CHAPTER 2
Purpose and Need

This section defines the objectives, purpose, and need for the proposed Southern California Edison (SCE) Banducci 66/12 kilovolt (kV) Substation and associated distribution, subtransmission, and telecommunication facilities (Proposed Project), as required by the California Public Utilities Commission's (CPUC) Proponent's Environmental Assessment Guidelines (CPUC Information and Criteria List, Appendix B, Section V) and the California Environmental Quality Act (CEQA) Guidelines (Section 15000 *et seq*). Additional information regarding the Proposed Project's purpose and need is provided in SCE's application to the CPUC, in accordance with CPUC General Order 131-D.

2.1 Overview

SCE is a public utility that provides electric service to a population of approximately 14 million people within a 50,000-square-mile service area that encompasses 180 cities throughout Southern California. SCE's Proposed Project would add capacity to meet forecasted electrical demands, maintain system reliability, resolve anticipated service delivery voltage problems, and enhance operational flexibility in the unincorporated Cummings Valley area of Kern County. Figure 1-1: Proposed Project Location shows the location of the Proposed Project in relation to the larger regional area.

The Proposed Project is planned to be operational by June 2016, and would include the following major components:

- Construction of a new Banducci 66/12 kV Substation. Banducci Substation would be an unstaffed, automated, 56 megavolt-ampere (MVA), low-profile substation with a potential capacity of 112 MVA at final build out. The proposed 66/12 kV distribution substation would be located on an approximately 6.3 acre parcel in the unincorporated Cummings Valley area of Kern County.

- Construction of two new 66 kV subtransmission line segments that would loop the existing Correction-Cummings-Kern River 1 66 kV Subtransmission Line: one that would enter and one that would exit the proposed Banducci Substation creating the new Banducci-Kern River 1 66 kV Subtransmission Line and the new Banducci-Correction-Cummings 66 kV Subtransmission Line.

- Construction of three new underground 12 kV distribution getaways.

- Installation of telecommunications facilities to connect the proposed Banducci Substation to SCE's existing telecommunications system.

2.2 Project Objectives

The Proposed Project is being proposed to meet the following fundamental objectives:

- Provide safe and reliable electrical service.
- Add capacity to serve long-term forecasted electrical demand requirements in the Cummings Valley (Bear Valley Springs and Stallions Springs communities) beginning in 2016.
- Maintain system reliability within the Electrical Needs Area (ENA).
- Provide greater operational flexibility to transfer load between circuits and substation(s) within the ENA.
- Alleviate the anticipated service delivery voltage problems as the forecasted demand in the Bear Valley Springs and Stallion Springs areas grows beyond what can be reliably served by the existing 12 kV distribution circuits from the existing Cummings Substation.
- Meet the Proposed Project needs while minimizing environmental impacts.
- Design and construct the Proposed Project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects.

The Proposed Project components, location, preliminary configuration, and the modifications to existing components, are presented in Chapter 3 – Project Description. Each of the Proposed Project objectives is more thoroughly described as follows.

Provide safe and reliable electrical service.

Under the Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC), and California Public Utilities Commission (CPUC) rules, guidelines and regulations, SCE has the responsibility to ensure that electrical transmission, subtransmission, and distribution systems have sufficient capacity to maintain safe, reliable, and adequate service to customers. To ensure the availability of safe and reliable electric service, SCE has established a set of standards and criteria by which

it determines when new projects are needed. The safety and reliability of the systems must be maintained under normal conditions when all facilities are in service and also maintained under abnormal conditions when facilities are out of service due to equipment or line failures, maintenance outages, or outages that cannot be predicted or controlled that are caused by weather, earthquakes, traffic accidents, and other unforeseeable events.

Add capacity to serve long-term forecasted electrical demand requirements in the Cummings Valley (Bear Valley Springs and Stallions Springs communities) beginning in 2016.

The amount of electrical load that can be served in the ENA is limited to the maximum amount of electrical power that Cummings Substation can deliver before exceeding its maximum operating limit. The existing Cummings 66/12 kV Substation, which currently serves the ENA, is connected to the Antelope-Bailey 66 kV System through a network of 66 kV subtransmission lines. The substation has a set of three single phase transformers that reduces voltage from 66 kV to 12 kV, with a total capacity of 24.4 MVA. Three existing 12 kV distribution circuits exit Cummings Substation to serve load within the ENA.

