Chapter 6: Detailed Discussion of Significant Impacts

6.1 Mitigation Measures Proposed to Minimize Significant Effects

6.1.1 Significant Irreversible Environmental Changes

Irreversible commitments of resources result from management decisions that affect non-renewable resources. Such commitments are considered irreversible when the affected resource deteriorates to the point that renewal can only occur over a long period of time or at great expense or when the resource has been destroyed or removed.

With regards to LEAPS, in accordance with FERC and USDA Forest Service requirements, the structures that are erected will be removed at the end of the federal hydropower license period and, unless otherwise dictated by the federal agency with jurisdiction thereupon, each of the affected sites located on federal lands will be returned to their pre-existing conditions. As such, although the license term may extend beyond fifty years, the Project's approval would not permanently alter the existing visual setting.

Since biological resources can, over time, be replaced and wetlands restored, impacts upon those resources would not constitute irreversible changes. Similarly, although generally non-renewable, cultural resource and heritage sites can, in certain instances, be preserved in-situ, replaced, relocated, reused, and/or their existence suitably documented.

During the Project's construction, fossil fuels, generally in the form of gasoline, diesel fuel, natural gas, oils, and lubricants and primarily associated with the operation of internal combustion engines will be directly utilized. Fossil fuels are consumed through the operation of equipment: (1) used in the transport of construction equipment, building materials, construction personnel, and fabricated products; (2) operated by construction workers and other personnel and utilized in the construction process; and (3) used on and off the site in the fabrication, transport, and assemblage of the equipment, materials, and products that will be used. Once consumed, fossil fuels are permanently expended and, through their consumption, cannot thus be conserved, become unavailable for other future or alternative uses, and produce often detrimental by-products, such as air pollutants. Construction of the Project cannot, however, currently and feasibly occur except through the use of equipment that will consume fossil fuels. Reasonable controls are already in place governing the handling, storage, and disposal of petroleum products, including any hazardous wastes that may be generated.[1]

In addition, during construction, a variety of natural resources will be consumed, including water, sand and gravel, clay, asphalt concrete and other petrochemical-based construction materials, metals, and metal products. Once utilized, these materials will be either irretrievably consumed or committed to the site on a relatively long-term basis.

The decision to approve or conditionally approve the Project constitutes a relatively long-term commitment of the affected sites for that land use. Once a particular property is allocated for a

[1]/ For example, as required under Chapter 6.95, Division 20, Article 1 of the H&SC (Hazardous Materials Release Response Plans and Inventory Law of 1985), businesses are required to develop a "release response plan" for hazardous material emergencies if they handle more than 500 pounds, 55 gallons, or 200 cubic yards of hazardous materials. In addition, the business must prepare a "hazardous material inventory" of all hazardous materials stored or handled at the facility over those thresholds and all hazardous materials must be stored in a safe manner.

particular use, the site's availability for an alternative use either diminishes or is eliminated during the term of that use. Because the federal license will be for a definite term, at the end of which FERC and the USDA Forest Service can direct that facilities be removed, development does not represent an irreversible and irretrievable commitment of finite real property resources.

With regards to LEAPS, pumping operations, required to fill the proposed upper reservoir, will result in the consumption of more electrical energy (600 MW) than will be generated through the facility's operation (500 MW). Since the plant will operate at an efficiency of 83.3 percent (500/600) net at the 500-kV primary levels, for every kilowatt of electricity used in the pumping mode, 0.833 kW of electricity will be created during the generation mode.

With regards to both LEAPS and the TE/VS Interconnect, the transmission of electrical energy will result in "line loss" or "transmission loss" (typically about 1-2 percent) which represents the energy that is consumed by the conductor (wire) generating heat during the transport of power through each line.

6.1.2 Mitigation Measures Proposed to Minimize Significant Effects

6.1.2.1 Mitigation Measures Proposed for the TE/VS Interconnect

Impacts arising from construction, operation, and maintenance of the TE/VS Interconnect are identified and analyzed in Chapter 5 (Environmental Impact Assessment Summary). The Applicant's proposed measures (APMs) for the TE/VS Interconnect, as identified therein, are presented in Attachment 5 (Applicant Proposed Measures).

In addition to the APMs, the TE/VS Interconnect would also be subject to permit conditions established by those federal, State, and local agencies with jurisdiction over the TE/VS Interconnect or the resources that the proposed transmission line may affect. To the extent that they are known to the Applicant or can be surmised from the administrative record, certain proposed and/or final articles, conditions, and measures, as formulated by FERC and/or the USDA Forest Service, are presented in Attachment 4 (Articles, Conditions, and Measures).

With regards to the TE/VS Interconnect, the Applicant distinguishes the articles, conditions, and measures presented in Attachment 4 (Articles, Conditions, and Measures) from the APMs identified in Attachment 5 (Applicant Proposed Measures). FERC's and the USDA Forest Service's findings, as presented in the FEIS, were based on the incorporation of the "environmental measures" (EMs), "protection, mitigation, and enhancement measures" (PMEs), and supplemental PMEs identified therein. As such, the federal actions described therein are based on the implementation of those articles, conditions, and measures by the Applicant. Although the CPUC may elect to treat them as such, because they constitute an integral part of those proposed actions, the EMs, PMEs, and supplemental PMEs may be viewed as part of the project before the CPUC and not as separate APMs.

6.1.2.2 Mitigation Measures Proposed for LEAPS

Impacts arising from construction, operation, and maintenance of LEAPS are identified and analyzed in Chapter 5 (Environmental Impact Assessment Summary). The Applicant's proposed measures for LEAPS, as identified therein, are presented in Attachment 5 (Applicant Proposed Measures).

LEAPS and its associated transmission lines have previously been evaluated under NEPA and jointly addressed by FERC and the USDA Forest Service in the FEIS, as prepared in response to the Applicant's final license application (FLA) for a new federal hydropower project. Both the FLA and the FEIS contain specific declarations concerning the Applicant's intentions concerning the nature of the LEAPS and the environmental measures proposed by the Applicant to address the potential environmental impacts associated therewith. Specifically, the FEIS identified a number of EMs, as identified by FERC and the USDA Forest Service, in response to the independent analysis conducted under NEPA. In addition, the FEIS included a list of Applicant-nominated PMEs that represented Applicant-imposed measures proactively nominated by the Applicant in recognition of the potential environmental impacts that could result from the implementation of the proposed action. Additionally, the FLA included additional Applicant-nominated measures, identified as supplemental PMEs, which served, in part, to define the federal action evaluated in the FEIS.

FERC's and the USDA Forest Service's findings, as presented in the FEIS, are based on the incorporation of the implementation of those EMs, PMEs, and supplemental PMEs. Because they constitute an integral part of LEAPS, the EMs, PMEs, and supplemental PMEs may be viewed as part of the project before the CPUC and not as separate APMs

For informational purposes, the EMs, PMEs, and supplemental PMEs are presented in Attachment 4 (Articles, Conditions, and Measures). In addition, to the extent that they are known to the Applicant or can be surmised from the administrative record, certain proposed and/or final articles, conditions, and measures, as formulated by FERC and/or the USDA Forest Service, are presented in Attachment 4 (Articles, Conditions, and Measures). Those measures include, but are not limited to, the "final 4(e) conditions" presented by Bernard Weingardt, Regional Forester, Cleveland National Forest, USDA Forest Service and transmitted to FERC in correspondence dated March 29, 2007.

Impacts arising from the construction, operation, and maintenance of LEAPS are identified and analyzed in Chapter 5 (Environmental Impact Assessment Summary). The corresponding APMs for LEAPS are presented in of Attachment 5 (Applicant Proposed Measures).

6.2 Description of Project Alternatives and Impact Analysis

6.2.1 Introduction to the Alternatives Analysis

As indicated in the CPUC's "Information and Criteria List," the PEA shall describe all reasonable alternatives to the project or to the location of the project which could feasibly attain the basic objectives of the project and state why they are rejected in favor of the ultimate choice. Under CEQA, a "no project" alternative must also be evaluated, along with its impact. The discussion of alternatives shall include alternatives capable of substantially reducing or eliminating any significant environmental effects, even if these alternatives substantially impede the attainment of the project's objectives and are more costly.

As authorized therein, in addition to the information and analysis presented in this PEA, the Applicant hereby incorporates by reference the following documents. Each of these documents contains detailed information concerning the Project and incorporates separate and independent alternatives analyses which are inclusive of the Project.

(1) "Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58" (CPUC/BLM, January 2008), including the "Recirculated Draft Environmental Impact Report/Environmental Impact Statement – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58" (CPUC/BLM, July 2008) (Sunrise DEIR/DEIS);

(2) "Final Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58" (CPUC/BLM, October 2008) (Sunrise FEIR/FEIS); and

(3) "Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F" (FERC/USDA Forest Service, February 2007) (FEIS).

6.2.2 Project Goals and Objectives

A pumped storage project requires a number of specific component parts. Among those, there must exist or there must exist the ability to construct both an upper (forebay) and lower (afterbay) reservoir in close proximity to one another and separated by sufficient height differential (head) to effectively generate hydroelectric energy. In describing pumped storage hydropower, FERC notes that this type of project is particularly effective at sites having high heads, defined as a large differences in elevation between the upper and lower reservoirs.

In 1990, the Tudor Engineering Company (TEC) published a reconnaissance-level investigation which identified the potential to construct a pumped storage hydropower project in the Santa Ana Mountains (Elsinore Mountains), in proximity to Lake Elsinore. As indicated therein, "[p]umped storage units are used by various utilities to mitigate the effects of daily peaking problems. The southwest region of California, however, has few sites that can be utilized for pumped storage, either because of insufficient or varying water supplies or an unacceptable elevation between the upper and lower reservoirs."[2]

The geographic area identified in the TEC study represents the only suitable location in the general vicinity of the Project which possesses an existing water body of sufficient size to serve as a pumped storage facility, substantial elevation differences (delta) over a relative short distance to allow for the operation of a large-scale pumped storage project, and proximity to large metropolitan areas with identified energy needs. Since those physiographic and locational conditions are not readily reproducible, the Lake Elsinore area represents the only known locale in southern California that can accommodate a pumped storage facility sufficient to accommodate large power levels and long discharge times.

[2]/ Tudor Engineering Company, Report on Reconnaissance Level Investigation of Lake Elsinore Pumped Storage Project, June 1990, p. 1-2.

Unlike an idea or a product that can be taken from its source of origin, produced, exported, and then assembled in any of a wide range of distant areas, pumped storage is dependent upon the existence of definable variables that impose real-world restrictions on its duplication and wide-scale application. As such, the primary goals of the Project are to: (1) take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage hydropower facility; and (2) connect the pumped storage facility to the CAISO-controlled grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas. Based on those primary goals, a number of Project-specific objectives have been formulated. Because they serve as the basis for identification of Project alternatives, the Project's objectives are repeated below.

I. The objectives of the "transmission component" of the Project include:

1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.
2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.
3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.
4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.
5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.
6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.
7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.

II. The objectives of the "pumped storage component" of the Project include:

1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.
2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).
3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.

4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.
5. Provide voltage support for wind energy integration in the southern California electrical region.

As summarized in Table 6.2.2-1 (Alternatives' Ability to Attain Stated Goals and Objectives), the "Applicant's Proposed Project" and nine (9) alternatives (inclusive of a "No Project/No Build" Alternative), as recommended by the Applicant for advancement herein, have been examined in the context of each alternative's potential ability to fulfill, either in whole or in part, the goals and objectives identified herein. As presented in that table, the following symbols have been used to reflect the degree to which each alternative serves to fulfill, in whole or in part, the Project's stated goals and objectives:

● Alternative allows for "full attainment" of the stated goals or objectives
○ Alternative may allow for "partial attainment" of the stated goals or objectives
\- Alternative would not allow for the attainment of the stated goals or objectives

Each of these nominated alternatives, as well as other alternatives considered but eliminated from further consideration by the Applicant (including the reasons for the rejection of those alternatives), are more thoroughly described below.

6.2.3 Alternatives Considered but Eliminated from Further Analysis by the Applicant

6.2.3.1 "Non-Wires" Alternative

The United States Department of Energy (DOE) recognizes "most of California is currently a generation-short load pocket." Because it is frequently difficult to site and build efficient new generation or additional transmission within urban areas, the load pocket will often experience congestion, meaning that "it cannot import as much low-cost energy as it would like, and the city's electricity provider(s) must operate one or more existing power plants inside the city more intensively to ensure that all customer needs are met, although at higher cost. If electricity demand inside the load pocket grows quickly without being checked by energy efficiency and demand response, the load pocket may be facing a looming reliability problem, with too little supply (local generation plus transmission-enabled imports) relative to demand – whether in actual terms or according to accepted rules for safe grid operation. In such cases, it is necessary for the transmission owner(s) serving the load pocket to resolve the reliability problem as quickly as possible. In the case of a load pocket, there are three primary ways to deal with a long-term congestion problem: (1) Build new central-station generation within the load pocket; (2) Build new or upgrade transmission capacity to enable distant generators to serve a portion of the area's load; or (3) reduce electricity demand within the load pocket, through some combination of energy efficiency, demand response and distributed generation."[3]

[3]/ United States Department of Energy, National Electric Transmission Congestion Study, August 2006, p. 4.

Table 6.2.2-1. Alternatives' Ability to Attain Stated Goals and Objectives

Goals and Objectives	Applicant Proposed Project	Alternatives								
		"LEAPS Only"	"TE/VS Interconnect Only"	"Alternative Powerhouse and Substation Site"	"Alternative Upper Reservoir Site"	"Alternative Lake Switchyard Site"	"Alternative Case Springs Substation Site"	"Alternative Transmission Line Underground Technology"	"New In-Area Renewable Generation"	"No Project/No Build"
Project Goals										
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	●	●	-	●	●	●	●	●	-	-
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	●	●	-	●	●	●	●	●	-	-
Objectives (Transmission Component)										
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	●	●	●	●	●	●	●	●	○	-
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	●	●	●	●	●	●	●	●	○	-
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	●	●	●	●	●	●	●	●	○	-
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	●	●	●	●	●	●	●	●	-	-
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	●	●	●	●	●	●	●	●	-	-
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	●	●	●	●	●	●	●	●	-	-
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	●	●	●	●	●	●	●	●	-	-
Objectives (Pumped Storage Component)										
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	●	●	-	●	●	●	●	●	-	-
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	●	●	-	●	●	●	●	●	-	-
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	●	●	-	●	●	●	●	●	-	-
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	●	●	●	●	●	●	●	●	-	-
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	●	●	-	●	●	●	●	●	-	-

Source: The Nevada Hydro Company

The Project involves two of the three DOE-identified strategies for addressing long-term congestion problems, including new generation (pumped storage) and new transmission facilities.[4] Since the third strategy (reduce electricity demand) represents a possible alternative to the Project, its potential application was considered by the Applicant.

As indicated by the California Energy Commission (CEC): "When an inadequacy is identified in the power transmission gird, the problem can often be solved in a variety of different ways. The installation of a new transmission line to move electricity from one place to another is one way of solving that problem. However, at various points in the transmission planning process, alternative means of solving the problem are considered. These options generally include the following: [1] Different transmission line routes, different tower designs, and installation of lines either overhead or underground. All of these options are still transmission lines, but with varying types and extents of environmental impacts and widely varying cost. [2] Generation can reduce or eliminate the need for transmission lines. Generation includes gas, coal, or nuclear-powered power plants, as well as renewable energy technologies (solar, wind, geothermal, biomass, hydro, and tidal power). [3] Electricity storage could reduce the need to import power to an area of load. [4] Conservation (demand-side management) can reduce demand for power, thus reducing or eliminating the need for new transmission lines."[5]

The CEC reports that the State "currently uses 265,000 GWh of electricity per year. Consumption is growing two percent annually. Peak demand is growing at about 2.4 percent per year, roughly equivalent of three new 500 megawatt power plants per year. This demand will need to be met by increased generation, but generation cannot always be located in areas of greatest demand so transmission of power is required. Major transmission lines are increasingly difficult to site, so consideration of other alternatives is critical. Non-transmission alternatives (also called 'non-wires' alternatives) are those that do not involve major transmission lines and are one way to respond to this load growth. Renewable energy and fossil fuel generation, if they can be produced near the location where they would be used, are potential non-wires alternatives. In addition, DSM [demand-side management] or conservation, electricity storage, and distributed generation (DG) can reduce the need for a transmission project and thus are also considered as non-wires alternatives."[6]

As indicated in the CEC's "Energy Action Plan II – Implementation Roadmap for Energy Policies" (EAP II), with regards to the State's "priority sequence for actions," the "loading order identifies energy efficiency and demand response as the State's preferred means of meeting growing energy needs. After cost-effective efficiency and demand response, we rely on renewable sources of power and distributed generation, such as combined heat and power applications."[7]

---

[4]/ In "Order of Rate Request," dated November 17, 2006, the FERC published the following determination: "With regards to whether the LEAPS facility meets the requirements of section 1223 of EPAct, we find that it does. Section 1223 of EPAct 2005 declares pumped hydro an 'advanced transmission technology' that this Commission should encourage, as appropriate. Nevada Hydro's LEAPS facility meets the requirements of this section." Section 1223 defined an advanced transmission technology as "a technology that increases the capacity, efficiency, or reliability of an existing or new transmission facility." Under that order, the Project's generation (pumped storage) component has been federally declared an "advanced transmission technology." As such, pumped storage could be categorized as both a "transmission" facility or as a "generation" asset.

[5]/ California Energy Commission (Aspen Environmental Group), Comparative Study of Transmission Alternatives: Background Report, 700-04-006, June 2004, pp. 2-3.

[6]/ Ibid., p. 5.

[7]/ California Energy Commission and California Public Utilities Commission, Energy Action Plan II – Implementation Roadmap for Energy Policies, September 21, 2005, p. 2.

As part of this evaluation, the Applicant considered whether one or more non-wires options could be undertaken as a potentially feasible option to the construction of new generation (pumped storage) and/or transmission facilities. Possible "non-wires" alternatives examined by the Applicant included distributed generation (DG), energy-efficiency (EE) measures, and demand-response (DR) strategies. Presented below is a brief summary of those "non-wires" alternatives and the Applicant's rationale for not including those alternatives herein.

- **"Distributed Generation" Alternative**. DG is a parallel or stand-alone electric generation unit generally located at or near where the energy is being consumed. Self-generation refers to DG technologies that are installed on the customer's side of the meter to provide electricity to the customer for a portion of its load. The CPUC has long recognized the value of DG in the resource planning and energy procurement context and has made a substantial effort to encourage the installation of DG in California.[8]

  As defined by the CEC: "DG refers to stationary applications of electric generating technologies which are smaller than 50 MW of net generating capacity, the [California] Energy Commission's power plant siting jurisdiction threshold. They may be owned by electric or gas utilities, by industrial, commercial, institutional or residential energy consumers, or by independent energy producers. They include generating technologies such as diesel engines, fuel cells, small and micro gas turbines, solar PV [photovoltaics], and wind turbines, and may be combined with electric storage technologies such as batteries and flywheels."[9]

  The Applicant notes that flywheels are not technologically and/or economically feasible at a scale sufficient to provide energy storage capacity comparable to that of LEAPS.

  DG generally refers to "electric power generation within the distribution network or on the customer side of the meter."[10] DG technologies are considered to be "behind the meter" if residential, commercial, or industrial customers implement them to reduce the amount of electricity they purchase from the distributing utility.[11] DG can substitute for other investment in transmission circuits and large generation if a sufficient amount of distributed generation is operating during peak-load periods. The challenge for DG is to reliably provide sufficient capacity at the right time to mitigate overloads.[12] DG applications include emergency and stand-by generators and battery systems to supply back-up electric power for critical loads in the event of a power outage, co-generation and renewable energy systems installed to augment utility power supplies and, if grid connected, to sell power, remote or off-grid electric loads.[13]

  DG can serve to reduce loading and use on transmission lines,[14] improve reliability by adding generation capacity at the customer site for continuous power and backup supply,

---

[8]/ California Public Utilities Commission, PUC Allows Distributed Generation Facility Owners To Retain Renewable Energy Credits, Docket No. R.06-03-004, January 11, 2007.
[9]/ California Energy Commission, Distributed Generation: CEQA Review and Permit Streamlining, P700-00-019, December 2000, p. 10.
[10]/ Ackermann, T., Anderson, G., and Soder, L., Distributed Generation: A Definition, Electric Power Systems Research, Vol. 57, pp. 195-204.
[11]/ If a technology is "behind the meter," its energy output reduces the amount of electricity purchased from the distribution utility.
[12]/ Energy and Environmental Economics, Inc. and Bonneville Power Administration, Olympic Peninsular Study of Non-Wires Solutions to the 500 KV Transmission Line from Olympia to Shelton and a Transformer Addition at Shelton, Draft, January 12, 2004, pp. 11 and 13.
[13]/ California Energy Commission, Distributed Generation: CEQA Review and Permit Streamlining, P700-00-019, December 2000, pp. 1 and 15.
[14]/ Office of Ratepayer Advocates, Tipping Point Analysis and Attribute Assessment for DPV2, Testimony of Lon W. House, California Public Utilities Commission, November 22, 2005, p. 34.

add system generation capacity, free up addition system generation, transmission, and distribution capacity, relieve transmission and distribution system bottlenecks, and support power system maintenance or restoration operations with generation of temporary backup power.[15]

Despite its many benefits, as indicated in Table 6.2.3.1-1 ("Distributed Generation" Alternative – Ability to Attain Stated Goals and Objectives), a DG alternative does not appear to allow for the attainment of the Project's two stated goals, does not appear to allow for the attainment of at least four of the seven "transmission component" objectives, and does not appear to allow for the attainment of at least three of the five "pumped storage component" objectives. Of those objectives that may be fulfilled, only partial attainment of the remaining objectives could, at best, be realistically achieved.

Although DG may reduce load, it will not serve to provide additional high-voltage capacity to reduce congestion on the CAISO grid. DG technologies will not improve import capacity to the San Diego load area, provide San Diego with a new 500-kV interconnection, or provide LEAPS access to the CAISO-controlled grid. Similarly, DG fails to provide any of the ancillary benefits associated with LEAPS and will not allow for the fortification and/or enhancement of localized electrical facilities and systems.

This alternative does not improve transmission access to the location-constrained LEAPS, provides a mechanism for the storage of renewable or off-peak energy resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems. Similarly, the selection of a "distributed generation" alternative would not facilitate the expansion of the State's backbone transmission and generation systems. As a result, a potential DG alternative was rejected because effectuation is deemed to be infeasible[16] by the Applicant since implementation would be subject to the actions of other parties and because the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

- **"Energy-Efficiency Measures" Alternative**. As indicated by the CEC and CPUC, "cost effective energy efficiency is the resource of first choice for meeting California's energy needs. Energy efficiency is the least cost, most reliable, and most environmentally-sensitive resource, and minimizes our contribution to climate change."[17]

  Certain conservation (load reduction) measures (such as heating efficiency, weatherization, and energy efficient lighting) can reduce loads and have an impact on peak-demand reductions.[18] However, the challenge with energy-efficiency measures are

[15]/ Arthur A. Little, Reliability and Distributed Generation, 2000, p. 16.

[16]/ The State CEQA Guidelines define "feasible" 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" (14 CCR 15364). Since the Applicant's proposed advanced pumped storage technology does not lend itself to broad geographic application and, even if an alternative technology were to be considered, the Applicant lacks a mechanism to implement a broad-based and decentralized application of that technology, there exists economic, environmental, legal, social, and technological reasons for the rejection of this and other similar alternatives herein.

[17]/ California Energy Commission and California Public Utilities Commission, Energy Action Plan II, Implementation Roadmap for Energy Policies, October 2005, p. 3.

[18]/ Energy and Environmental Economics, Inc. and Bonneville Power Administration, Olympic Peninsular Study of Non-Wires Solutions to the 500 KV Transmission Line from Olympia to Shelton and a Transformer Addition at Shelton, Draft, January 12, 2004, p. 14.

their ability to achieve a sufficient on-peak load reduction to substantively contribute to the deferral of the need for new generation (pumped storage) or transmission facilities.

The CEC has formulated a set of short-term and long-term goals for Statewide energy-efficiency (EE) programs. Short-term goals seek to achieve a 7,000 GWh savings per year (over a 2004 base year) by 2006 and a 30,000 GWh savings by 2013. Achieving recommended long-term goals "would be equivalent to reducing per capita electricity use by 0.3 percent per year over the next decade from 7,145 kWh per capita in 2003 to 6,930 kWh per capita in 2013. This is also equivalent to meeting roughly 50 percent of the projected increase in electricity usage over the next decade."[19] The CEC, however, concluded that "[a]chieving the additional savings necessary to achieve a sustained reduction of 0.3 percent per capita per year would be unprecedented in the 'history of energy policy.'"[20]

Reducing electric demand, through energy efficiency, can defer the need for new generation facilities and transmission lines for varying time periods. However, despite its many benefits, as indicated in Table 6.2.3.1-2 ("Energy Efficiency Measures" Alternative – Ability to Attain Stated Goals and Objectives), an EE alternative does not appear to allow for the attainment of the Project's two stated goals, does not appear to allow for the attainment of at least five of the seven "transmission component" objectives, and does not appear to allow for the attainment of at least four of the five "pumped storage component" objectives. Of those objectives that may be fulfilled, only partial attainment of the remaining objectives could, at best, be realistically achieved.

Although EE may reduce load, it will not serve to provide additional high-voltage capacity to reduce congestion on the CAISO grid. EE measures will not improve import capacity to the San Diego load area, provide San Diego with a new 500-kV interconnection, or provide LEAPS access to the CAISO-controlled grid. Similarly, EE measures would fail to provide any of the ancillary benefits associated with LEAPS and will not allow for the fortification and/or enhancement of localized electrical facilities and systems.

This alternative does not improve transmission access to the location-constrained LEAPS area, provide a mechanism for the storage of renewable or off-peak energy resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems. Similarly, the selection of an "energy efficiency" alternative would not facilitate the expansion of the State's backbone transmission and generation systems.

A potential EE alternative was rejected because effectuation is deemed to be infeasible by the Applicant since implementation would be subject to the actions of other parties and because the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

[19]/ Ibid., p. 20.
[20]/ Ibid., p. 32.

- **"Demand-Response Strategies" Alternative**. As indicated by the CEC: "By reducing system loads during critical-peak times, demand response can help reduce the threat of brownouts and blackouts. DR is also widely regarded as having an important role in lowering power costs – and customer bills, by making organized wholesale power spot markets more competitive and efficient and less subject to the abuse of market power. Consequently, there is common agreement among California's energy policy makers, utilities, independent system operators and other interested parties that DR should be a key resource option. The California 'Energy Action Plan II' places DR at the top of the resource procurement loading order with energy efficiency. It specifies that five percent of system peak demand be met by DR in 2007. However, despite significant past and continuing efforts by all of the parties, this goal is unlikely to be achieved."[21]

  Reducing electric demand can defer the need for new generation facilities and transmission lines for varying time periods. Electric demand can be reduced through broad strategies that encourage energy efficient appliances and public awareness, to highly technical Internet-based technologies that manage peak load. Load shifting, which is the practice of altering the pattern of energy use so that on-peak energy use is shifted to off-peak periods, is a fundamental demand-side management objective. Incentives can include programs such as receiving lower prices of energy through time-of-day rates offered by the electric utilities.[22]

  As indicated by FERC: "Over the years, we have learned repeatedly that people respond to price. In the case of electric power, this is likely to take several forms. First, there is likely to be more demand response. In the simplest terms, high prices at peak will lead some customers – both businesses and others – to prefer to save their money rather than use power. In fact, the first round of demand response may be both the cheapest and fastest way to improve capacity margins on many systems."[23]

  As further indicated by SDG&E: "Demand response offers an alternative to maintaining system reliability through capacity additions by providing customers opportunities to participate in demand-side management while seeking to limit the impact of their operation."[24] Most broadly, demand response applies rate design, incentives, and technology to enhance the ability of customers to change demand in response to prices and/or system conditions. DR strategies use real-time meters to track power usage constantly instead of once a month. Real-time meters would not alter how customers are charged but would give customers information about what they were being charged at any given time. Since power costs more during peak than during off-peak period, consumers could set-up an automatic system to regulate how much energy they use and when they use it so that their actions would be the most cost effective.

  The CPUC (CPUC Docket No. D.01-05-056) has identified the following two general types of demand-response programs that have been used to reduce demand when energy

[21]/ Faruqui, Ahmad and Hledik, Ryan (The Brattle Group), Draft Consultant Report – The State of Demand Response in California, CEC-200-2007-003-D, California Energy Commission, April 2007, p. 5.
[22]/ Op. Cit., Comparative Study of Transmission Alternatives: Background Report, pp. 15-16.
[23]/ Federal Energy Regulatory Commission, Increasing Costs in Electric Markets, Item No. A-3, June 19, 2008, p. 14.
[24]/ San Diego Gas & Electric Company, Supplement to Application of San Diego Gas & Electric Company (U 902-E) for a Certificate of Public Convenience and Necessity for the Sunrise Powerlink, A.05-12-014, December 19, 2005, Appendix V, p. V-v.

prices are high or when supplies are tight: (1) “price-responsive” programs in which customers choose how much load reduction they can provide based on either the electricity price or a per-kilowatt (kW) or kilowatt-hour (kWh) load reduction incentive; and (2) “reliability-triggered” programs in which customers agree to reduce their load to some contractually-determined level in exchange for an incentive, often a commodity price discount.[25] The CPUC (CPUC Docket No. D.06-03-024) has acknowledged that “[b]oth types of programs motivate customers to reduce their loads in exchange for some type of benefit such as reduced energy rates, bill credits, or exemptions from rotating outages.”[26]

As indicated by the CAISO, one of the barriers to DR programs “is the availability of hourly meters for residential customers, unless the CPUC adopts a default retail tariff for all customers that passes through the hourly wholesale price in the hourly retail rate that customers face, it is unlikely that active demand-side participation in the wholesale market will materialize.”[27]

As indicated in Table 6.2.3.1-3 (“Demand Response Strategies” Alternative – Ability to Attain Stated Goals and Objectives), a DR alternative does not appear to allow for the attainment of the Project’s two stated goals, does not appear to allow for the attainment of at least five of the seven “transmission component” objectives, and does not appear to allow for the attainment of at least four of the five “pumped storage component” objectives. Of those objectives that may be fulfilled, only partial attainment of the remaining objectives could, at best, be realistically achieved.

Although DR may reduce peak load, it will not serve to provide additional high-voltage capacity to reduce congestion on the CAISO grid. DR strategies will not improve import capacity to the San Diego load area, provide San Diego with a new 500-kV interconnection, or provide LEAPS access to the CAISO-controlled grid. DR fails to provide any of the ancillary benefits associated with LEAPS and will not allow for the fortification and/or enhancement of localized electrical facilities and systems. In addition, this alternative does not improve transmission access to the location-constrained LEAPS, provide a mechanism for the storage of renewable or off-peak energy resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems. Similarly, the selection of a “demand response” alternative would not facilitate the expansion of the State’s backbone transmission and generation systems.

A potential DR alternative was rejected because effectuation is deemed to be infeasible by the Applicant since implementation would be subject to the actions of other parties and because the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

[25]/ Quantum Consulting, Inc. and Summit Blue Consulting, LLC, Evaluation of 2005 Statewide Large Nonresidential Day-Ahead and Reliability Demand Response Programs, Final Report, April 28, 2006, p. 2-3.

[26]/ California Public Utilities Commission (Summit Blue Consulting, LLC and Quantum Consulting, Inc.), Protocols for Estimating the Load Impacts from DR Programs, Draft Version 1, April 3, 2006, pp. 3 and 4.

[27]/ Wolak, Frank A., Memorandum: Summary of the Market Surveillance Committee Meeting of August 8, 2006, California Independent System Operator, August 31, 2006, pp. 7-8.

Table 6.2.3.1-1
"Distributed Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. Because implementation will occur at remote locations and not include improvements to area's existing backbone systems, DG will not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. Because no improvements to area's existing backbone systems would occur, DG will not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Partial attainment**. Although import capacity will not be increased, by reducing individual load demands, additional energy supplies will be available.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Partial attainment**. Although import capacity will not be increased, by reducing individual load demands, additional energy supplies will be available.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Partial attainment**. Decentralizing of energy facilities would provide incremental enhancement.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. Because no improvements to area's existing backbone systems would occur, DG will not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Partial attainment**. If DG is used in combination with customer-based battery or other storage technologies, off-peak energy could be stored for peak-demand periods.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. DG does not accommodate regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. DG does not accommodate regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. DG does not provide Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Partial attainment**. Although DG could be used to help in the integration of wind energy, localized expansion of wind generators may be infeasible.

Source: The Nevada Hydro Company

Table 6.2.3.1-2
"Energy Efficiency Measures" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. Because implementation will occur at remote locations and not include improvements to area's existing backbone systems, DG will not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. Because no improvements to area's existing backbone systems would occur, DG will not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Partial attainment**. Although import capacity will not be increased, by reducing individual load demands, additional energy supplies will be available.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Partial attainment**. Although import capacity will not be increased, by reducing individual load demands, additional energy supplies will be available.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	Non-attainment. DR will not serve to fortify and/or enhance localized electrical facilities and systems.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. Because no improvements to area's existing backbone systems would occur, EE will not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. Although effective at reducing demand, EE does not provide for the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. EE does not accommodate regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. EE does not accommodate regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. EE does not provide Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Partial attainment**. EE can help sustain and keep the electrical system operating to meet long-term load demand.

Source: The Nevada Hydro Company

Table 6.2.3.1-3
"Demand Response Strategies" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. Because implementation will occur at remote locations and not include improvements to area's existing backbone systems, DG will not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. Because no improvements to area's existing backbone systems would occur, DG will not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Partial attainment**. Although import capacity will not be increased, by reducing individual load demands, additional energy supplies will be available.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Partial attainment**. Although import capacity will not be increased, by reducing individual load demands, additional energy supplies will be available.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	Non-attainment. DR will not serve to fortify and/or enhance localized electrical facilities and systems.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. Because no improvements to area's existing backbone systems would occur, DR will not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. Although potentially effective at reducing demand, DR does not provide for the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. DR does not accommodate regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. DR does not accommodate regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. DR does not provide Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Partial attainment**. DR can help sustain or keep the electrical system operating to meet long-term load demand.

Source: The Nevada Hydro Company

CEQA stipulates that, in general, the alternatives considered for a proposed action need only relate to the project "as a whole," not to its various parts. Agencies, therefore, need not analyze specific alternatives to "parts" of that action. In Big Rock Mesas Property Owners Association v. Board of Supervisors (1977) 73 Cal.App.3d 218, in pertinent part, the court found that "[t]he pertinent statute and EIR guidelines require that an EIR describe alternatives to the proposed [p]roject. We interpret such requirement as applicable only to the project as a whole, not to the various facets thereof." An EIR's alternatives analysis would not be deemed inadequate if it sufficiently "discusses alternatives to the project in its entirety. The Law requires no more." Similarly, in Local & Regional Monitor v. City of Los Angeles (1993) 16 Cal.App.4th 630, the courts concurred, in pertinent part, that "statutes do not require alternatives to various facets of the project. Rather, the EIR must discuss proposed alternatives to the project as a whole."

Under the Big Rock decision, alternatives based on DG, EE measures, and/or DR strategies do not constitute reasonable alternatives to the "Applicant's Proposed Project" under CEQA since those alternatives do not allow for a comparative analysis of the "project as a whole." A potential variation of a "non-wires" alternative conforming to that decision is, however, identified in Section 6.2.4.4 (Alternative No. 9 - "New In-Area Renewable Generation" Alternative). Under that alternative, other new renewable projects would be developed in the San Diego area not requiring the construction of new transmission lines as the alternative's "primary component."[28]

6.2.3.2 "Alternative Transmission Route" Alternative[29]

A potential "Alternative Transmission Route" alternative can be drawn from a number of sources, including those presented in the following documents and planning studies.

- **"Valley-Rainbow Interconnect Project" Alternative**. On March 23, 2001, SDG&E submitted an application (CPUC Docket No. A.01-03-036), seeking authorization from the CPUC for the Valley-Rainbow interconnect project. The 31-mile Valley-Rainbow project was proposed as an interconnection between SDG&E's existing 230-kV transmission system (at SDG&E's then proposed Rainbow Substation to be located in the unincorporated community of Rainbow in San Diego County) and SCE's existing 500-kV transmission system (at SCE's existing Valley Substation located in the unincorporated community of Romoland in Riverside County).

  As indicated by the CAISO: "The Valley-Rainbow Project is necessary to reliably serve the growing electric demands in the San Diego area. In addition, the project is an important component of a comprehensive strategy to enhance access by consumers in San Diego and other parts of California to reasonably priced, efficient and environmentally superior generation. . .the Valley-Rainbow Project should now be evaluated by the [CAISO] Board as part of a broad strategy by the State of California to put into place a robust transmission system to support reliable service to customers. In this regard, the

[28]/ California Public Utilities Commission and United States Department of the Interior, Bureau of Land Management, Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, January 2008, p. E.5-1.

[29]/ The consideration of an "alternative transmission route" differs from the subsequent assessment of an "alternative transmission alignment." Under the former option, routes other than those described in the Applicant's FLA, FERC's DEIS, and FERC's FEIS were considered. Under the latter option, some of the alignment variations presented in the Applicant's FLA, FERC's DEIS, and FERC's FEIS are examined.

Valley-Rainbow Project provides benefits to consumers in San Diego and the rest of California."

As it relates to LEAPS and the TE/VS Interconnect, the CAISO indicated that, "[u]nlike the route proposed by SDG&E, the route associated with the Lake Elsinore project will have minimal impacts on residential communities. SDG&E can and should be encouraged to explore the USDA Forest Service land alternative and other alternatives that would minimize impacts on affected communities."[30] As indicated by SDG&E: "Can the TE/VS-LEAPS project be configured to provide the same benefits as the Valley-Rainbow Interconnection (VRI)?" The answer is "'yes,' provided that the necessary associated projects and upgrades are identified and built. . .the TE/VS-LEAPS can be configured to provide the same benefits as VRI."[31]

On March 30, 2001, without selecting a preferred near-term alternative and without regards for routing, the CAISO Board of Governors adopted a resolution finding that a new 500-kV project(s), such as the Valley-Rainbow project, is needed to address the identified reliability concerns of San Diego and the southern Orange County portion of the CAISO grid beginning in 2004. The CAISO Board of Governors' formal needs determination neither specifically identified a precise transmission alignment for a new 500-kV transmission line or route serving the San Diego area nor contained any expiration terms or conditions with regards to its determination. In that regard, the CAISO's actions regarding the Valley-Rainbow project remain relevant and constitute an applicable needs determination in support of the TE/VS Interconnect.

