ROW, SDG&E would need to install an additional pole on the northern edge of the ROW, near the water tanks to the east of Princess Joann Road. From proposed Pole #1300 (see EIR Appendix 1), the circuits would head north and pass over/under the two existing 230 kV circuits to a new pole located on the north side of the ROW. The circuits would then head west paralleling the northern boundary (25 to 35 feet north of the existing northern boundary) of the ROW until a point approximately 800 feet northwest of the western end of Princess Joann Road, where the circuits would pass over/under the existing 230 kV circuits to a new pole located on the south side of the ROW and reconnect with the Proposed Project to Mission Substation. See Figures C-6a and C-6b for an illustration of the City of Santee 230 kV Overhead Northern ROW Boundary Alternative. The two options are:

- **138 kV/69 kV Overhead Option.** Under this option, the three proposed wood and steel poles associated with the Proposed Project would be retained, but would be moved further away from residents who reside adjacent to the southern boundary of the ROW. Three additional 138 kV wood and steel poles would be added to allow crossover of the circuits at Magnolia Avenue (to connect with the 138 kV circuit that is located along Magnolia Avenue) and at the two endpoints. Construction activities for installation of the new poles would occur at a greater distance (150 to 200 feet) from residents.
- **230 kV Overhead Option.** Similar to the 138 kV/69 kV Option, this option would retain the three proposed wood and steel poles associated with the Proposed Project along this segment. However, these poles would be moved further away from residents who reside adjacent to the southern boundary of the ROW. Only two additional 230 kV steel mono-poles would be required for this segment to allow crossover of the circuits at the two endpoints. Construction activities for installation of the new poles would occur at a greater distance from residents.

Conclusion Regarding Overhead Options. Because the 230 kV Overhead Option through the City of Santee provides better overall benefits to the environment (i.e., one fewer pole, only two crossings of the existing circuits) and the public in comparison to the 138 kV/69 kV Overhead Option, the 230 kV Overhead Option was selected as the alternative to be addressed for further evaluation in the screening analysis.

EMF levels along the southern edge of the existing ROW in the City of Santee would be reduced by roughly 50 percent, and because of locating the 230 kV at the northern edge of the ROW, levels would increase by nearly 100 percent on the north side of the ROW: **dropping from 39.8 mG with the Proposed Project to 18.0 mG with the alternative (at south edge of ROW) and increasing from 33.3 mG to 73.1 mG (at north edge of existing ROW)**. This alternative would also expand the width of the existing ROW to the north.

Rationale for Full Evaluation

Project Objectives. The City of Santee 230 kV Overhead Northern ROW Boundary Alternative is consistent with SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure.

Feasibility. CPUC requested that an independent engineering firm (CAI) review this route to evaluate the feasibility of this alternative (see EIR Appendix 4 for the complete feasibility assessment). CAI found that it is feasible to construct an overhead 230 kV transmission line along the north side of this segment of the Miguel-Mission ROW. However, the center of the 230 kV pole would be located approximately 35 feet north of the existing ROW (see Figures C-6a and C-6b). This is a result of the clearance needed between the proposed 230 kV circuit and the existing 230 kV circuits on the steel lattice structures.

Potential to Lessen Significant Environmental Effects. This alternative has the potential to lessen adverse environmental effects of the Proposed Project. Long-term impacts that would be reduced include the following:

- **Visual Resources.** In comparison to the Proposed Project, the three proposed 138 kV poles (230 kV steel mono-poles under this alternative) would be located along the northern boundary of the existing ROW, approximately 150 to 200 feet north of the residences in the City of Santee. This would substantially reduce the adverse visual impacts to the residents located along the existing southern ROW boundary because the poles and circuits would be further away from the residential community. However, two additional poles would be needed east and west of the residents to transition the pole from the middle of the ROW to the northern boundary. Overall, this alternative would improve the viewshed for those residents located along this segment of the Miguel-Mission ROW.
- **Air Quality.** Construction activities along the northern ROW boundary would create temporary dust and vehicle/engine emissions, although there would be an additional 150- to 200-foot buffer between the construction area and residents living adjacent to the southern boundary.
- **Noise.** Short-term construction noise at residents along the southern boundary would decrease with the exception of possible blasting to remove rock.
- **Corona Noise.** This alternative would decrease corona noise levels to residents along the southern boundary of the existing Miguel-Mission ROW because the circuits would be further away from the residential community.

Figure C-6a. City of Santee 230 kV Overhead Northern ROW Boundary Alternative

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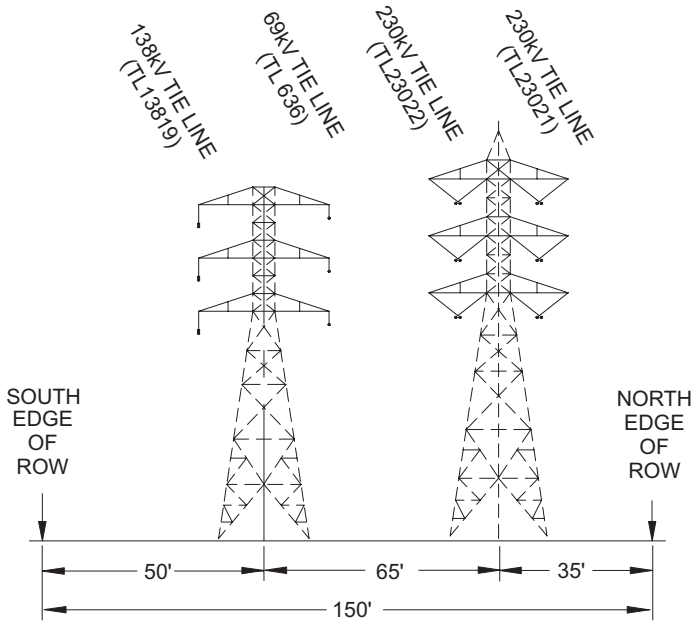
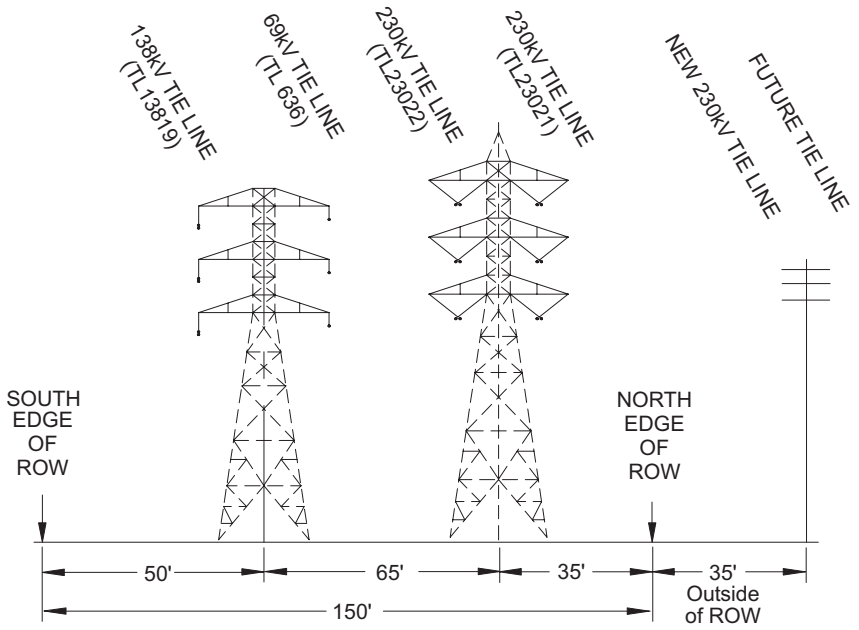
View: East to West



