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2.0 PROPOSED PROJECT PURPOSE AND NEED

This section of the PEA identifies the objectives, purpose, and need for SDG&E's Artesian 230kV Substation Expansion Project (Proposed Project) as required by the CPUC PEA Guidelines (CPUC Information and Criteria List, Appendix B, Section V) and the California Environmental Quality Act (CEQA) Guidelines (Section 15124(b)). Additional information regarding the Proposed Project's purpose and need is provided in SDG&E's application to the CPUC, in accordance with CPUC General Order 131-D.

SDG&E requests approval of the Proposed Project to mitigate North American Electric Reliability Corporation (NERC) reliability violations, ensure the reliability of the electrical transmission system¹, meet State of California policy goals to provide safe, reliable, and reasonably priced electric power to local cities and communities, accommodate future load growth, and improve transmission system efficiency.

2.1 OVERVIEW OF PROJECT NEED

2.1.1 Existing and Projected Electric System Constraints

SDG&E is a regulated public utility that provides electric service to approximately 3.4 million electric customers within a 4,100-square-mile service area, covering 25 cities and unincorporated areas within San Diego County and a portion of Orange County. The Poway Area Load Pocket² (as shown in Figure 2-1) includes five 69/12 kV distribution substations³ located in the Poway, 4S Ranch, Rancho Peñasquitos, Carmel Mountain Ranch and Black Mountain Ranch Communities. In 2013 this load pocket alone peaked at approximately 300 megawatts (MW) or 6 percent of the overall SDG&E system peak. These communities are forecasted to grow 15 percent (average annual growth of 1.5 percent to an aggregate load of approximately 345 MW) over the next ten years. Table 2-1 shows the 10-year forecasted loads in the Poway Area Load Pocket for the 2013 Transmission Planning study cycle. The forecasted load is based upon load transfers, customer requests adding new load (i.e. new development) and projected growth. Once SDG&E completed the forecast, the SDG&E non-coincident system forecast is compared against the system-wide projections prepared by the California Energy Commission (CEC), and adjustments are made if necessary.

¹ Per SDG&E Transmission terminology, the "transmission system" refers to all voltages above 50kV. This would therefore include voltages categorized as "power lines" and "transmission lines" under General Order 131-D.

² The Poway Area Load Pocket serves approximately 58,000 customers (including both small-scale residential and large-scale industrial customers).

³ From south to north: Pomerado, Poway, Rancho Carmel, Bernardo, and Artesian Substations.