On October 23, 2002, the assigned Administrative Law Judge (ALJ) issued a decision denying, without prejudice, SDG&E's application to construct the Valley-Rainbow Interconnect Project. As of the date of that ruling, the ALJ found that SDG&E would continue to meet established reliability criteria for the region until 2008. Utilizing a five-year planning horizon (2001-2006), the ALJ concluded that the Valley-Rainbow project was not then needed for reliability purposes. The ALJ also concluded that, at the time of its ruling, the Valley-Rainbow project could not be justified on economic grounds. An "Alternate Proposed Decision," which was not adopted, concludes that SDG&E had an unmet reliability need beginning in 2006, which fell within the required five-year planning horizon.

On December 19, 2002, the CPUC rejected SDG&E's application for rehearing (CPUC Docket No. D.02-12-066, rehearing denied in D.03-05-038) based on its need and cost-benefit analysis. As reported by the CEC, the CPUC "denied the CPCN despite the fact that the California CAISO had approved the [Valley-Rainbow] project and directed SDG&E to construct the line in order to satisfy a need it had identified."[32]

[30]/ Memorandum from James Detmers, Acting Vice President of Operations, Armando J. Perez, Director of Grid Planning, and Steve Greenleaf, Director of Regulatory Policy, California Independent System Operator to the CAISO Board of Governors, Re: Valley-Rainbow Transmission Project, March 23, 2001, p. 1.

[31]/ San Diego Gas & Electric Company, Attachment ALT-36, Response ALT-36, Sunrise Powerlink Project (A.06-08-010), SDG&E Response to Data Request No. 1, November 17, 2006.

[32]/ Op. Cit., Comparative Study of Transmission Alternatives: Background Report, p. 38.

The CPUC issued a subsequent decision stating: "SDG&E will have a capacity deficiency in 2008 under N-1/G-1 conditions."[33] A "reasonably foreseeable forecast" deficiency of 301 MW was documented by 2010 and a 571 MW deficiency was documented by 2012 within the SDG&E service area.[34] The CPUC's decision directed the preparation of "a document that provides a preliminary alternatives feasibility analysis based on the environmental information developed to date."[35]

In rejecting SDG&E's application (CPUC Docket No. A.01-03-036), without ruling on any particular routing option, the ALJ concluded that (in 2002) the need for Valley-Rainbow could not then be justified based on a five-year planning horizon. The ALJ did not make any specific findings concerning SDG&E's then proposed alignment. Because the Valley-Rainbow alignment was deemed to be electrically equivalent to the current TE/VS Interconnect, SDG&E's Valley-Rainbow project might be considered an alternative to the TE/VS Interconnect.

An alternative analysis for the Valley-Rainbow project was prepared in response to the ALJ's October 21, 2002 and December 19, 2002 rulings, directing the CPUC to prepare a document providing a preliminary alternatives analysis for the Valley-Rainbow project. The alternatives screening process culminated in the identification and screening of about 45 alternatives, including two options through the Trabuco Ranger District.

As indicated in the CPUC/BLM analysis, those alignments "would follow transmission paths across the Trabuco [Ranger] District and would result in a project that is electrically the same or similar to the proposed [Valley-Rainbow] project. Alternative 1 would be essentially the same as the proposed project, since the 500 kV line would still connect between the existing Valley and proposed Rainbow substations. Alternative 2 would entail construction of a new 500 kV switching station on or near the Valley-Serrano 500 kV right-of-way, located about 15 miles west of the existing Valley substation, and the relocation of the Rainbow substation site somewhere to the west of Rainbow, along the existing Talega-Escondido right-of-way. The 230 kV system changes would remain as described in the proposed project. Since this alternative is electrically the same as the proposed project, it would meet all project objective criteria."[36]

Other alternatives identified and retained by the CPUC/BLM as part of that preliminary alternatives analysis included, but may not have been limited to: (1) Eastern Riverside County – Route North of Vail Lake (45 miles); (2) Eastern Riverside County – Route South of Vail Lake (47 miles); (3) Alternative 1 (SDG&E Southeast Route) (57-61 miles)[37]; and (4) Alternative 3 (46 miles).

---

[33]/ "N-1" refers to the outage of the most critical transmission network element; "G-1" refers to the outage of the most significant in-basin generator.

[34]/ California Public Utilities Commission, Opinion on the Need for Additional Transmission Capacity to Serve the San Diego Gas & Electric Company Service Territory, Decision 02-12-066, December 19, 2002, p. 52.

[35]/ Ibid., p. 71.

[36]/ California Public Utilities Commission and United States Department of the Interior – Bureau of Land Management, Interim Preliminary Report on Alternatives Screening for: San Diego Gas & Electric Company Valley - Rainbow 500kV Interconnect Project CPCN Application No. 01-03-036 U.S. BLM Case No. CACA-43368, November 2002, p. ES-29.

[37]/ As indicated in the CPUC/BLM Valley-Rainbow analysis, PDR Alternative 1 would traverse designated roadless areas, the Southwest Riverside County Multi-Species Reserve, and had the potential to adversely impact both the Palomar Observatory and Palomar Mountain State Park. Since the Eastern Riverside County alternative would introduce additional impacts beyond those associated with the LEAPS and TE/VS Interconnect projects, that alternative was eliminated since it would not likely result in the avoidance or minimization of the projects' significant environmental effects.

As noted in correspondence from the CAISO: "While the ISO is not responsible for the specific siting of transmission lines, we are responsible for identifying transmission system technical needs and recommended transmission system additions. Currently, there is only one major transmission interconnection between the San Diego area and the rest of the State of California. This line has limited capacity to import or export power and creates a bottleneck that, absent transmission system additions, will seriously impact the reliability of electric service to the San Diego area in the future. In March 2001, the ISO recommended that a new 500 kV transmission line be constructed linking the San Diego area with the rest of the State's electrical grid by the year 2004. Based on this recommendation, the San Diego Gas and Electric Company filed an application for a Certificate of Public Convenience and Necessity for such a line (Valley-Rainbow 500 kV Transmission Project) with the California Public Utilities Commission. The CPUC application identified several potential routes for such a line, however, during the permitting process, essentially all of the routes being considered for this line were deemed to be infeasible. A transmission line through the Cleveland National Forest, as suggested in the potential legislation, would be the functional equivalent of the Valley-Rainbow 500 kV Transmission Project. Such a line would provide a major benefit to the San Diego area well into the future by helping to ensure system reliability, by reducing power costs and by helping connect a proposed new pumped hydro project in the area, the Lake Elsinore Advanced Pumped Storage facility."[38]

This alternative neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources.

With the exception of the Applicant's proposed routing through the Cleveland National Forest - Trabuco Ranger District (TRD), in the absence of conditions conducive to the development of a new pumped storage facility (e.g., presence of an existing water body of sufficient size and substantial topographic variation over a relatively short distance) along or proximal to any of the transmission alignments identified therein, neither SDG&E's proposed "Valley-Rainbow Interconnect Project" nor any of the alternative alignments identified by the CPUC/BLM allow, in either whole or in part, for the attainment of the Applicant's stated goal of developing and connecting a new pumped storage facility to the CAISO-controlled grid.

As indicated in Table 6.2.3.2-1 ("Alternative Transmission Route" Alternative – Ability to Attain Stated Goals and Objectives), SDG&E's Valley-Rainbow project and other CPUC/BLM-formulated alternatives do not appear to allow for the attainment of the Project's two stated goals, do not appear to allow for the attainment of at least one of the seven "transmission component" objectives, and do not appear to allow for any of the five "pumped storage component" objectives. An "Alternative Transmission Route" alternative would, however, potentially allow for the full attainment of six of the seven "transmission component" objectives.

The potential environmental impacts of the "Valley-Rainbow Interconnect Project" are identified in the following documents: (1) "Public Scoping Report: San Diego Gas and

[38]/ Letter from Terry M. Winter, President and Chief Executive Officer to Honorable Spencer Abraham, Secretary of Energy, and Honorable Gale A. Norton, Secretary of Interior, Subject: HR 1230, April 16, 2003, p. 2.

Electric Company – Valley-Rainbow 500 kV Interconnect Project, CPCN Application No. 01-03-036" (CPUC/BLM, October 2001); (2) "Addendum to the Public Scoping Report: San Diego Gas and Electric Company – Valley-Rainbow 500 kV Interconnect Project, CPCN Application No. 01-03-036" (CPUC/BLM, May 2002); and (3) "Proponent's Environmental Assessment – Valley Rainbow Interconnect" (SDG&E, March 2001). As documented therein, based on the information presented in the Valley-Rainbow proceedings (CPUC Docket No. A.01-03-036), selection of SDG&E's "Valley-Rainbow Interconnect Project" would not have the potential to substantially reduce the Project's potential environmental effects and could potentially result in greater environmental impacts. As a result, a "Valley-Rainbow Interconnect Project alternative" was rejected by the Applicant because that alternative does not satisfy the provisions of CEQA in that reasonable alternatives must be able to mitigate or avoid the significant effects of the proposed action (14 CCR 15126.6[b] and [c]).

To the extent that an "Alternative Transmission Route" alternative also served to accommodate pumped storage, the Big Rock decision would be inapposite with respect to that alternative because it would allow for a comparative analysis of the "project as a whole." However, although the Valley-Rainbow project and its accompanying alternatives could potentially allow for the attainment of three of the Applicant's twelve objectives, those routing options would not allow for the development of a pumped storage and a generation-interconnect (gen-tie) to a proximal transmission system..

CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action" which is the subject of the CEQA analysis. Because the "Applicant's Proposed Project" includes both a "transmission component" and a "pumped storage component," an "Alternative Transmission Route" alternative has been rejected because it fails to satisfy CEQA requirements for a reasonable alternative.

- **"Southwest Transmission Expansion Plan" Alternative**. In 2002, the CAISO established the "Southwest Transmission Expansion Plan" (STEP) as a collaborative ad-hoc study group whose goal was "[t]o provide a forum where all interested parties are encouraged to participate in the planning, coordination, and implementation of a robust transmission system between Arizona, Nevada, Mexico, and southern California areas."[39] Studies conducted by the CAISO concluded that a new high-voltage transmission line between Riverside and San Diego Counties was critically needed to serve future load growth. Studies conducted by STEP in 2003 indicated that a new 500-kV line into San Diego will be needed to serve future load growth.[40]

  As indicated in the Kyei Report: "Several alternative transmission lines were considered from the Imperial Valley into San Diego as well as the new 500 kV line associated with the Lake Elsinore Advanced Pumped Storage Project."[41] Options examined included: (1) Imperial Valley-Ramona 500-kV line (Imperial Valley-San Diego Expansion Plan); (2) Talega-Escondido/Valley-Serrano 500-kV Interconnect Project (without LEAPS); (3) Talega-Escondido/Valley-Serrano 500-kV line (with LEAPS); and; (4) both the Imperial

[39]/ California Independent System Operator, Southwest Transmission Expansion Plan, January 17, 2003, p. 1.
[40]/ Kyei, John, Comparative Reliability Evaluation for Alternative New 500 kV Transmission Lines into San Diego, Grid Planning Department, California Independent System Operator, April 17, 2004.
[41]/ Ibid., p. 2.

Valley-San Diego Expansion Plan and Talega-Escondido/Valley-Serrano 500-kV line (without LEAPS). The Imperial Valley-San Diego Expansion Plan (ISEP) project subsequently became SDG&E's Sunrise Powerlink Project (SRPL).

The "Talega-Escondido/Valley-Serrano 500-kV Interconnect (without LEAPS)" option, as identified in the Kyei Report, is examined as "Alternative No. 2 ("TE/VS Interconnect Only" Alternative) herein. The "Talega-Escondido/Valley-Serrano 500-kV line (with LEAPS)" option identified in the Kyei Report constitutes the "Applicant's Proposed Project." As a result, two of the four alternatives identified in the Kyei Report have been examined herein. The "Imperial Valley-San Diego Expansion Plan" (Sunrise Powerlink Project) was approved by the CPUC on December 24, 2008.

Based on the findings of the Kyei Report, the Applicant considered an "Imperial Valley-San Diego Expansion Plan" (Sunrise Powerlink Project or SRPL) alternative and a separate "Sunrise Powerlink Project and Talega-Escondido/Valley-Serrano 500-kV line (without LEAPS)" ("SRPL and TE/VS Interconnect") alternative. A "SRPL and TE/VS Interconnect" alternative would potentially allow for attainment or partial attainment of one of the Applicant's stated goals, all of the "transmission component" objectives, and one of the "pumped storage component" objectives. However, under CEQA (14 CCR 15126.6[b] and [c]), a combined "SRPL and TE/VS Interconnect" alternative was rejected because the potential impacts of that substantially larger project would result in the creation of additional environmental impacts at levels greater than individually associated with the Sunrise Powerlink Project (as described in the Sunrise FEIR/FEIS) and the TE/VS Interconnect (as described in this PEA).

Although the "SRPL and TE/VS Interconnect" alternative would potentially allow for the attainment of certain goals and objectives, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA neither obligate the Applicant or the Lead Agency to evaluate alternatives which have the potential to produce greater environmental impacts nor evaluate alternatives which address only a portion of the "whole of the action." In accordance with the Big Rock decision, a "SRPL and TE/VS Interconnect" alternative was rejected by the Applicant because that alternative does not serve to accommodate pumped storage if LEAPS is excluded. A "Sunrise Powerlink Project" alternative is, however, separately described below.

- **"South Regional Transmission Plan" Alternative**. In 2004, the CAISO initiated the "CAISO South Regional Transmission Plan" (CSRTP) for the purpose of assessing the following three major transmission projects in the southern California region: (1) Tehachapi project (transmission infrastructure to accommodate wind generation in the Tehachapi area); (2) Sun Path project (combination of SDG&E's SRPL and Citizens Energy's and Imperial Irrigation District's Phase 2 Green Path projects connecting Imperial Valley to the San Diego area); and (3) LEAPS (pumped storage plant and associated transmission line). The CAISO recognized "[e]ach of these projects offer unique reliability and economic benefits."[42]

[42]/ Op. Cit., CAISO South Regional Transmission Plan for 2006, Presentation at CEC Intermittency Analysis Project, Energy Commission Staff Workshop, p. 4.

Table 6.2.3.2-1
"Alternative Transmission Route" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. None of the alternative transmission routes would facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. None of the alternative transmission routes would facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Attainment**. An alternative transmission route could be developed to provide additional transmission capacity.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. An alternative transmission route could be developed to provide additional transmission import capacity.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. An alternative transmission route could be developed to provide additional transmission import capacity.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. An alternative transmission route could be developed to provide additional transmission capacity.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. An alternative transmission route could provide future options for future expansion.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Alternative distribution and transmission improvements could serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. None of the alternative transmission routes would facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. None of the alternative transportation routes would accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. None of the alternative transportation routes would provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. None of the alternative transportation routes would provide additional regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. None of the alternative transportation routes would provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. None of the alternative transportation routes would provide voltage support for wind integration.

Source: The Nevada Hydro Company

The "LEAPS project (pumped storage plant and associated transmission line)" can be construed as constituting the "Applicant's Proposed Project," as addressed herein.

SCE's "Tehachapi Renewable Transmission Project" is comprised of the "Antelope-Pardee Transmission Project" and the "Tehachapi-Vincent Transmission Project," as approved by the CPUC on March 1, 2007 and March 15, 2007, respectively. As an approved project, the purpose and intent of the "Tehachapi Renewable Transmission Project" differ from those associated with the "Applicant's Proposed Project," such that the two projects seek to accomplish separate sets of goals and objectives. In addition, this alternative does not improve transmission access to the location-constrained LEAPS area, provide a mechanism for the storage of renewable or off-peak energy resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems.

The "Tehachapi Renewable Transmission Project" alternative, inclusive of its individual segments, would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative would potentially allow for the attainment of one of the Applicant's "transmission component" objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "Tehachapi Renewable Transmission Project" alternative would potentially allow for the attainment of that stated objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action."

A "Tehachapi Renewable Transmission Project" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

In addition, as described above, a combined "SRPL and TE/VS Interconnect" alternative was rejected because the potential impacts of that substantially larger project would result in the creation of additional environmental impacts at levels greater than individually associated with the SRPL (as described in the Sunrise FEIR/FEIS) and TE/VS Interconnect (as described in this PEA).

- **"Southwest Transmission Line Project" Alternative**. In 2006, the Imperial Irrigation District (IID) and the BLM jointly prepared environmental documents[43] for a 118 mile, 500-kV transmission line extending from Blythe to SCE's Devers substation. Variation of that project included the construction of the transmission line within and adjacent to the existing right-of-way (ROW) for SCE's Devers-Palo Verde No. 2 transmission line. Four alternatives were examined, including a second northern route alternative, a southern route alternative which including upgrading and use of certain existing transmission facilities, a third northern route, and a "no action" alternative.

[43]/ United States Department of the Interior, Bureau of Land Management and Imperial Irrigation District, Final Environmental Impact Statement/Environmental Impact Report – Desert Southwest Transmission Line Project, September 15, 2006.

This alternative does not improve transmission access to the location-constrained LEAPS area, provide a mechanism for the storage of renewable or off-peak energy resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems.

The "Southwest Transmission Line Project" alternative would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative would appear to allow for the potential attainment of one of the Applicant's "transmission component" objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "Southwest Transmission Line Project" alternative would potentially allow for the attainment of that singular objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, a "Southwest Transmission Line Project" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

The Applicant has considered the analyses and the alternatives presented in the "Final Environmental Impact Statement/Environmental Impact Report – Desert Southwest Transmission Line Project" and, in accordance with CEQA (14 CCR 15126.6[b] and [c]), has rejected a "Southwest Transmission Line Project" alternative because that project and those alternatives would not result in a substantially reduction of the Project's potential environmental effects.

- **"Devers-Palo Verde No. 2 Transmission Line Project" Alternative**. In 2006, the CPUC and BLM prepared environmental documents[44] for a new 230-mile 500-kV transmission line from Harquahala substation (Arizona) to SCE's Devers substation (North Palm Springs), following SCE's existing Devers-Palo Verde No. 1 transmission line. The Devers-Palo Verde No. 2 (DPV2) transmission line project also included upgrades to existing transmission lines located to the west of the Devers substation (West of Devers). The Devers-Valley No. 2, a new 42-mile 500-kV line following the existing SCE Devers-Valley No. 1 500-kV transmission line, was identified by SCE as the preferred project. A total of eight alternatives were evaluated therein.

  This alternative does not improve transmission access to the location-constrained LEAPS area, provide a mechanism for the storage of renewable or off-peak energy resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems.

  The "Devers-Palo Verde No. 2 Transmission Line Project" alternative would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative would potentially appear to allow for the attainment of one of the Applicant's "transmission component"

[44]/ United States Department of the Interior, Bureau of Land Management and California Public Utilities Commission, Final Environmental Impact Report/Environmental Impact Statement for the Proposed Devers-Palo Verde No. 2 Transmission Line Project (Application No. A.05-04-015), October 2006.

objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "Devers-Palo Verde No. 2 Transmission Line Project" alternative would potentially allow for the attainment of that singular objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, a "Devers-Palo Verde No. 2 Transmission Line Project" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

The Applicant has considered the analyses and the alternatives presented in the "Final Environmental Impact Report/Environmental Impact Statement for the Proposed Devers-Palo Verde No. 2 Transmission Line Project" and, in accordance with CEQA (14 CCR 15126.6[b] and [c]), has rejected a "Devers-Palo Verde No. 2 Transmission Line Project" alternative because that project and those alternatives would not result in a substantially reduction of the Project's potential environmental effects.

- **"Sunrise Powerlink Project" Alternative**. In January 2008, in response to SDG&E's filing for an application for a CPCN (CPUC Docket Nos. A.05-12-014 and A.06-08-010), the CPUC and BLM released the Sunrise DEIR/DEIS. The Sunrise DEIR/DEIS, in combination with the scoping process that preceded its release, the "Alternative Screening Report" (Appendix 1) included therein, and the "Recirculated Draft Environmental Impact Report/Statement" (CPUC/BLM, July 2008), contain a detailed analysis of a broad array of alternatives formulated in response to the stated objectives of the SRPL project. In December 2008, the CPUC certified the Sunrise FEIR/FEIS. The Sunrise FEIR/FEIS contained additional information concerning a range of alternatives to the SRPL project. The Applicant has fully considered the environmental and the alternatives analyses presented in the SRPL proceedings.

  The Sunrise DEIR/DEIS concludes that the "LEAPS Transmission-Only Alternative is found to be the Overall Environmentally Superior Transmission Line Route Alternative."[45] Following the "New In-Area All-Source Generation Alternative" and the "New In-Area Renewable Generation Alternative," the "LEAPS Transmission-Only Alternative" was listed as the top three "overall environmentally superior alternatives" in the Sunrise FEIR/FEIS.[46] As noted by the CPUC/BLM, "the LEAPS Transmission-Only Alternative is found to be inferior to both New In-Area Renewable Generation and New In-Area All-Source Alternatives."[47]

  In its "Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project" (CPUC, December 24, 2008), the CPUC stated: "The

[45]/ California Public Utilities Commission and Bureau of Land Management, Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, January 2008, pp. ES-64 and ES-65.

[46]/ California Public Utilities Commission and Bureau of Land Management, Final Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, October 2008, p. ES-5.

[47]/ Op. Cit., Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, p. ES-65.

Final EIR/EIS ranks three alternatives as environmentally superior to the Final Environmentally Superior Southern Route – the All-Source Generation Alternative, the In-Area Renewable Alternative, and the LEAPS Transmission-Only Alternative. We find these three alternatives to be infeasible for, among other things, meeting California's broader policy goals."[48] With regards to the "LEAPS Transmission-Only Alternative," the Applicant does not concur with the CPUC's findings but possesses no information to refute the determination of feasibility of the other alternatives cited.

Although the objectives for the SRPL differ from those established for the "Applicant's Proposed Project," each of the alternatives evaluated in the Sunrise DEIR/DEIS were initially considered in the derivation of this alternatives analysis. Since that document is incorporated herein by reference, the following description of each of the SRPL alternative, as evaluated in the Sunrise DEIR/DEIS and/or Sunrise FEIR/FEIS, is intended to only be synoptic in nature.

◊ **"SDG&E Proposed Sunrise" Alternative**. SDG&E proposes to construct a new 91-mile, 500-kV electric transmission line from the Imperial Valley Substation (in Imperial County near the City of El Centro) to a new Central East Substation (in central San Diego County, southwest of the intersection of County Highways S22 and S2) and a new 59-mile, 230-kV transmission line that includes both overhead and underground segments from the Central East Substation to SDG&E's existing Peñasquitos Substation (in the City of San Diego).

On December 24, 2008, the CPUC stated, in pertinent part, that SDG&E's request "for a certificate of public convenience and necessity to construct the proposed Sunrise Powerlink Transmission Project is granted for the routing alternative identified in the Final Environmental Impact Report/Final Environmental Impact Statement as the Final Environmentally Superior Southern Route."[49] This alternatives analysis does not distinguish between the "SDG&E Proposed Sunrise" alternative, as described in the Sunrise DEIR/DEIS, and the "Final Environmentally Superior Southern Route" as described in the Sunrise FEIR/FEIS.

The "SDG&E Proposed Sunrise" alternative neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources.

The "SDG&E Proposed Sunrise" alternative would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative would appear to allow for the attainment of one of the Applicant's "transmission component" objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "SDG&E Proposed Sunrise" alternative would potentially allow for the potential

48/ California Public Utilities Commission, Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, December 24, 2008, p. 5.
49/ Ibid., p. 292.

attainment of that singular objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action."

A "SDG&E Proposed Sunrise" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors). Additionally, as evidenced by the findings presented in the Sunrise FEIR/FEIS, in accordance with CEQA (14 CCR 15126.6[b] and [c]), the Applicant has rejected a "SDG&E Proposed Sunrise" alternative because that alternative would not result in a substantially reduction of the Project's potential environmental effects.

◊ **"Interstate 8" Alternative**. In the context of the Sunrise FEIR/FEIS, the "I-8" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option. The route of the "I-8" alternative would be located adjacent to the existing 500-kV Southwest Powerlink (SWPL) transmission line for the first 37.5 miles, paralleling the I-8 Freeway. The route begins at the Imperial Valley substation, paralleling the SWPL to a point about six miles west of the San Diego/Imperial County line. At that point, the line would turn northwest, passing less than one mile southwest of the southwest corner of Anza-Borrego Desert State Park (ABDSP) and crossing the I-8 Freeway just west of the BLM Carrizo Gorge Wilderness Area and one mile east of the community of Boulevard. The "I-8" alternative diverges from the SWPL one mile due south of the southwestern ABDSP boundary and follows a northwesterly route.

This alternative neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources.

The "Interstate 8" alternative would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative would allow for the attainment of one of the Applicant's "transmission component" objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "Interstate 8" alternative would potentially allow for the attainment of that singular objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, an "Interstate 8" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

As evidenced by the findings presented in the Sunrise FEIR/FEIS, in accordance with CEQA (14 CCR 15126.6[b] and [c]), the Applicant has rejected an

"Interstate 8" alternative because that alternative would not result in a substantially reduction of the Project's potential environmental effects.

◊ **"B-C-D" Alternative**. As indicated in the Sunrise DEIR/DEIS, the "B-C-D" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option allowing for the avoidance of ABDSP. This alternative would diverge from the "I-8" alternative southeast of the community of Boulevard where it would cross the I-8 Freeway to the north. The route would pass one mile east of Boulevard and, heading north-northwest, generally parallel McCain Valley Road. The route would enter the Cleveland National Forest and head west crossing Thing Valley Road (La Posta Truck Trail), Fred Canyon Road, and the Pacific Crest National Scenic Trail. After passing through the CNF, the route would join the "I-8" alternative.

This alternative neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources.

The "B-C-D" alternative would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative would appear to allow for the attainment of one of the Applicant's "transmission component" objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "B-C-D" alternative would potentially allow for the attainment of that singular objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, a "B-C-D" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

As evidenced by the findings presented in the Sunrise FEIR/FEIS, in accordance with CEQA (14 CCR 15126.6[b] and [c]), the Applicant has rejected a "B-C-D" alternative because that alternative would not result in a substantially reduction of the Project's potential environmental effects.

◊ **"Route D" Alternative**. As indicated in the Sunrise DEIR/DEIS, the "Route D" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option allowing for the avoidance of ABDSP. The "Route D" alternative would be a 500-kV alternative that would diverge from the "I-8" alternative and pass through the Boulder Creek Valley north of the town of Descanso, passing between the Cuyamaca Ranch State Park and Capitan Grande Reservation. The "Route D" alternative would join the SDG&E preferred route between Santa Ysabel and Ramona.

This alternative neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources.
The "Route D" alternative would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative appears to allow for the attainment of one of the Applicant's "transmission component" objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "Route D" alternative would potentially allow for the attainment of that singular objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, a "Route D" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

As evidenced by the findings presented in the Sunrise FEIR/FEIS, in accordance with CEQA (14 CCR 15126.6[b] and [c]), the Applicant has rejected a "Route D" alternative because that alternative would not result in a substantially reduction of the Project's potential environmental effects.

◊ **"Modified Route D" Alternative**. As indicated in the Sunrise DEIR/DEIS, the "Modified Route D" alternative allows for the attainment of the basic objectives of the "SDG&E Proposed Sunrise" alternative but presents an alternative transmission line routing option allowing for the avoidance of ABDSP and a reduction of impact to the CNF. This 39 mile alternative would replace a segment of the "I-8" alternative.

This alternative neither improves transmission access to the location-constrained LEAPS area nor provides a mechanism for the storage of renewable or off-peak energy resources.

The "Modified Route D" alternative would neither allow for attainment of any of the Applicant's stated goals nor any of the Applicant's "pumped storage component" objectives; however, that alternative appears to allow for the attainment of one of the Applicant's "transmission component" objectives (i.e., Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers). Although the "Modified Route D" alternative would potentially allow for the attainment of that singular objective, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, a "Modified Route D" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

As evidenced by the findings presented in the Sunrise FEIR/FEIS, in accordance with CEQA (14 CCR 15126.6[b] and [c]), the Applicant has rejected a "Modified Route D" alternative because that alternative would not result in a substantially reduction of the Project's potential environmental effects.

◊ **"New In-Area Renewable Generation" Alternative**. The "New In-Area Renewable Generation" alternative would involve development of various In-Area renewable projects that together could provide sufficient generation capacity to defer the need for projects such as the SRPL. As indicated in the Sunrise DEIR/DEIS, this alternative would develop nearly 1,000 MW of Nameplate Capacity and 500 MW of Firm On-Peak Capacity by 2016; however, no single in-area generation project by itself would be likely to produce the necessary capacity to serve as a viable alternative to the SRPL.

As indicated in the Sunrise DEIR/DEIS, and repeated in the Sunrise FEIR/FEIS, based on all the factors described therein, "the environmental ranking of the environmentally superior transmission and non-wires alternatives from most environmentally superior to least environmentally superior is as follow: (1) New In-Area All-Source Generation Alternative; (2) New In-Area Renewable Generation Alternative; (3) LEAPS Transmission-Only Alternative."[50]

The "New In-Area Renewable Generation" alternative would not improve transmission access to the location-constrained LEAPS, provide a mechanism for the storage of renewable or off-peak energy resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems. In addition, as illustrated in Table 6.2.3.2-2 ("New In-Area Renewable Generation" Alternative – Ability to Attain Stated Goals and Objectives), a "New In-Area Renewable Generation" alternative does not appear to allow for the attainment of the Project's two stated objectives, does not appear to allow for the attainment of at least three of the seven "transmission component" objectives, and does not appear to allow for the attainment of at least four of the five the "pumped storage component" objectives. This alternative appears to allow for the full or partial attainment of four of the seven "transmission component" objectives and one of the "pumped storage" objectives, including those relating to renewable energy resources.

As indicated in the Sunrise FEIR/FEIS, this alternative was determined by the CPUC/BLM to be "environmentally superior" to both the TE/VS Interconnect and to the Project as a whole. However, in its "Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project" (CPUC, December 24, 2008), the CPUC concluded that the "In-Area Renewable Alternative" was infeasible."[51] The Applicant is not in possession of any information that would refute that determination.

[50]/ Ibid., p. H-137.
[51]/ Op. Cit., Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, p. 5.

Although constituting a substantially different remedy to the attainment of the Project's stated purpose and need, the Big Rock decision would be inapposite with respect to a "New In-Area Renewable Generation" alternative because that alternative may provide an alternative method of addressing the purpose and need upon which the Project is predicated and may, therefore, allow for a comparative analysis of the "project as a whole." Notwithstanding the CPUC's findings, for the purpose of informed decision making, a "New In-Area Renewable Generation" alternative is further discusses in Section 6.2.4.4 (Alternative No. 9 - "New In-Area Renewable Generation" Alternative).

◊ **"New In-Area All-Source Generation" Alternative**. The "New In-Area All-Source Generation" alternative would include a combination of fossil-fuel fired central station and peaking generators, renewable generators, and non-renewable distribution generation (DG). Under this alternative, the capacity provided by conventional generation projects would include at least 620 MW from a central station power plant (i.e., South Bay Replacement Project, San Diego Community Power Project, or Carlsbad Energy Center/Encina Power Plant Repowering Project) plus 250 MW from multiple peaking power plants assumed to come online by 2008. This alternative also includes 200 MW of solar photovoltaic, wind, and biomass projects.

This alternative would not improve transmission access to the location-constrained LEAPS area, allow for the storage of excess off-peak energy production in the CAISO region, effectively provide for the integration of intermittent renewable resources, enhance San Diego load area's access to renewable resources, or allow for the construction of a regional interconnection linking SCE-SDG&E systems.

In addition, as illustrated in Table 6.2.3.2-3 ("New In-Area All-Source Generation" Alternative – Ability to Attain Stated Goals and Objectives), a "New In-Area All-Source Generation" alternative does not appear to allow for the attainment of the Project's two stated goals, does not appear to allow for the attainment of at least one of the seven "transmission component" objectives, and does not appear to allow for the attainment of any of the five "pumped storage component" objectives.

By failing to address any of the Project's stated pumped storage goals and objectives, a "New In-Area All-Source Generation" alternative does not allow for a comparative assessment of Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors) and does not, therefore, constitute a reasonable alternative.

In addition, in its "Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project" (CPUC, December 24, 2008), the CPUC concluded that the "All-Source Generation Alternative" was infeasible."[52] The Applicant is not in possession of any information that would refute that determination.

- **"Report for SDG&E's Transmission Comparison Study" Alternative**. In 2005, SDG&E conducted a "transmission comparison screening study" in order "to evaluate various transmission alternatives and to select the best alternative(s) to: increase import capability into the SDG&E service area to meet a grid reliability deficiency in 2010, reduce congestion and reliability must run (RMR) costs for California ratepayers, [and] access, at an acceptable cost, renewable resources in support of goals set by the State of California and the CPUC. SDG&E reported that "the highest ranking alternative" was the "Full Loop" alternative. The "Full Loop options are so named because they complete the 500 kV loop from Palo Verde [Arizona] to SDG&E to SCE and then back to Palo Verde by adding the portion from SDG&E's 500 kV to SCE's 500 kV system."[53]

  SDG&E stated: "To the extent the transmission associated with the LEAPS project follows the same corridor as the Central-Serrano/Valley portion of the Full Loop, Imperial-Central Serrano/Valley 500 kV alternative, the transmission associated with the LEAPS project can be considered to constitute the bulk of the northern segment of the Imperial Valley-Central – Serrano/Valley 500 kV alternative."[54] This would suggest that, cumulatively, the "Applicant's Proposed Project" could then be described as the "north segment of the Imperial Valley-Central-Serrano/Valley 500 kV" alternative.

  SDG&E's December 2005 CPCN application, as addressed in the Sunrise DEIR/DEIS, included the "Imperial Valley-Central-Serrano/Valley" (Full Loop) alternative. As proposed, this alternative would connect SDG&E's proposed 500-kV system to SCE's existing 500-kV system through a proposed new 500/230-kV Central Substation, feeding into SDG&E's existing 230-kV system near the center of SDG&E's system, and then connects to SCE's 500-kV system.[55] The "Full Loop" alternative "would complete the 500-kV loop through southern California, connecting SCE's 500-kV Palo Verde-Devers-Valley-Serrano system to SDG&E's proposed 500-kV Southwest Powerlink."[56]

  As indicated by SDG&E: "The Technical Working Group determined that the "Full Loop" option and the Sunrise Powerlink were the best performing transmission alternatives with respect to grid reliability and technical performance, accessing areas of high renewable resource potential, and providing economic benefits."[57] Under this alternative, SDG&E's proposed 500-kV transmission line extending from the Imperial Valley Substation to the proposed new Central Substation would be further extended northward, connecting SDG&E's proposed new 500-kV system to the Serrano/Valley segment of SCE's 500-kV system.

  SDG&E's initial application noted that this alternative would "free up some amount of capacity on the existing Imperial Valley-Miguel 500 kV transmission line (the Southwest

52/ Op. Cit. Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, p. 5.
53/ San Diego Gas and Electric, Report for SDG&E's Transmission Comparison Study, October 5, 2005, pp. 1-2 and 29.
54/ Ibid., p. 2.
55/ San Diego Gas & Electric Company, Sunrise Powerlink Transmission Project – Purpose and Need, Volume 2, December 14, 2005, p. VI-ii.
56/ Ibid., p. VI-5.
57/ Ibid., p. II-3.

Powerlink or 'SWPL') and thereby allow renewable energy resources to economically connect to this existing 500 kV line. This could encourage renewable energy development that might otherwise not be feasible."[58]

"SDG&E has performed several sensitivities involving the Sunrise Powerlink. The first sensitivity assumes that in addition to the Sunrise Powerlink, the Lake Elsinore Advanced Pump Storage project is constructed and that the southern terminus of the associated 500 kV transmission is located at a new 500/230 kV substation on SDG&E's existing SONGS-Talega 230 kV line. The second sensitivity assumes that in addition to the Sunrise Powerlink, the LEAPS project is built and the southern terminus of the associated 500 kV transmission is located at Central substation. Both sensitivities include two 250 MW pump/generator sets interconnected with the CAISO grid via a 500 kV line connecting to the SDG&E system and a 500 kV line connecting to the SCE system on SCE's existing Serrano-Valley 500 kV line. The first sensitivity represents SDG&E's understanding of the LEAPS project sponsors' current proposal for integrating the LEAPS project into the CAISO grid. The second sensitivity represents a logical modification of the LEAPS project sponsors' current proposal because it eliminates the need for a 500/230 kV substation and has the advantage of completing a 500 kV loop through the Southern California load centers. The second sensitivity does require additional 500 kV transmission to reach Central substation."[59]

"A variation of the Full Loop is to incorporate the 500 kV transmission system associated with the planned LEAPS project which, as currently envisioned, would have a southern terminus at a new 500/230 kV substation somewhere along SDG&E's Talega-Escondido 230 kV line in northern San Diego County. It would have a northern terminus at a 500 kV switchyard somewhere along SCE's Serrano-Valley 500 kV line. A logical 'full loop' grid configuration would be to substitute the 500 kV transmission associated with the LEAPS project for most or all of the Central – Serrano/Valley portion of the Full Loop alternative. This configuration would eliminate the need for the LEAPS project's planned 500/230 kV substation on SDG&E's Talega-Escondido 230 kV line."[60]

SDG&E's analysis concluded that the "Full Loop" alternative "is consistent with the transmission additions that have been proposed in association with the Lake Elsinore Advanced Pumped Storage project"[61] and could, therefore, accommodate LEAPS and facilitate the transmission of pumped storage hydroelectricity.

To accommodate this alternative, the Applicant's proposed transmission alignment would need to be substantially expanded to include a linkage with SDG&E's new Central East Substation, southeast of Lake Henshaw. Since this alternative cannot exist in the absence of the rerouting of the Applicant's transmission alignment and the implementation of the SRPL project, the potential environmental impacts of this alternative would be cumulatively greater than associated with the "Applicant's Proposed Project."