Existing Alignment



Alternative Alignment

Miguel-Mission 230 kV #2 Project

Figure C-6b

City of Santee 230 kV Overhead Northern ROW Boundary Alternative

Aspen Environmental Group

C.5 Alternatives Eliminated from Full EIR Evaluation

C.5.1 Introduction

As discussed in Section C.1, alternatives were assessed for their ability to reasonably achieve the project objectives and reduce the significant environmental impacts of the Proposed Project. Also, their technical, legal, and regulatory feasibility was evaluated. Based on these screening criteria, the alternatives eliminated from EIR consideration are listed above in Section C.3.2. The rationale for elimination of each alternative is summarized below and presented in detail in Section 4 of Appendix 2 of this EIR.

C.5.2 SDG&E Proposed Alternatives

As described in Section C.3.2, SDG&E proposed several system alternatives, several route alternatives, and the no-project alternative in the July 2002 PEA. However, the analysis contained in the PEA determined that each of these alternatives was infeasible when compared to the project objectives. Segments of these alternatives have been incorporated into the alternatives considered in this EIR.

C.5.2.1 SDG&E Transmission System Upgrades

Description

Upgrading Existing 138 kV/69 kV System. The 138 kV/69 kV upgrade alternative would include the addition of two new transformers and various bundling and reconductoring of existing 138 kV and 69 kV transmission circuits. This alternative would include the following transmission system upgrades:

- Installation of a new 230 kV/138 kV 392 mega-volt-ampere (MVA) transformer at Miguel Substation
- Installation of a new 138 kV line (two 636-kcmil ACSR) from the new 138 kV transformer terminal at Miguel Substation to the Proctor Valley Substation (1.4 miles)
- Loop-in the 138 kV transmission line (TL) 13824 (South Bay to Los Coches) to Proctor Valley Substation and installation of two new breakers with 2200A breaker rating or higher
- Bundle the 138 kV TL 13824 from Proctor Valley Substation to Los Coches Substation to two 636-kcmil ACSR (15.3 miles)
- Reconductor a portion of the 69 kV TL 631 (El Cajon to Los Coches) to one 636-kcmil ACSR (7.7 miles)
- Installation of a new 138 kV/69 kV 224 MVA transformer at Main Street Substation and tap TL 13815 on the 138 kV side of the new transformer
- Installation of a motorized switch on the South Bay Substation to Main Street tap line at the Main Street Substation
- Reconductor the 69 kV TL 606 (Division Street Substation–Naval Station Metering Facility) to two 636-kcmil ACSR (1 mile)
- Reconductor the southeast and northeast main bus at South Bay Substation with bundled 1,033-kcmil ACSR.

Rationale for Elimination

The 69 kV/138 kV system upgrade alternative would take up to a year longer to design and construct. In addition, the 69 kV/138 kV upgrade alternative would not provide a long-term solution because more thermal overloads on the transformers at Miguel Substation and various 69 kV circuits would exist as load grows and power flow increases into Miguel Substation, resulting from more generation interconnection south and east of Miguel Substation. Therefore, this alternative would not meet the project objectives and was eliminated from further consideration.

C.5.2.2 SDG&E Other 230 kV Alternatives

Description

Other 230 kV transmission alternatives considered by SDG&E were as follows:

- Installation of a new 230 kV circuit from Miguel Substation to Main Street Substation and construction of a new 230 kV substation at Main Street;
- Installation of a new 230 kV circuit from Miguel Substation to Los Coches Substation and construction of a new 230 kV substation at Los Coches; and
- Installation of a new 230 kV circuit from Miguel Substation to Sycamore Substation.

Rationale for Elimination

These 230 kV alternatives would require significantly more system reinforcements, such as various 69 kV/ 138 kV transmission line upgrades and transformer additions, than the Proposed Project. The 230 kV alternatives were eliminated from further study because they would greatly delay the project schedule due to the need for substation land acquisition and the construction of a new substation, would require greater amounts of equipment and materials, and would, therefore, result in greater environmental impacts and their associated mitigation.

C.5.2.3 SDG&E Route Design Alternatives

Description

The following route design alternatives were considered for the relocated 138 kV/69 kV circuits between Miguel Substation and Fanita Junction:

- **SDG&E Subsection A Alternatives – Miguel Substation to Tower #28.** Beginning at Miguel Substation and continuing to Tower #40, the relocated 138 kV/69 kV circuits would be installed on a new pole alignment located either to the east of the existing lattice towers or in a centered position between the two lattice tower alignments. Between Tower #40 and Tower #28, the relocated 138 kV/69 kV circuits would be placed either to the west of the existing lattice towers or in a centered position between the two lattice tower alignments.
- **SDG&E Subsection B Alternatives – Tower #28 to Tower #5.** From Tower #28 to Tower #5, the new 138 kV/69 kV pole alignment would be installed in a centered position between the two existing lattice tower alignments.
- **SDG&E Subsection C Alternatives – Tower #5 to Los Coches Substation.** From Tower #5 to Los Coches Substation, the new 138 kV/69 kV pole alignment would be installed either to the east or west of the two existing lattice tower alignments.
- **SDG&E Subsection D Alternatives – Los Coches Substation to Tower #37.** From Los Coches Substation to Tower #37, the new 138 kV/69 kV pole alignment would be installed either to the east or in a centered position between the two existing lattice tower alignments.
- **SDG&E Subsection E Alternatives – Tower #37 to Fanita Junction.** From Tower #37 to Fanita Junction, the relocated 138 kV/69 kV pole alignment would be installed either to the north of or in a centered position between the two existing lattice tower alignments.

Rationale for Elimination

Although SDG&E considered and eliminated alternative routes for the proposed 230 kV circuit, portions of the above alternatives for the 138 kV/69 kV pole alignment have been incorporated into the

alternatives considered in this EIR; these are described in Section 4 of the Alternatives Screening Report (EIR Appendix 2).

C.5.2.4 SDG&E Energy Conservation and Load Management Alternatives

Description and Rationale for Elimination

Energy conservation alternatives included consideration of conservation programs for SDG&E customers, including the payment financial incentives for customers to install specific, energy efficient measures. SDG&E also considered load management alternatives, which would reduce electric peak demand or shift electric demand from peak to non-peak time periods, but these programs also require the payment of financial incentives to customers and are considered neither reliable nor long term. Demand side management alternatives are also discussed in Section C.5.3.1 below. The energy savings from such programs are very limited and would represent only a fraction of the capacity that the Proposed Project would supply. Therefore, these alternatives were eliminated from further consideration.