As shown in Table 2-1 below, historical peak demand and projected peak demand in the ENA have increased since 2007. It should also be noted that these increases are over and above actual peak demand of 17.0 MVA recorded in 2003. The maximum operating limit of the transformers in the substation was 19.5 MVA until late July of 2007, while the actual peak demand in the ENA grew to 21.8 MVA in 2006 and 23.6 MVA in 2007. On July 25, 2006, due to higher than expected load growth in the Stallion Springs and Bear Valley Springs communities, SCE had to initially drop approximately 3.6 MVA of load which resulted in multiple rolling power outages. These outages affected numerous customers in the Bear Valley Springs community area. On July 6, 2007, SCE had to once again drop approximately 4.6 MVA of load one time for the same reason, which also affected a number of customers in the Bear Valley Springs community.

In August 2007, to alleviate the risk of dropping load due to peak demand exceeding maximum operating limit, SCE increased Cummings Substation's maximum operating limit to 24.4 MVA by adding cooling fans to the existing single phase transformers. In 2008, SCE further relieved Cummings Substation by transferring approximately 6.5 MVA of electrical demand to the

existing Monolith 66/12 kV Substation located approximately 6.5 miles east of Cummings Substation.

The peak demand and capacity data for Cummings Substation can be found in Table 2-1: ENA Substation Capacity and Peak Demand, which depicts historical and forecasted normal temperature condition peak demand, the 1-in-10 year heat storm peak demand, and the maximum operating limit data. Data presented in Table 2-1 is graphically represented in Figure 2-1: Substation Capacity and Electrical Needs Area Peak Demand.

The Proposed Project is expected to add sufficient additional substation capacity to the ENA as well as additional 12 kV distribution circuitry to make the new capacity available to end users in 2016.[1]

[1] At Cummings Substation, there is a spare single phase transformer onsite that can be energized in less than 24 hours if one of the three operational single phase transformers fails. However, due to technical constraints energizing this spare transformer would not provide any additional capacity to meet the projected need, and as a result, a new source of capacity (*i.e.,* the Proposed Project) is needed.

Table 2.1 Electrical Needs Area Substation Capacity and Peak Demand

Actual	**2007**	**2008**	**2009**	**2010**	**2011**
Maximum Operating Limit (MVA)	19.5	24.4†	24.4	24.4	24.4
Historical Peak Demand (MVA)	23.6	19.2*	20.8	19.7	18.0
Temp Adjusted Peak Demand Normal Condition (MVA)	22.4	18.8	20.0	20.8	19.8
Temp Adjusted Peak Demand 1-in-10 Year Heat Storm (MVA)	23.8	20.1	21.9	22.8	21.7
Planned Capacity and Projected Demand	**2012**	**2013**	**2014**	**2015**	**2016**
Planned Maximum Operating Limit (MVA)	24.4	24.4	24.4	24.4	24.4
Projected Peak Demand Normal Conditions (MVA)	19.9	21.4	21.5	21.8	22.5
Projected Peak Demand 1-in-10 Year Heat Storm (MVA)	21.8	23.4	23.5	23.9	24.6
Planned Capacity and Projected Demand	**2017**	**2018**	**2019**	**2020**	**2021**
Planned Maximum Operating Limit (MVA)	24.4	24.4	24.4	24.4	24.4
Projected Peak Demand Normal Conditions (MVA)	23.2	24.0	24.8	25.7	26.5
Projected Peak Demand 1-in-10 Year Heat Storm (MVA)	25.5	26.3	27.2	28.1	29.1

† Added cooling fans to increase the existing transformers' maximum operating limit by 4.9 MVA