58/ Ibid., p. VI-iv.
59/ Ibid., p. V-28.
60/ Ibid., p. VI-8.
61/ Ibid., p. VI-iii.

As indicated by the Cities of Temecula, Hemet, and Murrieta, those cities "oppose the full loop alternative because it would almost certainly result in significant environmental and other impacts to their communities and residents. Because SDG&E's submittal lacks critical route information, it is impossible to discern the nature and extent of those impacts. It does appear, however, that the northern portion of the full loop alternative would cross through Southwest Riverside County. A similar transmission line was previously proposed and rejected in the Valley-Rainbow proceedings (A.01-03-036, filed March 23, 2001) after strong opposition from local residents. Because Riverside County is now even more populated and developed than it was during the Valley-Rainbow proceedings, construction of a transmission line through the area would be even less appropriate and feasible now."[62]

As indicated in the CPUC/BLM's "Final Notice – CPUC/BLM Notice Regarding Conclusions on EIR/EIS Alternatives to the Proposed Sunrise Powerlink Project – Results of the Second Scoping Process" (CPUC/BLM, March 16, 2007): "Full Loop Alternatives would build a new 500 kV transmission line from the existing Imperial Valley substation to either the proposed [SRPL] project's new Central East substation or to another new substation in northern San Diego County (e.g., Rainbow substation), then continue the new 500 kV line to a new substation in SCE's territory between the existing Serrano and Valley substations. Other partial implementation of the 'full loop' alternatives recommended for elimination include: Imperial Valley-Ramona 500 kV; Imperial Valley-Rainbow 500 kV; and Imperial Valley-East of Escondido 500 kV. These alternatives do not pose an option to, but rather an expansion of the proposed [SRPL] project. By expanding the Sunrise Powerlink project to include a 500 kV link to Ramona, or further west, or an interconnection with the SCE system, these alternatives would enhance the proposed [SRPL] project's ability to meet reliability and import capability objectives. However, these alternatives would add to the impacts of the proposed [SRPL] project due to the additional construction and ROW required."[63] The CPUC and BLM further concluded that this alternative "would have environmental impacts as severe as those of the proposed [SRPL] project."[64]

The Applicant has considered the analysis presented by the CPUC and BLM in the "Final Notice – CPUC/BLM Notice Regarding Conclusions on EIR/EIS Alternatives to the Proposed Sunrise Powerlink Project – Results of the Second Scoping Process" and, relative to the "Applicant's Proposed Project," concurs with those agencies' findings.

As illustrated in Table 6.2.3.2-4 ("Full Loop" Alternative – Ability to Attain Stated Goals and Objectives), if developed in combination with LEAPS, a "Full Loop" alternatives does appear to allow for the attainment of the Project's two stated goals, appear to allow for six of the seven "transmission component" objectives, and would appear to allow for the attainment of all five "pumped storage component" objectives.

---

[62]/ Cities of Temecula, Hemet, and Murrieta (Shute, Mihaly & Weinberger), In the Matter of the Application of San Diego Gas & Electric Company for a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, Protest of the Cities of Temecula, Hemet and Murrieta, January 17, 2006, p. 3.

[63]/ California Public Utilities Commission and United States Department of the Interior – Bureau of Land Management, Final Notice – CPUC/BLM Notice Regarding Conclusions on EIR/EIS Alternatives to the Proposed Sunrise Powerlink Project – Results of the Second Scoping Process, March 16, 2007, p. 27.

[64]/ Ibid., p. 26

To the extent that a "Full Loop" alternative also served to accommodate pumped storage, the Big Rock decision would be inapposite with respect to that alternative because it would allow for a comparative analysis of the "project as a whole." While a "Full Loop" alternative, if considered in combination with LEAPS and the remaining components of the TE/VS Interconnect, would allow for a comparative assessment of "Applicant's Proposed Project," because of its substantially larger size and expanded geographic area of disturbance, the "Full Loop" alternative no factual basis exists to suggest that this alternative would result in the avoidance or substantial lessening of the significant environmental effects attributable to the Project.

Table 6.2.3.2-2
"New In-Area Renewable Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Partial Attainment**. Under this alternative, some additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Partial Attainment**. Although no additional import capacity would be created, new in-basin sources of renewable energy would be developed.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Partial Attainment**. Although no additional import capacity would be created, reliability criteria could be addressed through the development of new in-basin sources of renewable energy resources.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non-attainment. This alternative does not assume the development of new 500-kV transmission lines.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	Non-attainment. This alternative does not assume the development of new 500-kV transmission lines.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements could serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Partial Attainment**. Although this alternative would not accommodate the storage of off-peak energy, new in-basin wind and geothermal energy resources would be developed hereunder.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

Table 6.2.3.2-3
"New In-Area All-Source Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Partial Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Implementation of this alternative would likely necessitate the development of new 500-kV transmission lines.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. New transmission facilities could provide options for future expansion.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements could serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

Table 6.2.3.2-4
"Full Loop" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Attainment**. This alternative would allow for the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Attainment**. This alternative would allow for the development of a pumped storage facility and a gen-tie..
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Under this alternative, new 500-kV transmission lines would interconnect SDG&E and SCE systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. This alternative would implement this objective.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements could serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Attainment**. Connection to SCE's existing transmission system would allow for the storage of wind energy from the Tehachapi region.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity and integrate renewable resources.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Attainment**. This alternative would allow for the provision of 500-MW of Black Start capability serving a portion of the CAISO grid.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Attainment**. This alternative would allow for the provision of voltage support for wind integration.

Source: The Nevada Hydro Company

In accordance with CEQA (14 CCR 15126.6[b] and [c]), a "Full Loop" alternative was, therefore, rejected by the Applicant because the potential impacts of that substantially larger alternative would not result in a lessening of potential environmental impacts and would likely result in the creation of additional environmental impacts and/or increase the severity of those impacts now associated with the "Applicant's Proposed Project."

- **"Existing Valley-Serrano Transmission Corridor" Alternative**. As required under Section 1221(b) of the EPAct 2005, the Secretaries of Agriculture, Energy, and Interior and the Chairman of the Council on Environmental Quality were directed to prepare a report identifying: (1) all existing designated transmission and distribution corridors on federal land; (2) the status of work related to proposed transmission and distribution corridor designations under Title V of the Federal Land Policy and Management Act of 1976 (FLPMA) and any impediments to completing the work; (3) the number of pending applications to locate transmission facilities on federal land; and (4) the number of existing transmission and distribution rights-of-way on federal land that will come up for renewal in the next 5-, 10-, and 15-year periods and how those renewals will be managed.

  In compliance with that mandate, the United States Department of Agriculture (USDA), United States Department of the Interior, the DOE, and the Council on Environmental Quality (CEQ) prepared a "Report to Congress: Corridors and Rights-of-Way on Federal Lands." As reported by the USDA Forest Service, within the general area, only SDG&E's existing 500-kV "Valley-Serrano" transmission line (identified as an "Existing Designated Transmission and Distribution Corridor"[65]) and the Applicant's proposed 500-kV "Elsinore Valley Municipal Water District" transmission line (identifies as a "Pending Transmission Facility Application") were identified therein.[66] These federal designations only apply to existing or proposed rights-of-way and utility corridors located on federal reservations.

  Located with the "existing designated transmission and distribution corridor" is SCE's existing 500-kV Valley-Serrano transmission line which traverses the TRD west of Lake Elsinore and connects SCE's existing Valley Substation (Romoland, Riverside County) and existing Serrano Substations (Orange, Orange County).

  As part of the Applicant's FERC filing, the Applicant explored a transmission route that connected the Project's 500-kV transmission line to the "Existing Designated Transmission Distribution Corridor" in the area of Bald Peak. That routing option was eliminated based on the potential presence of sensitive biological resources near that point of interconnect (e.g., presence of California spotted owl, *Strix occidentalis occidentalis*), and the inability of the Applicant to find a site suitable for the construction of a switchyard. As such, a northern connection with SCE's "Valley-Serrano Transmission Corridor," located within the boundaries of the TRD, was deemed infeasible based on spatial constraints and potential environmental impacts.

[65]/ Defined as "[a]ll electric transmission line ROW corridors that have been formally designated by law, Secretarial order, land use planning process, or other management decision."
[66]/ United States Department of Agriculture, United States Department of the Interior, United States Department of Energy, and the Council on Environmental Quality, Report to Congress: Corridors and Rights-of-Way on Federal Lands, November 7, 2005, pp. 18 and 37.

The Valley-Serrano 500-kV transmission line represents that segment of SCE's existing 500-kV transmission system into which the TE/VS Interconnect will connect. As such, this existing transmission line does not constitute a distinct alternative but an element of the existing proposal. Different points of junction between the "Applicant's Proposed Project" and SCE's Valley-Serrano transmission line may, however, exist and those alternative points of interconnect represent potential design variations for the "Applicant's Proposed Project." An alternative point of interconnection with the existing Valley-Serrano transmission line is separately examined in "Alternative No. 5 (Alternative Lake Switchyard Site) herein.

Although an "Existing Valley-Serrano Transmission Corridor" alternative, if considered in combination with LEAPS and the remaining components of the TE/VS Interconnect, would allow for a comparative assessment of the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors), this alternative could not be feasibly implemented based on existing physical siting constraints preventing the construction of requisite facilities (i.e., northern switchyard) allowing for its functional operation. In addition, under CEQA (14 CCR 15126.6[b] and [c]), an "Existing Valley-Serrano Transmission Corridor" alternative was also rejected by the Applicant because the potential impacts of that alternative would not result in a lessening of potential environmental impacts attributable to the Project.

- **"Non-National Forest Route" Alternative**. The Applicant submitted and the Forest Service accepted for processing separate special use permit (SUP) applications for the "Applicant's Proposed Project," including separate permits for the LEAPS and TE/VS Interconnect.[67] In accordance with USDA Forest Service Handbook (FSH) 2709.11, the Applicant was required to explain the selection of the location of the proposed uses, state why the use of National Forest System (NFS) lands was necessary, and demonstrate why lands under non-federal jurisdiction could not be feasibly utilized.[68]

  As indicated in the FEIS, "Given the numerous constraints on locating transmission line corridors in the Lake Elsinore area, the USDA Forest Service concluded during the application screening that NFS lands are necessary for the proposed interconnect. It is also evident that alternative locations are not reasonably available to the co-applicants."[69]

  As indicated in the FEIS, FERC and the USDA Forest Service have independent determined that there exists no viable non-federal transmission alignment for the "Applicant's Proposed Project." The Applicant concurs with FERC's and the USDA Forest Service's independent conclusion that the "Applicant's Proposed Project" cannot be reasonably accommodated on non-NFS lands and that a non-NFS route is, therefore, not reasonably feasible.

[67]/ Activities for which SUPs are authorized include: (1) systems and related facilities for generation, transmission, and distribution of electric energy (36 CFR 251.53[l][4]); and (2) such other necessary transportation or other systems or facilities which are in the public interest and which require rights-of-way over, upon, under, or through NFS lands (36 CFR 251.53[l][7]). The requested hydropower license can only be issued if the Commission determines that the proposed project is in or consistent with the public interest (16. U.S.C. 797[e]).

[68]/ As stipulated in Forest Service Manual 2703.3(3), the Forest Service may deny proposals located on National Forest System land if the proposal "can reasonably be accommodated on non-National Forest System lands."

[69]/ Op. Cit., Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, p. A-1.

A "freeway right-of-way" alternative was also considered. However, as indicated by the California Department of Transportation (Caltrans or Department): "Placement of longitudinal utility encroachments within freeway and expressway right-of-way is prohibited under Department policy."[70] The Federal Highway Administration (FHWA) has "delegated authority to Caltrans to approve public (utility companies regulated by the CPUC) utility longitudinal installations."[71] Based on the Caltrans-imposed prohibitions, the ability of the Applicant to obtain FHWA and/or Caltrans authorization for a "freeway right-of-way" alternative is considered speculative and is, therefore, deemed infeasible (14 CCR 15145).

6.2.3.3 "Alternative Advanced Transmission Technologies" Alternative

Under Section 1223 of the EPAct 2005, Congress provided guidance as to the types of "advanced transmission technologies" that FERC should encourage, including, among others, high-temperature lines (including superconducting cables); underground cables; advanced conductor technology (including advanced composite conductors, high temperature low-sag conductors, and fiber optic temperature sensing conductors); high-capacity ceramic electric wire, connectors, and insulators; optimized transmission line configurations (including multiple phased transmission lines); modular equipment; wireless power transmission; ultra-high voltage lines; high-voltage DC technology; flexible AC transmission systems; energy storage devices (including pumped hydro, compressed air, superconducting magnetic energy storage, flywheels and batteries); controllable load; distributed generation (including PV, fuel cells, and microturbines); enhanced power device monitoring; direct systems state sensors; fiber optic technologies; power electronics and related software (including real time monitoring and analytical software); mobile transformers and mobile substations; and other technologies FERC considers appropriate.[72]

On November 17, 2006, FERC stated that "Section 1223 of EPAct 2005 declares pumped hydro an 'advanced transmission technology' that this Commission should encourage, as appropriate. Nevada Hydro's LEAPS facility meets the requirements of this section."[73] As a result of that ruling, LEAPS has been federally designated an "advanced transmission technology."

Based on that federal designation, a possible alternative would thus be another substitute "advanced transmission technology," other than pumped storage. However, acting on their own, none of the technologies listed above would allow for the attainment of the Project's two stated goals, six "transmission component" objectives, "pumped storage component" objectives, or any subset thereof. Acting in combination with the overall Project, additional opportunities may exist to more fully integrate additional advanced transmission technologies (e.g., high-temperature lines and ultra-high voltage lines) into the design of the Project. For example, as indicated in Attachment 2 (3M ACCR Technical Information), proposed is the use of high-performance conductors, 3M™ Aluminum Conductor Composite Reinforced (ACCR) or equivalent, which can provide transmission capacity up to two or three times greater than those

---

[70]/ California Department of Transportation, Encroachment Permits – Manual for Encroachment Permits on California State Highways, Seventh Edition, revised January 2002, p. 6-11.
[71]/ Ibid., p. 6-12.
[72]/ Public. Law No. 109-58, Section 1223, 119 Stat. 594, 953-54 (2005).
[73]/ Federal Energy Regulatory Commission, Order on Rate Request (Docket Nos. ER-06-278-000 et al.), issued November 17, 2006, p. 12.

of conventional transmission lines. This conductor operates at elevated temperatures with reduced sag and with higher ampacity than comparably sized traditional conductors.

The Big Rock decision would be inapposite with respect to an "Alternative Advanced Transmission Technology" because it would allow for a comparative analysis of the "project as a whole." This alternative should, therefore, not be viewed as a separate alternative to the Project but, in combination with LEAPS and the remaining components of the TE/VS Interconnect, a functional element thereof. Possible variations of an "Alternative Advanced Transmission Technologies" alternative are presented in Section 6.2.3.1 ("Non-Wires" Alternative) and Section 6.2.3.5 ("Alternative Electricity Storage Technologies" Alternative) herein.

6.2.3.4 "Alternative Hydropower Site" Alternative

Although LEAPS is an exception, as illustrated in Figure 6.2.3.4-1 (Southern California Renewable Energy Resources),[74] within the southern California area, additional renewable energy will be predominately developed from wind and geothermal sources and not from new hydropower facilities. Nationally, the DOE predicts that "[a]lmost no new hydropower capacity is predicted through 2020"[75] and only 560 MW of conventional hydropower capacity is expected to be added to the nation's energy supplies by 2025.[76] In California, the California Environmental Protection Agency (CalEPA) notes "[a] finite water supply and lack of suitable dam sites that do not already have hydroelectric facilities severely limits the potential for expansion."[77] Similarly, the CEC notes "[o]pportunities for construction of new hydroelectric plants and pumped storage projects are extremely limited in California."[78] This is particularly evident in southern California where only 20 MW of total installed hydroelectric capacity presently exists.[79] As indicated in the 1990 TEC investigative study: "Pumped storage units are used by various utilities to mitigate the effects of daily peaking problems. The southwest region of California, however, has few sites that can be utilized for pumped storage projects, either because of insufficient or varying water supplies or an unacceptable elevation between the upper and lower reservoirs."[80]

Early in the 20th Century, abundant hydrological resources were the main sources of electricity. Hydroelectric development continued in all decades throughout the century, peaking in the 1960's. Substantial hydroelectric pumped storage capacity was added from the late 1960's to the early 1980's. Most of the cost-effective, environmentally appropriate sites for hydropower projects have already been developed.[81] Opportunities for new hydropower dam and storage projects are extremely limited in California due to a lack of sites, lack of availability of

---

74/ California Public Utilities Commission, Report to the Legislature – SB 1038/Public Utilities Code Section 383.6: Electric Transmission Plan for Renewable Resources in California, December 1, 2003, Map 5.
75/ Sale, M.J., et al., DOE Hydropower Program Annual Report for FY 2002, DOE/ID-1107, United States Department of Energy July 2003, p. 1; Sale, M.J., et al., DOE Hydropower Program Biennial Report for FY 2005-2006, ORNL/TM-2006/97, United States Department of Energy, July 2006, p. 1.
76/ Cada, Glen F., et al., DOE Hydropower Program Annual Report for 2003, DOE/NE-ID-11136, United States Department of Energy, February 2004, p. 1.
77/ California Environmental Protection Agency, California Response to the Federal Energy Regulatory Commission Staff Report on Hydroelectric Licensing Policies, Procedures, and Regulations – Comprehensive Review and Recommendations Pursuant to Section 603 of the Energy Act of 2000 – May 2001, October 2001, p. viii.
78/ California Energy Commission, Integrated Energy Policy Report, CEC-100-2-5-007CMF, November 2005, p. 141.
79/ California Energy Commission, California Hydro-Electricity Outlook for 2002, Staff Report, P 700-02-004F, April 2002, p. 5.
80/ Op. Cit., Report on Reconnaissance Level Investigation of Lake Elsinore Pumped Storage Project, June 1990, p. 1-2.
81/ California Energy Commission, California Hydropower System: Energy and Environment, Append D – 2003 Environmental Performance Report, 100-03-018, October 2003, p. D-6.

unallocated water rights, environmental protection measures, and strong political opposition. New development requires an approximate 10-year timeframe in order to plan and understand the potential environmental effects and prepare appropriate environmental safeguards.[82] The lack of additional suitable sites inhibits the further application of this technology.[83]

Based on a Statewide resource assessment conducted by the DOE, a total of 3,390 MW of undeveloped hydropower potential exists in California. Of that, 51 percent is contained within the following three major river basins: American, Feather, and Stanislaus River basins. As illustrated in Figure 6.2.3.4-2 (Megawatts of Undeveloped Hydropower Potential in the California River Basins), the DOE has not identified any megawatts of undeveloped hydropower potential in the southern California coastal region.[84] Because of the limited potential for additional pumped storage and other hydropower facilities, with the exception of LEAPS, it is unlikely that any substantial new regional hydropower capacity can be created in southern California.

Based on the absence of viable alternative hydropower (inclusive of both run-of-the-river and pumped storage) sites, the Applicant has determined that there exists no hydropower siting alternatives not involving the combination of surface waters within Lake Elsinore and the proximity of that existing water body to the Elsinore Mountains. As a result, the Applicant has concluded that an "Alternative Hydropower Site" alternative is infeasible.

6.2.3.5 "Alternative Electricity Storage Technologies" Alternative

The transmission grid is often considered analogous to a "highway" linking generation to load. Transmission networks serve as the "principal media for achieving reliable electric supply." Those networks provide flexibility so that the highway functions can be maintained over a wide range of generation, load, and transmission conditions, thus reducing the amount of installed generating capacity needed for reliability by connecting different electrical systems, permitting economic exchange of energy among systems, and connecting new generators to the grid.[85]

As indicated in the "National Transmission Grid Study," electricity is not a commodity that can be easily stored.[86] In drawing an analogy, the study states: "Image an interstate highway system without storage depots or warehouses, where traffic congestion would mean not just a loss of time in delivering a commodity, but a loss of the commodity itself."[87]

As indicated by the Electric Power Research Institute (EPRI): "Electricity is unique among energy commodities because of the difficulty of storing it in bulk. Instant-response storage units such as batteries, for example, have a very limited capacity, while pumped hydro storage is large

---

82/ Op. Cit., Comparative Study of Transmission Alternatives: Background Report, 700-04-006, p. 13.
83/ Price, Anthony, Thijssen, Gerald, and Symons, Phil, Electricity Storage, A Solution in Network Operations?, October 12, 2000.
84/ Conner, Alison M. and Francfort, James E., U.S. Hydropower Resource Assessment for California, Idaho National Engineering and Environmental Laboratory, U.S. Department of Energy, October 1998, pp. 2 and 5.
85/ Hirst, Eric and Kirby, Brendan, Transmission Planning for a Restructuring U.S. Electricity Industry, Edison Electric Institute, June 2001, p. 1.
86/ "Since electricity is not economically storable in large quantities, it must be generated when demanded and is consumed nearly instantaneously. Consumers or others acting on their behalf, cannot simply put a large amount of power in storage when the price is low for use later or resell it when the price is higher. If storage were available, it could be used to moderate the price and dampen any supplier market power. Also, because of transmission constraints and other physical limits on sending power over long geographic distances, power may not be available to send to higher prices areas to moderate the price" (Rose, Kenneth, 2005 Performance Review of Electric Power Markets – Update and Perspective, Virginia State Corporation Commission August 23, 2005).
87/ United States Department of Energy, National Transmission Grid Study, May 2002, p. ii.

but involves a long response time. . .Until large-scale storage of electricity becomes practical, electricity must be generated to closely follow the swings of demand in real time."[88]

Some power sources are intermittent and uncontrollable in that they do not provide continuous electrical power. This intermittent nature is characteristic of certain renewable energy technologies (e.g., solar and wind power) which require backup sources of power and/or storage devices to store power for later use.[89] As indicated by the President's Committee of Advisors on Science and Technology Panel on Energy Research and Development: "The extent to which intermittent renewable energy technologies (iRETs), wind and solar, can penetrate utility grids without storage depends on what other generating capacity is on the system. An electric system optimized to accommodate iRETs would have less baseload and more load-following or peaking capacity. However, if iRETs are to make very large contributions to electricity supplies in the longer term, technologies are needed that would make it possible to store energy for many hours at attractive costs. . .Storage will take on added importance in the future to ensure reliable, high-quality service. It will provide for increased renewable use and system stabilization with distributed generation. Areas of importance include pumped hydro, compressed air, battery, inertial, and SMES [superconducting magnetic energy storage] technologies covering a wide capacity range."[90]

As indicated by the United States Government Accountability Office (GAO), "wind and solar energy are intermittent energy sources because wind speed and sunlight vary, depending, for example, on the time of day and the weather – on average, wind turbines operate the equivalent of less than 40 percent of the hours in a year due to the intermittency of wind. Alternatively, the electricity generated must be immediately used or transmitted to the power transmission gird because no cost-effective means exists for storing electricity."[91]

The traditional function of energy storage devices is to save production costs by holding cheaply generated off-peak energy that can be then be dispatched during peak-consumption periods. Stored energy produced by base generation units during off-peak periods can avoid the need to use highly polluting supplemental/peak generation units during periods of peak demand. In addition, energy storage devices can be used to provide effective power system control. Different dispatch modes can be superimposed on the daily cycle of energy storage and additional capacity can be reserved for the express purpose of providing these control functions. As a distributed resource, energy storage devices can enhance power quality and reliability.[92]

When used in combination with renewable resources, storage devices can make supply coincident with periods of peak consumer demand and can facilitate large-scale integration of

[88]/ Electric Power Research Institute, The Western States Power Crisis: Imperatives and Opportunities, An EPRI White Paper, June 24, 2001, pp. 18 and 45.

[89]/ International Atomic Energy Agency, Health and Environmental Impacts of Electricity Generation Systems: Procedures for Comparative Assessment, Technical Report Series No. 394, 1999, p. 47.

[90]/ President's Committee of Advisors on Science and Technology Panel on Energy Research and Development, Report to the President on Federal Energy Research and Development for the Challenges of the Twenty-First Century, November 1997, pp. 6-3, 6-4, and 6-25.

[91]/ United States Government Accountability Office, Department of Energy – Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs, GAO-07-106, December 2006, p. 31.

[92]/ California Energy Commission, California's Electricity System in the Future – Scenario Analysis in Support of Public-Interest Transmission System R& D Planning, P500-03-010F, Public Interest Energy Research Program Energy Systems Integration Team, April 2003, p. 41.

intermittent renewable resources onto the electric grid.[93] Figure 6.2.3.5-1 (Wind Generation and System Load Have Different Daily Patterns) presents a curve that plots energy demand and wind turbine generation on an hourly basis in California.[94] As noted, wind turbine generation is not coincident with demand.[95]

In order to optimize the use of wind energy and facilitate the balancing of generation and load, storage devices would permit off-peak and non-firm wind turbine energy to be stored and provided to consumers as firm and on-peak energy. As indicated by the American Solar Energy Society, "even greater wind and solar contributions might be possible through greater use of storage and high-efficiency transmission lines."[96]

Alternating current (AC) electricity is not directly stored but is converted and stored by mechanical, chemical, or electrical potential energy methods. Each of these methods has its own particular operational range and capabilities. Electricity storage technologies include pumped hydroelectric storage, compressed air energy storage (CAES), flow batteries, sodium sulfur batteries, lead-acid batteries, nickel-cadmium batteries, flywheels, electro-chemical capacitors, superconducting magnetic energy storage, and thermal storage.[97] With 38 operating plants, pumped storage is the "most popular large storage technology in the world with 19 gigawatts in the United States (2.7 percent of total generation).[98]

As reported by the American Physics Society (APS): "Storage technologies are at various states of commercial maturity, which can be broken down into four stages: [1] Commercial: At least 5 units installed, with more than 10 years of experience per plant, with demonstrable economic return on investment; [2] Pre-commercial: One or more plants installed as commercial ventures, but lacking either demonstrable benefit or sufficient cumulative time in service to be regard as commercial; [3] Demonstration: Some in-grid, in-field experience, but not commercial or pre-commercial as defined above; [4] Developmental: Laboratory units, sub-scale plants, or technologies used in non-utility applications."[99]

Table 6.2.3.5-1 (Summary of the Development Status of Key Electricity Storage Devices) provides a general survey of the status of various energy storage technologies in the United States. As noted, few of these technologies, except for pumped hydropower and flywheels, are at a point where they are able to make significant contributions in transmission and distribution of electricity.[100]

---

[93]/ University of Missouri-Rolla, Energy Storage, Overview of Energy Storage Technologies, undated, p. A-1 (http://www.ece.umr.edu/links/power/Energy_Course/energy/Renewables/DOE_Charac/append_overview.pdf).
[94]/ Hawkins, David, Wind Generation and Grid Operations: Experience and Perspective, California Independent System Operator, March 23, 2005.
[95]/ On the day of the State's peak demand (August 24, 2006), wind power produced at 254.6 MW at the time of peak demand, representing only 10.2 percent of wind's rated capacity of 2,500 MW. Over the preceding seven days (August 17-23, 2006), wind produced at 89.4 to 113.0 MW, averaging only 99.1 MW at the time of peak demand or just 4 percent of rated capacity (Source: Dixon, David, Wind Generation's Performance during the July 2006 California Heat Storm, Energy Central Network, August 8, 2006).
[96]/ American Solar Energy Society, Tackling Climate Change in the U.S., - Potential Carbon Emission Reductions from Energy Efficiency and Renewable Energy by 2030, January 2007, p. 4.
[97]/ Baxter, Richard, Energy Storage - A Nontechnical Guide, 2006, pp. 55-164.
[98]/ United States Department of Energy (Energetics, Incorporated), Technology Briefs – Overview of Advanced Electric Delivery Technologies, Office of Electric Transmission and Distribution, August 2004, p. 40.
[99]/ American Physics Society, APS Panel on Public Affairs, Challenges of Electricity Storage Technologies – A Report from the APS Panel on Public Affairs Committee on Energy and Environment, May 2007, pp. 9-10.
[100]/ Ibid., p. 10.

Of those electricity storage devices, those categorized as “pre-commercial prototypes,” “demonstration stage,” and/or “developmental” by the APS were rejected by the Applicant because effectuation is deemed to be infeasible since the technologies for those alternatives are not presently available. As such, an “Alternative Electricity Storage Technologies” alternative could not be reasonably effectuated by the Applicant.

One battery system that has shown potential promise for utility application is the vanadium redox flow batteries (VRBs). VRBs have been used in a number of demonstrations in small-scale utility-scale applications. The Electric Power Research Institute (EPRI), however, acknowledges that VRBs remain a developing and unproven large-scale technology undergoing limited and, as yet, incomplete demonstration. As indicated by the EPRI: “The technical performance of vanadium redox battery systems built to date has apparently shown their usefulness and reliability in a number of utility applications, including peak shaving, wind farm stabilization and leveling, and backup power. While the specifications for batteries will depend on the application and location, batteries generally are most useful to utilities when they have reasonably high power ratings (5 to 10 MW) for relatively long duration (8 hours or longer). While no vanadium redox batteries have been built at these power levels so far, the experience with systems such as that at Tomamae would seem to indicate that there are few technical obstacles to building batteries of this size.”[101]

Presently, VRBs are technologically and economically infeasible on a scale sufficient to provide energy storage capacity comparable to that of LEAPS. A potential “VRB” alternative was rejected by the Applicant because effectuation is deemed to be infeasible since the technology for that alternative is not presently available. As such, a “vanadium redox flow batteries” alternative could not be reasonably effectuated by the Applicant.

Besides pumped storage, only flywheel technology currently has the potential for commercial application. Flywheels store energy in a spinning disk on a metal shaft. Increases in the speed of rotation, the mass of the disk, and locating more of the mass closer to the rim of the disk will increase the amount of energy stored. Two generations of flywheels have produced increases in storage capacity through increased disk mass and increased rotation speeds; however, earlier generations of flywheels have technical limitations. New prototypes are utilizing magnetic levitation to increase speed and mass while minimizing previous technical issues. This technology is best utilized for applications requiring short discharge time (e.g., stabilizing voltage and frequency). A flywheel farm approach, where several devices are networked together, may be adaptable to large-scale energy management. Flywheels necessary for wider commercial energy storage applications are, however, primarily limited by materials properties and cost.[102]

---

[101]/ Electric Power Research Institute, Vanadium Redox Flow Batteries – An In-Depth Analysis, Technical Update, March 2007, p. 5-2.
[102]/ American Physics Society, APS Panel on Public Affairs, Challenges of Electricity Storage Technologies – A Report from the APS Panel on Public Affairs Committee on Energy and Environment, May 2007, p. 4)

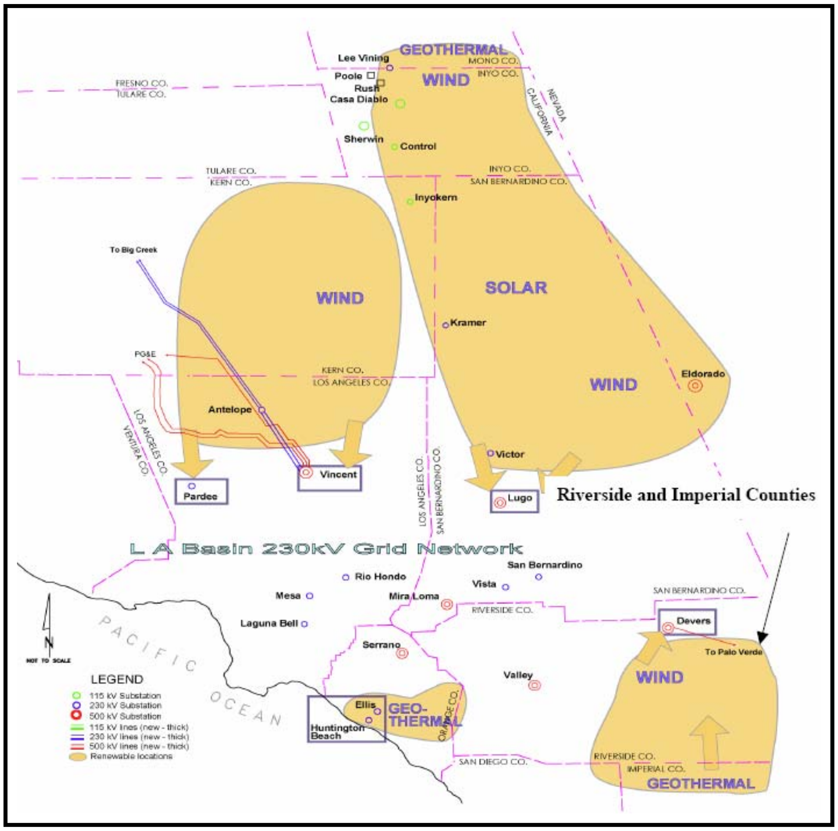


Figure 6.2.3.4-1. Southern California Renewable Energy Resources
Source: California Public Utilities Commission

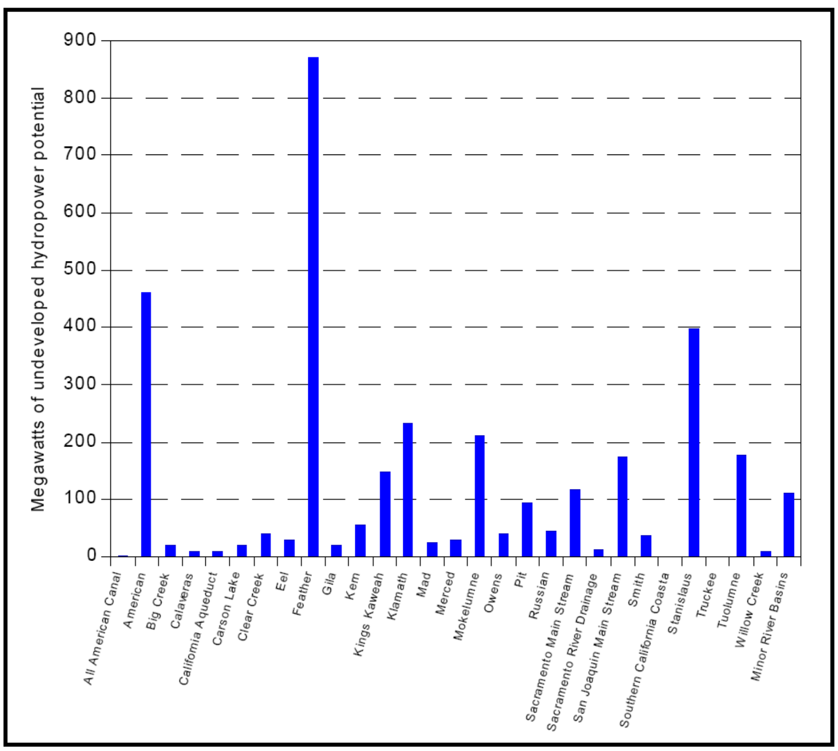


Figure 6.2.3.4-2. Megawatts of Undeveloped Hydropower Potential in the California River Basins
Source: United States Department of Energy

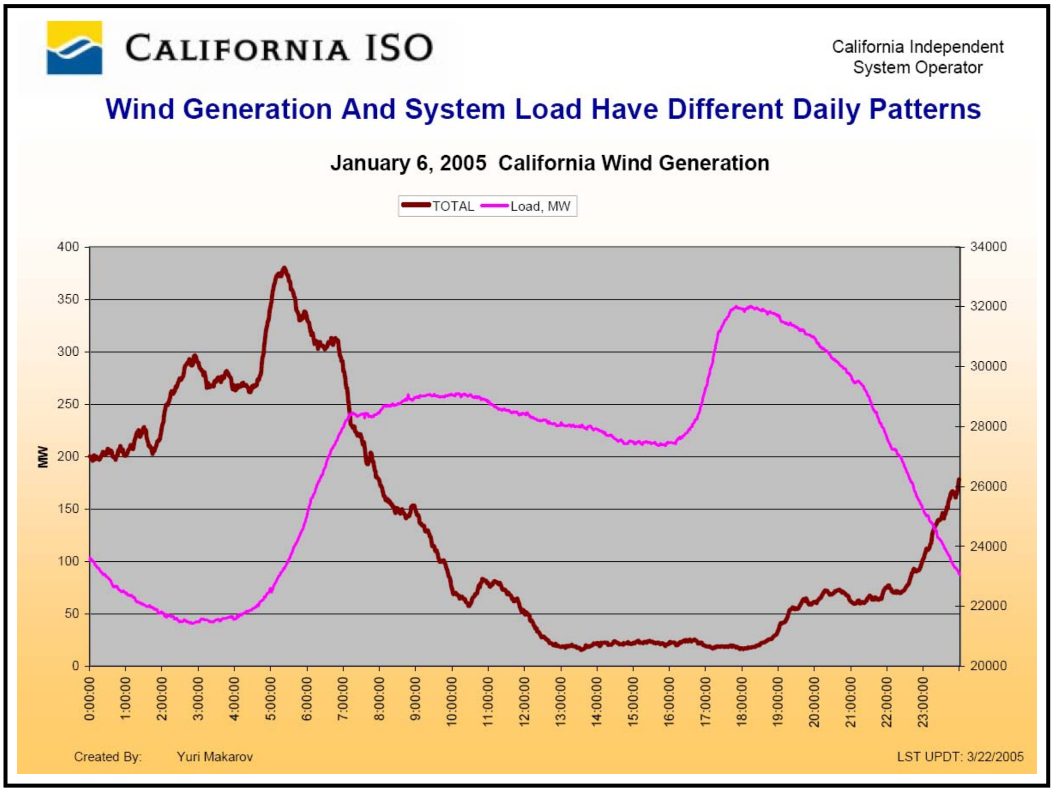


Figure 6.2.3.5-1. Wind Generation and System Load Have Different Daily Patterns
Source: California Independent System Operator

Table 6.2.3.5-1. Summary of the Development Status of Key Electricity Storage Devices

Commercial	Pre-Commercial Prototype	Demonstration Stage	Developmental
Pumped Hydro	CAES	Zinc-Bromine Battery	Lithium-Ion Battery for grid application
Flywheel for power quality applications at the consumer site	Lead-Acid Battery[1]	Flywheel (as grid device)	SMES (as grid device)
	Ni-Cad Battery[1]	Vanadium Redox Battery[2]	Electro-chemical capacitors
	Flywheel (as load device)	Electro-chemical capacitor	Other advanced batteries

Notes:
1. Commercial in utility emergency backup power applications.
2. Commercial in telecom applications < 15 kW.