C.5.2.5 Underground High-Voltage Transmission Alternative

Description and Rationale for Elimination

SDG&E considered placing all or part of the new 230 kV circuit underground as an alternative. However, this alternative was eliminated from consideration based on the potentially greater environmental impacts and construction duration associated with new underground construction versus overhead construction in the existing ROW. Underground trenching would have greater biological resources, cultural resources, soil disturbance, noise, air quality, and traffic impacts than the Proposed Project.

Other issues that have been discussed include possible circuit clearance problems, conflicts with other underground utilities, the requirement to obtain new right-of-way in order to construct a segment of overhead line outside of SDG&E's existing right-of-way and the possibility of increased EMF levels.

C.5.3 Alternatives Developed by CPUC

The alternatives listed below were developed as possible means of avoiding or reducing adverse impacts associated with the Proposed Project. Development of the following alternatives involved multiple site visits to the project area by the EIR preparation team in order to evaluate the Proposed Project route and to identify any route and/or system alternatives that could exist in the surrounding areas to the west and north of Miguel Substation and to the south of Sycamore Canyon Substation. The information gathered during these site visits and the comments and suggestions received from agencies and the public during the Scoping Period. In developing these alternatives, special consideration was given to the potential visual impacts of the Proposed Project and the concerns of the public regarding potential impacts from EMF. It should be noted that EMF information presented in the Alternatives Screening Report (EIR Appendix 2) is informational only and not part of the adopted standards under CEQA.

In addition, development of possible route and system alternatives considered a number of potential impacts to sensitive receptors or areas, including Balboa Park, ocean front areas, San Diego and Sweetwater Rivers, Old Town San Diego, various community parks and multiple residential neighborhoods. The discussions below briefly explain the reasons for elimination from EIR analysis for each potential alternative; more in-depth descriptions of each alternative are provided in Appendix 2.

There was also a detailed review of the highly developed areas and communities west and north of Miguel Substation in the attempt to develop a shorter route for the new 230 kV circuit and address the concerns

of residents living near or adjacent to the Miguel-Mission ROW regarding potential visual and EMF impacts associated with the Proposed Project. These alternatives are similar to the Proposed Project route in that they begin at Miguel Substation and end at Mission Substation; however, these alternative routes and route segments travel through more highly developed areas and communities to the north and west of the Miguel Substation.

C.5.3.1 City of Santee 230 kV Underground Along the Southern ROW Boundary Alternative

Description

EIR preparers discussed with the Planning Director of the City of Santee about potential alternatives to the Proposed Project along the existing ROW in the northern portion of the City of Santee. The City of Santee suggested that any new line through the City be placed underground. As documented below, the CPUC considered two underground options along the southern ROW boundary in the City of Santee; installing either the 138 kV and 69 kV circuits or the 230 kV circuit underground along this segment of the ROW.

Undergrounding of the proposed circuits along the southern ROW boundary for both options would begin at the water tanks approximately 1,450 feet due east of the eastern end of Princess Joann Road and would continue to a point approximately 800 feet northwest of the western end of Princess Joann Road (see Figure Ap.2-6 in Appendix 2). Underground placement would be along the paved access road (3,000 feet) until it intersects with Princess Joann Road, at which time the underground route would proceed west along the southern boundary of the existing SDG&E boundary (4,100 feet). The two underground options are:

- **138 kV/69 kV Underground Option**. Under this alternative, the 138 kV and 69 kV circuits would be placed underground along the southern boundary of the existing Miguel-Mission ROW. This alternative would eliminate three proposed 138 kV wood and steel poles associated with the Proposed Project. However, this alternative would require the installation of three transition poles to transition the circuits from overhead to underground and vice versa. Two of the transition poles would be located at the ends of this undergrounding segment (1,450 feet due east of the eastern end of Princess Joann Road and approximately 800 feet northwest of the western end of Princess Joann Road). The third transition pole (located north of Magnolia Avenue) is needed to enable the 138 kV circuit to tie into the existing 138 kV power line that continues south along Magnolia Avenue.
- **230 kV Underground Option**. Only two transition poles would be required under this alternative, one at each end of this underground segment. This option would eliminate three proposed 138 kV wood and steel poles associated with the Proposed Project.

Conclusion Regarding Underground Options. Because of the engineering issues and visual effects that would result from the additional pole (north end of Magnolia Avenue) under the 138 kV/69 kV underground option, this underground alternative focused on placing the proposed 230 kV circuit underground along the southern boundary of the ROW.

Rationale for Elimination

Feasibility. This underground alternative may cause project delays for this segment of the Miguel-Mission ROW due to underground construction.

Potential New Impacts Created. This alternative has the potential to create or increase short-term environmental effects of the Proposed Project. Short-term impacts that would increase include the following:

- **Cultural Resources.** The continuous trenching required for the City of Santee 230 kV Underground Along Southern ROW Boundary Alternative would have the potential to impact cultural resources. Four identified cultural resources sites are located within or adjacent to the ROW. Depending on the particular site, impacts may extend into the long-term. One of the four sites is considered sensitive, and would require excavation by a qualified archaeologist. The other three sites would require monitoring during construction. This alternative would require that the trenching occur within known cultural resource sites.

  In addition, there is an increased likelihood of affecting unknown buried cultural resources under this alternative as a result of trenching activities.

- **Biological Resources.** This alternative would increase temporary and permanent impacts to biological resources (e.g., coastal sage scrub) and sensitive biological species. It is estimated that 1.2 acres of habitat would be disturbed during trenching operations along the Miguel-Mission ROW.

- **Soil Erosion.** In comparison to the Proposed Project, soil erosion from construction activities would be increased because of trenching activities.

- **Air Quality.** Construction activities along the southern ROW boundary would temporarily increase noise and dust emissions to residents directly adjacent to the ROW.

- **Noise.** Noise levels would increase during underground circuit placement. Should blasting be required for underground placement, noise levels would increase significantly for short periods.

In addition, SDG&E has stated that it would need to construct a termination station at each end of the underground segment, which would require the acquisition of, and impact to, additional land. This requirement may contribute to additional impacts to visual resources, biological resources, cultural resources, land use, noise, air quality, and water resources.

C.5.3.2 City of Santee 230 kV Underground Along Northern ROW Boundary

Similar to the City of Santee Underground Along Southern ROW Boundary Alternative, this alternative would place the proposed 230 kV circuit underground along the northern ROW boundary. The length of this underground alternative would be approximately 4,200 feet (see Figure Ap.2-8 in Appendix 2). The CPUC also evaluated the potential for installing the 138 kV/69 kV circuits underground along the northern ROW boundary in the City of Santee. Undergrounding the 230 kV circuit is considered to be a better option because it would not require a transition pole north of Magnolia Avenue for the 138 kV circuit.

Feasibility. This underground alternative may cause project delays for this segment of the Miguel-Mission ROW due to underground construction.

Potential New Impacts Created. This alternative has the potential to create or increase short-term environmental effects of the Proposed Project. Short-term impacts that would increase include the following:

- **Cultural Resources.** The underground construction associated with the City of Santee Northern ROW Underground Alternative would impact known cultural resources. Four identified cultural resources sites are located within or adjacent to the ROW. Depending on the particular site, impacts may extend into the long-term. As described above, one of the four sites is considered sensitive, which would require excavation by a qualified archaeologist. The other three sites would require monitoring during construction. This alternative would require that the trenching occur within known cultural resource sites.