* Transferred approximately 6.5 MVA of load to Monolith 66/12 kV Substation

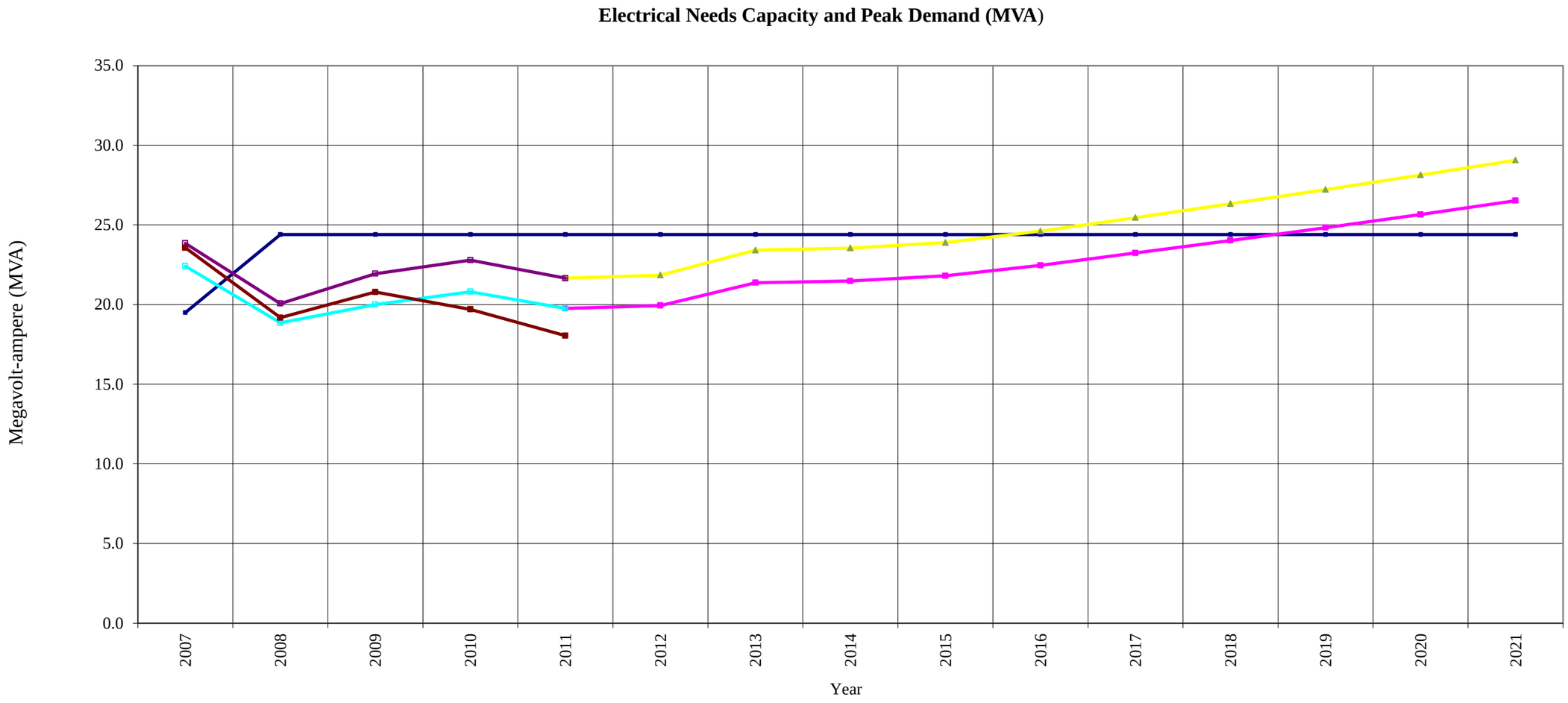

FIGURE 2.1: SUBSTATION CAPACITY AND ELECTRICAL NEEDS AREA PEAK DEMAND

PROPOSED BANDUCCI SUBSTATION PROJECT

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Maintain system reliability within the Electrical Needs Area.

The ENA is located within the Antelope-Bailey 66 kV System and is bounded by Woodford-Tehachapi Road to the east, El Camino Drive to the north, Pacific Gas & Electric (PG&E) service territory to the west, and High Gun Drive to the south. The ENA and the Substation Study Area are shown on Figure 1-2: Electrical Needs Area and Substation Study Area. The ENA's approximately 7,250 metered customers are currently served from Cummings Substation by three existing 12 kV distribution circuits. Cummings Substation is interconnected to the 66 kV system with Monolith 66/12 kV Substation to the east and Correction 66/12 kV Substation, which is a customer dedicated substation, to the west. However, Cummings Substation cannot accommodate the anticipated load growth in this area beyond 2016. Therefore, the Proposed Project is needed to serve increased electrical demand in the ENA as well as provide additional distribution circuits within the ENA in order to avoid a situation where load would have to be dropped to avoid overloading existing facilities during peak conditions. Load transfers are standard procedure to resolve distribution circuit and substation overloads during normal and abnormal operating conditions. If the ability to transfer load is limited, the end result would be diminished operating capabilities and reduced reliability. Furthermore, reliability issues arise from longer distribution circuits which create difficulties in transferring load between distribution circuits and between distribution substations. As distribution circuits increase in length and the load on those circuits continues to grow, the delivery voltage to the end of the circuits decreases and exposure to outages increases, thereby resulting in reduced reliability to the customers served by those circuits. Having an additional substation within the ENA as well as three additional 12 kV distribution circuits would increase the capacity available from which to draw power from during normal peak and abnormal emergency conditions, thereby maintaining reliability. These facilities would also be available to help facilitate the scheduling of planned maintenance outages, which would also help maintain reliability.

Provide greater operational flexibility to transfer load between circuits and substation(s) within the Electrical Needs Area.

Because Cummings Substation cannot accommodate the anticipated load growth in this area beyond 2016, the Proposed Project is needed to serve increased electrical demand in the ENA as well as provide additional distribution circuits within the ENA in order to avoid a situation where

load would have to be dropped to avoid overloading existing facilities during peak conditions. Having an additional substation with the ENA as well as three additional 12 kV distribution circuits would increase the number of substations and distribution circuits available to draw power from during abnormal emergency conditions, thus improving operational flexibility. These facilities would also provide an increased number of substations and distribution circuits in the area to help facilitate the scheduling of planned maintenance outages.