Figure 2-1: Poway Area Load Pocket Existing System

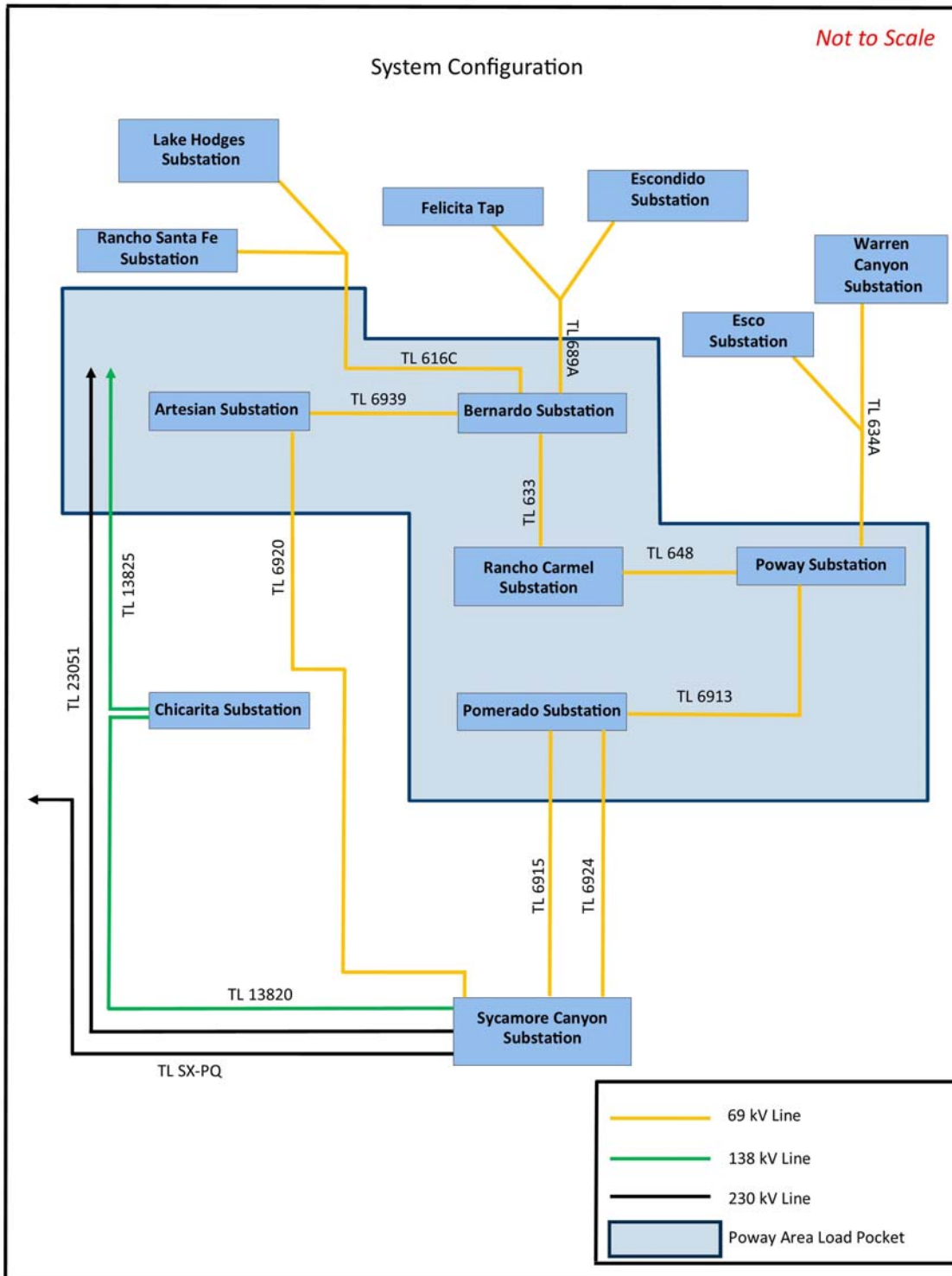


Table 2-1: 2013 Non-coincident Loads (MW) in Poway Area Load Pocket

Substation	2013 (MW)	2014 (MW)	2015 (MW)	2016 (MW)	2017 (MW)	2018 (MW)	2023 ⁴ (MW)
Artesian	34.2	34.5	34.9	35.2	35.6	36.6	44.5
Bernardo	94.5	96.7	98.0	99.3	100.6	104.5	107.3
Poway	47.3	42.8	43.3	43.8	44.3	45.7	45.5
Pomerado	54.7	59.9	69.3	69.9	70.5	71.1	75.3
Rancho Carmel	69.6	70.3	70.7	71.1	71.5	71.9	74
<i>Aggregate</i>	<i>300.3</i>	<i>304.2</i>	<i>316.2</i>	<i>319.3</i>	<i>322.5</i>	<i>329.8</i>	<i>346.6</i>
<p><u>Notes:</u> Poway Area Load Pocket is forecasted to increase by as much as 15 percent over the next 10 years (2013 – 2023).</p> <p>Source: SDG&E Individual Non-Coincident Substation Load Forecast Published in 2013</p>							

Based on technical studies performed as a part of the 2013/2014 transmission planning cycle, SDG&E identified a NERC Category B thermal violation occurring as early as 2016. In 2015, as directed by NERC and the California Independent System Operator (CAISO), SDG&E adopted the new NERC Reliability Standard, TPL 001-4; this new standard supersedes the previous NERC standards TPL-001, -002, -003, and -004. TPL-001-4 revised the naming convention for system contingencies. Under the new standard, N-1 Category B violations would now be referred to as Category P1⁵. The Category P1 violation, N-1⁶ of TL6915 overloads TL6924 and the N-1 of TL6924 overloads TL6915, see Figure 2-2 below.