In addition, there is an increased likelihood of affecting unknown buried cultural resources under this alternative as a result of trenching activities.

- **Biological Resources.** This alternative would increase temporary and permanent impacts to biological resources (e.g., coastal sage scrub) and sensitive biological species. It is estimated that 1.2 acres of disturbed land would result from trenching operations along the Miguel-Mission ROW.
- **Soil Erosion.** In comparison to the Proposed Project, soil erosion from construction activities would be increased because of trenching activities.
- **Air Quality.** Construction activities along the northern ROW boundary would temporarily increase noise and dust emissions due to the more extensive construction required for continuous trenching.
- **Noise.** Noise levels would increase during underground circuit installation as the trenching activities were underway. Should blasting be required for underground placement, noise levels would increase significantly for short periods.

A 230 kV circuit would require construction of a termination station at each end of the underground segment, which would require the acquisition of, and impact to, additional land. This requirement may contribute to additional impacts to visual resources, biological resources, cultural resources, land use, noise, air quality, and water resources.

C.5.3.3 Miguel-Los Coches Alternative

Description

The Miguel–Los Coches Alternative has been proposed in response to concerns of residents living near or adjacent to the Miguel-Mission ROW regarding potential permanent visual impacts and EMF emissions associated with the Proposed Project. It also addresses the public's request for consideration of consolidating the existing and proposed circuits within SDG&E's existing ROW.

Under this alternative, between Miguel and Los Coches Substations, the new 230 kV circuit would be installed on a newly constructed alignment of steel mono-poles to be located in the center of the Miguel-Mission ROW between the existing 230 kV lattice tower alignment and the existing 138 kV/69 kV lattice tower alignment. The new 230 kV circuit would be installed on the west side of the new steel poles from Miguel Substation to Los Coches Substation. See Figure Ap.2-9 in Appendix 2 for an illustration of this alternative.

Rationale for Elimination

Potential New Impacts Created. This alternative has the potential to create or increase short-term and long-term environmental effects of the Proposed Project. Impacts that would increase include the following:

- **Visual Resources**. In comparison to the Proposed Project, the visual resources impacts of the Miguel–Los Coches Alternative would be slightly greater because the new steel mono-poles would be approximately 15 to 20 feet taller than the new poles proposed by SDG&E for the 138 kV/69 kV design. In addition, the poles would not mirror the existing structures in the ROW, there would be a need for intermediate poles between the lattice structures to maintain clearances.
- **Public Services**. In addition, because of the more compact spacing requirements between structures and transmission lines, this alternative could result in short and long-term impacts to the public, including the potential for more frequent and longer service interruptions during installation and maintenance of the transmission lines.

- **Worker Safety**. SDG&E has also stated that there may be worker safety concerns associated with installing a steel mono-pole in between the two existing lattice structures.

C.5.3.4 El Cajon–Mission Trails Alternative

Description

This alternative route would exit the Miguel Substation in an overhead configuration and proceed northwest following the Miguel-Mission ROW. The circuit would transition underground and turn west onto Campo Road for 1.5 miles, turn east on Jamacha Valley Road and continue north for 5 miles to Broadway. The route would then continue west for 5-miles on Broadway as it becomes Fletcher Parkway, and then continue on Navajo Road until it connects with Jackson Drive. On Jackson Drive, the route would continue northwest for 1 mile and turn southwest on Mission Gorge Road. The route would continue on Mission Gorge Road for 3 miles until reaching Friars Road, at which point the route would continue west for another 2.5 miles until reaching Mission Substation. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. The El Cajon–Mission Trails Alternative is consistent with all of SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative would traverse densely populated and traveled urban settings, thus creating significantly greater impacts in the areas of air quality, traffic, public services, noise, safety (increased response times for emergency vehicles), hazardous materials, recreation, unknown cultural resources, and biological resources (near parks). In addition, SDG&E has stated that it would need to construct a termination station at each end of the underground segment, which would require the acquisition of, and impact to, additional land. This requirement may contribute to additional impacts to visual resources, biological and cultural resources, land use, noise, air quality, and water resources. In addition, this alternative would delay the project schedule.

C.5.3.5 Miguel–La Mesa Alternative

Description

This alternative route would exit Miguel Substation in an overhead configuration and proceed northwest along the Miguel-Mission ROW until reaching Campo Road, where it would transition underground, and head west to Broadway. At Broadway, the route would turn southwest and continue for 4 miles until reaching Massachusetts Avenue, where the route would turn north and continue for 1-mile until reaching University Avenue. The route would then continue west on University Avenue for 1.5 miles, turn north on College Avenue for 2 miles until reaching Montezuma Road. The route would then proceed west on Montezuma Road for 1.5 miles until reaching Fairmount Avenue, at which point the route would follow Mission Gorge Road north for 1.5 miles to Friars Road and continue west for 2.5 miles until reaching Mission Substation. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. The Miguel–La Mesa Alternative is consistent with all of SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative would have substantial adverse issues in the areas of air quality, unknown cultural resources, hazardous materials, noise, traffic (crossing four major roadways, and parallel to State Route 94 for 3 miles), public services and safety (increased response times for emergency vehicles), and water resources (crossing two major watercourses). Route may temporarily impact access to recreational areas along the route, as well as San Diego State University operations. In addition, SDG&E has stated that it would need to construct a termination station at each end of the underground segment, which would require the acquisition of, and impact to, additional land, which may contribute to additional impacts to visual resources, biological and cultural resources, land use, noise, air quality, and water resources. In addition, this alternative would delay the project schedule.

C.5.3.6 El Cajon Mission Gorge Road Alternative

Description

This alternative would exit the Miguel Substation in an overhead configuration and follow the Miguel-Mission ROW until reaching La Cresta Road. At La Cresta Road, the new 230 kV circuit would transition underground and continue along La Cresta Road for 1.5 miles until reaching Broadway via Greenfield Drive. The route would then proceed west for 5 miles on Broadway as it becomes Fletcher Parkway, continue along Navajo Road until reaching Jackson drive, at which point the route would turn northwest. The route would continue northwest on Jackson Drive for 1-mile, turn southwest on Mission Gorge Road and continue for 3 miles until reaching Friars Road. At Friars Road the route would continue west for 2.5 miles until reaching Mission Substation. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. The El Cajon–Mission Gorge Road Alternative is consistent with all of SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative would create potentially greater impacts in the areas of air quality, unknown cultural resources, hazardous materials, noise, traffic (this route would cross six major roadways), public services, and safety (increased response times for emergency vehicles) and water resources (crossing two major watercourses). In addition, SDG&E has stated that it would need to construct a termination station at each end of the underground segment, which would require the acquisition of, and impact to, additional land, which may contribute to additional impacts to visual resources, biological and cultural resources, land use, noise, air quality, and water resources. In addition, this alternative would delay the project schedule.