Source: American Physics Society

As noted by the APS: "A conventional flywheel stores energy as the kinetic energy of a massive disk spinning on a metal shaft. The amount of energy stored depends upon the linear speed of rotation and the mass of the disk. First-generation flywheels, typically manufactured from steel, increased the mass while maintaining rim speeds on the order of 50 meters per second. The introduction of fiber-composite materials enables second-generation flywheels to reach speeds of 800-1000 m/s. These higher-speed machines are limited by the expansion of the rim, which can be as much as 1-2% at high speeds. The expanding rim separates from the rest of the flywheel. They also experience bending resonances and other dynamical instabilities. Third-generation flywheels, currently under development, combine high mass with high rotational speed to maximize overall energy storage. One system utilizes levitated ring design that resolves many of the design flaws in first- and second-generation flywheels. Using a ring as the rotator eliminates the expansion failure. In addition, the magnetic field can be adjusted to control the rotational instability failure. In addition, the magnetic fields can be adjusted to control the rotational instabilities that arise at high speeds. These systems currently exist as prototypes only. Short discharge time flywheels are suitable for stabilizing voltage and frequency, while longer duration flywheels may be suitable for damping load fluctuations. However, the high cost and limited capacity of first- and second-generation flywheels has greatly limited the implementation of this technology. A flywheel farm approach could be advantageous for larger-scale energy storage. Current technology could allow forty 25 kW flywheels to operate at 1 MW for 1 hour in one facility."[103]

Presently, flywheels are technologically and economically infeasible on a scale sufficient to provide energy storage capacity comparable to that of LEAPS. A potential "flywheel" alternative was rejected by the Applicant because effectuation is deemed to be infeasible since the technology for that alternative is not presently available. As such, a "flywheel" alternative could not be reasonably effectuated by the Applicant.

Since storage devices only store and do not generate energy, an "Alternative Electricity Storage Technologies" alternative cannot exist in isolation but must be integrally tied and physically linked to one or more energy production sites. Other than through decentralized small-scale application, such as might be used in combination with DG, no alternative centralized storage technologies have been identified which can replicate the storage capacity of LEAPS.

Lack of storage is a major impediment to the introduction of renewable energy from intermittent sources.[104] Electric-drive vehicles have the potential to make major contributions to the electric supply system, as storage or generation resources, or both.[105] Under a vehicle-to-grid power (V2G) or vehicle-based distributed generation application, electric-drive vehicles (i.e., battery, fuel cell, and hybrid) can be used to provide power for specific electric markets. It has been reported that "when just one-fourth of the U.S. light vehicle fleet has converted to electric drive, it would rival the electricity generation power capacity of the entire utility system."[106] It has been further reported that the "most important role for V2G may ultimately be in emerging

[103]/ Ibid., pp. 13-14.
[104]/ Kempton, Willett, Tomić Jasna, Letendre, Steven, Brooks, Alec, and Lipman, Timothy, Vehicle-to-Grid Power: Battery, Hybrid, and Fuel Cell Vehicles as Resources for Distributed Electric Power in California, California Air Resources Board and California Environmental Protection Agency, June 2001, p. 1.
[105]/ Kempton, Willett and Letendre, Steven E, Electric Vehicles as a New Power Source for Electric Utilities, Transportation Research 2(3), 1997, pp. 157-175.
[106]/ Kempton, Willett and Tomić, Vehicle-to-Grid Power Implementation: From Stabilizing the Grid to Supporting Large-Scale Renewable Energy, Journel Power Sources Volume 144, Issue 1, 1 June 2005, Pages 280-294.

power markets to support renewable energy. The two largest renewable sources likely to be widely used in the near future, photovoltaic and wind turbines, are both intermittent. At low levels of penetration, the intermittency of renewable energy can be handled by existing mechanisms for managing load and supply fluctuations. However, as renewable energy exceeds 10-30% of the power supply, additional resources are needed to match the fluctuating supply to the already fluctuating load. Intermittency can be managed either by backup or storage. 'Backup' refers to generators that can be turned on to provide power when the renewable source is insufficient. 'Storage' has the advantage of additionally being able to absorb excess power, but adds the constraint that giving back power is duration-limited (as is absorbing it). In terms of V2G, backup can be provided by the fueled vehicles (fuel cell and hybrid running motor-generator). Storage can be provided by the battery vehicle and the plug-in hybrid running V2G from its battery."[107]

Although V2G power is not yet in commercial application, electric-drive vehicles (EDVs) can serve as an alternative storage technology for off-peak power. As indicated by CEC, "plug in hybrid vehicles (PHEVs) may offer an opportunity to obtain the distribution system benefits of local energy storage without having to purchase the equipment solely for that purpose. . .When plugged in to the grid, PHEVs or other electric vehicles with sufficient energy storage capacities could be used as a source of back up power to a home during an outage. Alternatively, they could be used to supply power to the grid in times of peak loads at either the system or distribution level. These types of applications (referred to as 'Vehicle to Grid' or V2G), would be auxiliary benefits of the customer purchasing the vehicle for transportation."[108] The CEC, however, notes that "the requirements and potential distribution system benefits of PHEV usage in California are still years away and not yet a certainty."[109]

A potential "PHEV/EDV/V2G" alternative was rejected because effectuation is deemed to be infeasible by the Applicant since the technologies and distribution systems for that alternative is not presently available. If available, implementation would be subject to the actions of other parties and the Applicant has no reasonable ability to or expectations for the imposition of control or influence over the actions of those parties. As such, this alternative could not be reasonably effectuated by the Applicant.

6.2.3.6 "Generation-Interconnection" Alternative

With regards to the point of juncture, a number of options were identified by the Applicant, including: (1) a single point of connection via a new extra high-voltage transmission line extending northward from the Santa Rosa Substation (LEAPS Powerhouse) to the Lake Switchyard or an alternative new substation located along the SCE's 500-kV Valley-Serrano transmission line; (2) a single point of connection via a new extra high-voltage transmission line extending southward from the Santa Rosa Substation (LEAPS Powerhouse) to the Case Springs Substation or an alternative new substation located along the SDG&E's 230-kV Talega-Escondido transmission line; or (3) two points of connection, one extending northward to a new substation located along the SCE's Valley-Serrano transmission line and one extending southward to a new substation located along the SDG&E's Talega-Escondido transmission line.

107/ Ibid.
108/ California Energy Commission (Energy and Environmental Economics, Inc.), PEIR Final Project Report - Value of Distribution Automation Applications, CEC 500-2007-028, p. 96.
109/ Ibid.

The possible integration of the northern and the southern segments into a single, consolidated extra high-voltage transmission line (serving as a network upgrade and not solely as a LEAPS gen-tie) was initially identified in the Applicant's FERC-filed "Initial Stage Consultation Document" (Elsinore Valley Municipal Water District and The Nevada Hydro Company, April 2001). As indicated therein: "If constructed concurrently, the two high-voltage transmission lines would appear as a single, integrated 500 kV conduit linking SCE's Valley-Serrano line in Riverside County to SDG&E's Talega-Escondido line in San Diego County. The combined high-voltage transmission line could possibly serve as an alternative to and functional equivalent of SDG&E's Valley-Rainbow Interconnect Project."[110]

The combined northern and southern transmission line segments, identified herein as the TE/VS Interconnect, was initially suggested by the CPUC/BLM as part of its alternative analysis for the Valley-Rainbow Interconnect Project (CPUC Docket No. A.01-03-036). The TE/VS Interconnect, as described herein, can, therefore, be seen as the product of the CPUC's own creation, supported by the CPUC's own independent determinations of functionality, electrical equivalency, and need (as presented in the Valley-Rainbow proceedings).

The "San Diego Energy Infrastructure Study," as prepared by the San Diego Association of Governments (SANDAG), concluded: "Transmission capacity and import capability become important over the 2004-2010 time period. To avoid near-term imbalances the region needs 1 to 2 new generation plants, additional transmission, and increased energy efficiency. If these resources are not available, higher prices and load curtailments may occur. Unless the [San Diego] region pursues a strategy of diversifying its electric supply portfolio, including energy efficiency, demand response, distributed generation, renewables and additional transmission, the ability of the region to meet its needs in the longer-term will become increasingly difficult, particularly in the outer years."[111]

SANDAG has stated that, without a project like Valley-Rainbow, "the generation development in these areas may for all practical purposes be limited to about 1,000 to 1,400 MWs due to congestion constraints going north from SDG&E. An outage of the single connection to SONGS can leave SDG&E with a serious power shortage, such as that which occurred on February 27, 2002. If the Valley Rainbow interconnect project had been in operation at the time of this event, it would have prevented the need for firm load shedding of some 211,000 customers (approximately 300 MW) in SDG&E's service area."[112]

With regards to either a single northern (Lake-Santa Rosa) or single southern (Santa Rosa-Case Springs) point of juncture between LEAPS and the CAISO-controlled grid, as indicated by FERC: "SDGE needs additional in-area generation resources. Therefore, the southern route is the indicated choice. However, the maximum benefit to both the CAISO and SDGE would be derived from completing the total connection between the TE and VS transmission lines. The second connection would also add" other system-wide benefits, including reliability, reduced

[110]/ Elsinore Valley Municipal Water District and The Nevada Hydro Company, Inc., Initial Stage Consultation Document – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, April 2001, p. 66.
[111]/ County of San Diego, San Diego Regional Energy Office, City of San Diego, Utility Consumers Action Network, San Diego County Water Authority, San Diego Association of Governments, and Ports of San Diego (Science Applications International Corp.), San Diego Energy Infrastructure Study, December 30, 2002, p. 4-1.
[112]/ Ibid., p. 4-17.

congestion, and improved access.[113] Assuming the construction of both the northern (Lake-Santa Rosa) and the southern (Santa Rosa-Case Springs) line segments, the Project would provide substantial reliability benefits, as well as increase import capacity to the San Diego area and provide a path for the importation of renewable energy into the San Diego area.

As indicated in Table 6.2.3.7-1 ("Northern Generation-Interconnection" Alternative – Ability to Attain Stated Goals and Objectives), a "Northern Generation-Interconnection" alternative appears to allows for the attainment of one of the two of the Project's stated goals, appears to allow for the attainment of all five "pumped storage component" objectives, and appears to allow for the full or partial attainment of four of the seven "transmission component" objectives. However, by eliminating the southern line segment (Santa Rosa-Case Springs), the Project would not serve to provide a regional renewable resource benefit.

As indicated in Table 6.2.3.7-2 ("Southern Generation-Interconnection" Alternative – Ability to Attain Stated Goals and Objectives), a "Southern Generation-Interconnection" alternative would appear to allow for the attainment of one of the two of the Project's stated goals, appear to allow for the attainment or partial attainment of three of the five "pumped storage component" objectives, and appear to allow for the attainment or partial attainment of three of the seven "transmission component" objectives. However, by eliminating the northern line segment (Lake-Santa Rosa), the Project would not serve to provide a regional renewable resource benefit.

The Applicant's CPCN application is for a network upgrade, namely an electrical interconnect linking SCE's existing 500-kV Valley-Serrano transmission system and SDG&E's existing 230-kV Talega-Escondido transmission system. The CPCN applicant was not submitted for the purpose of authorizing a generation-interconnection for LEAPS with the existing network. The LEAPS gen-tie is a component of the FERC-licensed hydropower license and, for the purpose of that license, has been previously addressed in the FEIS. Although a single gen-tie to either the Valley-Serrano (SCE) or Talega-Escondido (SDG&E) transmission lines could potentially allow for the functional operation of LEAPS, the fundamental basis for the Applicant's CPCN filing would remain unfulfilled and no CPCN would be needed because the resulting single gen-tie project would be fully permitted by FERC. As a result, this alternative was rejected because it would eliminate CPUC's review, permitting, and environmental compliance functions.

CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action" which is the subject of the CEQA analysis (Big Rock Mesas Property Owners Association v. Board of Supervisors). Because the "Applicant's Proposed Project" includes the development of a interconnect (Lake-Case Springs) and associated network upgrades, a "Generation-Interconnection" alternative fails to accommodate that interconnection and has been rejected because it fails to satisfy CEQA requirements for a reasonable alternative. In addition, a "Generation-Interconnect" alternative would not likely be economically feasible.

6.2.3.7 "Alternative Hydropower Facility" Alternative

The Applicant has considered the following additional hydroelectric facility alternatives.

[113]/ Op. Cit., Final Environmental Impact Statement Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, p. B-21.

Table 6.2.3.7-1
"Northern Generation-Interconnection" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Attainment**. This alternative would allow for the development of a pumped storage project and allow for the creation of a gen-tie.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. Since no interconnection would be created, system benefits would likely only accrue to the Los Angeles metropolitan area.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Partial Attainment**. Associated network improvements would serve to reduce congestion and increase capacity.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	Non-attainment. This alternative does not create additional import capacity to the SDG&E system.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	Non-attainment. This alternative does not create additional import capacity to the SDG&E system.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non attainment. This alternative does not create a 500-kV interconnect between SCE and SDG&E transmission systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Partial attainment**. The Lake-Santa Rosa 500-kV transmission line could serve as a partial component of a larger regional facility.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements could serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Attainment**. This alternative provides the CAISO grid access to LEAPS.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Attainment**. Connection to SCE's existing transmission system would allow for the storage of wind energy from the Tehachapi region.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity and integrate renewable resources.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Attainment**. This alternative would allow for the provision of 500-MW of Black Start capability serving a portion of the CAISO grid.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Attainment**. This alternative would allow for the provision of voltage support for wind integration.

Source: The Nevada Hydro Company

Table 6.2.3.7-2
"Southern Generation-Interconnection" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Attainment**. This alternative would allow for the development of a pumped storage project and allow for the creation of a gen-tie.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. Since no interconnection would be created, system benefits would likely only accrue to the San Diego metropolitan area.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Partial Attainment**. Associated network improvements would serve to reduce congestion and increase capacity.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	Non-attainment. This alternative would not provide at least 1,000 MW of additional import capacity to the SDG&E system.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	Non-attainment. This alternative would not provide at least 1,000 MW of additional import capacity to the SDG&E system.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non attainment. This alternative does not create a 500-kV interconnect between SCE and SDG&E transmission systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Partial attainment**. The Case Springs-Santa Rosa 230-kV transmission line could serve as a partial component of a larger regional facility.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	Non-attainment. No distribution or transmission facilities or improvements would be developed in the Lake Elsinore area.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Attainment**. This alternative provides the CAISO grid access to LEAPS.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Partial attainment**. Under this alternative, excess off-peak power could be stored but the power would primarily be that associated with the SONGS facility and not renewable resources.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. This alternative would not allow for the integration of renewable energy resources.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Attainment**. This alternative would allow for the provision of 500-MW of Black Start capability serving a portion of the CAISO grid.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. This alternative would not appear to allow for the provision of voltage support for wind integration.

Source: The Nevada Hydro Company

- **"Small-Hydropower" Alternative**. "Small hydro" (<30 MW) is considered a renewable energy resource. FERC treats, as a single generating facility, the aggregated generation at a site for which an interconnection customer seeks a single point of interconnection. As such, if the total aggregated generation exceeds 20 MW, the combined project would not qualify as small-generator status. The Applicant would need to undertake multiple small-hydro projects to approach the generation capacity associated with the "Applicant's Proposed Project." Multiple small-generator projects would likely increase the impacts associated with a single, albeit, larger project.

  A small hydro project was considered and rejected as infeasible because there are not sufficient water resources in southern California to allow for the development of multiple small-scale hydropower projects. If opportunities could be located, multiple small-generator projects would not substantively reduce or result in the avoidance of the Project's environmental effects.

- **"Relicense, Retrofit, Upgrade Existing Hydroelectric Facilities" Alternative**. Retrofit of and upgrades to existing hydropower projects, including increasing the efficiency of turbines and generators and increasing the flow or head, could increase the capacity of those facilities. However, based on an analysis conducted by the Oak Ridge National Laboratory for the DOE, no existing hydropower facilities located in the southern California area were identified which were "likely to benefit from upgrades." Projects deemed to be "likely to benefit from upgrades" included those that were constructed prior to 1940 and those that were constructed between 1940 and 1970.[114]

  Only about five percent of the 67,000 existing dams in the United States have potential hydropower capacity and many of these dams are unsuitable for hydropower development because of size, isolation, and/or safety consideration. The Applicant has not identify any existing hydropower projects, located in the southern California area, that would be apparent candidates for potential relicensing, retrofitting, and/or upgrading that were not presently proposed for or presently undergoing relicensing. Even if one or more projects could be identified, substantive contractual constraints would exist which would need to be resolved allowing for the Applicant's joint participation. Because participatory contractual agreements with existing facility operators would logically be contrary to the economic interests of those operators, the Applicant concluded that this alternative was both speculative and infeasible.

- **"300/330-MW Advanced Pumped Storage" Alternative**. As indicated in the Elsinore Valley Municipal Water District's (EVMWD) 1994 preliminary permit (FERC Project No. 11504), a 300-MW FERC-licensed advanced pumped storage facility was previously proposed. As further indicated in the EVMWD's 2000 non-perfected preliminary permit application, an earlier pumped storage hydropower project proposed in the Elsinore Mountains was initially identified as comprising "three pump/turbines [which] would be of the vertical, reversible Francis type, rated to produce 110 to 167 MW at the minimum operating head."[115]

[114]/ Railsback, S.F., et al., Environmental Impacts of Increased Hydroelectric Development of Existing Dams, Publication No. 3585, United States Department of Energy, Oak Ridge National Laboratory, April 1991, pp. 2-3.
[115]/ Elsinore Valley Municipal Water District, Application for Preliminary Permit – Lake Elsinore Advanced Pumped Storage Project, September 15, 2000, p. 1-3.

On October 21, 2000, Voith Siemens Hydro, Inc. (VSH) completed an in-depth study of three alternatives plant sizes. The intent of those studies was to optimize the turbine generator selections, current utility rates, cost equipment utilization, and interconnect voltages. Of the options examined by VSH, a 500-MW facility was found to be the best selection for a 230/500-kV interconnection to the existing SDG&E and SCE system.

Construction of a 300/330-MW pumped storage facility would incorporate the same general features as associated with the "Applicant's Proposed Project," including a new upper reservoir, powerhouse, transmission lines, and substations. Other than the size and the efficiency of the reversible turbines, the construction-related and the operational impacts would be virtually identical to those associated with LEAPS, including the need for similar mitigation measures. The electrical and ancillary benefits of the "Applicant's Proposed Project" would, however, be reduced if the generation capacity were itself reduced, as would the Project's ability to both serve electricity needs of the San Diego area and facilitate the attainment of the State's RPS goals.

Because the development footprint would remain generally comparable to the "Applicant's Proposed Project," a 300/330-MW hydropower project would not reasonably be expected to substantively reduce or avoid any of the Project's potential environmental effects. Although the environmental impacts would be virtually identical, the corresponding energy system benefits of a reduced-output project would be reduced and would predicate the need for one or more additional projects to replace those forfeited benefits. Based on the VSH analysis, it is uncertain whether a reduced-output hydropower project would remain economically viable.

The Applicant has concluded that the further consideration of this option is not warranted since a "300/330 MW Advanced Pumped Storage" alternative would not satisfy CEQA's obligation to limit the range of alternatives to those both capable of reducing or avoiding the Project's significant environmental effects (14 CCR 15126.6[b] and [c]) and those which would foster informed decision making (14 CCR 15126.6[a] and [f]).

- **"1,000-MW Advanced Pumped Storage Hydropower" Alternative**. As now proposed, the "Applicant's Proposed Project" involves a single approximately 100-acre upper reservoir (Decker Canyon Reservoir) and two 250-MW Francis-type reversible turbines. Although no power flow studies have been performed, none of the studies conducted by or for the Applicant have demonstrated the lack of feasibility of constructing either a larger single reservoir or two upper reservoirs (e.g., Decker Canyon and Morrell Canyon) and installing either additional turbines or increasing the output of the turbines now proposed to be installed.

  The State CEQA Guidelines limits the investigation of reasonable alternatives to those that could feasibly accomplish most of the basic objectives of the project and avoid or substantially lessen one or more of the significant impacts (14 CCR 15126.6[b] and [c]). It can be reasonably concluded that, based on the larger development footprint which would be required for the upper reservoir, this alternative's impacts would be greater than those associated with the proposed 500-MW hydropower pumped storage facility.

Since the impacts of a larger hydropower project would not likely be less that those associated with the "Applicant's Proposed Project," the Applicant has eliminated this alternative not because of its inability to satisfy the Project's basic objectives but because it does not satisfy the impact-avoidance intent of CEQA.

- **"Other Hydropower" Alternatives**. A run-of-the-river (ROR) hydropower project alternative was eliminated because, in the general area, there does not exist a river or other water body of sufficient size or containing year-round flows conducive to the development of this type of hydroelectric facility.

  On December 21, 2007, the Director of the United States Department of the Interior, Minerals Management Service (MMS) signed the "Record of Decision" for the "Final Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternative Use of Facilities on the Outer Continental Shelf."[116] Technologies examined included wind turbines, wave energy (point absorbers, attenuators, overtopping devices, and terminators), and ocean currents (tidal energy).

  The MMS selected the preferred alternative, establishing an alternative energy and alternative use (AEAU) program for the issuance of leases, easements, and rights-of-way on the Outer Continental Shelf (OCS) for alternative energy activities and the alternative use of structures on the OCS. Selection of the preferred project also provided the MMS the option to authorize, on a case-by-case basis, individual AEAU projects that are in the national interest prior to the promulgation of the final rule.

  Each of the OCS alternatives identified by the MMS were considered but subsequently eliminated by the Applicant based on the limited application of those technologies, the absence of suitable lands or waters in the general area, the speculative nature of the Applicant's ability to obtain permits from the California Coastal Commission and the Federal Marine Fisheries Service, and the absence of current environmental information upon which an alternative analysis of those technologies could be reasonably based.[117]

6.2.3.8 "Alternative Generation" Alternative

The electric generating system must have sufficient operating generating capacity to supply the peak demand for electricity by consumers. An additional amount of reserve power plant capacity must be operational to act as instantaneous backup supplies should some power plants or transmission lines unexpectedly fail. According to the Western Systems Coordinating Council (WSCC), to reliably deliver power, control area operators should maintain operating reserves of seven percent of their peak demand. If operating reserves decline below that level, customers that have agreed to be interrupted in exchange for reduced rates may be disconnected. If operating reserves get as low a one and a half percent, firm load will likely be shed locally, resulting in rotating blackouts in order to avoid system-wide blackouts.

[116]/ United States Department of the Interior, Minerals Management Service, Final Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternative Use of Facilities on the Outer Continental Shelf, OCS EIS/EA MMS 2007-046, October 2007.

[117]/ The Minerals Management Service (MMS), a bureau of the United States Department of the Interior, has conducted initial scoping meetings in advance of the preparation of a "Outer Continental Shelf Renewable Energy and Alternative Use Programmatic Environmental Impact Statement." The programmatic EIS will evaluate the issues associated with renewable energy development in federal waters of the Outer Continental Shelf (OCS).

As opposed to baseload power plants that operate continuously, peaking power plants (peakers) generally only run when demand is high. Although natural gas turbine plants dominate the peaker plant category, other plant types, including pumped storage facilities, also are used to provide power on a peak-demand basis.

As indicated in the FEIS, FERC identified "a natural gas-fired simple cycle combustion turbine as the likely alternative to the LEAPS project because the LEAPS project would operate at a 35.6 percent plant factor and would be dispatched in a somewhat similar manner to meet peak demand."[118] Substantial documentation exists demonstrating that thermal power plants generate significant environmental impacts, including criteria pollutants and GHG emissions, and are difficult to site in southern California based on the non-attainment status of the South Coast Air Basin.

As indicated in Table 6.2.3.8-1 ("Alternative Generation" Alternative – Ability to Attain Stated Goals and Objectives), a natural gas-fired simple cycle combustion turbine, constructed in combination with the TE/VS Interconnect, does not appear to allow for the attainment of the Project's two stated goals and does not appear to allow for the attainment of any of the five "pumped storage component" objectives. With the inclusion of the TE/VS Interconnect, the "Alternative Generation" alternative appears to allow for the attainment of least six of the seven "transmission component" objectives.

In accordance with CEQA (14 CCR 15126.6[b] and [c]), the Applicant has rejected an "Alternative Generation" alternative because that alternative would not likely result in a substantially reduction of the Project's potential environmental effects.

In addition, although an "Alternative Generation" alternative would potentially allow for the partial attainment of the stated objectives, because the "Applicant's Proposed Project" includes both LEAPS and the TE/VS Interconnect, CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action." As a result, an "Alternative Generation" alternative was rejected by the Applicant because that alternative does not consider the Applicant's "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors).

6.2.3.9 "Design and Development Variation" Alternative

The results of detailed design and engineering studies were presented in the Applicant's "Final License Application"[119] (FLA). In addition to the alternative upper reservoir, powerhouse, transmission alignment, and substation alternatives identified therein, numerous design and development variations were identified for the Project's individual component parts. Those options included, but where not limited to: (1) dam and dike design alternatives (e.g., zoned earth-fill dam with a central impervious core or inclined upstream impervious zone, concrete-faced earth-fill dam, earth-fill dam with an asphaltic-concrete upstream face, and gravity dam constructed of roller compacted concrete), including variations in dam and dike configuration; (2) alternative reservoir liner systems (e.g., clay, asphaltic concrete, geo-membrane, and

---

118/ Op. Cit., Final Environmental Impact Statement for Hydropower License – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, FERC/EIS-0191F, p. 2-2.

119/ Elsinore Valley Municipal Water District and The Nevada Hydro Company, Inc., Final Application for License of Major Unconstructed Project, Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, November 2004.

combination liner systems); (3) alternative penstock alignments and configurations; and (4) transmission tower design alternatives (e.g., guyed, V-shaped structure, guyed, delta structure, four-legged, self-supporting structure, and H-Frame, tubular-steel structure) and alignment alternatives.

With regards to the proposed 500-kV transmission alignment, the ROW is primarily on federal lands located within the TRD. Because it exists primarily on a federal reservation, within the National Forest, Project-related facilities are subject to FERC licensing and a USDA Forest Service-issued SUP. As identified in the FEIS, FERC and the USDA Forest Service have identified a preferred alignment (identified in the FEIS as the "staff alternative"). As a result, on NFS lands, the Applicant has eliminated all substantially different 500-kV transmission alignments associated with the "Applicant's Proposed Project" and concluded that any such alternative transmission alignments would be speculative since, based on the findings of the FEIS, the entitlement of an alignment federal route would appear unlikely.

The USDA Forest Service has dictated the transmission alignment through the National Forest. As indicated, in pertinent part, in correspondence dated December 18, 2008: "The Forest [Service] can accept, subject to the 4(e) conditions in the [F]EIS, the location of the supporting towers and access roads for the TE/VS transmission line." Based on extensive discussions between the Applicant and the USDA Forest Service, it is the Applicant's belief that there exist no other alternative transmission alignments through the TRD which would be acceptable to the federal agency with jurisdiction thereupon.

With regards to the upper reservoir site, based on topographic considerations and the proximity of the San Mateo Canyon Wilderness, only two candidate reservoir sites where identified in the Elsinore Mountains (Decker Canyon and Morrell Canyon). Based on environmental consideration, the Decker Canyon Reservoir site was identified by FERC and by the USDA Forest Service as the preferred location for that facility. As such, based on requisite FERC-licensing and USDA Forest Service permitting requirements and stipulations, the Applicant has eliminated the alternative Morrell Canyon Reservoir site from further consideration, concluding that any alternative upper reservoir site would be speculative since, based on the findings of the FEIS, the entitlement of an alternative forebay within the TRD would appear unlikely.

In formulating a reasonable range of alternatives, except as otherwise described herein, the Applicant has not elected to examine other alternatives involving only relatively minor design variations to the Project's individual components.

6.2.3.10 "Concurrent vs. Sequential Construction" Alternative

The Project's schedule assumes that the transmission component would be constructed prior to the construction of the generation (pumped storage) component The sequential construction of Project facilities is the result of a number of factors including, but not limited to: (1) increased engineering complexity associated with the generation (pumped storage) facility as compared to the transmission facility; (2) the benefits to the regional transmission grid that early energization of the interconnection will provide the State and the region; (3) the ability of permitting agencies to bifurcate the Project's transmission and generation (pumped storage) components from a permitting perspective; and (4) the ability to entitle, finance, and physically construct the transmission component in advance of the generation (pumped storage) component.

Whether the transmission and generation (pumped storage) components of the Project area constructed concurrently or sequentially, the impacts of construction and development would be expected to be generally comparable. The Applicant has concluded that the further consideration of a "Concurrent vs. Sequential Construction" alternative would not satisfy CEQA's obligation to limit the range of alternatives to those both capable of reducing or avoiding the Project's significant environmental effects (14 CCR 15126.6[b] and [c]) and those which would foster informed decision making (14 CCR 15126.6[a] and [f]).

Although not presented as a distinct alternative herein, the Applicant retains, at the Applicant's sole discretion, the option and ability to construct the Project's transmission and generation (pumped storage) facilities either concurrently or sequentially, subject to receipt of appropriate permits and approvals.

6.2.4 Alternatives under Consideration

With the exception of the "No Project/No Build" alternative, except where otherwise noted, each of the following development (build) alternatives satisfies, in whole or in part, the stated goals and objectives of the "Applicant's Proposed Project."

6.2.4.1 Alternative No. 1 - "LEAPS Only"

The identification of LEAPS as an "alternative" herein is presented for informational purposes only. LEAPS is not specifically an alternative to the "Applicant's Proposed Project" but is one of the two principal components of the proposed action addressed herein. Similarly, to the extent that LEAPS is defined to include only a single northern (Lake-Santa Rosa) or single southern (Santa Rosa-Case Springs) point of juncture between LEAPS and the CAISO-controlled grid and to that extent that the resulting transmission facilities are defined as gen-tie and not network upgrades, this alternative would fail to meet the CEQA standard requiring reasonable alternatives to examine the "project as a whole" (Big Rock Mesas Property Owners Association v. Board of Supervisors). As defined herein, this alternative encompasses the "project as a whole."

Since the subsequent actions of FERC and any associated federal entitlements regarding the Project cannot be predetermined and remain subject to the discretionary actions of those federal agencies, from a CEQA perspective and with regards to the formulation of alternatives, the following possible FERC-licensed scenarios were identified. Since a number of variations to these scenarios may also exist, the following descriptions are not intended to limit or otherwise restrict the actions of any entitling governing agency and/or those of the Applicant.

Nothing herein is intended to limit, restrict, dictate, or presuppose the actions of any federal agency with regards to LEAPS and/or the TE/VS Interconnect. The following possible licensing scenarios are of the Applicant's own invention and have not been suggested or otherwise created, suggested, or inferred by FERC or by any other federal agency. These scenarios are presented herein for the sole purpose of CEQA compliance and informed decision making.

- **Short-tap generation-interconnection**. Under the first scenario, the TE/VS Interconnect and LEAPS are fully entitled by FERC and include both a new 500-MW generation (pumped storage) facility and a new FERC-licensed transmission facility allowing for not less than 1,000 MW of additional import capacity into the San Diego region. The Lake-Case Springs transmission line serves as a network upgrade between SCE's existing 500-kV Valley-Serrano transmission line and SDG&E's existing 230-kV Talega-Escondido transmission line and links those separate network to the LEAPS hydropower facility via a new short-tap gen-tie extending from the Santa Rosa Substation (LEAPS Powerhouse), via a new GIL, to the point of interconnection with the new FERC-licensed and USDA Forest Service-permitted Lake-Case Springs transmission line. Under this scenario, the new 500-kV Lake-Santa Rosa-Case Springs transmission line, including all associated improvements to SCE and SDG&E's systems, are network upgrades and the short-tap is a gen-tie.

- **Lake-Santa Rosa-Case Springs generation-interconnection**. Under the second scenario, the LEAPS facilities are constructed but the associated transmission facilities are sized to serve as "primary" lines (1,500-MW rating). Under this scenario, the major differences between this alternative and the "Applicant's Proposed Project" relates to FERC's licensing and transmission line designation. Differences, if any, concerning the sizing and capacity of the transmission interconnection and gen-tie (including minor design variations relative to conductors and insulators on the transmission towers), the placement and sizing of individual substation and switchyard components, and design variations within the proposed substations and switchyard would not be substantial.

  Under this scenario, the improved 230-kV Talega-Case Springs-Escondido transmission and associated improvements to SCE and SDG&E's systems are network upgrades but the new 500-kV Lake-Santa Rosa-Case Springs transmission line is a gen-tie.

Once SCE and SDG&E systems are interconnected, the resulting 500-kV Lake-Santa Rosa-Case Springs transmission line, the Lake Switchyard, the Santa Rosa and Case Springs Substations, and all associated network upgrades as may be required to fully accommodate the resulting electrical flows, functionally become network upgrades. As such, although described as a "LEAPS Only" alternative, this alternative is functionally similar to the Project and the physical differences, if any, relate more to agency permitting and entitlement structure that any substantive functional and/or environmental differences.

From an environmental impact perspective alone, any differences between these scenarios are not substantial because the physical changes to the existing environmental setting would generally be the same under either option. As a result, the impacts attributable to a "LEAPS only" alternative would not be expected to be substantially different from those associated with the "Applicant's Proposed Project." The potential environmental impacts of a "LEAPS Only" alternative are further described in Section 5.0 (Environmental Impact Assessment Summary).

As indicated in Table 6.2.4.1-1 (Alternative 1: "LEAPS Only" – Ability to Attain Stated Goals and Objectives), a "LEAPS Only" alternative allows for the attainment of the Project's two stated goals, all seven of the "transmission component" objectives, and all five of the "pumped storage component" objectives.

6.2.4.2 Alternative No. 2 - "TE/VS Interconnect Only"

The identification of TE/VS Interconnect as an "alternative" herein is presented for informational purposes only. The TE/VS Interconnect, defined as a network upgrade connecting SCE's existing 500-kV Valley-Serrano transmission line and SDG&E existing 230-kV Talega-Escondido transmission line, including all additional network upgrades as may be associated therewith, is not specifically an alternative to the "Applicant's Proposed Project" but is one of the two principal components of the proposed action addressed herein.

Since the subsequent actions of State and federal regulators cannot be predetermined and remain subject to the discretionary actions of those agencies with jurisdiction over the Project, from a CEQA perspective and with regards to the formulation of reasonable alternatives to the "Applicant's Proposed Project," the following possible scenarios were identified. Since a number of variations to these scenarios may also exist, the following descriptions are not intended to limit or otherwise restrict the actions of any entitling agency and/or those of the Applicant.

Nothing herein is intended to limit, restrict, dictate, or presuppose the actions of any federal agency with regards to LEAPS and/or the TE/VS Interconnect. The following possible licensing scenarios are of the Applicant's own invention and have not been suggested or otherwise created, suggested, or inferred by FERC or by any other federal agency. These scenarios are presented herein for the sole purpose of CEQA compliance and informed decision making.

- **No FERC/USDA Forest Service Entitlements**. Under this scenario, the Project's 500-MW "pumped storage component" is not licensed by FERC and/or permitted by the USDA Forest Service and is, therefore, not constructed. This scenario could also materialize should the State Water Resources Control Board (SWRCB) fail to grant the Applicant a Section 401 water quality certification or should any other agency from whom discretionary permits or approvals may be required absent a Federal Power Act (FPA) preemption fail to grant or convey to the Applicant those requisite entitlements.

- **Federal Entitlements/No Construction**. Under this scenario, notwithstanding the Applicant's receipt of a federal hydropower license and the requisite SUPs from the USDA Forest Service, the 500-MW "pumped storage component" is not constructed based on the Applicant's inability to secure necessary financing or as a result of other factors, including those both within and outside the Applicant's control, preventing the construction and operation of the "pumped storage component." This scenario could also materialize should the State Water Resources Control Board (SWRCB) fail to grant the Applicant a Section 401 water quality certification.

- **Federal Permits/Permit Expiration**. Under this scenario, all requisite federal licenses and permits are issued but those entitlements expire based on the Applicant's inactivity or inability to proceed with the timely construction of the federal hydropower facilities.

Although LEAPS (including the proposed LEAPS Powerhouse, Santa Rosa Substation, Decker Canyon Reservoir, associated penstocks, electrical and water conduits, intake/outlet structures, and such other related improvements and facilities as may be associated therewith) and the 115-kV subtransmission improvements and upgrades (including the Skylark and Elsinore Substations) are not construction under this alternative, under each of the above scenarios, the following facilities are constructed and energized: (1) the new Lake-Case Springs transmission lines, including all associated substations, switchyard, and appurtenant facilities; (2) network upgrades to SCE's existing 500-kV Valley-Serrano system, including all appurtenant facilities; (3) network upgrades to SDG&E's existing 230 kV Talega-Escondido system, including all appurtenant facilities; (4) other associated subtransmission and distribution system improvements, including the rebuilding of SDG&E's 69-kV Pala-Lilac line.

With regards to those transmission lines and associated improvements and upgrades, two possible design variations were considered under this alternative:

- **TE/VS Interconnect precursor to LEAPS**. Assuming that TE/VS Interconnect is a precursor to LEAPS, the transmission lines and related facilities are sized to accommodate both the power flows associated with the SCE/SDG&E interconnection and the additional electricity required for the 600 MW of pumping and the 500 MW of generation (pumped storage) associated with the hydropower component (not less than 1,000-MW path rating).

- **TE/VS Interconnect not a precursor to LEAPS**. Assuming that TE/VS Interconnect is not a precursor to LEAPS or can be constructed in such a fashion as to phase the installation of such additional improvements as may be required to accommodate the additional power flows associated with the hydropower facility, the transmission lines and related facilities would only be initially sized to accommodate the power flows attributable to the TE/VS Interconnect and not the additional capacity required for the pumping and generation (pumped storage) associated with the pumped storage facility (not less than 1,000-MW rating).

Differences, if any, between these variations relate to the rating of the transmission lines, including any resulting design variations relative to conductors and insulators on the transmission towers and design variations within the Lake Switchyard and Case Springs Substation would not be substantial.

If the construction of the transmission lines were to be phased, such as to include two distinct construction phases, construction impacts would occur at two distinct occasions rather than just once. Although they would occur over a longer duration, the impacts that would likely manifest during the second construction sequence would not be expected to exceed those likely to exist during the initial construction phase. From an impact perspective, two construction phases would extend the overall construction time but may not substantively increase the significance of the impacts predicted to occur during term of those construction activities.