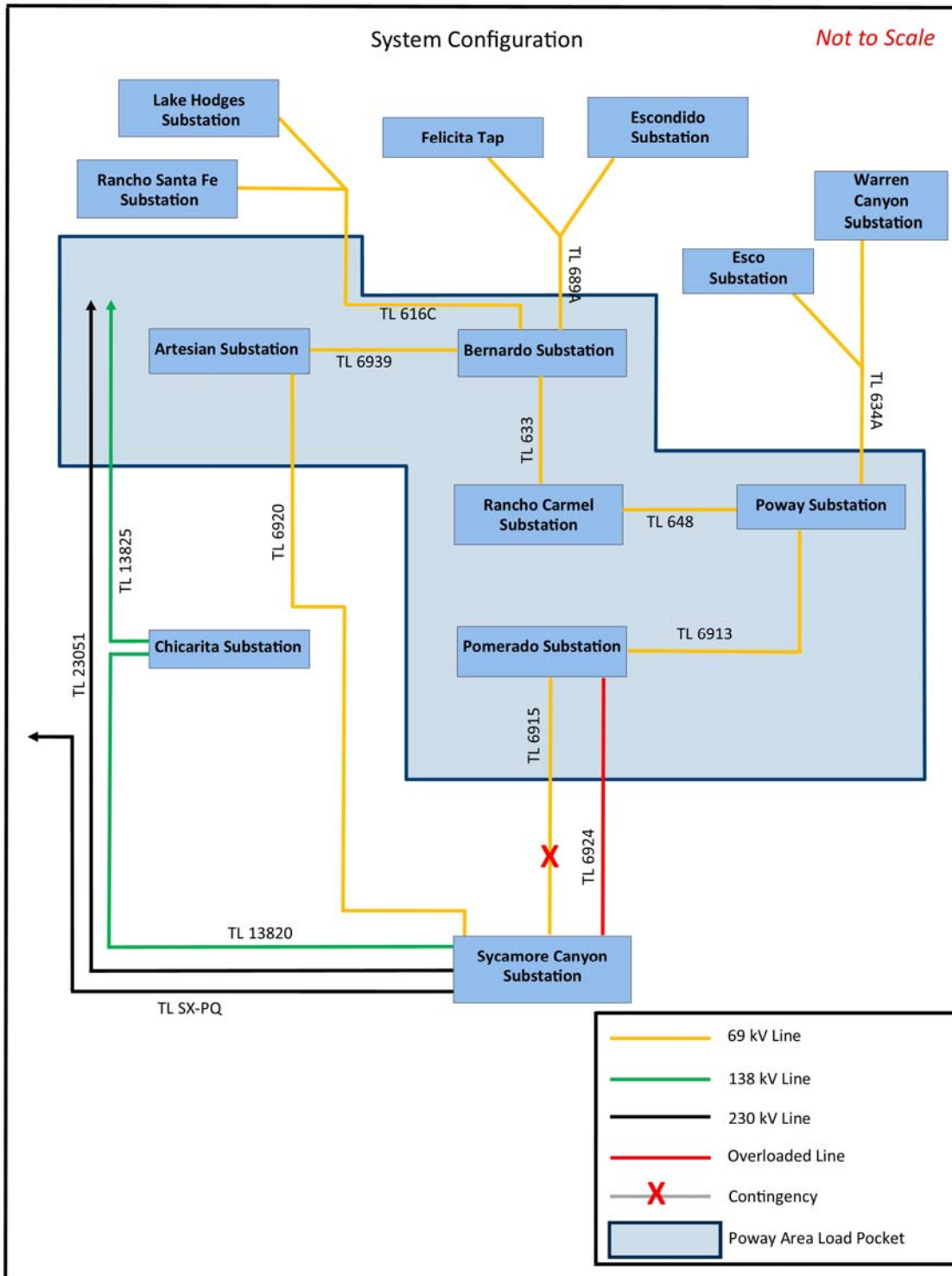
NERC Reliability Standard TPL001-4 is a mandatory standard, as provided for under the Energy Policy Act of 2005. SDG&E, as a NERC registered Transmission Planner, is obligated to comply with the requirements of this standard. For a Category P1 violation, non-consequential loss of customer load is not an acceptable mitigation. As there is no significant amount of generation available for redispatch within the Poway load pocket, it is necessary to upgrade the transmission network serving this area in order to meet NERC planning criteria and avoid violation of the applicable standard.

⁴ The 10th year load forecast is extrapolated based on long term growth rates

⁵ The new naming criteria is defined in the NERC TPL001-4 standard.

⁶ N-1 – Event resulting in the loss of a single element (i.e. a power or transmission line).