C.5.3.7 City of Santee–Mission Gorge Road Alternative

Description

This alternative would exit Miguel Substation and follow the Miguel-Mission ROW overhead until reaching Los Coches Substation. At Los Coches Substation, the proposed 230 kV line would transition underground and follow Julian Road west for 1.5 miles. The route would then proceed north on Los Coches Road for a short distance until reaching Woodside Avenue, continuing southwest for 5 miles until reaching Mission Gorge Road. The route would follow Mission Gorge Road until Friars Road and then continue to Mission Substation. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. City of Santee–Mission Gorge Road Alternative is consistent with all of SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative would create greater impacts in the areas of air quality, unknown cultural resources, hazardous materials, noise, traffic, and public services and safety (increased response times for emergency vehicles). This route passes through the center of the City of Santee, which may cause major disruption to public services and safety (including increased response times for emergency vehicles). SDG&E has stated that it would require a reactor station (up to 1 acre in size) for a 230 kV circuit underground. This requirement may contribute to additional impacts to visual resources, biological and cultural resources, land use, noise, air quality, and water resources. In addition, this alternative would delay the project schedule.

C.5.3.8 Moreno-Santee Regional Lakes Alternative

Description

Under this alternative, the new 230 kV circuit would be installed in the same overhead configuration within the Miguel-Mission ROW until reaching Willow Road in the community of Moreno. At Willow Road, the proposed 230 kV circuit would transition to a cable pole and into an underground configuration, continuing underground in a southwest direction for 6 miles along Lakeside Avenue (as it turns into Riverside Drive and Mast Street) until reaching Santee Regional Lakes. The proposed circuit would continue underground along the eastern edge of the Santee Lakes on or near Fanita Parkway until the intersection of Santee Lakes Blvd and the Miguel-Mission ROW. The 230 kV circuit would then transition through a new cable pole to an overhead configuration and reconnect to the Miguel-Mission ROW. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. Moreno–Santee Regional Lakes Alternative is consistent with all of SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative would create greater impacts in the areas of air quality, unknown cultural resources, hazardous materials, noise, recreational areas (e.g., Santee Lakes Regional Park), traffic (State Route 67), and public services and

safety (increased response times for emergency vehicles). This route passes through the center of the City of Santee on Mast Boulevard, which may cause major disruption to public services and safety (including increased response times for emergency vehicles). SDG&E has stated that it would require a reactor station (up to 1 acre in size) for a 230 kV circuit underground. This requirement may contribute to additional impacts to visual resources, biological and cultural resources, land use, noise, air quality, and water resources. In addition, this alternative would delay the project schedule.

C.5.3.9 Miguel-Main-Mission A Alternative

Description

This alternative has been proposed in order to develop an alternate route for the proposed 230 kV circuit that would be shorter than the Proposed Project route and would avoid public concerns regarding visual impacts, biological impacts, and EMF emissions that were brought up during the scoping process.

This alternative would exit Miguel Substation west and underground along San Miguel Road until reaching Bonita Road, where it would continue underground to until reaching an existing ROW at the intersection of E Street and Bay Boulevard (adjacent to the Sweetwater Marsh National Wildlife Preserve), a distance of approximately 7.5 miles. The new 230 kV circuit would then transition to an overhead configuration on a new cable pole and continue north/northwest for approximately 5.5 miles in a vacant position on the east side of an existing lattice tower alignment along the waterfront that eventually connects to Main Street Substation. The new 230 kV circuit would then exit Main Street Substation northwest and underground and continue along Harbor Blvd. to the Pacific Coast Highway, at which point it would continue underground another 7 miles until reaching Interstate 5. The proposed circuit would then transition to an overhead configuration in order to cross the San Diego River in the vicinity of Old Town Substation located at 5525 Gaines Street. From Old Town Substation, the 230 kV circuit would continue east for approximately 3.75 miles in an overhead configuration on one of two existing pole alignments located on the north side of Friars Road and enter the Mission Substation. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. The Miguel-Main-Mission A Alternative is consistent with all of SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. This route would also increase reliability of SDG&E system between Miguel and Mission Substation. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative is likely to result in significant adverse impacts in the areas of air quality, traffic (route would cross Interstate 805, Interstate 5, Interstate 8, and State Route 163), rail services, public services and safety (increased response times for emergency vehicles), noise, cultural resources, hazardous materials, and recreation and tourist areas (Chula Vista Nature Center, Seaport Village, Petco Park, San Diego Convention Center). A portion of this alternative route is located within the Sweetwater March National Wildlife Refuge, a very sensitive biological resource area. The construction of this route would also cause significant regional traffic impacts along roadways adjacent to San Diego International Airport. In addition, this alternative would delay the project schedule.

C.5.3.10 Miguel-Main-Mission B Alternative

This alternative has been proposed in order to develop an alternate route for the proposed 230 kV circuit that would be shorter than the Proposed Project route and would avoid public concerns regarding visual impacts, biological impacts, and EMF emissions received during the scoping process.

This alternative would exit Miguel Substation west and would be placed underground along San Miguel Road until reaching Bonita Road, where it would continue underground until reaching an existing ROW at the intersection of E Street and Bay Boulevard (adjacent to the Sweetwater Marsh National Wildlife Preserve), a distance of approximately 7.5 miles. The proposed 230 kV circuit would then transition to an overhead configuration on a new cable pole and continue north/northwest for approximately 5.5 miles in a vacant position on the east side of an existing lattice tower alignment along the waterfront that eventually connects to Main Street Substation. The proposed 230 kV circuit would exit Main Street Substation north and underground and continue along 30th Street until reaching University Avenue, turning west and continuing underground along University until turning southwest on Washington Avenue and intersecting with Pacific Coast Highway. From this point the line would continue underground north/northwest along the Pacific Coast Highway until it reaches Interstate 5.

The proposed circuit would then transition to an overhead configuration in order to cross the San Diego River in the vicinity of Old Town Substation located at 5525 Gaines Street. From Old Town Substation, the proposed circuit would continue east for approximately 3.75 miles in an overhead configuration on one of two existing pole alignments located on the north side of Friars Road and enter the Mission Substation. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. Miguel-Main-Mission B Alternative is consistent with all of SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative is likely to result in significant adverse impacts in the areas of air quality, traffic (route would cross Interstate 805, Interstate 5, Interstate 8, and State Route 163), rail services, public services and safety (increased response times for emergency vehicles), noise, cultural resources, hazardous materials, and recreation (Chula Vista Nature Center, Memorial Community Park Recreational Center). In addition, a portion of this alternative route (even though it would only require reconductoring) is located within the Sweetwater March National Wildlife Refuge, a very sensitive biological resource area. The construction of this route would also cause significant regional traffic impacts along roadways adjacent to San Diego International Airport. In addition, this alternative would delay the project schedule.

C.5.3.11 West of Miguel Underground Alternative

Description

This alternative would exit Miguel Substation underground to the west and would continue along San Miguel Road for 2 miles until reaching Bonita Road, at which point the route would turn north through Bonita Golf Club and continue north along Sweetwater Road to Worthington Street until connecting with Paradise Valley Road. At Paradise Valley Road, the route would continue west for 0.5 miles, turn north on Skyline Drive and continue on Cardiff Street/Skyline Drive until reaching Broadway. At

Broadway, the route would turn to the west and continue for 1 mile, turn north on Massachusetts Road and continue on University Avenue for 1.5 miles until reaching College Avenue, and continue north on Montezuma Road for 1.5 miles until reaching Fairmount Avenue. The route would continue north on Fairmont Avenue until reaching Mission Gorge Road and then 1.5 miles on Mission Gorge Road until reaching Friars Road and turning west. The route would then continue west on Friars Road for 2.5 miles until reaching Mission Substation. This alternative would be legally, technically, and regulatorily feasible.