Because CEQA is to "be interpreted in such a manner as to afford the fullest possible protection to the environment" (14 CCR 15003[f]), for the purpose of CEQA analysis, it should be assumed that the transmission lines, substations, and related facilities are designed, sized, constructed, improved, and upgraded to accommodate both interconnection and generation (pumped storage) functions.

As indicated in Table 6.2.4.2-1 (Alternative 2: "TE/VS Interconnect Only" – Ability to Attain Stated Goals and Objectives), a "TE/VS Interconnect Only" alternative does not appear to allow for the attainment of the Project's two stated goals and all five of the "pumped storage component" objectives. This alternative would, however, allow for the attainment of all seven of the "transmission component" objectives.

The potential environmental impacts of this "TE/VS Interconnect only" alternative are as outlined in Section 5.0 (Environmental Impact Assessment Summary) and Section 6.0 (Detailed Discussion of Environmental Impacts) herein.

Although included for informational purposes herein, it is noted that CEQA does not obligate the Applicant or the Lead Agency to evaluate alternatives to only a portion of the "whole of the action" which is the subject of the CEQA analysis. Because the Project includes both a "transmission component" and a "pumped storage component," a "TE/VS Interconnect Only" alternative would fail to satisfy CEQA requirements for a reasonable alternative.

6.2.4.3 "Alternative Facility Siting" Alternative

For consistency, except where otherwise modified and with minor modifications to the proposed transmission alignment resulting from further guidance provided by the USDA Forest Service, the "Applicant's Proposed Project," as identified and described in this PEA, constitutes the "staff alternative" as described in the FEIS. For a number of facility components, however, one or more locational variations have been identified whereby a specific Project-related facility might be constructed in a different location. None of the retained variations, however, result in a change in the functional and engineering characteristics of the "Applicant's Proposed Project." Because an "Alternative Facility Siting" alternative would allow for the development of both the "transmission component" and the "pumped storage component," the Big Rock decision would be inapposite with respect to that alternative because it would allow for a comparative analysis of the "project as a whole."

As indicated in Table 6.2.4.3-1 ("Alternative Facility Siting" Alternative – Ability to Attain Stated Goals and Objectives), each of the siting alternatives identified herein (i.e., Alternative No. 3 – Alternative Powerhouse and Substation Site, Alternative No. 4 – Alternative Upper Reservoir Site, Alternative No. 5 – Alternative Lake Switchyard Site, and Alternative No. 6 – Alternative Case Springs Substation Site) relate only to locational considerations regarding individual facilities.

Since each siting alternative allows for the development of the entirely of the "Applicant's Proposed Project," an "Alternative Facility Siting" alternative would allow for the attainment of the Project's two stated goals, as well as all seven of the "transmission component" objectives and all five of the "pumped storage component" objectives.

The following "Alternative Facility Siting" variations constitute development options that the Applicant seeks to retain in the upcoming CEQA documentation and constitute possible alternatives to the location and placement of certain facilities described in Section 3.0 (Project Description).

- **Alternative No. 3 - "Alternative Powerhouse and Substation Site."** This alternative is proposed because it represents one of only two possible locations where the proposed LEAPS Powerhouse could be feasibly constructed. As indicated in the Applicant's FLA and as described in the FEIS, three possible LEAPS Powerhouse sites were initially identified by the Applicant. The names used for the purpose of identifying these powerhouse sites (Ortega Oaks, Santa Rosa, and Evergreen) related to proximal streets or other local landmarks which define their location.

Table 6.2.3.8-1
"Alternative Generation" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non attainment. This alternative does not facilitate the development of a pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non attainment. This alternative does not facilitate the development of a pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Under this alternative, new 500-kV transmission lines would interconnect SDG&E and SCE systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. This alternative would implement this objective.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements could serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non attainment. This alternative would not provide additional regulation, fast responding spin, or load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

Table 6.2.4.1-1
Alternative 1: "LEAPS Only" - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Attainment**. This alternative includes the development of the LEAPS facility and those associated network upgrades and gen-ties required for its operation.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Attainment**. This alternative includes the development of the LEAPS facility and those associated network upgrades and gen-ties required for its operation.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Under this alternative, new 500-kV transmission lines would interconnect SDG&E and SCE systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. This alternative would implement this objective.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements would serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Attainment**. This alternative process the CAISO grid access to LEAPS.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Attainment**. Connection to SCE's existing transmission system would allow for the storage of wind energy from the Tehachapi region.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity and integrate renewable resources.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Attainment**. This alternative would allow for the provision of 500-MW of Black Start capability serving a portion of the CAISO grid.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Attainment**. This alternative would allow for the provision of voltage support for wind integration.

Source: The Nevada Hydro Company

Table 6.2.4.2-1
Alternative 2: "TE/VS Interconnect" - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. This alternative would not include the development of the pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. This alternative would not include the development of the pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Under this alternative, new 500-kV transmission lines would interconnect SDG&E and SCE systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. This alternative would implement this objective.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements would serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Attainment**. This alternative process the CAISO grid access to LEAPS.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non attainment. This alternative would not provide additional regulation, fast responding spin, or load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

Table 6.2.4.3-1
"Alternative Facility Siting" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	**Attainment**. This alternative includes the development of the LEAPS facility and those associated network upgrades and gen-ties required for its operation.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	**Attainment**. This alternative includes the development of the LEAPS facility and those associated network upgrades and gen-ties required for its operation.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Attainment**. Under this alternative, additional high-voltage transmission capacity would be created.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Attainment**. Under this alternative, additional important transmission import capacity would be created.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	**Attainment**. Under this alternative, new 500-kV transmission lines would interconnect SDG&E and SCE systems.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	**Attainment**. This alternative would implement this objective.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	**Attainment**. Additional distribution and transmission improvements would serve to fortify localized systems and enhance reliability.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	**Attainment**. This alternative process the CAISO grid access to LEAPS.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	**Attainment**. Connection to SCE's existing transmission system would allow for the storage of wind energy from the Tehachapi region.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity and integrate renewable resources.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	**Attainment**. This alternative would allow for the provision of regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	**Attainment**. This alternative would allow for the provision of 500-MW of Black Start capability serving a portion of the CAISO grid.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	**Attainment**. This alternative would allow for the provision of voltage support for wind integration.

Source: The Nevada Hydro Company

The "Santa Rosa" powerhouse site (identified herein as the LEAPS Powerhouse) was identified in the FLA as the Applicant's "preferred" powerhouse site based, in part, on its relationship to the Applicant's "preferred" Morrell Canyon Reservoir site. Although the alternative "Ortega Oaks" powerhouse site was better aligned with the proposed Decker Canyon Reservoir site, the FEIS identified the "Santa Rosa" powerhouse and the Decker Canyon Reservoir sites as FERC's and the USDA Forest Service's "staff alterative."

Of the two alternative powerhouse sites, only the "Ortega Oaks" site has been retained by the Applicant as a possible siting alternative herein. Because the distance between the Decker Canyon Reservoir site and the previously identified "Evergreen" powerhouse site would substantially increase tunneling and associated construction costs, the Applicant has elected not to retain the previously identified "Evergreen" powerhouse site under this "Alternative Facility Siting" alternative. The decision not to carry forward the discussion and analysis of the "Evergreen" site from the FEIS is the result of a preliminary economic analysis conducted by the Applicant and is not itself indicative of the presence of additional unmitigable environmental or other constraints that would preclude the possible development of that property should it be subsequently included by the Applicant or the Lead Agency in the CEQA analysis.

As depicted in Figure 6.2.4.3-1 (Alternative Ortega Oaks Powerhouse and Substation Site), the alternative powerhouse and substation site abuts SR-74 (Ortega Highway) and is primarily undeveloped. If constructed on the "Ortega Oaks" site, the powerhouse would be located about 340 feet underground (at an elevation of about 1050 feet above msl) and about 1,950 feet from the edge of Lake Elsinore. With the exception of their location, the alternative "Ortega Oaks" powerhouse and substation designs would generally be as described for the LEAPS Powerhouse and Santa Rosa Substation.

The southern portion of the "Ortega Oaks" property has historically been used by the Elsinore Hang Gliding Association (EHGA), operating under a SUP issued by the USDA Forest Service,[120] as a landing zone for flights emanating from within the "Edwards" and "E" launch sites (located in the vicinity of the proposed Decker Canyon Reservoir).[121]

Although the Applicant has no first-hand knowledge, it has been reported that, in October 2008, the Riverside County Superior Court ruled that the EHGA had violated the terms of a 2000 agreement signed by the association and CKS Concordia Development and, by so doing, voided the agreement between the two parties regarding the EHGA's continuing use of that property. That action paves the way for the property owner to develop the property,[122] in accordance with the approved tract map (Tract Map 22626).

Single-family residential uses and a Riverside County flood control facility abut the "Ortega Oaks" property to the east. Existing commercial uses, including Ortega Oaks Market (15887 Grand Avenue, Lake Elsinore) and Ortega Oaks Plaza (15887 Grand

[120]/ Authorization ID: TRD05805; Contact ID: TRD0303.

[121]/ It is the Applicant's understanding that the EHGA's use of the "Ortega Oaks" powerhouse site is the subject of two on-going lawsuits before the Riverside County Superior Court (Elsinore Hang Gliding Association v. Western International Development, LLC, Kang Shen Chen, CKS Concordia Development, L.L.C. [Case RIC411343] and Western International Development, LLC, Kang Shen Chen, CKS Concordia Development, L.L.C. v. Elsinore Hang Gliding Association [Case RIC455494]). The current status of that litigation is unknown.

[122]/ Claverie, Aaron, Lake Elsinore: Hang Gliders Lose Court Battle, The Californian, October 24, 2008.

Avenue, Lake Elsinore), abuts the property to the south. Rural residential uses and a religious facility (Mountainside Ministries [30515 Ortega Highway, Lake Elsinore]) are located to the south of Ortega Highway. North of Grand Avenue, single-family uses and vacant buildings comprising the site of the former Elsinore Country Club and Elsinore Naval Academy (15900 Grand Avenue, Lake Elsinore) are located adjacent to the area of the alternative inlet/outlet structure. The alternative powerhouse and substation sites and the alternative tailrace structure are located in the unincorporated Lakeland Village area of Riverside County. The alternative inlet/outlet structure extends into Lake Elsinore, located within the City of Lake Elsinore.

Elevations range from a maximum of 1480-feet above msl at the extreme southerly point of the site to a minimum of approximately 1340-feet above msl along the northerly site boundary. Topographically, the alternative powerhouse and substation site comprises a portion of a relatively broad alluvial fan that is transected by small erosion gullies. Drainage is to the north, towards Lake Elsinore. On-site vegetation comprises a mix of Riversidian sage scrub and non-native grasses. Some of the more readily identifiable trees and plants included a single live oak, numerous olive and pepper trees, buckwheat, chamise, white sage, sumac, wild tobacco, coyote gourd, and foxtails.

The alternative “Ortega Oaks” powerhouse and substation site is privately owned and, although located within the Congressional boundaries of the CNF, is not administered by the USDA Forest Service. The powerhouse site is about 60 acre in size and is bordered on the north and east by the City of Lake Elsinore. On April 20, 2004, the Riverside County Board of Supervisors approved final Tract Map Nos. 22626 and 22626-1 (Board of Supervisors Agenda Item Nos. 2.15 and 2.16), subdividing the proposed “Ortega Oaks” powerhouse site into approximately 133 single-family residential lots. In the event that residential development were to occur on that site, it is likely that powerhouse development of that property would be deemed to be infeasible.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the “Applicant’s Proposed Project.”

◊ **Aesthetics**. The visual resource impacts of this alternative would be generally comparable to those associated with the LEAPS Powerhouse and Santa Rosa Substation site. Because the “Ortega Oaks” site has greater visibility and abuts Ortega Highway, construction-term impacts would likely be more pronounced. Once operation, the greater visibility of the site would result in beneficial aesthetic impacts based on the limited nature of above ground improvements, the proposed powerhouse and substation landscaping, and the incorporation of a publicly accessible neighborhood park abutting that Ortega Highway.

◊ **Agricultural Resources**. Since neither the “Ortega Oaks” nor the “Santa Rosa” sites are presently used for any agricultural or farm-related use, the impacts on agricultural resources would be generally comparable.

◊ **Air Quality**. The quantity of construction-term and operational criteria and GHG emissions would not be expected to differ substantially between the two alternative powerhouse sites. However, because the "Ortega Oaks" site is located in closer proximity to a larger number of residential receptors, construction-related air quality impacts on those residences, both in terms of fugitive dust and toxic air contaminants, would be expected to be greater.

◊ **Biological Resources**. Although possessing remnants of Riversidean sage scrub (RSS), the "Ortega Oaks" site has been predominately cleared of most native vegetation and is routinely maintained for weed abatement purposes. Conversely, the "Santa Rosa" site is generally undisturbed, containing a predominant RSS scrub plant community. As a result, selection of the "Ortega Oaks" site would result in an incremental reduction in the acreage of disturbance to that plant community. RSS is not, however, categorized as a plant community that is "known or believed to be of high priority for inventory" in the California Natural Diversity Database (CNDDB)[123] and this habitat type is not categorized as a "rare natural community."[124]

◊ **Cultural Resources**. Three archaeological sites have been identified near the "Santa Rosa" site, including one prehistoric site (RIV-5878[125]) and two historic sites (RIV-5877H[126] and RIV-7658H[127]). Reconnaissance surveys of the "Ortega Oaks" site have been negative and no prehistoric or historic resources have been encountered on that property. Ground-borne vibration from construction could, however, potentially affect a number of historic-period buildings (33-7177 and 33-7221) located in close proximity to the "Santa Rosa" property.

◊ **Geology and Soils**.[128] Both the "Santa Rosa" and "Ortega Oaks" sites are feasible from a geotechnical perspective. Based on the geophysical survey results and geologic mapping, competent bedrock will be encountered at the required depths at both sites. The depth to bedrock at the "Ortega Oaks" site is estimated to range from 110-160 feet below ground surface. Depth to bedrock at the "Santa Rosa" is estimated to range form 70-145 feet below ground surface.

For the "Ortega Oaks" site, construction access to the powerhouse may require significant excavation in the overburden soils. At the "Ortega Oaks" site, a shaft-type of powerhouse may be the most feasible method of construction since the

---

123/ California Department of Fish and Game, The Vegetation Classification and Mapping Program List of California Terrestrial Natural Communities Recognized by The California Natural Diversity Database, September 2003 Edition.

124/ California Department of Fish and Game, Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities, December 9, 1984, Revised May 8, 2000.

125/ RIV-5878 comprises a bedrock milling station situated adjacent to a small building pad located midway along the eastern margin of the site. The building pad comprises the only vestiges of a dwelling that was demolished in the mid 1960's in connection with the Cox Mine eviction. The single, elongated granitic boulder bears one milling slick and one starter mortar. No obvious signs of a subsurface deposit were observed at this location.

126/ RIV-5877H consists of the ruins of a dwelling, most likely that of a cabin or small house located adjacent to a dirt road approximately 700 feet northwest of RIV-5878. The only visible remains of the structure itself comprise a small concrete cellar. It is rectangular in plan and measures 8 feet by 11 feet with a depth of approximately 6 feet. A four-step staircase leads into the cellar from the northern elevation. The age of the ruin is unknown although it may have been contemporaneous with the dwelling demolished in conjunction with the Cox Mine eviction. The location of the ruin is illustrated on the 1942 Lake Elsinore 15-Minute United States Army War Department map (Corps of Engineers, U. S. Army Grid Zone G).

127/ RIV-7658H is described as consisting of the wall and foundation remnants of a historic and semi-subterranean building located along an ephemeral drainage on the north-facing slope north of the Elsinore Mountains and south of Lake Elsinore.

128/ A comparative analysis of the two powerhouse sites is included in "Comparative Review of Geotechnical Conditions at Three Candidate Powerhouse Sites: Ortega Oaks, Santa Rosa and Evergreen, Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858" (GENTERRA Consultants, Inc., March 24, 2006).

overburden soils will require a shoring system, which could be incorporated into the permanent support system for the shaft. For the "Santa Rosa" site, an underground cavern-type of powerhouse is being considered because of the proximity of bedrock to the ground surface.

◊ **Hazards and Hazardous Materials**. The quantity of hazardous materials that may be on the sites during construction would be minimal and, with the possible exception of explosive material, would not be expended to differ substantially between the two properties. Based on preliminary geotechnical information, grading activities at the "Santa Rosa" site may require a greater quantity of blasting for the excavation of the powerhouse. Potential hazards would nonetheless be incrementally less at the "Santa Rosa" site based on the smaller number of near-site receptors and the greater separate distances between the powerhouse and existing residences.

Once operation, the same quantity of hazardous materials would be expected on the two sites. The potential for exposure to those materials by any off-site sensitive receptors located near either property would, however, be minimal.

Development plans for the "Ortega Oaks" property include provisions of the incorporation of a hang glider landing area either at the upslope or downslope portion of the site. Because hang gliding is an identified hazardous recreational activity, subject to the skill level of the pilot and changing meteorological conditions, a number of additional safety hazards would be associated with the "Ortega Oaks" site.

◊ **Hydrology and Water Quality**. Since the quantity of impervious surfaces would generally be similar and since compliance with applicable water quality permits constitutes a pre-existing obligation, no appreciable difference in hydrologic or water quality impacts would result from the selection between the proposed "Santa Rosa" and the alternative "Ortega Oaks" sites.

◊ **Land Use and Planning**. Only limited residential development currently exists in close proximity to the "Santa Rosa" site. In comparison, residential uses directly abut the "Ortega Oaks" site to the east of the site and to the west of Ortega Highway. Mountainside Ministries (30515 Ortega Highway, Lake Elsinore) is located to the north of Ortega Highway. In addition, while the "Santa Rosa" site is not presently subject to any authorized land use, the "Ortega Oaks" site has historically been used as a landing zone for hang gliders launching from within the CNF.

◊ **Mineral Resources**. Neither site contains known recoverable mineral resources.

◊ **Noise**. The "Ortega Oaks" property is located in close proximity to single-family residences and a religious use. The "Santa Rosa" site is located in close proximity to multi-family residential uses and an existing school facility. Construction on either the "Ortega Oaks" or "Santa Rosa" sites would, therefore, expose near-site sensitive receptors to short-term increases in ambient noise levels above levels existing without the construction of the "Applicant's Proposed Project." Construction activities conducted on either property would be in conformance with the noise ordinances of the applicable jurisdiction.

◊ **Population and Housing**. Should the "Santa Rosa" powerhouse site be selected, the Applicant has indicated an intent to pursue the purchase of the 12-unit Santa Rosa Mountain Villas (33071-33091 Santa Rosa, Lake Elsinore) and use those vacated units for construction-related purposes, including temporary housing for employees. Additionally, at least one single-family residence (including associated out-buildings) would be acquired and demolished for the construction of the tailrace and inlet/outlet structure. If required under applicable laws, the Applicant would provide relocation assistance to any displaced residents.

Should the "Ortega Oaks" site be selected, presently no residential units have been identified for purchase by the Applicant. As a result, the impacts on population and housing would be incrementally less under an "Ortega Oaks" alternative. Based on the size of the regional housing inventory, the incremental differences between the two sites would not be significant.

It is noted that on April 20, 2004, the Riverside County Board of Supervisors approved Tract Map Nos. 22626 and 22626-1 (Board of Supervisors Agenda Item Nos. 2.15 and 2.16), creating 133 single-family residential lots. Should the "Ortega Oaks" property be subsequently developed for single-family residential use prior to the commencement of construction operations, the impact of the demolition of those new homes and the displacement of any occupying households would likely be deemed significant.

◊ **Public Services**. The two alternative sites would have a generally comparable impact upon police, fire protection, and vector control services.

◊ **Recreation**. The EHGA and others have asserted a right to utilize the "Ortega Oaks" site, or a portion thereof, as a landing site for recreational hang gliding originating from within the CNF. The status of pending litigation between the EHGA and the underlying property owner is not known. Although the Applicant has indicated an intent to develop a hang glider landing site upon the "Ortega Oaks" site should that site be selected by FERC, the temporary use of that property for any recreational purposes would need to be suspended during the facility's construction. As a result, under the "Ortega Oaks" alternative, there would be a short-term and less-than-significant impact upon recreation.

As proposed and in accordance with enabling legislation, new recreational facilities will be provided by the Applicant under FERC's federal hydropower license. Different but reasonably comparable facilities would be provided at either the "Santa Rosa" or "Ortega Oaks" site. Additionally, independent of the site selected, construction of the intake/outlet structure from the powerhouse into Lake Elsinore would result in the closure of a portion of Lake Elsinore to recreational use. The impacts on lake-related recreation from either site would be similar and, because of the limited area involved, would be less than significant.

◊ **Transportation and Traffic**. Because the "Ortega Oaks" site abuts Ortega Highway and since vehicular access to that site would be limited to the use of that roadway, including direct ingress and egress, construction-related traffic would impose a greater impact on traffic along that State highway.

Prior to the commencement of construction operations, the Applicant would prepare a traffic management plan (TMP) consistent with Caltrans' "Manual of Traffic Controls for Construction and Maintenance Work Zones." Flag persons would be positioned to facilitate ingress to and egress from the site by construction vehicles, result in short-term disruptions to traffic flow. As documented in Caltrans' "State Route 74 Safety Improvement Project from San Juan Canyon Bridge to Orange/Riverside County Line,"[129] implementation of a TMP can effectively reduce construction impacts to a less than significant level.

Construction activities conducted on the "Santa Rosa" site would place construction traffic in close proximity to Butterfield Elementary Visual and Performing Arts Magnet School and the Ortega Trails Youth Center (16275 Grand Avenue, Lake Elsinore). Grand Avenue is the primary travel path used by children going to and coming from the elementary school and by adult caregivers dropping off and picking up children from those sites. In proximity to the school site and youth center, construction traffic would be expected to be heavier at the "Santa Rosa" site since all construction traffic would have to utilize Grand Avenue in order to access that site. Heavy trucks entering and exiting the site may cross the path of children going to or coming from school. No sidewalks now exist along Grand Avenue along the "Santa Rosa" site's frontage. In order to address potential safety hazards, a traffic management plan would be developed in consultation with the Lake Elsinore Unified School District.

◊ **Utilities and Service Systems**. The two alternative sites would have a generally comparable impact upon potable and non-potable water services and supplies.

◊ **Energy Resources**. The two alternative powerhouse sites would have a generally comparable impact upon energy resources.

▪ **Alternative No. 4 - "Alternative Upper Reservoir Site."**[130] This alternative is proposed because it represents one of only two possible locations where the proposed upper reservoir could be feasibly constructed.

[129]/ California Department of Transportation, Negative Declaration/Finding of No Significant Impact, State Route 74 Safety Improvement Project from San Juan Canyon Bridge to Orange/Riverside County Line, Orange County, California, October 13, 2005.

[130]/ Morrell Canyon was identified by the Applicant as the preferred upper reservoir site in the FLA. Additional information concerning Morrell Canyon, its existing environmental setting, and the potential impacts associated with the development and operation of a new reservoir at that location can be found in the FLA and FEIS, both of which are incorporated by reference herein.

The alternative Morrell Canyon Reservoir site[131] is bounded by the San Mateo Canyon Wilderness Area to the south, South Main Divide Truck Trail (Forest Route 6S07) to the north, and Morgan Trail (Forest Route 7-s-12) to the west. The site, ranging in elevation from about 2700-feet to 2900-feet above msl, encompasses the area of "Lion Springs" (as identified on the USGS quadrangle). While Lion Spring is shown as a discrete point on published maps, the spring (seep) is actually a linear feature subjected to artesian groundwater pressure. Flows from Lion Spring, including tributary areas, would be maintained by constructing a subdrain collection system under the alternative Morrell Canyon Reservoir site to collect and safely discharge flows downstream of that facility.

The Morrell Canyon Reservoir site, depicted in Figure 6.2.4.3-2 (Alternative Morrell Canyon Upper Reservoir Sites), is located about 3.1 miles (16,300 feet) upstream of where Morrell Canyon drainage flows under Ortega Highway. In comparison, the Decker Canyon Reservoir site is located about 2.1 miles (11,200 feet) upstream of its Ortega Highway crossing. The confluence of these two creeks is located approximately 0.25 miles below the Morrell Canyon undercrossing of Ortega Highway. Below this confluence, the combined streamflow from Morrell Canyon and Decker Canyon flow into the San Juan Creek channel.

Of the three different configurations for the Morrell Canyon Reservoir described in the FLA, "Morrell Canyon - Alternative A-3" was identified by the Applicant as the optimal (preferred) configuration in the FLA. Some general features of "Morrell Canyon - Alternative A.3" include: (1) an approximately 180 foot-high main dam located on the southwest side of the reservoir; (2) a perimeter dike ranging up to about 60 feet in heigh located along the northeast side of the reservoir; (3) a normal reservoir water surface at an elevation ob about 2,880-feet above msl; (4) an inlet elevation of about 2760-feet above msl for the intake structure; and (5) a reservoir surface area of approximately 76 acres. The required fill volume of the alternative dam and dike is approximately 2.5 million cubic yards. "Morrell Canyon - Alterative A-3" has been retained as an alternative to the proposed Decker Canyon Reservoir.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the "Applicant's Proposed Project."

◊ **Aesthetics**. Activities associated with the construction of the reservoir would result in the introduction of construction equipment and security lighting, into a relatively undisturbed landscape, involve the removal of existing vegetation, and site grading. Construction activities visible from South Main Divide Truck Trail would be viewed as disharmonious with the natural environment.

Both the Decker Canyon and alternative Morrell Canyon Reservoirs sites exist along South Main Divide Truck Trail. A similar number of motorists and other observers pass by the two sites each day. Based on existing topography, Morrell Canyon may be partially screened from the roadway and could be further screened through the installation of additional landscaping, thus reducing its potential visual impact.

[131]/ Sections 22, 23, and 27, T6S, R5W, SBBM, Lake Elsinore, Alberhill, and Sitton Peak USGS 7.5-Minute Topographic Quadrangles.

The Morrell Canyon Reservoir site is located adjacent to Morgan Trail, a USDA Forest Service maintained hiking trail extending south from South Main Divide Truck Trail. Individuals traveling along that trail would have an unimpeded view of the reservoir. Although judgments as to the aesthetic value of a water element verse a terrestrial landscape would be subject to the individual perceptions of each viewer, the change in landscape would constitute a significant physical change.

◊ **Agricultural Resources**. Since neither the Decker Canyon nor the Morrell Canyon Reservoir sites are presently used for any agricultural or farm-related use, the impacts on agricultural resources would be generally comparable.

◊ **Air Quality**. The quantity of construction and operational criteria pollutant and GHG emissions would not be expected to differ substantially between the two alternative sites. No sensitive receptors exist in close proximity to either area.

◊ **Biological Resources**. No protected wildlife species have been observed or are expected to occur in the area of the Morrell Canyon and/or the Decker Canyon Reservoir sites. However, based on the available of a seasonal source of water (Lion Springs), the Morrell Canyon site would appear more conducive to species occurrence. Coast live oak riparian woodland occur in Morrell Canyon, with a smaller stand present in Decker Canyon. With regards to coast live oaks, the provision of compensatory resources is required under Section 21083.4(b) of the Public Resources Code. The USDA Forest Service has specified a replacement ratio of 2:1. Compliance with those obligations will reduce impacts on this sensitive plant species to a less-than-significant level.

◊ **Cultural Resources**. Sensitive cultural resources have been identified in the general area of Morrell Canyon (RIV-1082, RIV-2205, RIV-3836). No sensitive resources have, however, been identified in the area of the proposed Decker Canyon Reservoir. Since in-situ preservation may not be feasible, grading activities within the Morrell Canyon area would likely result in the destruction of those cultural resources. No comparable impact would occur in the vicinity of the Decker Canyon Reservoir.

◊ **Geology and Soils**. The two alternative upper reservoir sites would have a generally comparable impact upon geology and soils.

◊ **Hazards and Hazardous Materials**. No hazardous materials are known to exist in the vicinity of either the Morrell Canyon or the Decker Canyon sites. Since construction would result in the introduction of a comparable quantity of such materials, from a hazardous materials perspective, no substantive difference exists between the two sites.

As indicated by the United States Department of the Interior - Bureau of Reclamation: "The 1964 failure of the Baldwin Hills Dam, near Los Angeles, California, and the near failure of Lower Van Norman (San Fernando) Dam in 1971 prompted the State of California to enact statutes requiring dam owners to prepare dam failure inundation maps" and "[t]he Federal Guidelines for Dam Safety, dated June 25, 1979, stated that inundation maps be prepared."[132]

In accordance therewith, as presented in Figure 6.2.4.3-3 (Preliminary Upper Reservoir Inundation Map), preliminary inundation maps have been prepared for

[132]/ United States Bureau of Reclamation, Prediction of Embankment Dam Breach Parameters – A Literature Review and Needs Assessment, DSO-98-004, July 1998, pp. 4-5.

both the proposed Decker Canyon Reservoir and the alternative Morrell Canyon Reservoir sites.[133] A catastrophic breach of either the Decker Canyon or the Morrell Canyon Reservoirs would cause inundation of downstream recreational areas, Ortega Highway road crossings, and some low-lying buildings, as well as scouring along San Juan Creek from the dam to the area of the I-5 Freeway under-crossing. Based on the analysis of the flow (discharge) through a hypothetical breach of either dam, the peak outflow would be less than 91,000 cubic feet per second (ft^3/s) for Morrell Canyon and about 115,000 ft^3/s for Decker Canyon.

The time to peak flow at the Morrell Canyon dam would be about 0.33 hours (20 minutes). The time to peak flow at the Decker Canyon dam would be about 0.28 hours (17 minutes). Downstream of the confluence of Morrell Canyon and Decker Canyon, the depths shown on the inundation map correspond to the Decker Canyon Reservoir scenario since they are generally higher than the depths corresponding to the Morrell Canyon Reservoir scenario.

Water flowing in the upstream portion of the channel below either dam would attain depths of about 30 feet for the Morrell Canyon Reservoir scenario and about 33.5 feet for the Decker Canyon Reservoir scenario. For Morrell Canyon, it is estimated that the peak discharge would reach the first stream crossing of Ortega Highway in approximately 0.45 hours (27 minutes), with a maximum depth of about 20 feet. Some inundation of the roadway would be expected at this street crossing because the existing culvert under Ortega Highway does not have sufficient capacity to convey the projected flow.

The first stream crossing of Ortega Highway in the Decker Canyon scenario would have a peak depth of about 28 feet and would arrive in approximately 0.38 hours (23 minutes). Some inundation of the roadway would be expected at this street crossing because the existing culvert under Ortega Highway does not have sufficient capacity to convey the projected flow. The flooding would inundate low-lying areas of the USDA Forest Service campground that is located just downstream of the Ortega Highway crossing.

Farther downstream, two other areas along the San Juan Creek channel would experience relatively deeper flows during the period of peak discharge. The model simulation shows the greatest flow depths in the vicinity of the Riverside County – Orange County line, where the maximum depth of flow would reach approximately 37 feet for the Morrell Canyon Reservoir scenario and 39 feet for the Decker Canyon Reservoir scenario. The other areas of relatively deeper flows is located about one mile east (upstream) of San Juan Hot Springs in Orange County. San Juan Canyon has relatively steep sides through this reach. Through this area, the depth of flow would attain a maximum of about 36.4 feet for the Morrell Canyon scenario and about 35.9 feet for the Decker Canyon scenario.

[133]/ Detailed information concurring the development of the inundation maps, methodologies, and assumptions used in the derivation of those maps, and a description of the affected properties is presented "Conceptual-Level Inundation Study – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, Riverside County, California" (GENTERRA Consultants, Inc., August 28, 2003) and "Supplemental Report Conceptual-Level Inundation Study – Lake Elsinore Advanced Pumped Storage Project, FERC Project No. 11858, Riverside County, California" (GENTERRA Consultants, Inc., December 12, 2003).

San Juan Creek passes near the southern boundary of Ronald W. Caspers Wilderness Park at its confluence with Bell Canyon Creek. As the flood wave moves past the park, the entrance road, visitor's center, and several campgrounds located upstream along the banks of Bell Canyon Creek are likely to be subject to flood inundation. Below Ronald W. Caspers Wilderness Park, San Juan Creek traverses the Rancho Mission Viejo Company's (RMVC) approved "The Ranch" development (Orange County General Plan Amendment/Zone Change PA01-114). Preliminary inundation maps were submitted to the County of Orange and to the RMVC as part of the separate CEQA process conducted for that development. By the time the flood wave reaches the confluence of Trabuco Creek, it would have attenuated to well below 50,000 cubic feet per second (ft^3/s), which is less than the peak flow of the 100-year storm event (58,600 ft^3/s).

With regards to the proposed Decker Canyon Reservoir, the preliminary inundation maps were prepared based on an earlier conceptual reservoir design that included both a dam and dike configuration, placing the water elevation in the upper reservoir above the height of South Main Divide Road. The Decker Canyon Reservoir design plans have been subsequently modified to eliminate the dike and reduce the elevation of the stored water.

Based on the earlier design plans, a catastrophic failure of either reservoir could potentially result in an overtopping of the ridgeline separating Morrell and Decker Canyons from Lake Elsinore. In that event or in the event of an overtopping of the dike crest and/or internal erosion through the dike embankment material, waters could discharge toward Lake Elsinore. In order to assess potential inundation hazards under that scenario, it was assumed that the direction of outflow from the breach was oriented perpendicularly toward nearby low points along the South Main Divide Truck Trail roadway and that the momentum of escaping water was sufficient to force the water over the ridgeline and down the slope toward Lake Elsinore to the northeast, ignoring the quantity of water that would be retained south of the roadway.

The estimated extend of flood inundation for the Morrell Canyon Reservoir scenario was based on a peak outflow (discharge) of approximately 60,300 ft^3/s through the breach. For the Decker Canyon Reservoir scenario, the corresponding peak outflow would be about 6,130 ft^3/s. The time to peak flow at the dike due to the breach of the Morrell Canyon Reservoir would be approximately 0.30 hours (18 minutes). At the last modeled cross section, near Lake Elsinore (1.76 miles downstream), the maximum depth at the deepest point would be about 10.2 feet. For the Decker Canyon Reservoir scenario, the time to peak flow would be about 0.28 hours (17 minutes). At the last modeled cross section, near Lake Elsinore (1.76 miles downstream), the maximum depth at the deepest point would be about 4.2 feet.

Comparison of the flows produced for the two dike breach scenarios revealed that the peak outflow for the Decker Canyon Reservoir simulation is an order of magnitude lower that the peak outflow for the Morrell Canyon Reservoir simulation. This outcome is due to the lower maximum water level elevation for the earlier Decker Canyon Reservoir design compared to the water level for the earlier Morrell Canyon Reservoir design.

For the Morrell Canyon Reservoir scenario, there are no down-flow stream crossings of Ortega Highway. In comparison, there are two down-flow stream crossings of Ortega Highway for the Decker Canyon Reservoir scenario. The transitory flow of water over the roadway at these crossings has the potential to temporarily block traffic, wash away any vehicles traveling along that State Highway, and to cause erosion of the roadway embankment. Similarly, flood waters from both reservoir sites would cross Grand Avenue, temporarily block traffic, and place vehicles and their occupants at risk.

For the Morrell Canyon Reservoir scenario, the inundation analysis indicated that Butterfield Elementary Visual and Performing Arts Magnet School (16275 Grand Avenue, Lake Elsinore) and Lakeland Children Center (17159 Grand Avenue, Lake Elsinore) are outside the flow pathways. A number of single-family homes, located between Santa Rosa Drive and Magnolia Street are, however, located with the resulting flood zone.

Following the commencement of operations, the Applicant proposes to construct a neighborhood park in the vicinity of the "Santa Rosa" site, adjacent to Grand Avenue. Based on the earlier reservoir design, that proposed park site is located within the inundation area for the alternative Morrell Canyon Reservoir.

For the Decker Canyon Reservoir scenario, a number of single-family residences located along Ortega Highway and in proximity to Grand Avenue are located within the flood inundation zone. Residential areas located in the Decker Canyon flood zone include residents located along Lighthouse, Shoreline, Bonnie Lae, Pepper, Cedar, and Oleander Drives, and Leeward and Anchor Ways. Additionally, based on the earlier design plans, Mountainside Ministries (30515 Ortega Highway, Lake Elsinore) appears to be located within the flow path for the Decker Canyon Reservoir.

A downstream hazard is defined as "the potential loss of life or property damage downstream of a dam from floodwaters released at the dam or waters released by partial or complete failure of the dam."[134]

Downstream hazard classification does not correspond to the condition of the dam or appurtenant works nor the anticipated performance or operation of the dam. It is a description of the setting in areas downstream of the dam and an index of relative magnitude of the potential consequences to human life and property should the dam fail. Hazard classification is based on the size of the dam and an estimation of potential structural damage and risk to human life in case of a dam failure. Large-size dams may be defined as those that are 100 feet or higher or

[134]/ Ad Hoc Committee of Dam Safety of the Federal Coordinating Council for Science, Engineering and Technology, Federal Guidelines for Dam Safety, Washington DC, June 1979.

have a reservoir volume of a least 1,000 acre-feet. Since the upper reservoir will be about 5,500 acre-foot in size and since the dam is expected to be greater than 100 feet in height, that facility would be classified as being a "large-size" dam.

As defined by the United States Bureau of Reclamation, a "significant hazard dam" is "[a] dam which places 1-6 lives at risk or would cause appreciable economic loss (rural area with notable agriculture, industry, work sites, or outstanding natural resources)." A "high hazard dam" is defined as "[a] dam which places more than 6 lives at risk or would cause excessive economic loss (urban area including extensive community, industry, agriculture, or outstanding natural resources)."[135]

As defined by FERC: "Dams in the high hazard potential category are those located where failure may cause serious damage to homes, agricultural, industrial and commercial facilities, important public utilities, main highways, or railroads, and there would be danger to human life. . .Included in the high hazard potential category are dams where failure could result in loss of life of people gathered for an unorganized recreational activity where concentrated use of a confined area below the dam is a common annual occurrence during certain times of year."[136] As defined by the Interagency Committee on Dam Safety: "Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life. The hazard potential classification assigned to a dam should be based on the worst-case failure condition, i.e., the classification is based on failure consequences resulting from the failure condition that will result in the greatest potential for loss of life and property damage."[137]

A dam constructed to form the proposed Decker Canyon or the alternative Morrell Canyon Reservoir would have a "high-hazard" classification, based on the classification system outlined by the United States Army Corps of Engineers,[138] indicating the potential for loss of six or more lives should a catastrophic failure occur. Based on existing development near Lake Elsinore, the potential for loss of life would appear incrementally greater from the Decker Canyon Reservoir.