Figure 2-2: NERC Violation in the Poway Area Load Pocket



2.1.2 CAISO Review/ Approval and SDG&E's Proposed Project

The need to upgrade the transmission system in the Poway Area Load Pocket has been identified in both SDG&E's and the CAISO long term assessment of this area. The Proposed Project was reviewed for need and effectiveness by CAISO technical staff in the CAISO's 2013/2014 Transmission Planning Process (TPP). CAISO technical staff determined that the Proposed Project was necessary, appropriate, and cost effective and recommended approval of the Proposed Project by the CAISO Board of Governors. The Proposed Project was approved by the CAISO Board of Governors in 2014 and is included in the Board-approved 2013/2014 transmission expansion plan. The scope of the Proposed Project is described in detail in Section 3.0 of this PEA, Proposed Project Description.

The Proposed Project would result in the Artesian Substation being expanded into a 230/69kV substation and includes upgrades to the existing 69kV system, that combined with the 230kV expansion at the Artesian Substation, will provide an additional 230kV source sufficient to supply power to the Poway Area Load Pocket, see Figure 2-4 below.

In addition, the Proposed Project meets the ultimate goal for SDG&E and the CAISO that any upgrade to the transmission system provide safe, reliable, and reasonably priced electric power to the local cities and communities. This is consistent with California Public Utilities Code Section 451⁷ and SDG&E's obligation to serve by implementing a comprehensive and long-term electric system strategy. Also, it meets one of CAISO's primary missions: to benefit customers by operating the electric grid in a reliable and efficient manner.⁸

2.2 PROJECT OBJECTIVES

The Proposed Project objectives are as follows:

1. Meet mandatory NERC reliability criteria identified in the Poway Area Load Pocket;
2. Alleviate ongoing 69kV congestion at the Sycamore Canyon 230/138/69kV Substation;
3. Locate proposed facilities within existing transmission corridors, SDG&E ROW, and utility owned property.

⁷ Pursuant to Cal. Pub. Util. Code § 451 "[e]very public utility shall furnish and maintain such adequate, efficient, just, and reasonable service, instrumentalities, equipment, and facilities, including telephone facilities, as defined in Section 54.1 of the Civil Code, as are necessary to promote the safety, health, comfort, and convenience of its patrons, employees, and the public." Further, Cal. Pub. Util. Code § 330 (g) provides that "[r]eliable electric service is of utmost importance to the safety, health, and welfare of the state's citizenry and economy. It is the intent of the Legislature that electric industry restructuring should enhance the reliability of the interconnected regional transmission systems, and provide strong coordination and enforceable protocols for all users of the power grid." Generally, the CPUC provides the following language in regards to a utility's obligation to serve: "The utilities' obligation to serve their customers is mandated by state law and is part and parcel of the entire regulatory scheme under which the utilities received a franchise and under which the CPUC regulates utilities under the Public Utilities Act. (*See, e.g.*, Pub. Util. Code §§ 451, 761, 762, 768, and 770)" [Footnote omitted] (D.02-12-069 at 7-8).

⁸ CAISO Mission Statement: "For the benefit of our customers, we: (1) operate the grid reliably and efficiently; (2) provide fair and open transmission access; (3) promote environmental stewardship; and (4) facilitate effective markets and promote infrastructure development. All through the provision of timely and accurate information."

2.2.1 Objective 1: Meet mandatory NERC reliability criteria and mitigate existing NERC thermal violations identified in the Poway Area Load Pocket

Under current conditions as described in Section 2.1.1, loss of either the TL6915 or TL6924 power line results in a NERC Category P1 thermal violation of the other line. The Proposed Project will provide an additional 230kV source directly connected into the Poway Area Load Pocket. Having a 230kV source at Artesian, along with the associated plan of service, will mitigate the NERC Category P1 violations. The Proposed Project would allow SDG&E to comply with NERC TPL001-4 standards. As a result, the Proposed Project would achieve Objective No. 1.

2.2.2 Objective 2: Alleviate existing 69kV Congestion at the Sycamore Canyon Substation

As illustrated in Section 2.1.1, the Poway Area Load Pocket is primarily supported by three 69kV power lines sourced from Sycamore Canyon Substation (230kV source). In year 2016, SDG&E forecasts that approximately 82 percent of the Poway Area Load Pocket load will be supplied by the three 69kV power lines out of the Sycamore Canyon Substation (TL6920, TL6915, and TL6924). Having a 230/69kV substation at Artesian will allow SDG&E to redistribute approximately 48 percent of the Poway Area Load Pocket load through Artesian, reducing the existing 69kV congestion at the Sycamore Canyon Substation by approximately 30 percent with all lines in service (see Figure 2-3 and Figure 2-4 below). As a result, the Proposed Project would achieve Objective No. 2.