Rationale for Elimination

Project Objectives. This alternative is consistent with SDG&E's project objectives to improve system reliability, reduce constraints on the existing transmission system, and improve the existing transmission infrastructure. However, this alternative would not support SDG&E's proposed future 230 kV circuit within the existing Miguel-Mission ROW.

Potential New Impacts Created. The underground construction associated with this alternative would create substantial temporary impacts in the areas of air quality, unknown cultural resources, hazardous materials, noise, and public services and safety (increased response times for emergency vehicles). In particular, this alternative route would create substantial traffic and transportation issues on a regional scale. As described above, this route would cross five major roadways in the region, including State Route 54, State Route 125, State Route 94, Interstate 8, and Interstate 15. In addition, there is also major construction currently underway at the intersection of Sweetwater Road and State Route 125; Caltrans is in the process of improving this interchange. This route may also impact Sweetwater County Park and access to other recreational areas (e.g., Skyline Community Park, Bonita Golf Club). In addition, this alternative would delay the project schedule.

C.5.4 Non-Wires Alternatives

Non-wires alternatives are those that do not involve the construction of new transmission lines. For example, if adequate sources exist, renewable energy and fossil fuel generation are potential non-wires alternatives. In addition, demand-side management (e.g., conservation) and distributed generation can also result in a reduced need for the Proposed Project without new transmission. The following section provides a discussion of these alternatives and their feasibility to alleviate project impacts while fulfilling the project objectives.

C.5.4.1 Renewable Resource Alternatives

Conscious efforts are being made to increase the renewable resource component of California's generation supply. As of 2001, approximately 54 percent of California's in-state generation was from oil, gas, and coal plants and 38 percent from hydroelectric, wind, waste-to-energy, geothermal, and solar plants. This section considers the principal renewable electricity generation technologies that could serve as alternatives to the Proposed Project. Renewable technologies include biomass, solar thermal, photovoltaic, wind, geothermal, tidal, small hydropower of 30 megawatts or less, waste tire, digester gas, landfill gas, and municipal solid waste generation technologies. The technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions. However, these technologies also have environmental consequences, feasibility problems, and may not meet the objectives of this Proposed Project.

In 2003, the CPUC, in collaboration with the California Energy Commission (CEC), has initiated a proceeding to implement the State's Renewable Portfolio Standard Program as mandated by Senate Bill 1078, which requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least 1 percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. On May 8, 2003 the CEC, the Consumer Power and Conservation Financing Authority (CPA), and the CPUC approved an Energy Action Plan in addition to the Renewable Portfolio Standard (CEC, 2003b). The goal of the Energy Action Plan is to:

> ***"Ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers taxpayers."***

The Renewable Resources Development Report (2003) prepared by the CEC and applicable to the San Diego area identifies wind and solar as the principal renewable resources available within the San Diego Gas and Electric territory (CEC, 2003a). Major California wind resources are located in the Altamont Pass, Tehachapi, and San Gorgonio areas of the state with more limited resources operating and available in the project area. Similarly, major existing solar energy facilities are also located outside of the project area, although the southern portion of the state overall has the strongest solar resource potential.

Wind Technology

Description

Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current (AC) into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. Modern wind turbines represent viable alternatives to large bulk power fossil power plants as well as small-scale distributed systems. The range of capacity for an individual wind turbine today ranges from 400 watts up to 3.6 MW. California currently generates about 1,800 MW of electricity from 105 separate wind facilities.

The components of a utility-scale "wind farm" include wind turbines, an underground power transmission system, control and maintenance facilities, and a substation that connects the farm with the utility power grid. Utility-scale wind turbines are classified by size as follows: small (less than 50 kilowatts [kW]); intermediate (50 to 500 kW); and large (above 500 kW). Small and intermediate turbines make up the bulk of the older installed turbine base, but new turbines installed in the late 1990s are generally 600 kW and larger. Utility-scale wind farms are generally located in areas with average annual wind speeds of at least 13 miles per hour. Wind power is more available during certain seasons because climatic conditions affect wind speed. In California, wind speeds are highest in the hot summer months, and approximately three-fourths of all annual wind power output is produced during the spring and summer.

The perception of wind as an emerging energy source reached a peak in the early 1980s, when wind turbine generators to convert wind power into electricity were being installed in California at a rate of nearly 2,000 per year. Progress slowed a few years later, as startup tax subsidies disappeared and experience demonstrated some deficiencies in design. At the present time, technological progress again has caught up, contributing lower cost and greater reliability. A major factor has been the inclusion of environmental externalities by electric utilities in their resource planning programs. It is now being shown that wind power is substantially more economically attractive and technically feasible than was previously thought.

There are now more than 16,000 wind turbines installed in the U.S., with almost all located in California. Their aggregate power rating is about 1,500 MW, and they generated some 2.7 billion kilowatt-hours (kWh) of electricity in 1991. It has been estimated that with fully commercial development, 20 percent of the nation's electricity needs could be supplied by wind power. And while California is providing a large share of this resource, there still are opportunities for substantial growth. California currently generates about 1,800 MW of electricity from 105 separate wind facilities.

According to the San Diego Regional Energy Infrastructure Study (2002), San Diego could obtain significant amounts of wind power from the Laguna and Jacumba Mountains located in eastern San Diego County, where Class 5 and Class 6 wind speeds are not uncommon. The study suggests that up to 500 MW of potential wind generation capacity could be developed over the next 30 years in the San Diego area (SDREO and SAIC, 2002). The main obstacle to utilizing wind generation is the existing lack of transmission infrastructure to transport the power to the grid. In addition to land required for transmission lines, approximately 5 to 6 acres are needed per megawatt of wind power. To achieve the approximately 500 MW proposed to be provided to Mission Substation by the Proposed Project, 2,500 to 3,000 acres for an equivalent wind-powered project would be needed.

Rationale for Elimination

Project Objectives. This alternative would increase operational flexibility within the SDG&E service area. However, there are reliability concerns with wind technology because of the need for a consistent wind source and it would not improve transmission system infrastructure.

Feasibility. The San Diego Regional Energy Infrastructure Study (SDREO and SAIC, 2002) concluded that untapped supplies of wind resources exist in mountainous and desert regions of San Diego County, and in Northern Baja California. However, there is currently insufficient transmission infrastructure available to bring this power to the grid. In addition, to develop 500 MW of wind generation, SDG&E would be required to procure additional easements from multiple public and private entities, which may be infeasible from a regulatory perspective. Therefore, this alternative is infeasible.

Potential New Impacts Created. In general, the areas in California with the best wind resources have already been developed. Centralized wind generation areas generally require 5 to 6 acres per megawatt. The land area needed for wind electricity generation could create significant land use, biological, cultural, and visual concerns. Wind turbines would have noise impacts associated with both construction and operation. Wind turbines have been documented to kill large numbers of raptors because these fast-flying birds do not account for movement of the rotating blades. In addition, new transmission would be required creating impacts similar or greater than the Proposed Project.