As indicated by the United States Department of the Interior: "As potential targets for acts of terrorism, hydroelectric dams present unquantifiable costs in terms of diminished national security. The damage resulting from failure of a conventional hydroelectric facility could be severe in terms of lives lost and electricity supply disruption. As the same time. . .a real but not readily quantifiable benefit of conventional hydropower is its contribution to U.S. energy independence."[139]

---

[135]/ United States Bureau of Reclamation, Reclamation Manual FAC 06-01, Reclamation Dam Safety Program, January 8, 2002, p. 2.
[136]/ Op. Cit., Engineering Guidelines for the Evaluation of Hydropower Projects, p. 1-2.
[137]/ Federal Emergency Management Agency, Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners, FEMA 333, Interagency Committee on Dam Safety, October 1998, Section III(B)(3).
[138]/ United States Army Corps of Engineers, Engineering and Design – Earthquake Design and Evaluation for Civil Works Projects, ER 1110-2-1806, July 31, 1995, Appendix B.
[139]/ Weiss, John C., Boehlert, Brent B., and Unsworth, Robert E., Assessing the Costs and Benefits of Electricity Generation Using Alternative Energy Resources on the Outer Continental Shelf – Final Report, MMS 2007013, United States Department of the Interior, Minerals Management Service, March 2007, p. 39.

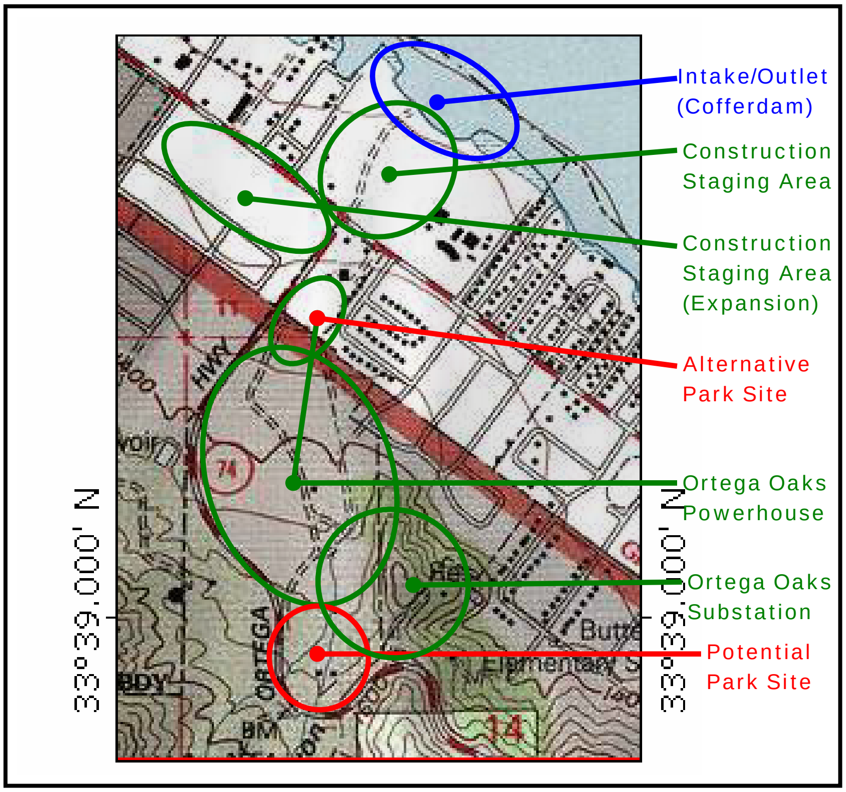


Figure 6.2.4.3-1
Alternative
Ortega Oaks Powerhouse
and Substation Sites
Source: The Nevada Hydro Company

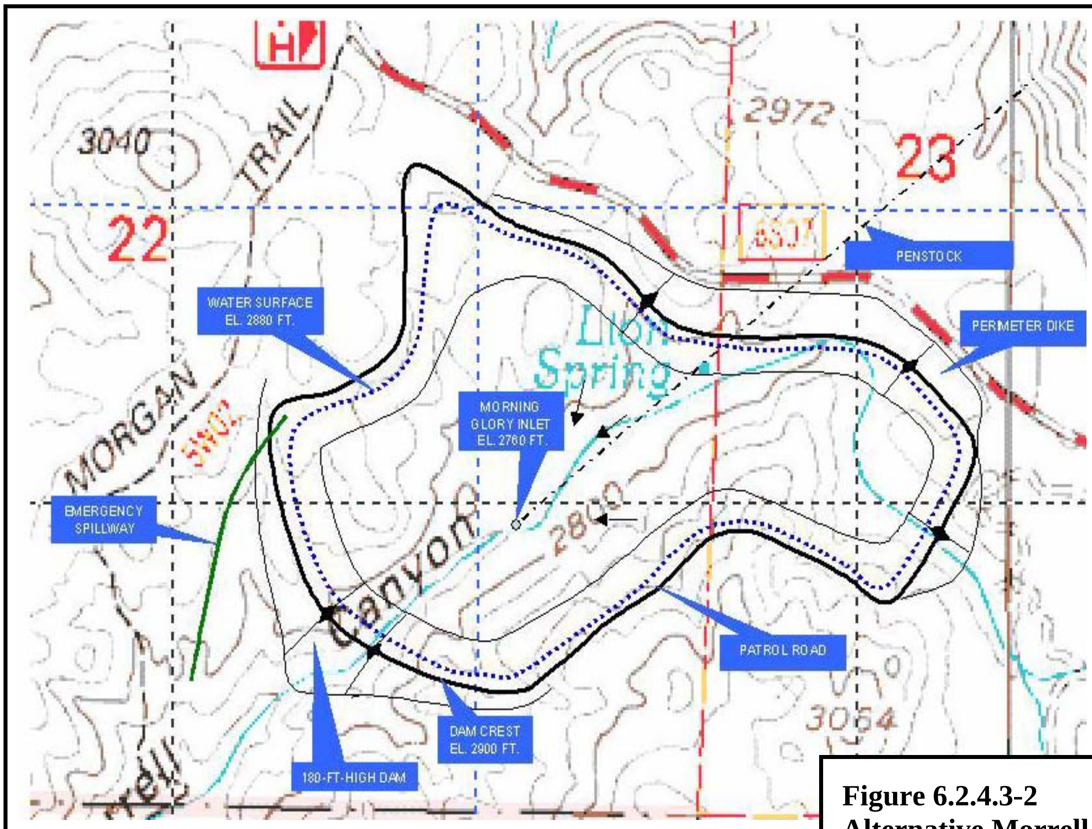
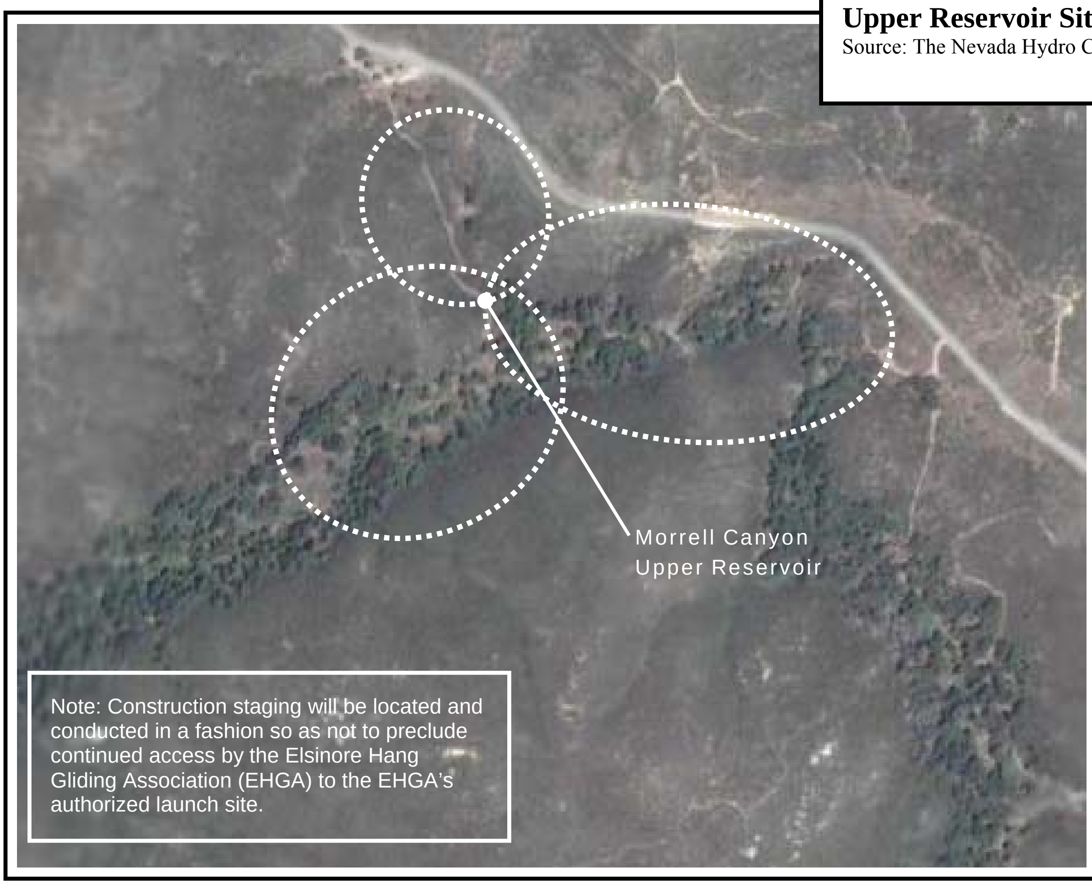


Figure 6.2.4.3-2
Alternative Morrell Canyon Upper Reservoir Site
Source: The Nevada Hydro Company



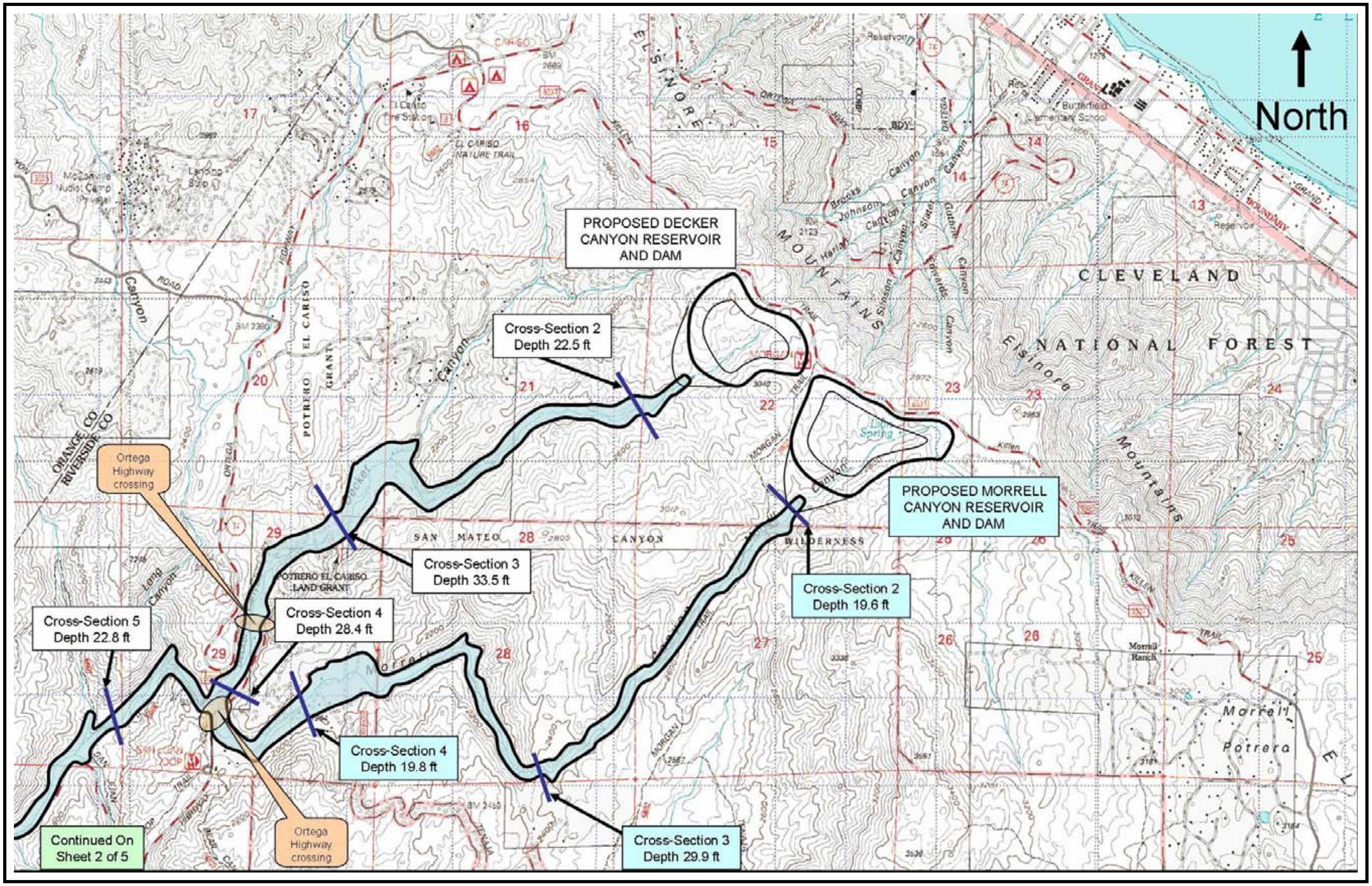


Figure 6.2.4.3-3 (1 of 6). Preliminary Upper Reservoir Inundation Map - Sheet 1
Source: GENTERRA Consultants, Inc.

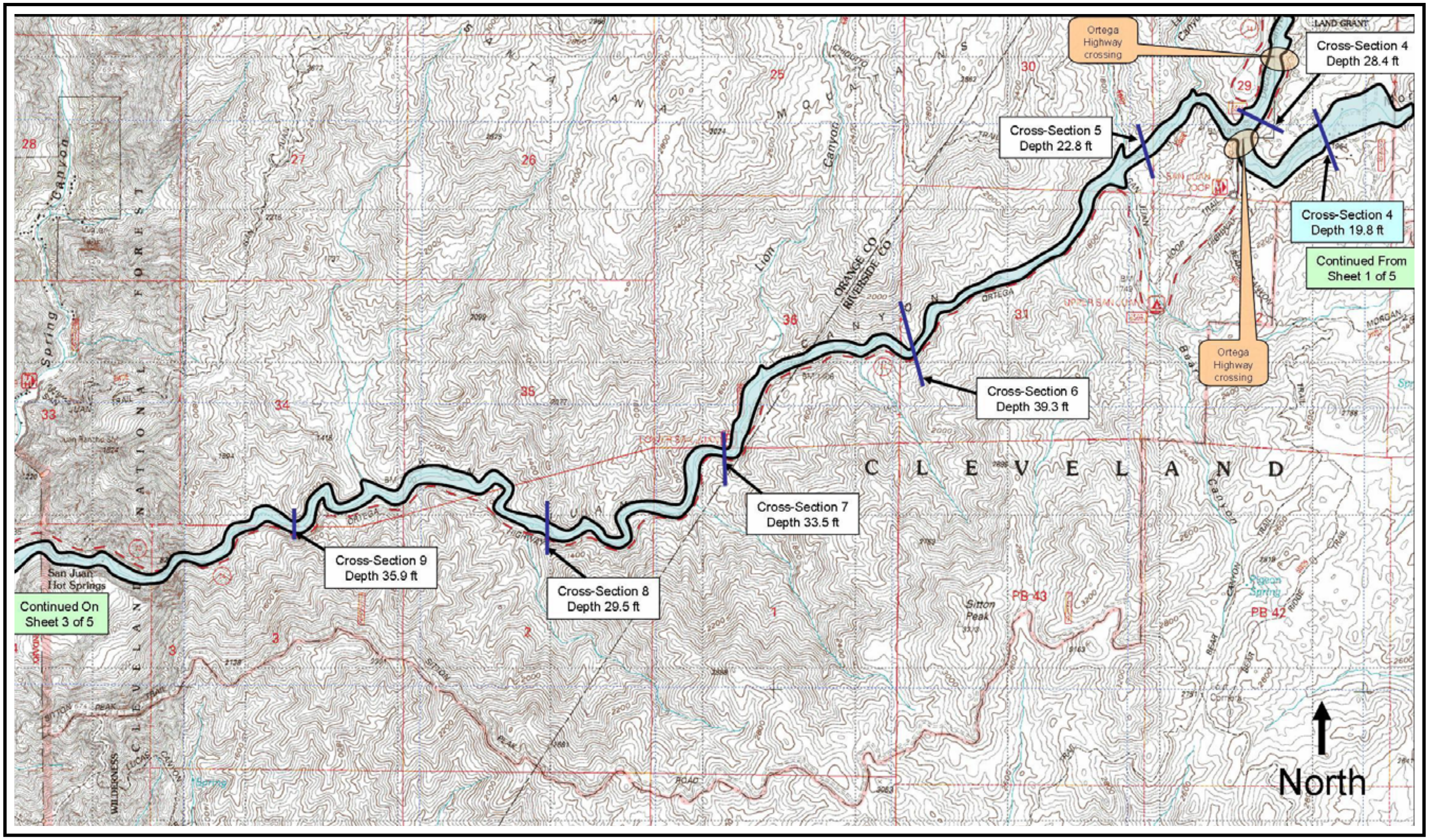


Figure 6.2.4.3-3 (2 of 6). Preliminary Upper Reservoir Inundation Map – Sheet 2
Source: GENTERRA Consultants Inc.

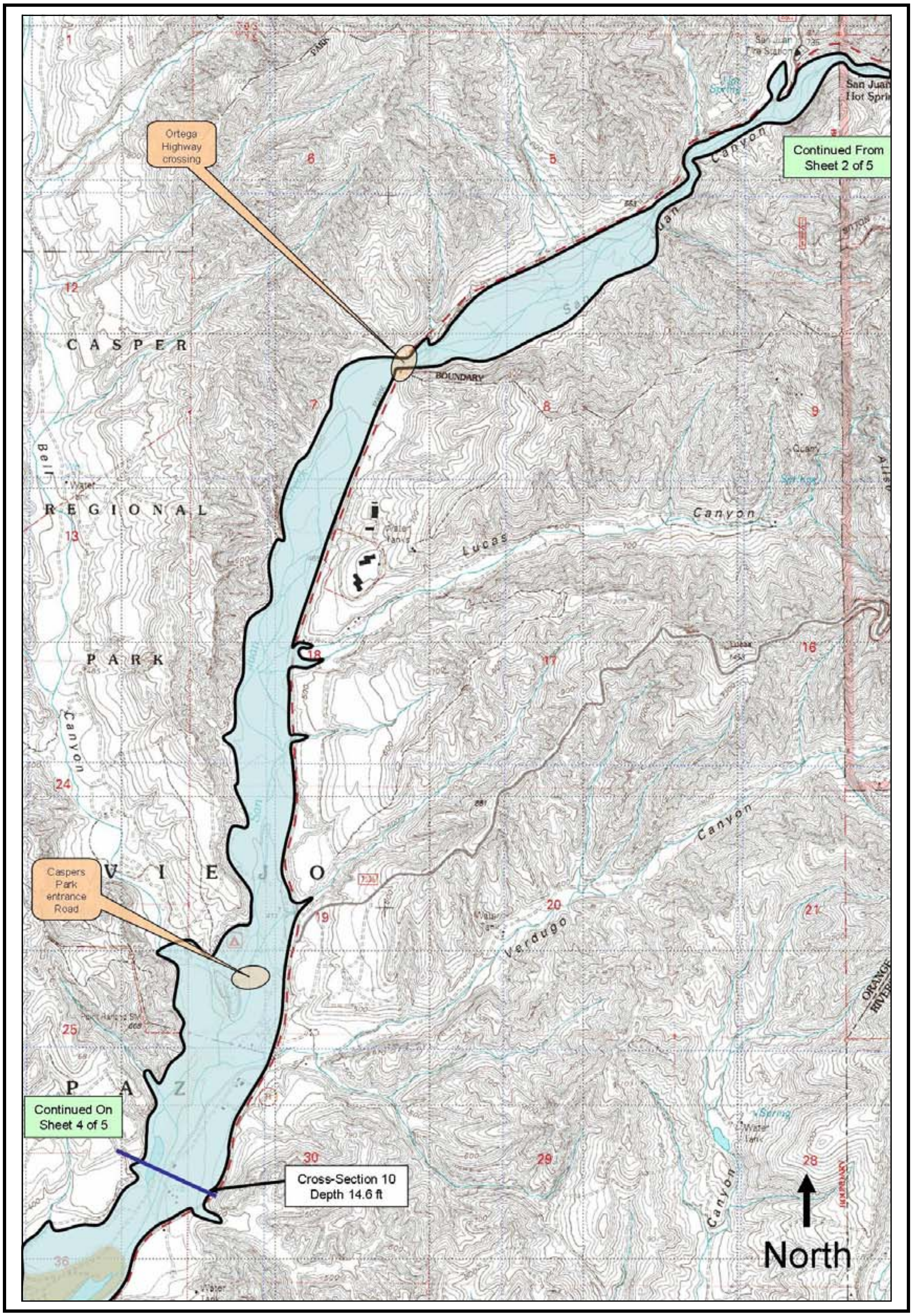


Figure 6.2.4.3-3 (3 of 6). Preliminary Upper Reservoir Inundation Map – Sheet 3
Source: GENTERRA Consultants Inc.

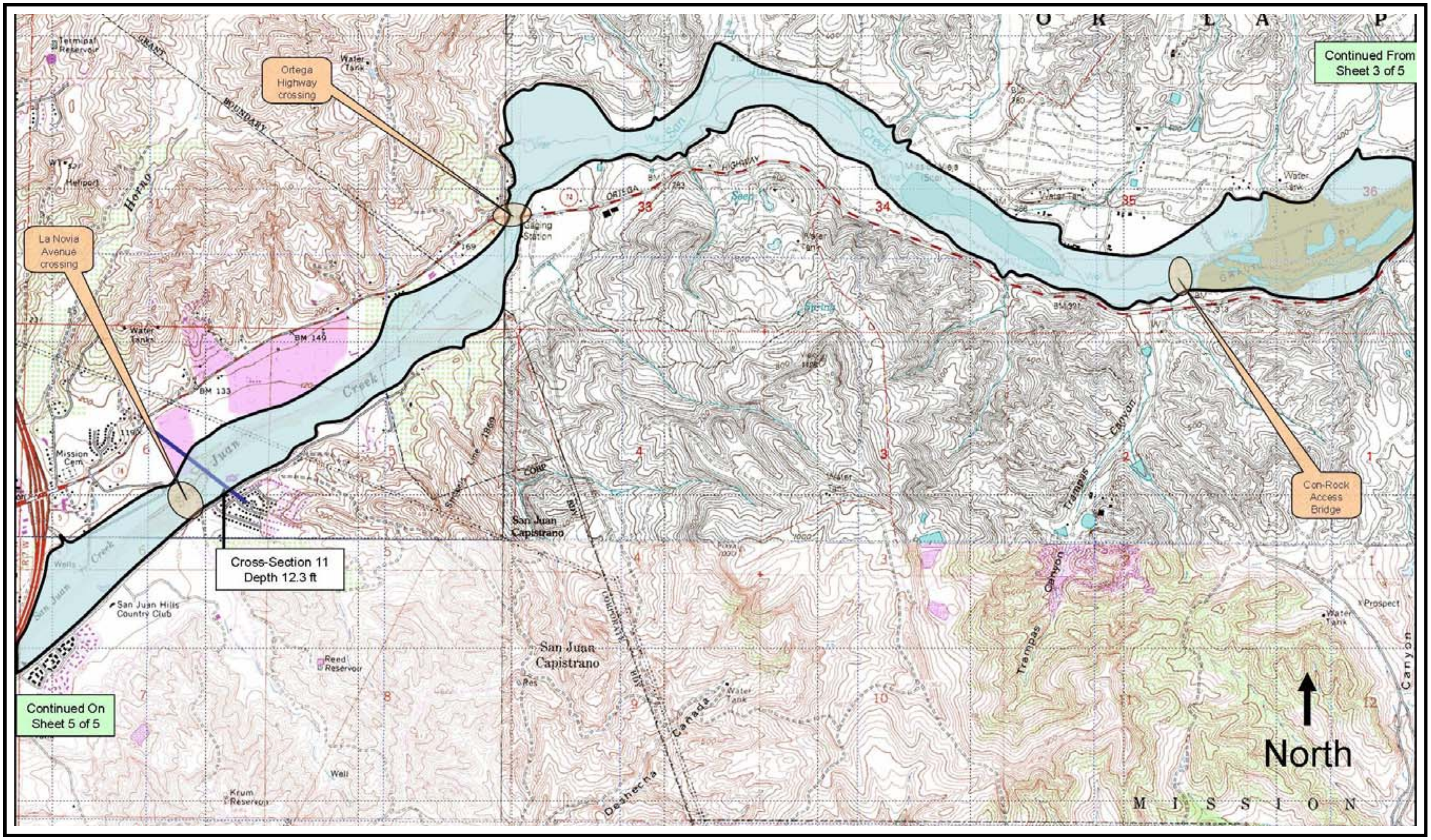


Figure 6.2.4.3-3 (4 of 6). Preliminary Upper Reservoir Inundation Map – Sheet 4
Source: GENTERRA Consultants Inc.

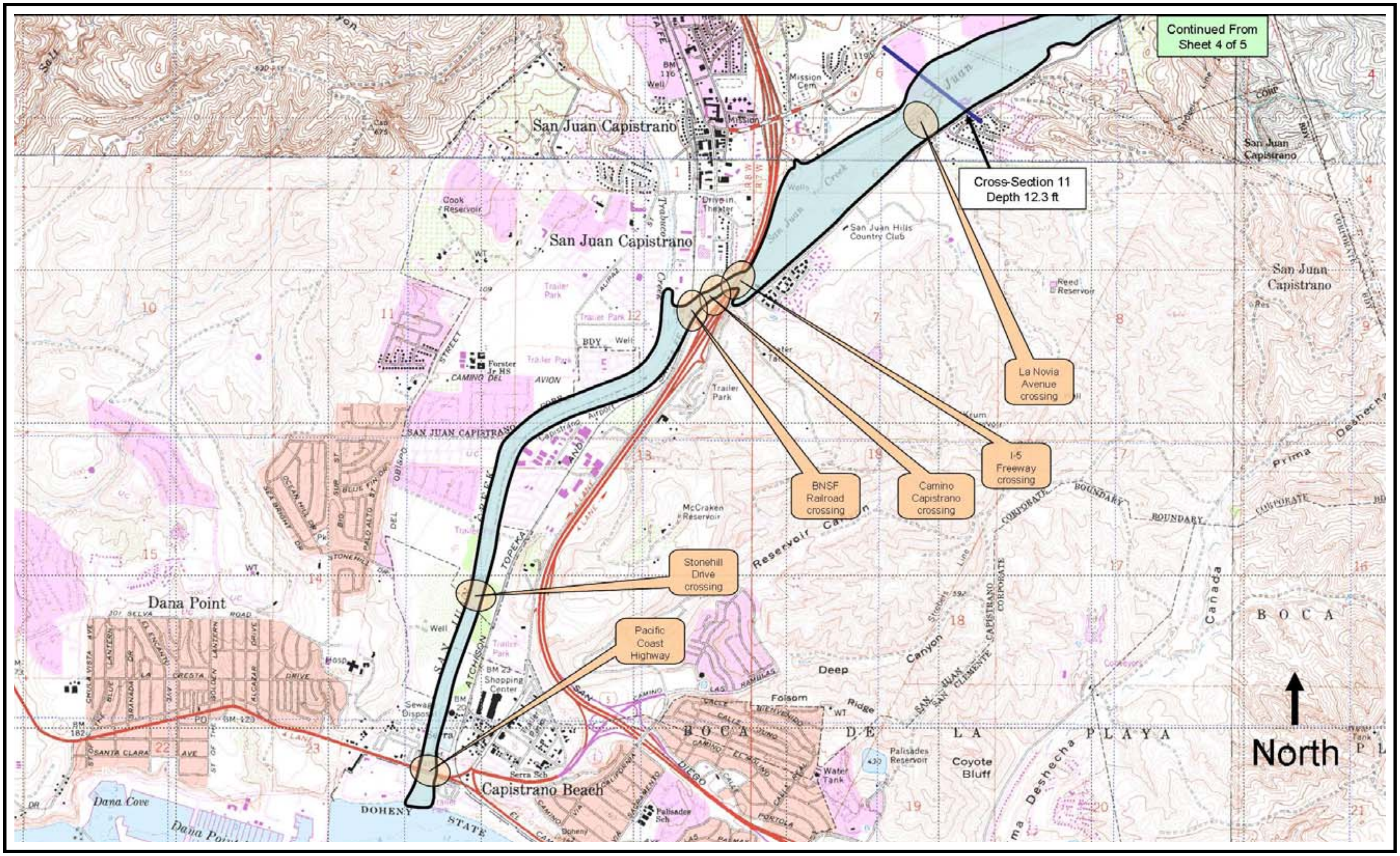


Figure 6.2.4.3-3 (5 of 6). Preliminary Upper Reservoir Inundation Map – Sheet 5
Source: GENTERRA Consultants Inc.

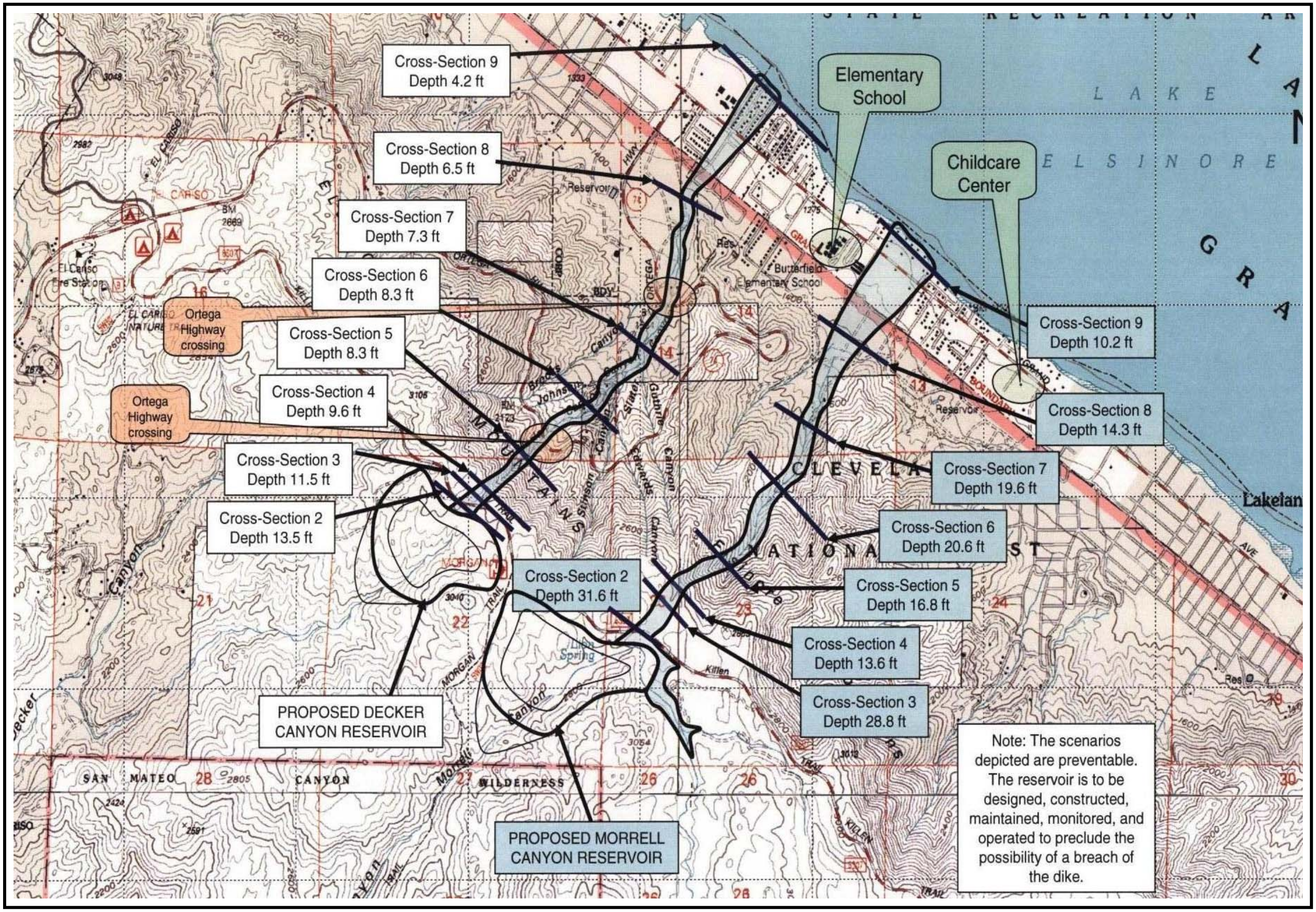


Figure 6.2.4.3-3 (6 of 6). Preliminary Upper Reservoir Inundation Map – Sheet 6
Source: GENTERRA Consultants Inc.

Compliance with applicable federal and State dam construction, safety, and monitoring requirements, including implementation of a dam safety surveillance monitoring plan, will reduce potential hazards to the maximum extent feasible.

◊ **Hydrology and Water Quality**. Decker Canyon is located at the headwaters of the watercourse and has no contributing upstream drainage. Conversely, the drainage area upstream of the Morrell Canyon site is approximately 560 acres (0.9 square miles). The runoff generated from a 100-year rainfall event from that upstream area would produce a peak flow of about 2,200 ft^3/s. Based on the presence of Lion Springs, as evidenced by the coast live oak riparian forest that exists within Morrell Canyon, additional stream flows exist at that site. A significant impact would likely exist if the construction of the alternative Morrell Canyon Reservoir were to reduce or eliminate flows from Lion Springs and/or impede the conveyance of storm waters to downstream areas. Engineering studies demonstrate that both upstream and Lion Springs flows can be safely and effectively conveyed to a point of discharge downstream from the dam area.

◊ **Land Use and Planning**. Within the TRD, existing plans and policies allows for the construction and subsequent operation of the proposed and/or the alternative reservoir sites. As such, the two upper reservoir sites would have a generally comparable land use and planning impact.

◊ **Mineral Resources**. Neither site contains known recoverable mineral resources.

◊ **Noise**. The two reservoir sites would have a generally comparable noise impacts.

◊ **Population and Housing**. The two alternative upper reservoir sites would have a generally comparable impact upon population and housing.

◊ **Public Services**. The two alternative upper reservoir sites would have a generally comparable impact upon police, fire protection, and vector control services.

◊ **Recreation**. Because of its proximity to Morgan Trail, accessibility from South Main Divide Truck Trail, existing oak woodland, and presence of Lion Springs, Morrell Canyon receives frequent recreational use. Conversely, although more visible from South Main Divide Truck Trail, there exists no trails to facilitate public access into the Decker Canyon area.

Construction and construction staging activities conducted at either reservoir site would not directly impact the EHGA's USDA Forest Service SUP-permitted existing launch sites. In accordance with the provisions of the federal hydropower license and the USDA Forest Services 4(e) conditions, subject to USDA Forest Service specifications, new recreational facilities will be provided within the TRD independent of which upper reservoir site is selected.

◊ **Transportation and Traffic**. The two alternative upper reservoir sites would have a generally comparable impact upon transportation and traffic.

◊ **Utilities and Service Systems**. The two alternative sites would have a generally comparable impact upon potable and non-potable water services and supplies.

◊ **Energy Resources**. The two alternative reservoir sites would have a generally comparable impact upon energy resources.

- **Alternative No. 5 - "Alternative Lake Switchyard Site."** Based on information obtained from SCE, the Applicant is aware that SCE has initiated preliminary planning for unconnected improvements to the existing 115-kV distribution system in a portion of western Riverside County. Although no detailed siting information is available, it is the Applicant's understanding that SCE may be considering the development of a new 500/115-kV substation on an approximately 50-acre site in the Glen Ivy/Alberhill area of unincorporated Riverside County, in the general vicinity of the proposed Lake Switchyard. Based on constraints imposed by the proximity of Temescal Canyon Road and the I-15 (Corona) Freeway, the Applicant's proposed Lake Switchyard site may not be sufficiently sized and/or configured to accommodate the Applicant's proposed switchyard and additional SCE facilities when and if those facilities should be developed.

  Although the Lake Switchyard and an as yet unspecified SCE substation have separate utility, there may exist tangible environmental, economic, and engineering benefits that would result from the proximal siting of those two facilities. As such, the Applicant has sought to identify other properties in the general area of the proposed Lake Switchyard that could potentially accommodate both uses.

  As illustrated in Figure 6.2.4.3-4 (Alternative 500-kV Lake Switchyard Site), in order to adequately accommodate both the Applicant's proposed switchyard, SCE's future and unconnected distribution substation, and minimize the number of 500-kV interconnections located in relatively close proximity, in addition to the Applicant's proposed Lake Switchyard site, an alternative substation/switchyard site has been identified in the general vicinity of the I-15 (Corona) Freeway and Temescal Canyon Road. The alternative Lake Switchyard site is approximately two miles southeast of the Applicant-proposed Lake Switchyard and accessible from Temescal Canyon Road.

  A conceptual single line diagram of the alternative Lake Switchyard is shown in Figure 6.2.4.3-5 (Alternative 500-kV Lake Switchyard Conceptual Single Line Diagram).