Alleviate the anticipated service delivery voltage problems as the forecasted demand in the Bear Valley Springs and Stallion Springs areas grows beyond what can be reliably served by the existing 12 kV distribution circuits from the existing Cummings Substation.

In the past five years, the area has seen significant load growth of approximately 3 to 4 percent per year, with most of the growth occurring in the Bear Valley Springs and Stallion Springs communities located more than seven miles west of the existing Cummings Substation. With continued anticipated load growth in these communities, Cummings Substation would not be able to reliably serve the Bear Valley Springs and Stallion Springs communities. Therefore, the Proposed Project is needed and is proposed to be located closer to the Bear Valley Springs and Stallion Springs communities. The Proposed Project would relieve Cummings Substation by transferring the load of Bear Valley Springs and Stallion Springs from Cummings Substation to the proposed Banducci Substation. Two of the existing 12 kV distribution circuits that exit Cummings Substation to serve the Bear Valley Springs and Stallion Springs communities are approximately 22 miles and 14 miles long, respectively. These circuits have very limited load transfer capability, and the lengths of the circuits significantly exceed SCE's maximum preferred distribution circuit length of approximately 3 to 5 miles. In fact, the customers in the Bear Valley Springs and Stallion Springs communities have experienced outages due to delivery voltage levels that fell below acceptable limits in the past. SCE has implemented improvements on these 12 kV distribution circuits to correct low voltage problems. These improvements included the addition of circuit regulators used to boost circuit voltage, the addition of field capacitor banks to improve power factor, and the replacement of circuit conductors to minimize voltage drop.

However, additional similar improvements would not be effective in providing the necessary additional capacity to meet the long term projected increase in electrical demand. In fact, based on historical growth trends and known residential and agricultural developments either under construction or planned to be constructed, SCE projects that the forecasted peak demand of a 1-in-10 year heat storm in accordance with SCE's peak demand forecast for the Bear Valley Springs and Stallion Springs communities would increase by approximately 0.2 MVA and approximately 0.6 MVA in 2012 and 2013. As a result, the electrical demand is projected to exceed the operating limits of the circuits serving these communities, even with the existing 12 kV circuit improvements in place, increasing the risks of service interruptions due to overloaded automatic reclosers (ARs).[2]

By constructing the Proposed Project, the new Banducci Substation would be located closer to these loads and the new 12 kV distribution circuits would be shorter, would serve less load than the existing configured circuits, and thus would improve overall voltage to SCE's customers located in the Bear Valley Springs and Stallion Springs communities.

Meet the Proposed Project needs while minimizing environmental impacts.

CEQA and the CEQA Guidelines—Title 14 of the California Code of Regulations, Section 15000, *et seq.*—require that an environmental impact report describe a reasonable range of alternatives to a proposed project, or the location of the proposed project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. CEQA Guidelines Section 15126.6(d) requires that sufficient information about each alternative be included to allow meaningful evaluation and analysis.

[2] An automatic recloser is a protective device used to clear downstream electrical faults.

Although several locations and subtransmission route alternatives and system alternatives were considered, the Proposed Project described in this PEA was ultimately selected because it is technically feasible, and would result in the fewest potential environmental impacts compared to the other alternatives while still meeting the Proposed Project objectives.

Design and construct the Proposed Project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects.

SCE strives to construct substations in a consistent manner, meaning that the substation layouts, switch rack designs, equipment, and operating requirements at each substation are consistent and familiar to the field personnel required to operate and maintain the equipment at multiple substations. SCE develops and revises these standards as necessary based on experience to ensure SCE builds safe, reliable and operable substations on a consistent basis. In addition, consistent designs help ensure that upgrades to existing substations and newly constructed substations are completed in a manner that provides the lowest total cost of ownership.

This same concept applies to transmission lines, subtransmission lines, and distribution lines. SCE obtains this consistent design through the development and use of standards. In addition, SCE's standards provide a base to evaluate the merits of proposed changes which are evaluated to determine impact on safety, reliability, operations, maintenance, construction and cost.

2.3 References

California Natural Resources Agency. (2007). *Title 14 California Code of Regulations, Section 15000 et seq*. Retrieved August 2013 from http://ceres.ca.gov/ceqa/guidelines/

California Public Utilities Commission. (1979). Information and Criteria List, Appendix B, Section V. Retrieved August 2013 from http://www.cpuc.ca.gov/puc/energy/environment/infocrit.htmCalifornia Public Utilities Commission. (1995). *General Order 131-D*. Retrieved August 2013 from http://docs.cpuc.ca.gov/published//Graphics/589.PDF