Solar Technology

Description

Currently, there are two types of solar generation available: solar thermal power (also known as concentrating solar power) and photovoltaic (PV) power generation. Solar thermal power generation uses high temperature solar collectors to convert the sun’s radiation into heat energy, which is then used to run steam power systems. Solar thermal is suitable for distributed or centralized generation, but requires far more land than conventional natural gas power plants and cannot provide power consistently over a 24-hour period. However, when hybridized with natural gas-fired power plants it can provide dispatchable power, i.e., power which can be provided at will, such as during short periods when solar energy is not available. Hybridization and thermal storage can enhance the economic value of the electricity produced and reduce its average cost.

With 354 MW of operating power plants, California leads the world in solar-thermal electric power generation. The vast majority of these facilities are parabolic-trough electric plants installed in the 1980s in the Mojave Desert where large tracks of available land exist. Centralized solar projects using the parabolic trough technology require approximately five acres per megawatt and photovoltaic arrays require approximately 2.5 to 10 acres per megawatt.

PV power systems convert sunlight to direct-current (DC) electricity, using solid-state semiconductor devices. PV technology has received increased support from private and public sectors since the 1970s, resulting in a steady decrease in costs and increases in performance. PV systems typically convert about 10 percent of the available solar energy to AC electricity. Approximately one square kilometer (247 acres) is required for a 100 MW rated PV power system. Such a system would produce an energy output of 600 MWh/day.

PV power systems are typically ground mounted or building mounted. Because only about 10 percent of the available solar radiation that falls on a given PV cell is converted into electricity, large areas are needed to achieve power outputs comparable to conventional electric plants. There is a current move by the PV industry towards "building-integrated" PV power systems. They reduce the land area required and can provide multiple benefits such as shade and thermal insulation for the building as well as electric power. Utilization of dual-purpose locations such as roof spaces and covered parking areas can help mitigate the area issues, and are becoming an increasingly attractive deployment strategy. With long term planning and a responsive government, SDREO predicts that PV could economically represent 230 and 865 MW capability in San Diego over the next 30 years (SDREO and SAIC, 2002). However, without rebate incentives, solar PV is not currently competitive with grid power.

Despite current drawbacks, the use of solar energy in California offers promise. San Diego in particular has among the best solar resources in the nation, possessing an average of 5.7 usable hours of peak sunshine per day (NREL, 2003). In addition, there has been significant growth of the use of PV in San Diego, largely because of long term planning efforts. For example, the San Diego Regional Energy Office (SDREO) and the U.S. Department of Energy have agreed on the goal of installing 20,000 solar roofs on industrial and commercial buildings by the year 2020. The SDREO has further indicated that the substantial costs associated with solar technology can be reduced through increased module production, aggregated purchasing strategies, and government tax incentives.

Rationale for Elimination

Project Objectives. There are reliability concerns with solar technology. While the use of solar technology may be appropriate for some peaker plants, solar energy technologies cannot provide full-time availability or regional reliability given the current state of the industry. Solar technology does not currently meet the objectives of the Proposed Project.

Feasibility. The use of solar energy in California offers obvious promise as an environmentally preferred resource and in the San Diego Region a potentially feasible alternative. However, it is limited by its availability (only during daytime hours), by the relatively high cost of solar panels, and by the significant quantities of land that would be required to support a facility to equal the capacity of the Proposed Project.

Potential New Impacts Created. While solar generation facilities do not generate air emissions (unless they operate with a fossil fuel component) and have relatively low water requirements, there are other potential impacts associated with their use. Construction of solar thermal plants can lead to habitat destruction and visual impacts. PV systems can also have negative visual impacts, especially if ground-mounted. Furthermore, PV installations are highly capital intensive, and manufacturing of the panels generates some hazardous wastes that could pose an occupational hazard. In addition, use of wind resources would still require new transmission lines to be constructed with impacts similar to or greater than the Proposed Project.

C.5.5 System Enhancement Alternatives

C.5.5.1 Demand-Side Management Alternative

Description

Demand-side management programs are designed to reduce customer energy consumption and overall electricity use. Because there would be no construction, there would be no new environmental impacts created from this alternative. Some programs also attempt to shift such energy use to off-peak periods.

The CPUC supervises various demand-side management programs administered by the regulated utilities, and many municipal electric utilities have their own demand-side management programs. The combination of these programs constitutes the most ambitious overall approach to reducing electricity demand administered by any state in the nation. In spite of the State's success in reducing demand to some extent in 2001, California continues to grow and overall demand is increasing. Economic and price considerations as well as long-term impacts of State-sponsored conservation efforts are considered in load forecasts. However, there are uncertainties about how much the demand reduction in the summer of 2001 was due to temporary behavioral changes and how much was due to permanent equipment changes. Despite the fact that demand-side management remains the leading focus of the State's efforts to meet electricity needs, population and economic growth, and reliability concerns limit demand reductions in the project area.

Rationale for Elimination

Project Objectives. While reductions in demand are considered an essential part of SDG&E's future operations and are incorporated into its system base and peak load forecasts, the available energy savings from these programs is insufficient to improve the service reliability to SDG&E customers to the level desired. As a stand-alone alternative to the Proposed Project, energy conservation and load management program alternatives were eliminated from consideration because they represent a small fraction of the capacity requirements needed to meet SDG&E's reliability and improved transmission infrastructure objectives.

Feasibility. Demand-side management is feasible on a small scale, but not on a scale that would be required to replace the Proposed Project.

C.5.5.2 Distributed Generation

Description

Distributed generation (DG) is the generation of electricity from facilities that are smaller than 50 MW in net generating capacity. Local jurisdictions such as: cities, counties, and air districts, would conduct all environmental reviews and issue all required approvals or permits for these facilities. Most DG facilities are very small, for example, a fuel cell can provide power in peak demand periods for a single hotel building. More than 2,000 MW of DG are now in place in California.

There are many DG technologies, including microturbines, internal combustion engines, combined heat and power (CHP) applications, fuel cells, photovoltaics and other solar energy systems, wind, landfill gas, digester gas and geothermal power generation technologies. DG units may be owned by electric or gas utilities, by industrial, commercial, institutional or residential energy consumers, or by independent energy producers. To the extent that it is established, DG acts to either reduce the load on the SDG&E system or augment supply as additional system generation. In either case, it would help to support SDG&E's ability to meet the applicable reliability criteria.

San Diego has 527 DG sites with a combined capacity of 372.3 MW, most of which comes from combined heat and power. In addition, other DG systems such as landfill gas and hydropower currently add about 40 MW of the above total. The potential for an increased use of DG systems is expected to occur mostly in association with Combined Heat and Power (Combined cycle) applications, although, landfill gas (biomass energy) facilities are estimated to almost double by the year 2020.

Rationale for Elimination

Project Objectives. While DG technologies are recognized as important resources to the region's ability to meet its long-term energy needs, DG does not provide a means for SDG&E to meet the objectives of the Proposed Project because of the comparatively small capacity of DG systems and the relatively high cost. DG technologies do not have the capability to meet SDG&E's stated objectives for increased import capacity, increased export capacity and grid enhancement.