  The approximately 50-acre alternative Lake Switchyard site[140] is generally located to the north of Temescal Canyon Road and the I-15 Freeway, east of Horsethief Canyon Road, and west of Lake Street in the unincorporated Glen Ivy/Alberhill area of Riverside County. This alternative site is relatively flat and contains vacant lands, an existing horse ranch, and at least one residence. Because the property has been previously disturbed, the alternative switchyard area contains limited habitat value. Much of the surrounding area is vacant or used for equipment storage purposes. As such, unlike the Applicant-proposed Lake Switchyard site, other than Temescal Creek, there does not appear

[140]/ The referenced acreage is not inclusive of the additional lands associated with the 500-kV connection to the existing Valley-Serrano 500-kV transmission line, the access roads associated with those new transmission towers, and any additional areas of temporary disturbance associated with the facility's construction and operation.

existing physical constraints that would preclude the development of an approximately 50-acre 500/115-kV substation at that alternative site.[141]

Although the location, shape, and configuration of the alternative Lake Switchyard is different than that of the Applicant's proposed Lake Switchyard, the purpose, function, and component parts of the two switchyard sites would be generally the same. Independent of the location selected, the switchyard will be designed in accordance with applicable SCE specifications.

As with the Applicant-proposed Lake Switchyard, the alternative switchyard site will be split into the following parts: 500-kV connection to the existing Valley-Serrano 500-kV transmission line and 500-kV connection to the new Lake-Case Springs transmission line. Facility design would not foreclose a future electrical connection to a SCE-proposed and unconnected 500/115-kV substation but would not include that substation as part of the "Applicant's Proposed Project."

Based on a variety of factors, it would not be desirable to construct two separate 500-kV interconnections within as short a distance as that which separates the Applicant's proposed Lake Switchyard and the alternative switchyard sites identified herein. Should an independent SCE 500/115-kV substation be developed in the general area at an unspecified future date, an electrical connection between SCE's future substation and TNHC's Lake Switchyard (independent of the site selected) would likely need be established. Any modifications, upgrades, and improvements to the Lake Switchyard as may be needed to accommodate that electrical connection would be a part of a later SCE-submitted application to the Commission.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the "Applicant's Proposed Project." Only those topical areas where environmental impacts may differ from those associated with the "Applicant's Proposed Project" are discussed below.

◊ **Aesthetics**. Because the alternative Lake Switchyard may be air-insulated (AIS) and the Applicant-proposed Lake Switchyard is a gas-insulated (GIS), the visual character of the two sites would differ, including the presence of a smaller footprint associated with the use of GIS technology. Although both sites would be visible from the I-15 Freeway, the Applicant's proposed Lake Switchyard is located directly adjacent to the freeway (providing a foreground view from passing motorists) while the alternative switchyard site is located further from that arterial (providing a middle-ground view from passing motorists).

  Since the freeway is located at a higher elevation that either switchyard site, visual screening would have limited effectiveness. The I-15 Freeway is not a designated scenic highway in the general area and numerous industrial uses

[141]/ Although a future SCE 500/115-kV SCE substation is referenced herein, that substation is not a part of the "Applicant's Proposed Project" since: (1) both facilities could separately operate, such that one facility is not dependent upon the other for its operations; (2) SCE has not filed an application with the Commission for that use, no development schedule exists, and any information concerning that future SCE facility is speculate; (3) the Applicant is not in possession of any detailed siting information which would illustrate the precise location of that facility. The inclusion of this alternative herein is based on the assumption that the cumulative impacts of the two independent and unconnected facilities might be minimized if total site disturbance and if the number of 500-kV interconnections could be reduced.

presently exist in close proximity thereto. Although the proposed and alternative switchyards will result in a substantial physical change to either site, independent of the site selected, the aesthetic impacts would not be deemed significant.

◊ **Agricultural Resources**. Since the proposed and the alternative Lake Switchyard sites are not presently used for any agricultural use, the impacts on agricultural resources would be generally comparable. The alternative switchyard site is, however, presently used as a horse ranch and may allow for both boarding of horses by non-residents and include a breeding program and veterinary activities. The extent of any commercial operations at that facility are unknown but appear limited based on available visual observations.

◊ **Air Quality**. During construction, the quantity of construction criteria pollutants and GHG emissions would not be expected to differ substantially between the two switchyard sites.

Sulfur hexafluoride (SF_6), a non-toxic and non-flammable gas, is used for the insulation of GIS technology. The EPA has identified sulfur hexafluoride as a GHG with a global warming potential 23,900 times the effect of an equal mass of carbon dioxide (CO_2) and an atmospheric lifetime of 3,200 years. Because the use and operation of sulfur hexafluoride, including leak detection and effective management practices, will be in accordance with applicable the EPA standards,[142] potential air quality impacts would be comparable.

◊ **Biological Resources**. The Applicant-proposed Lake Switchyard is located in an undeveloped and mostly disturbed area between Temescal Road and the I-15 Freeway. The vegetation is dominated by coastal sage scrub and areas of disturbed soil. Existing land uses consist of vacant lands and an active storage facilities for construction equipment. The coastal sage scrub habitat on the site is considered low-quality and is frequently disturbed by human activity, such as trash dumping, vehicle usage, and pedestrian traffic. Based on the findings of the 2008 focused surveys, there are no sensitive plant or wildlife species present within the area of the Lake Switchyard.

Portions of the alternative Lake Switchyard and its associated 500-kV connection to the existing Valley-Serrano 500-kV transmission line may be in the process of being incorporated into the Western Riverside County Regional Conservation Authority. Based on "Riverside County Multiple Species Habitat Conservation Plan" (MSHCP) report generator, the alternative Lake Switchyard site requires a burrowing owl habitat assessment. Based on the current, habitat on the site, the coastal sage scrub cover provides low quality burrowing owl habitat. The human disturbance also contributes to the degraded habitat quality and, therefore, the alternative Lake Switchyard does not appear to warrant burrowing owl surveys since site conditions are not conducive to the presence of that species.

[142]/ United States Environmental Protection Agency, Substation Maintenance – Electrical Operating Procedures, EOP 430.51.4, March 28, 2005.

As indicate in the MSHCP, but not verified through on-site biological surveys, this alternative switchyard site also contains the following: (1) "Criteria Area Species" (thread-leaved brodiaea, Davidson's saltscale, Parish's brittlescale, smooth tarplant, round-leaved filaree, Coulter's goldfields, little Mousetail); (2) "Narrow Endemic Plant Species" (Munz's onion, San Diego ambrosia, slender-horned spineflower, many-stemmed dudleya, spreading navarretia, California Orcutt grass, San Miguel savory, Hammitt's clay-cress, Wright's trichocoronis).

The general area contains suitable habitat for several ground-nesting birds. A nesting bird survey will, therefore, be required should construction activities occur on the alternative switchyard site during the nesting period.

There are areas within the immediate vicinity of the proposed and alternative switchyard sites that contain jurisdictional drainage features. Careful switchyard siting would allow for the facility's development, on either site, avoiding or minimizing encroachment into a designated 100-year flood plain and/or directly impacting jurisdictional drainage features. These features may still be indirectly affected by associated construction activities and will need to be evaluated once final design plans have been formulated.

◊ **Cultural Resources**. No cultural resources have been identified or are suspected to occur on the alternative switchyard site.

◊ **Geology and Soils**. As illustrated in Figure 6.2.4.3-6 (Portion of the USGS 7.5-Minute Alberhill Topographic Quadrangle), neither of the two switchyards sites is located in close proximity to an Alquist-Priolo Earthquake Fault Zone. Since the "Class B" Elsinore Fault is located to the south of the proposed and alternative switchyards, based on comparable distance from that fault, the two sites would have a generally comparable impact upon geology and soils.

◊ **Hazards and Hazardous Materials**. Neither the proposed nor the alternative switchyards will result in a significant hazard to the public or to the environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials to the environment. Development will not impair the implementation of or physically interfere with an adopted emergency response plan or an emergency evacuation plan. The construction and operation of either switchyard site will not result in the release or hazardous materials within one-quarter mile of an existing or proposed school site. Neither switchyard site is believed to be located on a property included on a list of hazardous material sites.

◊ **Hydrology and Water Quality**. The proposed and alternative Lake Switchyard sites are located within the jurisdiction of the Regional Water Quality Control Board, Santa Ana Region (SARWQCB); however, because the "Applicant's Proposed Project" is multi-jurisdiction, water quality permitting is subject to the jurisdiction of the State Regional Water Quality Control Board (SWRCB).

Waters discharging from the alternative Lake Switchyard would first drain to Temescal Creek, above Lee (Corona) Lake, a tributary of the Santa Ana River

(HU No. 801.00). Lee (Corona) Lake is an agricultural impoundment and is a potable water source. All surface water discharges would be in accordance with SARWQCB and SWRCB permit requirements.

Waters discharging from the proposed Lake Switchyard would continue to discharge to Temescal Creek but below Lee (Corona) Lake. Hydrologic and water quality impacts from the two switchyards would be generally comparable.

As illustrated in Figure 6.2.4.3-7 (Proposed Lake Switchyard Site - Portion of Flood Insurance Rate Map Panel No. 06065C2005G) and Figure 6.2.4.3-8 (Alternative Lake Switchyard Site - Portion of Flood Insurance Rate Map Panel No. 06065C2006G), as illustrated in FEMA's FIRM map, neither the proposed Lake Switchyard nor the alternative Lake Switchyard sites are located within a 100-year flood plain.[143] Independent of the switchyard's location, compliance with applicable water quality permit requirements will ensure that impacts on surface and water quality will be reduced to a less-than-significant level.

◊ **Land Use and Planning**. Both switchyard sites are designated "Light Industrial" in the "Elsinore Area Plan," a component of the "County of Riverside General Plan." As indicated therein: "The Light Industrial land use designation allows for a wide variety of industrial and related uses, including assembly and light manufacturing, repair and other service facilities, warehousing, distribution centers, and supporting retail uses. Building intensity ranges from 0.25 to 0.6 FAR [floor area ratio]." An electrical switchyard/substation would appear to be consistent with the land-use policies of the "Riverside County General Plan."

In accordance with Article XI (M-SC Zone) of the Riverside County Zoning Ordinance (Ordinance No. 348), both switchyard sites are zone "M-SC Zone (Manufacturing – Service Commercial)." As specified therein: "It is the intent of the Board of Supervisors in amending this article to: (1) promote and attract industrial and manufacturing activities which will provide jobs to local residents and strengthens the County's economic base; (2) provide the necessary improvements to support industrial growth; (3) insure that new industry is compatible with uses on adjacent lands; and (4) protect industrial areas from encroachment by incompatible uses that may jeopardize industry." Permitted uses include "electrical and electronic apparatus and components." An electrical switchyard would appear to be consistent with the "Riverside County Zoning Ordinance."

◊ **Mineral Resources**. Neither site contains recoverable mineral resources.

◊ **Noise**. The construction and operation of the Applicant-proposed and the alternative Lake Switchyard sites would have a generally comparable noise impacts. With the exception of corona and periodic maintenance activities, noise impacts would generally be limited to the construction term.

143/ Both sites are categorized as "Zone X," defined as areas of 0.2percent annual chance flood; areas of 1percent annual chance flood with average depth of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levee from 1percent annual change flood.

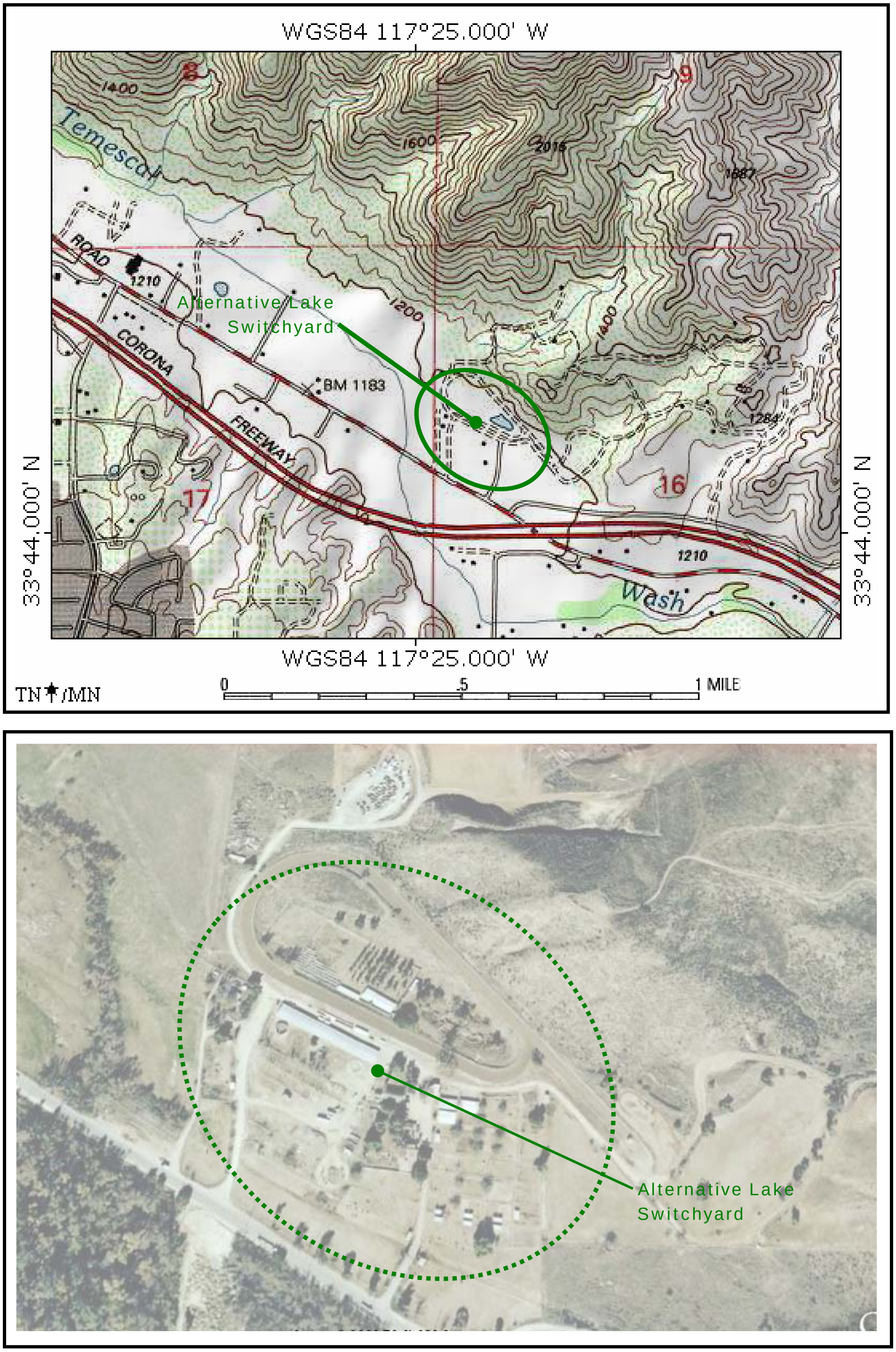


Figure 6.2.4.3-4. Alternative 500-kV Lake Switchyard Site
Source: The Nevada Hydro Company

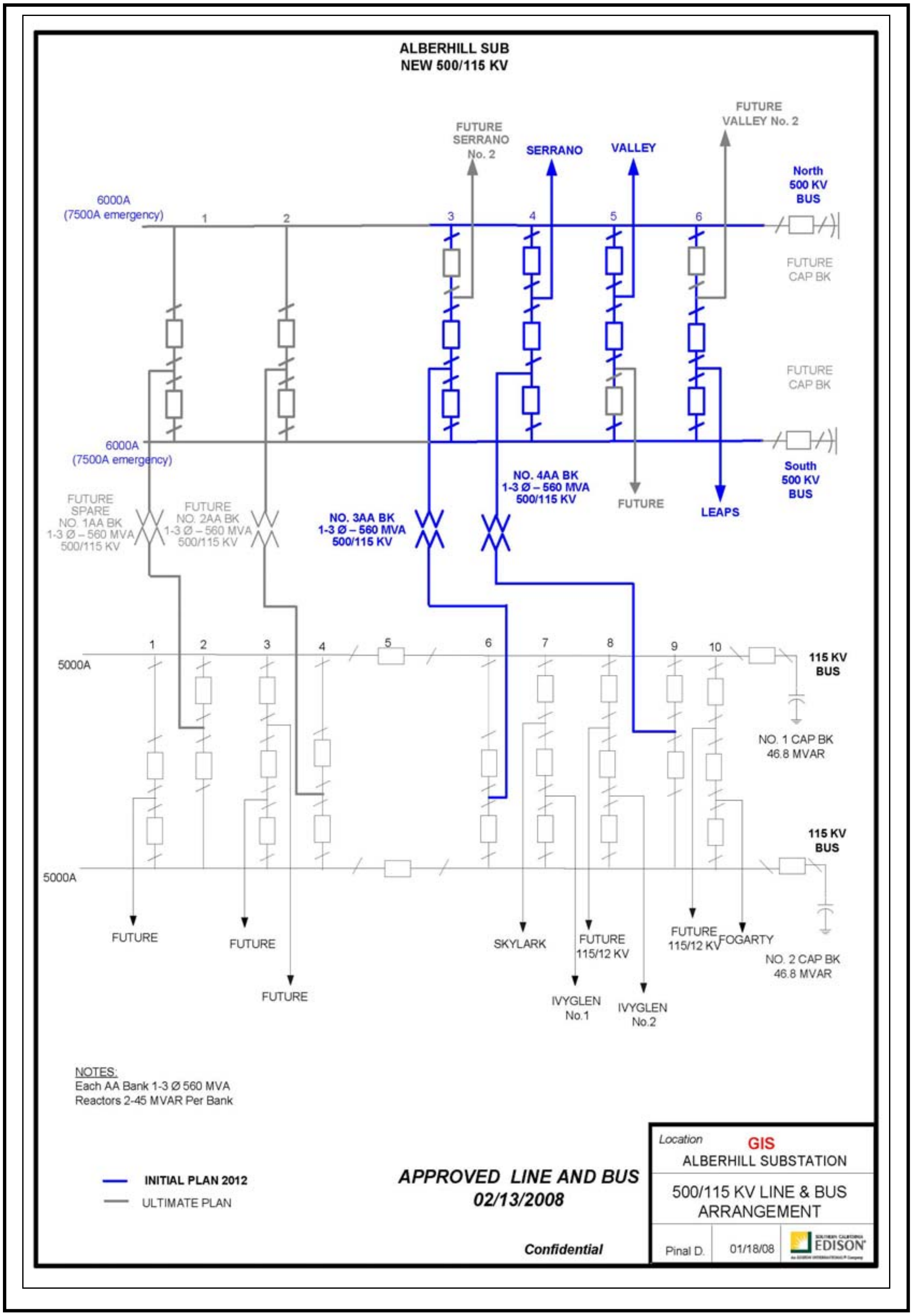


Figure 6.2.4.3-5. Alternative 500-kV Lake Switchyard Conceptual Single Line Diagram
Source: Southern California Edison Company

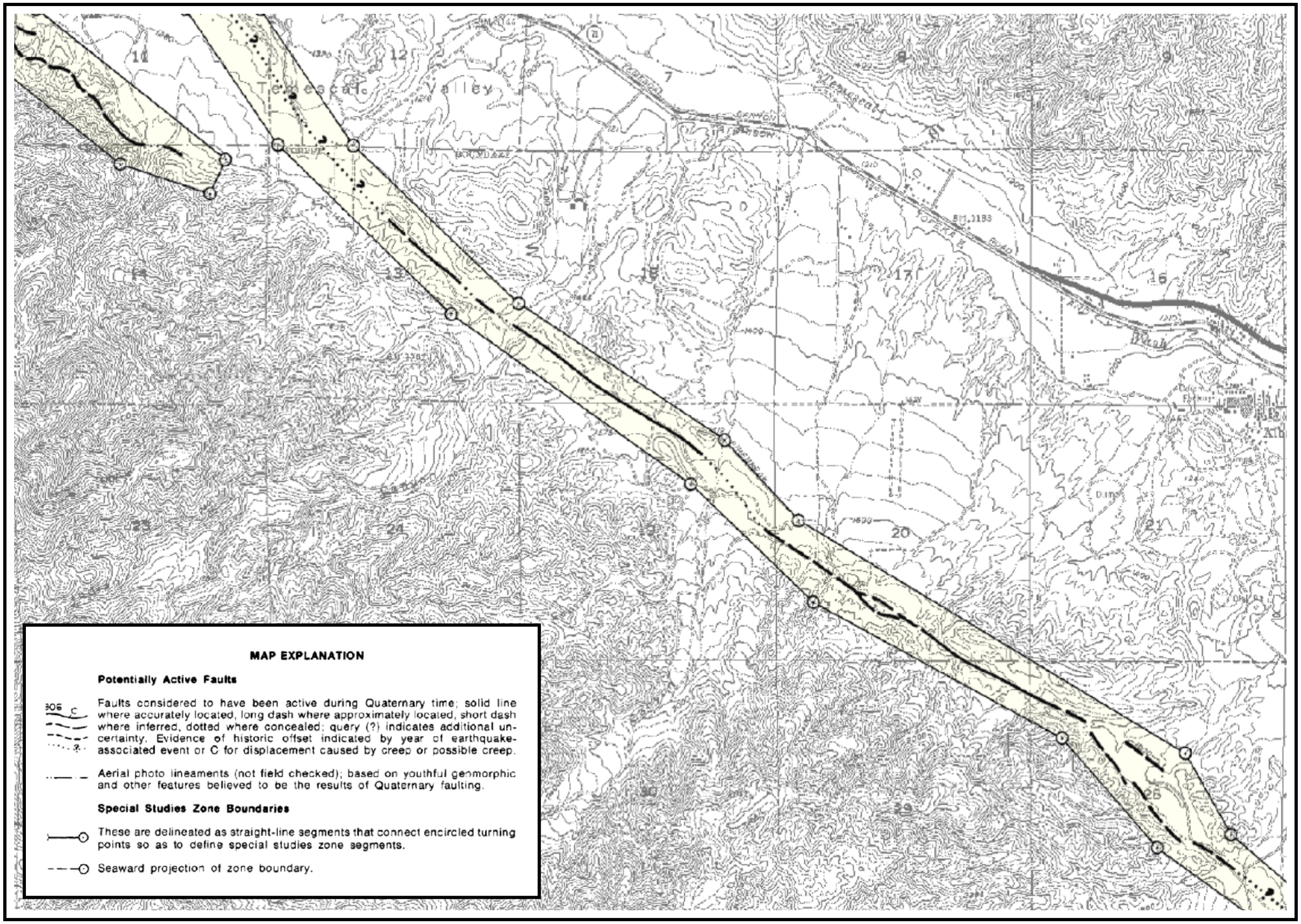


Figure 6.2.4.3-6. Portion of the USGS 7.5-Minute Alberhill Topographic Quadrangle
Source: California Department of Conservation

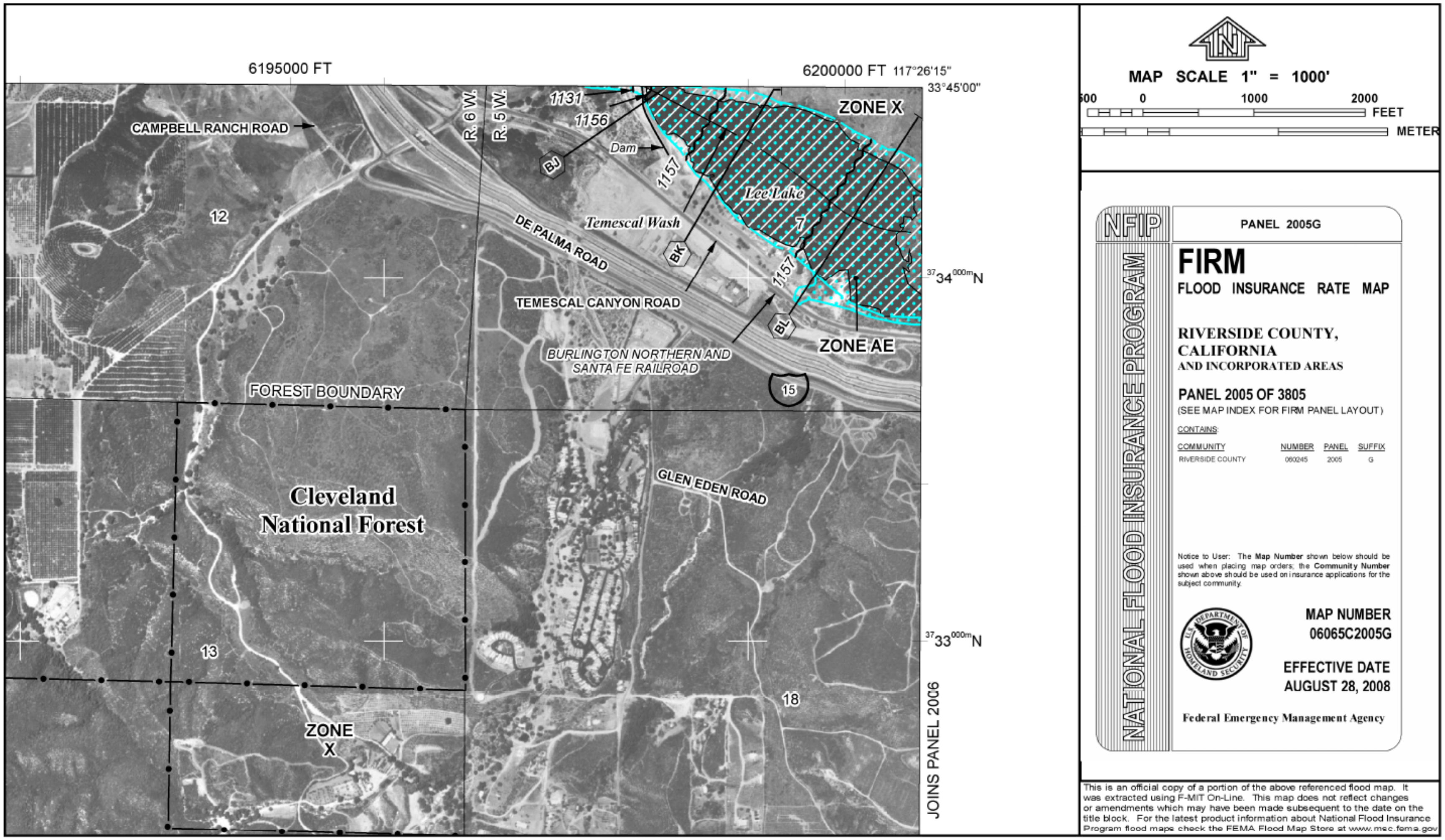


Figure 6.2.4.3-7. Proposed Lake Switchyard Site - Portion of Flood Insurance Rate Map Panel No. 06065C2005G
Source: Federal Emergency Management Agency

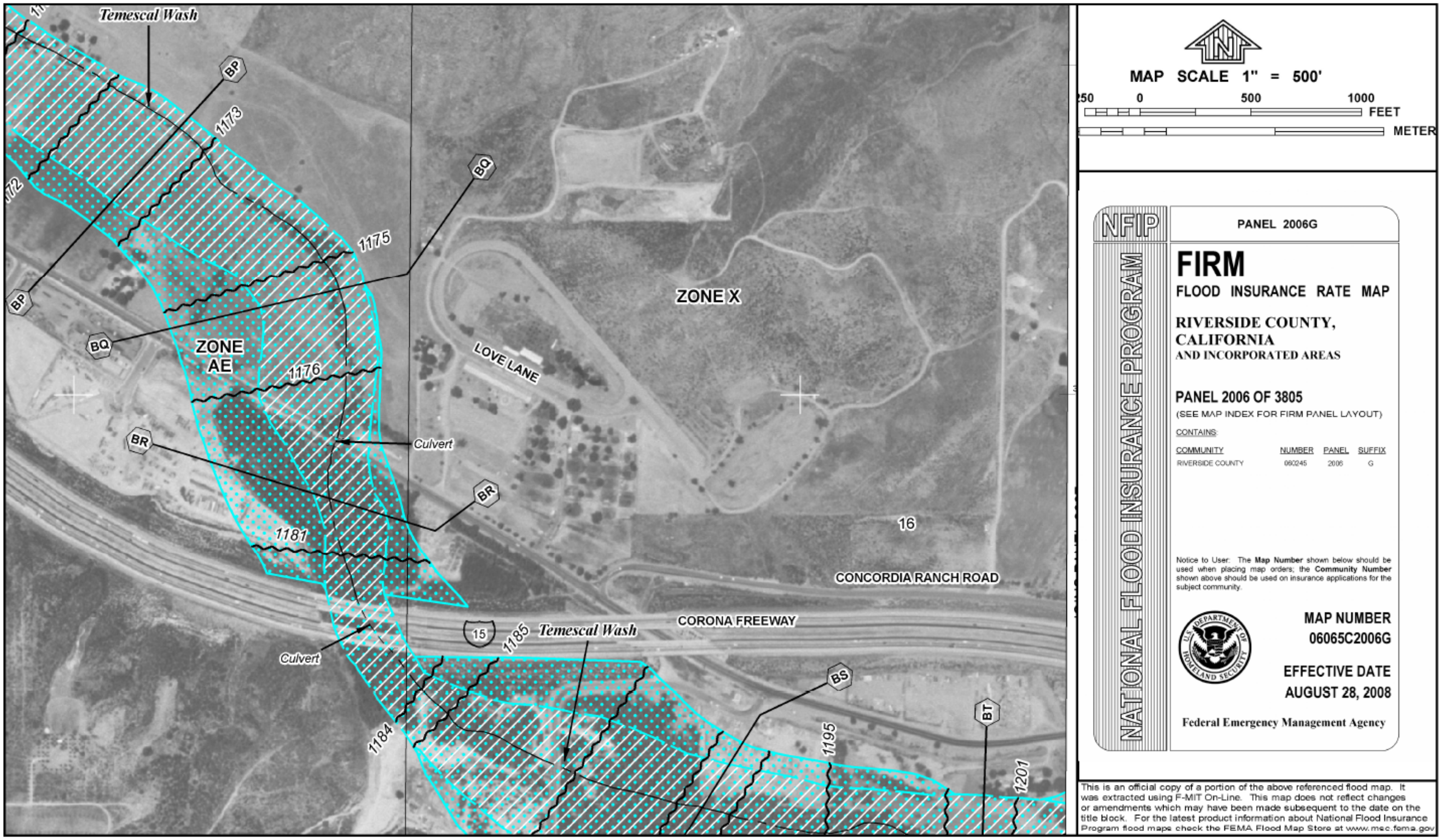


Figure 6.2.4.3-8. Alternative Lake Switchyard Site - Portion of Flood Insurance Rate Map Panel No. 06065C2006G

Source: Federal Emergency Management Agency

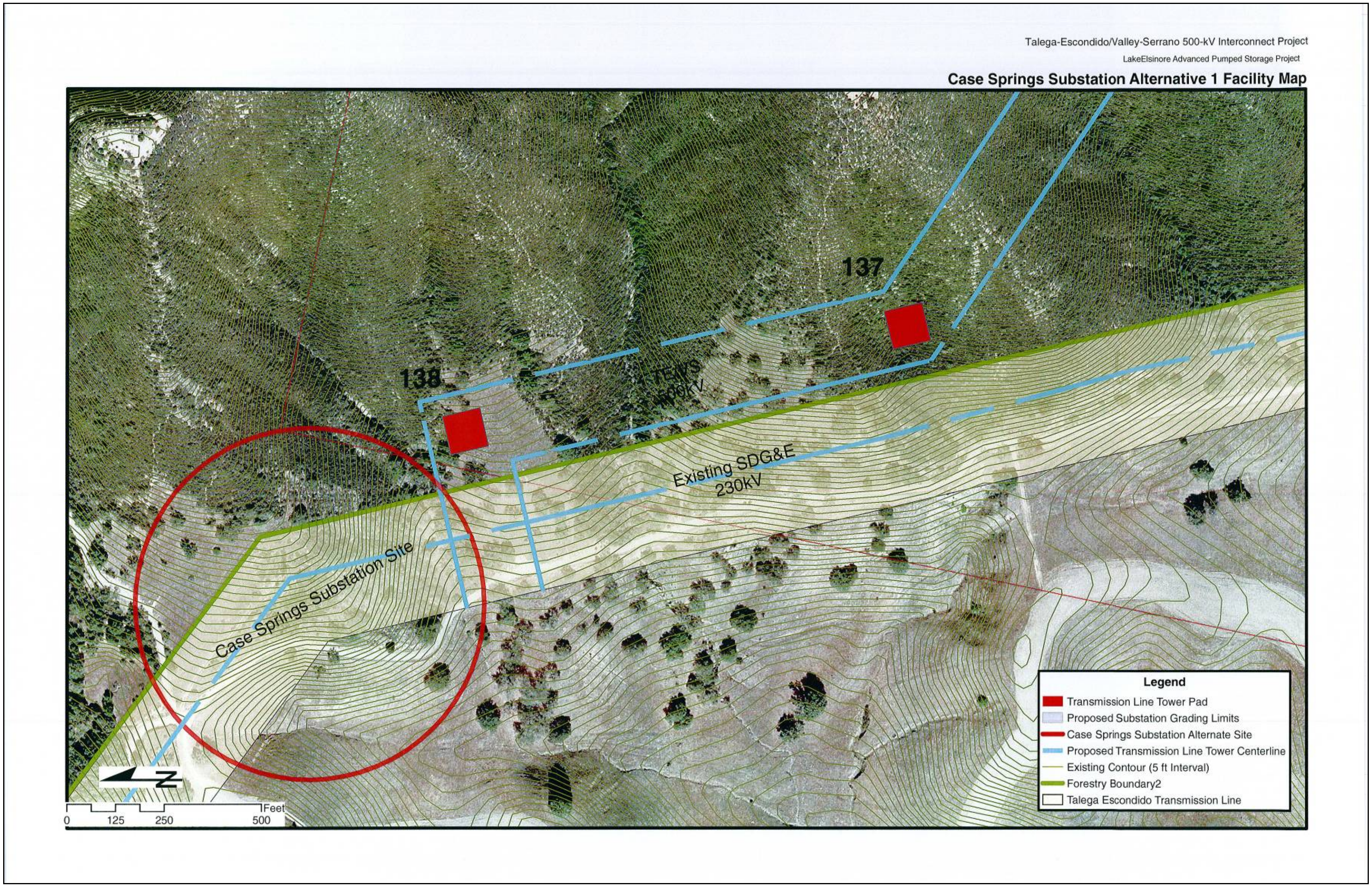


Figure 6.2.4.3-9. Alternative Case Springs Substation Site
Source: The Nevada Hydro Company

◊ **Population and Housing**. The proposed and the alternative switchyard sites would have a generally comparable impact upon population and housing.

◊ **Public Services**. The switchyard sites are located in close proximity to Riverside County Fire Station No. 64 (Sycamore Creek) (25310 Campbell Ranch Road, Corona 92883), operated by the Riverside County Fire Department. The Applicant-proposed and the alternative Lake Switchyard sites would have a generally comparable impact upon police, fire protection, and vector control services.

◊ **Recreation**. Neither the proposed nor the alternative switchyard site is presented used for public recreational purposes. As a result, site development will not impact recreational opportunities in the general area.

Lee (Corona) Lake is however, commercially operated as a fishing lake. Overhead transmission lines connecting the Applicant-proposed Lake Switchyard to the existing Valley-Serrano 500-kV transmission line may encroach into the air space located above that water body. If so located, restrictions on overhead casting may need to be implemented to avoid contact with the high-voltage transmission lines. No such impacts would occur should the alternative Lake Switchyard site be selected.

◊ **Transportation and Traffic**. Both the proposed and alternative switchyard sites are located along Temescal Canyon Road. As a result, construction-term and operational traffic would be expected to produce comparable traffic impacts along that roadway.

◊ **Utilities and Service Systems**. Development of the alternative switchyard site will likely necessitate the rerouting of an existing 36-inch diameter water line, relocation of existing overhead telephone lines, and the relocation of existing microwave repeater stations.

◊ **Energy Resources**. Development of either switchyard site will beneficially contribute to the availability of energy resources both within the general area and throughout the southern California area.

▪ **Alternative No. 6 - "Alternative Case Springs Substation Site."** This alternative substation site, located in the vicinity of the Case Springs Fire Station adjacent to the northern boundary of Camp Pendleton, is proposed should the preferred Case Springs Substation site not be acceptable.

The proposed Case Springs Substation site is located within the ROW of SDG&E's existing 230 kV transmission lines near the northern border of Camp Pendleton and the southern border of the TRD. The area is designated by the USMC as "Echo."[144] To the south of the proposed substation site is the "Whiskey/Zulu Impact Area,"[145] often

144/ United States Marine Corps, Integrated Natural Resources Management Plan – Marine Corps Base and Marine Corps Air Station, Camp Pendleton, March 2007, Figure 2-14, p. 2-14.
145/ Ibid., Figure 2-15, p. 2-14.

referred to as the "Central Impact Area." North of that impact area and south of the TRD is a designated "mortar firing areas" (MFAs), "artillery firing areas" (AFAs),[146] "live fire and maneuver" (LFAM) areas,[147] and "helicopter terrain flight" (TERF) route.[148] Helicopters use the door gunner ranges located adjacent to Case Springs, which involve firing machine guns into the "Whiskey Impact Area."[149] To the west of the proposed substation is a designated "drop zone."[150]

The USMC may conclude that the Case Springs substation's proposed placement interferes with existing military training operations or other planned uses. An alternative substation site has, therefore, been identified in the area of the existing USMC and USDA Forest Service jointly operated Case Springs Fire Station. The alternative approximately 8-acre site is shown in Figure 6.2.4.3-9 (Alternative Case Springs Substation Site). This alternative site, if subsequently selected, provides a greater separation distance from the proposed substation to critical military training facilities, including TERF, located on Camp Pendleton.

As proposed, the alternative Case Springs Substation is also proposed to be located within the TE line ROW, near the Case Springs Fire Station.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the "Applicant's Proposed Project."

◊ **Aesthetics**. The proposed and alternative Case Springs Substation sites exist in an isolated corner of Camp Pendleton, adjacent to a remote corner of the TRD. Development will result in the conversion of the existing fire station site and surrounding area (containing mostly invasive grasslands and a limited number of oak trees) from a naturally appearing landscape with limited cultural modifications to a more industrial-appearing land use. Although the site's conversion constitutes a substantial physical change, with the exception of on-base military personnel, no large number of viewers will be able to see this site.

◊ **Agricultural Resources**. Since neither the proposed nor the alternative Case Springs Substation site is presently used for any agricultural or farm-related use, the impacts on agricultural resources would be generally comparable.

◊ **Air Quality**. During construction, the quantity of construction criteria pollutants and GHG emissions would not be expected to differ substantially between the two sites. No sensitive receptors exist in close proximity to either substation site.