Feasibility. Consideration of DG as an alternative to the Proposed Project is not feasible because no single entity has proposed implementing a substantial DG program. Also, a number of serious barriers including technical issues, business practices, and regulatory policies make interconnection to the electrical grid difficult. Broad use of DG resources would likely require regulatory support and technological improvements. Therefore, this alternative has been eliminated from further consideration because it would not be technologically feasible.

Potential New Impacts Created. Potential new impacts created by the use of DG generation would depend on the type of generation selected. Potential impacts associated with the use of solar and wind facilities are noted above.

C.5.6 Integrated Resources Alternative

Description

An integrated resources alternative could be made up of several components, rather than consideration of only a single transmission line project. The components could include a combination of the following:

- Demand-side management
- Transmission system upgrades
- Development of solar power and other renewables
- Distributed generation
- Generating facilities or cogeneration facilities.

Rationale for Elimination

Project Objectives. None of these alternatives individually meet the stated project objectives. Together, however, they would add needed power to the grid, improve the transmission infrastructure, and, together with conservation measures and reduced energy consumption, could alleviate transmission constraints and provide more reliable power.

Feasibility. Each of these components is technically feasible and could be implemented on a limited scale in San Diego County. However, each component has environmental and/or regulatory obstacles to its implementation (described in the individual sections above). Any combination of these alternatives would have no fewer obstacles than each alternative would have individually. Furthermore, implementation of a combination of resources could not be accomplished by the Applicant in this project, and would require regulatory changes or financial incentives that are not available in today's market.

Potential New Impacts Created. The creation of new impacts would be determined by the configuration of alternative technology and demand reduction options that would be selected for implementation. See the individual discussions of alternative technologies above for impacts that would be created through the use of a particular technology.

C.6 No Project Alternative

CEQA requires an evaluation of the No Project Alternative so that decision-makers can compare the impacts of approving the project with the impacts of not approving the project. According to CEQA Guidelines [Section 15126.6(e)], the No Project Alternative must include (a) the assumption that conditions at the time of the Notice of Preparation (i.e., baseline environmental conditions) would not be changed since the Proposed Project would not be installed, and (b) the events or actions that would be reasonably expected to occur in the foreseeable future if the project were not approved. The first condition is described in the EIR for each environmental discipline as the "environmental baseline", since no impacts of the Proposed Project would be created.

Section C.6.1 provides background on issues related to the No Project Alternative. Section C.6.2 presents the No Project Alternative scenario.

C.6.1 Background

The following paragraphs provide background information related to possible options and issues regarding the No Project Alternative.

SWPL Transmission and Miguel Station Upgrades

The San Diego system was historically designed to be dependant upon transmission imports to reliably meet customers load. Presently there are two corridors that the region relies on to accomplish this. One to the north, referred to as Path 44, which consists of a number of 230 kV facilities interconnecting with the SCE system. The second is a 500 kV line, known as the Southwest Power Link (SWPL), connecting the Miguel Substation in the southern portion of the SDG&E area with generation located to the east. As new generation in Mexico, the Imperial Valley, and other locations further east in Arizona are developed, additional energy will be delivered into the SDG&E region via the SWPL and Miguel Substation. The Miguel Substation acts as the western terminus of the SWPL, where imports are transformed from 500 kV to 230 kV. Once transformed to 230 kV, the energy must be integrated into the SDG&E system. One of the primary means of accomplishing this is via the existing Miguel-Mission 230 kV transmission line along with a number of 138 kV and 69 kV lines, as well as the 230/69 kV and 230/138 kV transformers on SDG&E's system. It is these facilities that experience potential overloads during high power imports from Mexico, especially in the southwest and the new merchant generators along the U.S.-Mexico border.

Additional Regional Generation

The Border Generation Group (Border Generation) is comprised of Calpine Corporation, Coral Power LLC, Intergen, PG&E National Energy Group, and Sempra Energy Resources. These five generating companies have announced construction of a total of 2,260 MW of new generation located along the U.S.-Mexican border. This generation is either currently operational or under construction. The majority of the generation is interconnected to the CAISO system at the Imperial Valley substation, and much of this generation is delivered to San Diego via the SWPL. In addition to the above generation,

Calpine has licensed the construction of the Otay Mesa project that will further increase the power flowing into the Miguel Substation. The Otay Mesa project is a 510 MW generator located just south of Miguel Substation and north of the U.S.-Mexican Border. AEP Resources has announced the construction of two 250 MW units just south of the Otay Mesa project that will interconnect with either the Otay Mesa project or directly to Miguel.

Thus, presently over 3,270 MW of new electricity generation is either operating, proposed, or under construction in the area south and east of Miguel Substation. The new electricity is positioned to flow into the SDG&E system via the Miguel Substation.

C.6.2 No Project Alternative Scenario

The No Project Alternative required for consideration under CEQA regulations would mean that the Miguel-Mission 230 kV #2 Project would not be built. Under the No Project Alternative, the adverse environmental impacts from the construction and operation of the Proposed Project would not occur. As a consequence, SDG&E or some other entity would need to either augment existing facilities and add new transmission and/or generation capacity to compensate for existing system limitations and anticipated new generation located in the area or continue to incur additional congestion charges associated with the lack of the import transmission capability necessary to take advantage of the economics associated with the operation of the new generation.

If neither the Proposed Project nor any alternative were approved by the CPUC, SDG&E and the CAISO would need to evaluate updated generation dispatch scenarios and consider alternative courses of action that could be implemented to provide adequate electric service to both the SDG&E area as well as providing necessary generation resources to the state. This would initially take the form of initiating new and costly congestion monitoring and mitigation actions. The CAISO is committed to replacing its current zonal congestion management process with a Locational Marginal Pricing (LMP) method. With either the zonal method or the LMP method of managing congestion, the economic benefits associated with the new generation would be lost to the San Diego region as well as much of California.

In addition to the economic impacts, the remaining congestion and constraints on the State's transmission grid would decrease access to new generating capacity, which would inhibit competition between a wide range of generators (new and efficient or old and less efficient). Any environmental benefits of increased competition would be less likely to occur under the No Project Alternative.

The components of the No Project Alternative were assumed to be the following:

1. **Additional Regional Generation:** No change to the existing generation construction schedules has been considered. There is a possibility that, without the project, a portion of the planned generation would either be cancelled or delayed. There is also a possibility that new generation capacity could be necessary in San Diego County or elsewhere to compensate for existing transmission system limitations and anticipated loads. It would be speculative to predict the type and location or schedule of development for new power plants needed to overcome the transmission system constraints remaining under the No Project Alternative.

2. **Congestion Issues:** The CAISO would be forced to implement short-term congestion measures until such time as it initiates its anticipated long-term Locational Marginal Pricing procedures. In both cases many of the economic benefits that would have been derived from the new generation would be lost. Under the No Project Alternative, SDG&E would continue to incur the congestion charges.

Summary of No Project Alternative Scenario

To the extent that the Proposed Project or an alternative thereto is not completed, many of the economic benefits that would have been derived from the new generation would not materialize and potential environmental benefits of increased competition within the generation sector would be lost.

C.7 References

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