Based on the presence of near-site military operations, independent of the site selected, the substation would be developed as a GIS facility. Sulfur hexafluoride (SF_6), a non-toxic and non-flammable gas, is used for the insulation of GIS technology. Sulfur hexafluoride has been identified as a greenhouse gas.

146/ Ibid., Figure 2-16, p. 2-16.
147/ Ibid., Figure 2-17, p. 2-17.
148/ Ibid., Figure 2-19, p. 2-20.
149/ United States Marine Corps, Integrated Natural Resources Management Plan – Marine Corps Base and Marine Corps Air Station, Camp Pendleton, October 2001, p. 2-23.
150/ Ibid., Figure 2-5, p. 2-25.

◊ **Biological Resources**. The Case Springs Substation is located south of the existing Case Springs Fire Station in the northern portion of Camp Pendleton. This substation site is located west of the main access road that runs parallel to the eastern limits of the base. The vegetation is dominated by non-native grasslands within several areas that were recently cleared for fire breaks and includes a sparse stand of oak trees with a non-native grassland understory. The vegetation community is moderate in quality due to lack of consistent human disturbance. This area is not within the western Riverside County MSHCP.

The alternative substation site has been previously disturbed and contains non-native grasslands with a few native grasses and forbs. There are no sensitive plants or wildlife species recorded to occur within this area and no sensitive plant or wildlife species were observed during focused surveys conducted during the 2008 field season.

The general area in the vicinity of the substation site contains suitable habitat for several ground-nesting and tree nesting birds, which will require a nesting bird survey if construction related activities are to occur during the nesting period.

◊ **Cultural Resources**. No cultural resources have been identified or are suspected to occur on the alternative substation site. Additional cultural resource surveys will, however, be conducted prior to any site disturbance.

◊ **Geology and Soils**. In general, Camp Pendleton is underlain by Holocene to late Pleistocene unconsolidated sedimentary deposits that include alluvium in canyon bottoms and coastal terraces, Eocene to Pliocent sedimentary rocks of marine and non-marine origin, and Cretaceous to Triassic bedrock that include highly consolidated and cemented sedimentary rock and plutonic and metamorphic crystalline rock.

No Alquist-Priolo Earthquake Hazard Maps have been prepared for the USGS 7.5-Minute Margarita Peak quadrangle. That topographic quadrangle, however, does not reveal the presence of any fault traces in the general area of the two substation sites. Prior to the commencement of any grading activities in the vicinity of the two substation sites, subject to USMC authorization, a detailed geotechnical investigation will be required to identify appropriate grading and design parameters for the selected substation.

◊ **Hazards and Hazardous Materials**. Because of their location within an active military reservation, both substation sites could pose hazards to military personal and operations unless sited and operated in accordance with USMC use authorization. Numerous non-military uses presently exist on Camp Pendleton, demonstrating that permitted uses can effectively co-exist with base operations.

Neither the proposed substation nor the alternative substation will, therefore, result in a significant hazard to the public or to the environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials to the environment. Development on the two sites will not impair the implementation of or physically interfere with an adopted emergency response plan or an emergency evacuation plan.

The construction and operation of these substation sites will not result in the release or hazardous materials within one-quarter mile of an existing or proposed school site and neither site is located directly in an area included on a list of hazardous material sites. Based on the potential presence of unexploded ordnances, additional surveys will be required prior to any ground-disturbing activities.

◊ **Hydrology and Water Quality**. The proposed and alternative Case Springs Substation sites are located within the jurisdiction of the Regional Water Quality Control Board, San Diego Region; however, because the "Applicant's Proposed Project" is multi-jurisdiction, it is subject to the jurisdiction of the SWRCB. The two substation sites are located within the San Onofre Creek watershed (Basin No. 901.50). Hydrologic and water quality impacts from the two substations would be generally comparable.

◊ **Land Use and Planning**. Because both substation sites are located on Camp Pendleton, consultation with the USMC is required and a use authorization will need to be obtained by the Applicant. Airspace above the substation sites is designated as "Restrictive Airspace R-2503B." Additionally, because the two substation sites are located in proximity to a number of USMC-designated "live fire and maneuver" (LFAM), "artillery firing areas" (AFAs), and "mortar firing areas" (MFAs), additional siting constraints exist with regards to existing land uses. Because the Case Springs Fire Station site is located near the northern edge of Camp Pendleton, the selection of the alternative substation site would result in less potential disruption to military training operations.

◊ **Mineral Resources**. Neither site contains recoverable mineral resources.

◊ **Noise**. The construction and operation of the two substation sites would have a generally comparable noise impacts. With the exception of corona and periodic maintenance activities, noise impacts would generally be limited to the construction term.

◊ **Population and Housing**. The two alternative substation sites would have a generally comparable impact upon population and housing.

◊ **Public Services**. The two alternative substation sites would have a generally comparable impact upon police, fire protection, and vector control services.

◊ **Recreation**. West of the proposed substation site, undeveloped recreational campsites are available in the Case Springs Lake area.[151] Neither substation site is designated for nor currently used for any form of recreation.

◊ **Transportation and Traffic**. Vehicular access to the two substation sites can be obtained, via dirt roads, through the TRD (via a locked gate) and Camp Pendleton (subject to USMC authorization). Because access through Camp Pendleton can be disrupted when military operations are being conducted within specified areas, once operational, vehicular access to the two substation sites would be primarily directed through the National Forest.

◊ **Utilities and Service Systems**. Water and electrical services are available near the substation sites. Station power will be generated at the substation.

◊ **Energy Resources**. Development of either substation site will beneficially contribute to the availability of energy resources both within the general area and throughout the southern California area.

▪ **Alternative No. 7 - "Alternative Transmission Line Underground Technologies."**[152] Although the Applicant is initially proposing a high-pressure, gas-insulated transmission line (GIL) system for that segment of the proposed 500-kV transmission line to be constructed underground, other underground technologies and design options may be available and may be implemented in lieu of the GIL system, including solid dielectric (cross-linked polyethylene) (XLPE), high-pressure fluid-filled (HPFF), and self-contained fluid-filled (SCFF) technologies. The Applicant seeks to retain future options with regards to the Project-specific application of any of these alternative technologies should environmental, technological, cost, of other considerations dictate the use of an alternative type of underground transmission system. Each of the alternative underground system is briefly described below.

◊ **Cross-linked polyethylene**. The XLPE system consists of three cables per phase in a concrete duct bank or buried in separate trenches. Each cable consists of a copper conductor, a semi-conducting shield, cross-linked polyethylene insulation, and an outer covering consisting of another semi-conducting shield, a metallic sheath, and a plastic jacket.

◊ **High-pressure, fluid-filled pipe-type cable**. A HPFF system consists of a steel pipe containing three separate conductors per phase which are insulated within the pipe by dielectric oil. The pressurized dielectric fluid prevents electrical discharges in the conductors' insulation and transfers heat away from the conductors. HPFF requires a high volume of fluid to be pumped through the

---

151/ Op. Cit., Integrated Natural Resources Management Plan – Marine Corps Base and Marine Corps Air Station, Camp Pendleton, p. 5-12.
152/ Detailed information concerning underground transmission lines is contained in "EPRI Underground Transmission Systems Reference Book, 2006 Edition (EPRI Product 1014840)" (Electric Power Research Institute, 2006)" (EPRI Green Book).

system using fluid-pressurizing plants and highly charging current requirements. Compared to dielectric cables, HPFF has a higher risk of oil leak and fire.

The main advantages of solid dielectric cables compared to oil-filled cables are a decrease in fire hazard, reduced maintenance and transition space requirements, less expensive cable installation, and shorter repair time.

◊ **Self-contained fluid-filled pipe-type cable**. In the SCFF system, the conductors are hollow and filled with an insulting pressurized fluid. The three cables per phase are independent and are not placed together in a pipe. Each cable consists of the fluid-filled conductor insulated with high-quality kraft paper and protected by a lead-bronze or aluminum sheath which helps pressurize the conductor's fluid and a plastic jacket which keeps the water out. The fluid reduces that chance of electrical discharge and line failure.

As illustrated in Figure 6.2.4.3-10 (Alternative Transmission Line Underground Technology - Elevation), Figure 6.2.4.3-11 (Alternative Transmission Line Underground Technology – Single Line Drawing), and Figure 6.2.4.3-12 (Alternative Transmission Line Underground Technology – Plan View), under these alternatives, an additional switchyard (Transition Switchyard) has to be build at the 500-kV overhead line – cable transition point linking the Santa Rosa Substation to the underground line.

As reported by the CPUC: "Counter to popular belief, higher magnetic fields may actually occur directly over an underground transmission line than directly under an overhead transmission line. This occurs because a person standing directly over an underground transmission line is much closer to the underground line than they would be to an overhead line. However, the magnetic field will decay much more rapidly in underground transmission lines than overhead transmission lines as the horizontal distance away from the line increases. As a result, underground transmission lines generally have lower EMF levels than overhead transmission lines."[153]

To the extend that any of these alternative underground line technologies would allow for a reduction in the area of ground disturbance, the impacts of that alternative's selection would likely be an overall lessening of Project-related biological impacts.

6.2.4.4 Alternative No. 8 - "New In-Area Renewable Generation" Alternative

This alternative, as identified and described in the Sunrise DEIR/DEIS (Section E.5), constitutes a distinct and substantially different means of meeting many of the Project's stated objectives that would otherwise be obtained through the implementation of the "Applicant's Proposed Project." As described therein, this alternative would involve the development of various in-area renewable projects (i.e., solar, wind, and biomass/biogas) that together could provide sufficient generation capacity within the San Diego load center to defer the need for the "Applicant's Proposed Project."

[153]/ Commonwealth Associates, Inc., Feasibility of Undergrounding a Portion of the Miguel-Mission 230 kV #2 Transmission Line Project Proposed by San Diego Gas & Electric Company, February 26, 2004, p. 4.

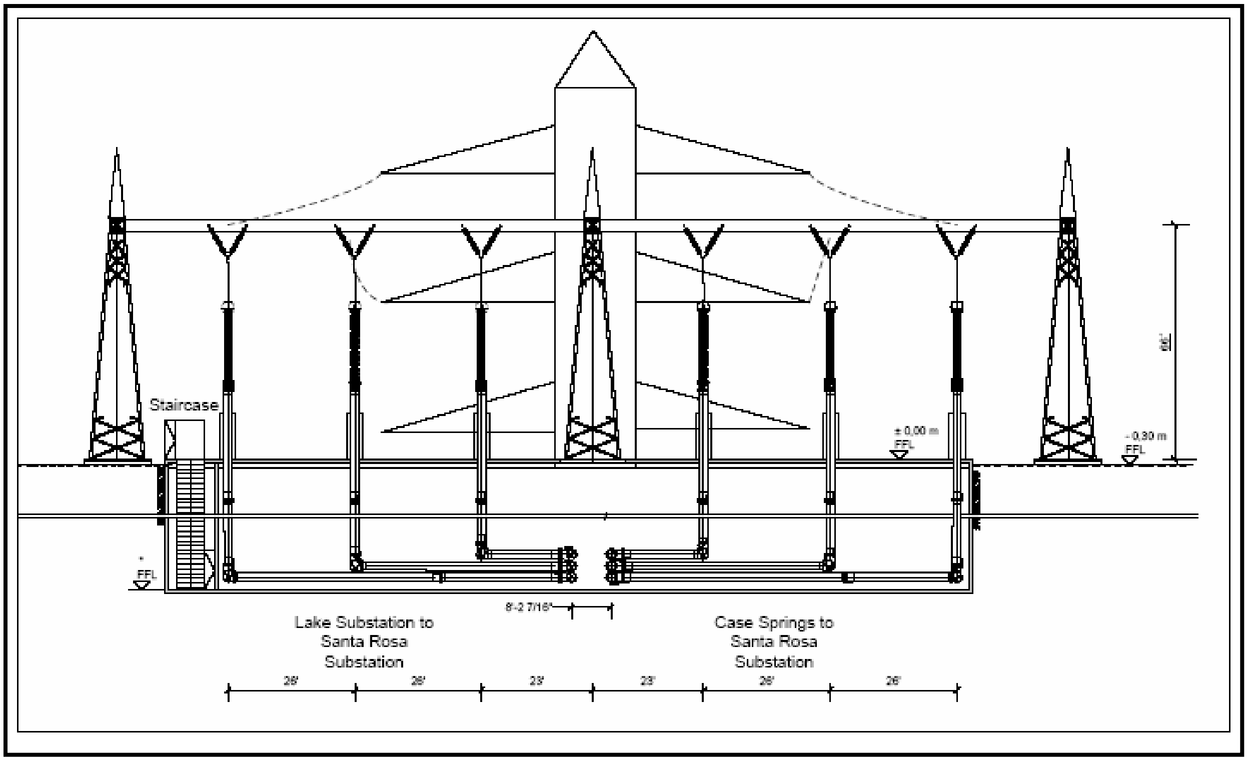


Figure 6.2.4.3-10 (1 of 2). Alternative Transmission Line Underground Technology Elevation
Source: The Nevada Hydro Company

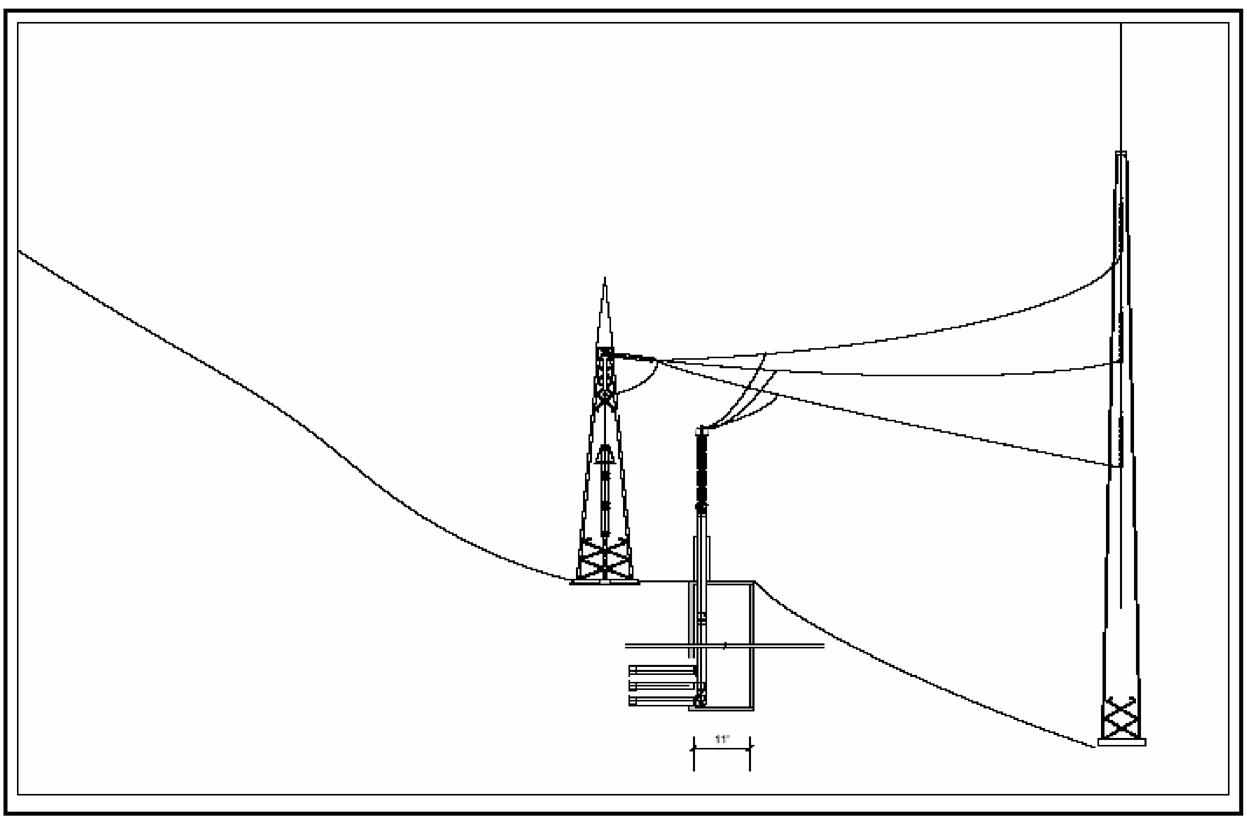


Figure 6.2.4.3-10 (2 of 2). Alternative Transmission Line Underground Technology Elevation
Source: The Nevada Hydro Company

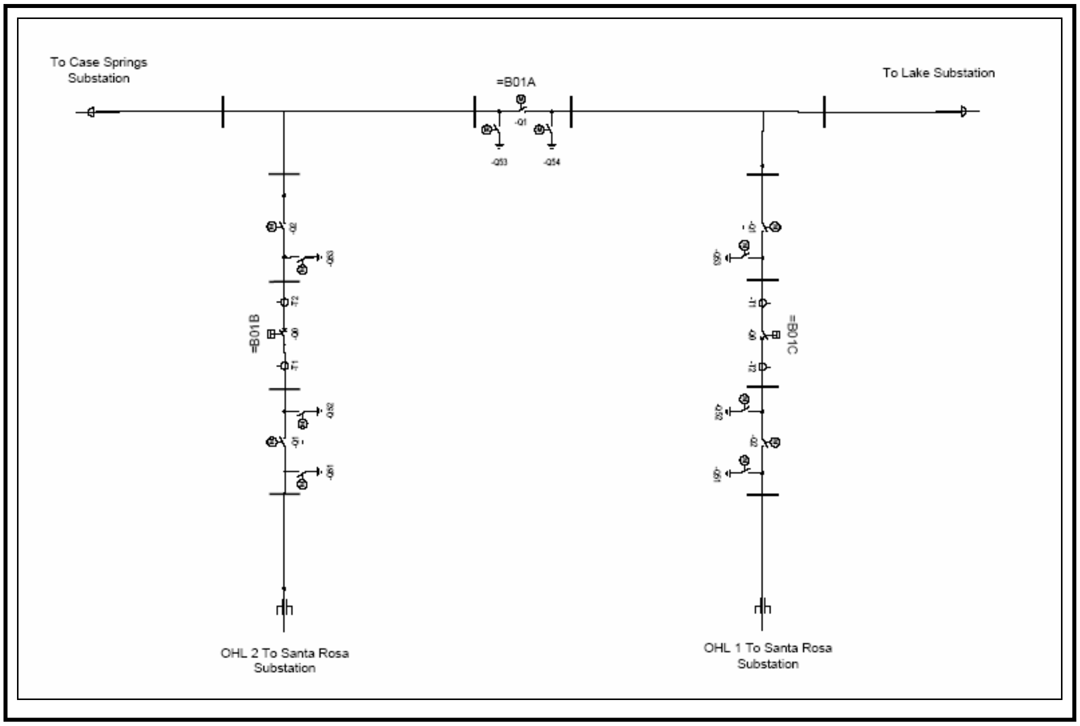


Figure 6.2.4.3-11. Alternative Transmission Line Underground Technology Single Line Drawing
Source: The Nevada Hydro Company

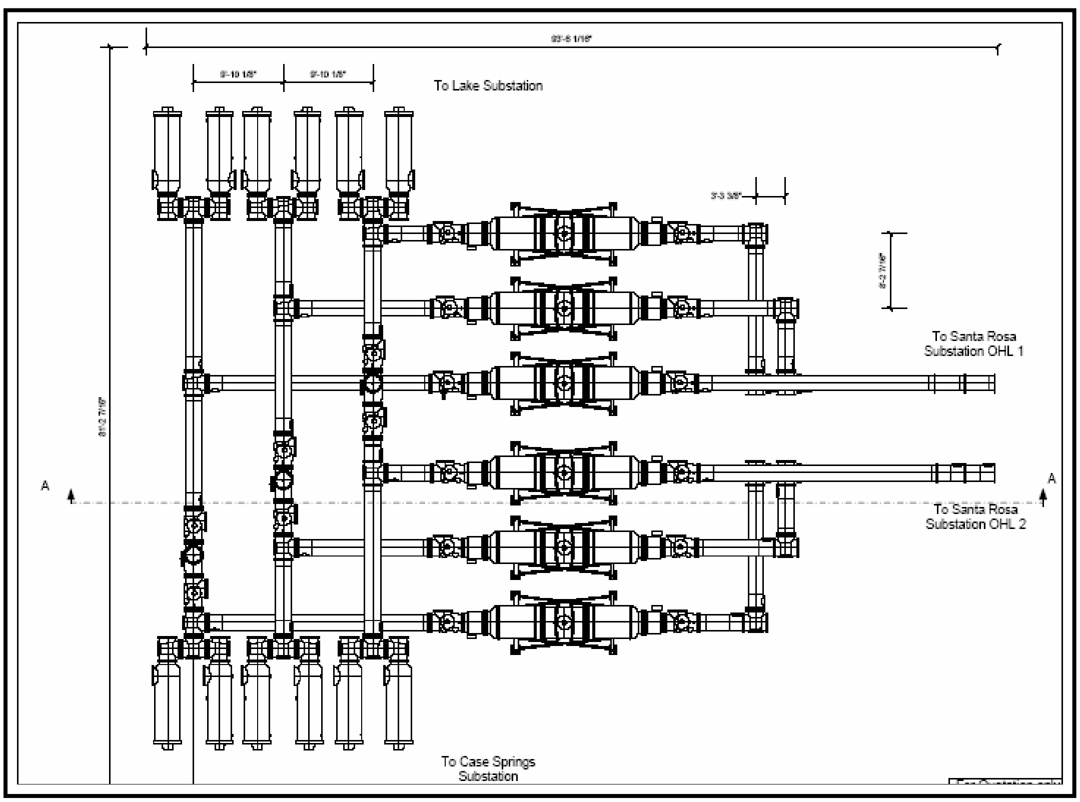


Figure 6.2.4.3-12. Alternative Transmission Line Underground Technology Plan View
Source: The Nevada Hydro Company

Assuming, for the purpose of this analysis, that generation and pumped storage are reasonably synonymous, although LEAPS provides an opportunity for new in-area renewable generation, it is assumed that a “New In-Area Renewable Generation” alternative constitutes an alternative strategy for renewable generation. As described in the Sunrise FEIR/FEIS, these renewable technologies are “considered as ‘non-wires alternatives’ because they offer alternatives. . .that do not include, as their primary component, construction of a transmission line.”[154]

Using the terminology from the Sunrise FEIR/FEIS, independent of any alternative assessment or licensing by FERC, while the TE/VS Interconnect can serve, in whole or in part, the combined role of a network upgrade and a generation-interconnect, the transmission portion of the “Applicant’s Proposed Project” is not the “primary component” LEAPS.

In order to distinguish this alternative from the “Applicant’s Proposed Project, presented in Table 6.2.4.3-2 (Capacity Added by the New In-Area Renewable Generation Alternative) is the mix of new renewable resources that would be developed (by others) in San Diego County under this alternative. As indicated in the Sunrise FEIR/FEIS, this capacity distribution is based on an energy planning assessment proportional to renewable availability in San Diego County.

Table 6.2.4.3-2. Capacity Added by the New In-Area Renewable Generation Alternative

In-Area Renewable Resource	Nameplate Capacity Added	Incremental Firm On-Peak Capacity
Solar Thermal	290	232
Solar Photovoltaic	210	105
Wind	400	96
Biomass/Biogas	100	100
Total	1,000 MW	533 MW

Source: California Public Utilities Commission

As indicated in the Sunrise FEIR/FEIS, the solar thermal component of the “New In-Area Renewable Generation” alternative would include large-scale solar thermal energy development in the Borrego Springs area.[155] However, “no developers have identified sites in Borrego Springs for such a large solar thermal project”[156] The solar photovoltaic component of this alternative would be dispersed throughout the SDG&E service territory; however, no “specific installation locations have not been identified.”[157]

In addition to those installations which are already likely to occur under the California Solar Initiative, the implementation of this alternative’s photovoltaic (PV) component would require the installation of “approximately 20,000 residential systems and 85 commercial systems per year during the three year period, 2008-2010.”[158] The accomplishment of that goal would necessitate an aggressive implementation program.

154/ Op. Cit., Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, p. E.5-1.
155/ As indicated in the Sunrise DEIR/DEIS, one of the “options” associated with this solar plant component would necessitate the construction of a new 36.5-mile transmission line (p. E.5-6), a length which is substantially longer than the new transmission line associated with the proposed project.
156/ Op. Cit., Draft Environmental Impact Report/Environmental Impact Statement and Proposed Land Use Amendment – San Diego Gas & Electric Company Application for the Sunrise Powerlink Project, SCH No. 2006091071, DOI Control No. DES-07-58, p. E.5-2.
157/ Ibid., p. E.5-12.
158/ Ibid., p. E.5-12.

With regards to biomass/biogas, one potential location is identified as the "Fallbrook Renewable Energy Project." As indicated in the Sunrise FEIR/FEIS: "Envirepel, Inc. would be the facility owner and as of this printing had yet to submit an Application for Certification to the California Energy Commission for project approval."[159] From this information, since this alternative's effectuation calls for implementation by others, the Applicant cannot attest to the feasibility of this alternative.

As indicated in Table 6.2.4.3-3 ("New In-Area Renewable Generation" Alternative" – Ability to Attain Stated Goals and Objectives), a "New In-Area Renewable Generation" alternative does not allow for the attainment of the Project's two stated goals, does not allow for the attainment of at least four of the seven "transmission component" objectives, and does not allow for the attainment of any of the five "pumped storage component" objectives. Three "transmission component" objectives could be deemed to be partially fulfilled because this alternative provides another solution accommodating a similar functional result.

As indicated in the Sunrise FEIR/FEIS, the large-scale solar thermal energy development in the Borrego Springs area would not be projected to come on line until 2016,[160] representing an in-service date substantially longer than the "Applicant's Proposed Project."

Other than the analysis presented in the Sunrise FEIR/FEIS, the Applicant does not possess independent material allowing for a further analysis of this alternative. As indicated in the Sunrise FEIR/FEIS, based on the assumptions presented therein and assuming that the document's conclusions would remain reasonably applicable to the "Applicant's Proposed Project": "This alternative would still create significant impacts as a result of the extensive ground disturbance, habitat loss, and visibility of the large wind and solar thermal components. The solar thermal component would have significant visual and recreation impacts due to its location in the Borrego Valley, highly visible from surrounding Anza-Borrego Wilderness areas. Also, the solar thermal component would require transmission line upgrades through the [Anza-Borrego Desert] Park, but they would be installed underground within paved roads. While these significant and unmitigable impacts would occur, the impacts would be largely confined to specific areas (except for transmission connections), rather than along an extended linear path. This alternative also greatly reduces the impacts of fire due to overhead obstacles (using the option in which the solar thermal transmission line would be underground)."[161]

The closure of older gas-fired power plants is not expected to occur under this alternative.[162]

In its "Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project" (CPUC, December 24, 2008), the CPUC stated that the "In-Area Renewable Alternative" was "infeasible for, among other things, meeting California's broader policy goals."[163]

159/ Ibid., p. E.5-14.
160/ Ibid., p. C-75.
161/ Ibid., p. ES-65.
162/ Ibid., p. H-137.
163/ California Public Utilities Commission, Decision Granting a Certificate of Public Convenience and Necessity for the Sunrise Powerlink Transmission Project, December 24, 2008, p. 5.

6.2.4.5 Alternative No. 9 - "No Project/No Build" Alternative

A "No Project/No Build" alternative is expressly required by the State CEQA Guidelines (14 CCR 15126.6[e]) and has, therefore, been included herein. The "No Project/No Build" alternative serves as a baseline against which all other development options are compared. The "No Project/No Build" alternative reflects the conditions and associated environmental impacts that would predictably occur should the "Applicant's Proposed Project" be denied by regulators or should the Project's regulators fail to take affirmative action on the proposed development plan, resulting in the retention of the Project sites in their existing condition.

Should the "Applicant's Proposed Project" or an alternative not be approved, the regional need for new generation and transmission facilities would continue to exist. The failure by the State, the IOUs, or another party to address those needs and/or the failure of conservation, distributed generation, and/or other efforts to increase supply or reduce demand would have regional environmental and economic consequences (e.g., increased potential for blackouts).[164] Those regional consequences are not addressed herein; rather, the "No Project/No Build" alternative focuses on the localized implications with regards to the individual Project sites.

Since it cannot be presumed that new energy development and/or conservations will occur elsewhere within the region, any election not to evaluate the continuing disparity between anticipated supply and expected demand underestimates the potential adverse impacts that would likely occur should the "Applicant's Proposed Project" not be implemented. Regional energy shortfalls can be anticipated beginning in 2010 but are not direct consequences of the "No Project/No Build" alternative.

As indicated in Table 6.2.4.5-1 ("No Project/No Build" Alternative – Ability to Attain Stated Goals and Objectives), a "No Project/No Build" alternative does not appear to allow for the attainment of the Project's two stated goals, does not appear to allow for the attainment of any of seven "transmission component" objectives, and does not appear to allow for the attainment of any of the five "pumped storage component" objectives.

The following analysis compares the potential environmental effects of this alternative against the potential impacts associated with the "Applicant's Proposed Project." Although each of the Project sites are assumed to be retained in their current conditions, additional areawide development is assumed (in a manner consistent with agency projections and other related projects located within the generalized geographic scope of cumulative impacts) to occur.

[164]/ As indicated by SDG&E, speaking with regards to their proposed SRPL project: "In the unfortunate event that the proposed project cannot be in place by the summer of 2010, at least 247 MW of in-basin generation or increased import capability would be needed to satisfy the identified reliability deficiency. This deficiency grows over time (reaching 835 MW by year 2020). In response to this growing deficiency, SDG&E must implement alternative schemes to meet the San Diego area reliability requirement. Certain new in-area generation options may be feasible. It might be possible to install enough new gas turbines to meet the San Diego area local reliability requirement for a few years. SDG&E, on behalf of its bundled customers, has issued a Request for Offer to see if additional peaking capacity can be economically added to the service territory by the summer of 2008. Assuming no other local plants retire, this additional peaking capacity would meet part of the identified need beginning in year 2010. SDG&E has also identified in its resource plan filed in R.06-02-013, a resource need starting in 2010 for additional capacity to meet bundled customer needs. A portion of this capacity may need to be in the form of new in-area generation if the Sunrise Powerlink is delayed. However, over the longer term it is impractical and inefficient to build enough gas turbines to satisfy the San Diego area reliability requirement, even without considering the obvious consequences for air quality. Even the most efficient gas turbines emit significant amounts of particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO) and volatile organic compounds (VOC). Case 200, SDG&E's gas-turbine reference case, requires 18 gas turbines each sized 46.6 MW to meet local reliability requirements in year 2020" (Source: San Diego Gas & Electric, Chapter VII – Supplemental Testimony, A.06-08-010, January 26, 2007, pp. 55-56).

Related projects are assumed to include, but are not limited to, the development of the "Ortega Oaks" site for residential use (Tract Map Nos. 22626 and 22626-1).

Under the "No Project/No Build" alternative, any positive environmental and economic impacts associated with the "Applicant's Proposed Project" would be forfeited.

- **Aesthetics**. Under the "No Project/No Build" alternative, no physical change would occur to any of the sites upon which the Project's proposed facilities (including facility alternative sites) have been identified. As a result, the significant aesthetic impacts of the "Applicant's Proposed Project" would be avoided. Localized and other areawide development would continue to occur and contribute to the furtherance of urbanization throughout the southern California area, including the conversion of undeveloped properties to urban uses and the reduction in areawide open space areas.

- **Agricultural Resources**. Independent of the development of the Project or the retention of those sites (or alternative facility sites) in their current conditions, because areawide development will continue to result in the conversion of farmlands to non-agricultural uses, impacts on agricultural resources will remain cumulatively significant.

- **Air Quality**. The San Diego Air Basin (SDAB) and the South Coast Air Basin (SCAB) are classified as non-attainment for a number of criteria pollutants, including ozone and inhalable particulate mater. As a result, since areawide development will continue to occur under this alternative, air quality impacts will remain cumulatively significant.

- **Biological Resources**. Predicted areawide development will continue to contribute to the progressive fragmentation of habitat areas and decline in species diversity throughout the southern California bioregion. Independent of the development of the "Applicant's Proposed Project" or the retention of the facility sites (or alternative facility sites) in their current conditions, the long-term, areawide loss of biological resources attributable to future development will produce a significant cumulative impact on biological resources.

- **Cultural Resources**. Under this alternative, impacts upon both on-site and near-site cultural resources (prehistoric, historic, and paleontological) attributable to the "Applicant's Proposed Project" would be avoided.

- **Geology and Soils**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no grading activities would be initiated by the Applicant. As a result, no significant geologic or soils impacts would be projected occur.

- **Hazards and Hazardous Materials**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no significant hazards or hazardous materials impacts would be projected to occur.

- **Hydrology and Water Quality**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no significant hydrology or water quality impacts would be projected to occur.

Table 6.2.4.3-3
"New In-Area Renewable Generation" Alternative" – Ability to Attain Stated Goals and Objective

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. This alternative does not include the development of the pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. This alternative does not include the development of the pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	**Partial attainment**. An unspecified amount of additional high-voltage transmission capacity would be developed under this alternative.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	**Partial attainment**. Although no additional import capacity would be created, in-area generation would reduce the need for that capacity.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	**Partial attainment**. Although no additional import capacity would be created, in-area generation would reduce the need for that capacity.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non-attainment. No new 500-kV interconnection would be constructed under this alternative.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	Non-attainment. This alternative is not anticipated to result in the development of any regional 500-kV transmission line segment.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	Non-attainment. No new electrical facilities would be constructed in the Lake Elsinore area.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

Table 6.2.4.5-1
"No Project/No Build" Alternative - Ability to Attain Stated Goals and Objectives

Goals and Objectives	Ability to Attain Stated Goal or Objective
Goals	
1. Take advantage of the unique combination of an existing water body, sufficient topographic variation (high head), and proximity to southern California energy markets to allow for the construction and operation of a modern and efficient pumped storage project.	Non-attainment. This alternative does not include the development of the pumped storage facility.
2. Connect the pumped storage project to CAISO grid in a manner which allows the stored power to serve the power needs of both the San Diego and Los Angeles metropolitan areas.	Non-attainment. This alternative does not include the development of the pumped storage facility.
Objectives (Transmission Component)	
I.1. Provide additional high-voltage transmission capacity to reduce congestion on the CAISO grid and thus reduce energy costs for CAISO consumers.	Non-attainment. No high-voltage transmission lines would be constructed or improved under this alternative.
I.2. Provide at least 1,000 MW of additional import capacity to SDG&E system at all times to enhance San Diego load area's access to renewable resources available through the WECC/CAISO transmission grid.	Non-attainment. This alternative does not create additional import capacity to the SDG&E system.
I.3. Provide at least 1,000 MW incremental transmission import capability for SDG&E under G-1/N-1 conditions to satisfy reliability criteria and to reduce the cost to SDG&E ratepayers of CPUC Resource Adequacy capacity.	Non-attainment. This alternative does not create additional import capacity to the SDG&E system.
I.4. Provide SDG&E with the first 500-kV interconnection with SCE and thus to the CAISO 500-kV network and thereby enhance the integration and operational reliability of the CAISO transmission grid.	Non-attainment. No new 500-kV interconnection would be constructed under this alternative.
I.5. Provide a potential future option for further expansion of the CAISO grid by contributing to the creation of a 500-kV link from Arizona-Imperial Valley-San Diego 500-kV facilities to the 500-kV network in the Los Angeles basin.	Non-attainment. This alternative would not result in the development of any regional 500-kV transmission line facilities.
1.6. Fortify and/or enhance localized electrical facilities and systems in order to better serve electrical demands and enhance local reliability within the Lake Elsinore area.	Non-attainment. No new electrical facilities would be constructed in the Lake Elsinore area.
I.7. Provide the CAISO grid with access to the planned LEAPS pumped storage hydropower generation plant, a location-constrained facility.	Non-attainment. This alternative would not facilitate the development of a pumped storage facility.
Objectives (Pumped Storage Component)	
II.1. Store excess off-peak energy production in the CAISO region, including off-peak production by wind generation facilities in the Tehachapi region and/or elsewhere, geothermal generation, and other existing baseload generation and release such energy by operation of the LEAPS hydropower generators as needed during peak-demand hours.	Non-attainment. This alternative would not accommodate the storage of off-peak energy.
II.2. Provide 500 MW of regulation, fast responding spin, and load following capability to integrate intermittent renewable resources procured by southern California Load Serving Entities (LSEs).	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.3. Provide 500 MW of regulation, fast responding spin, and load following capability to facilitate the development of workable competitive wholesale markets.	Non-attainment. This alternative would not provide additional regulation, fast responding spin, and load following capacity.
II.4. Provide 500 MW of Black Start capability, allowing for the restoration of network interconnections, to the CAISO southern California transmission system.	Non-attainment. This alternative would not provide additional Black Start capacity.
II.5. Provide voltage support for wind energy integration in the southern California electrical region.	Non-attainment. This alternative would not provide voltage support for wind integration.

Source: The Nevada Hydro Company

- **Land Use and Planning**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative for any Project-related use, no significant land use and planning impacts would be projected to occur.

- **Mineral Resources**. Since none of the Project's facility sites and none of the alternative site would be developed under this alternative, no significant mineral resource impacts would occur.

- **Noise**. Under the "No Project/No Build" alternative, none of the facility sites and none of the alternative sites would be developed for the proposed or an alternative use. Any proximal sensitive receptors would, therefore, not be subjected to either construction-term or operational noise attributable to the "Applicant's Proposed Project."

- **Population and Housing**. Under this alternative, no homes or other real property would be purchased, no residents would be displaced, and no inundation or other hazards would be created. Existing hazards would either remain at there existing levels or would increase as a result of other areawide and related project activities.

- **Public Services**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant impacts to police, fire protection, or vector control services would be projected to occur.

- **Recreation**. Since none of the Project's facility sites and none of the alternatives sites would be developed, no significant recreational impacts would be projected to occur.

- **Transportation and Traffic**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant transportation and traffic impacts would be projected occur.

- **Utilities and Service Systems**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant impacts to potable or non-potable water services or systems would be projected to occur.

- **Energy Resources**. Since none of the Project's facility sites and none of the alternative sites would be developed under this alternative, no significant energy resource impacts would be expected to occur.

6.3 Growth-Inducing Impacts

See Section 5.18 for a discussion and analysis of growth-inducing impacts.

This page intentionally left blank.