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Figure 2-3: Flow Directions in Poway Area Load Pocket – Pre Project

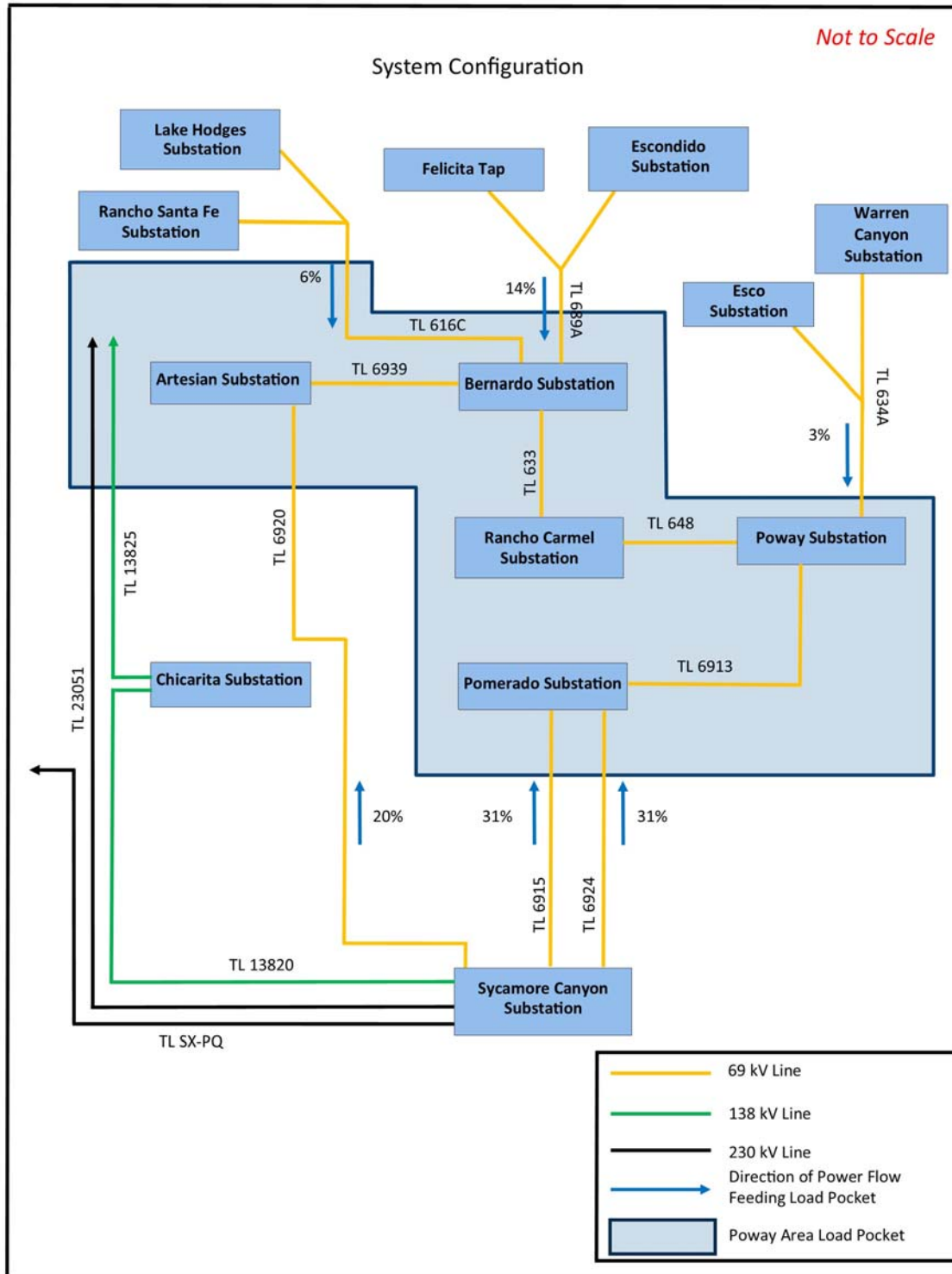
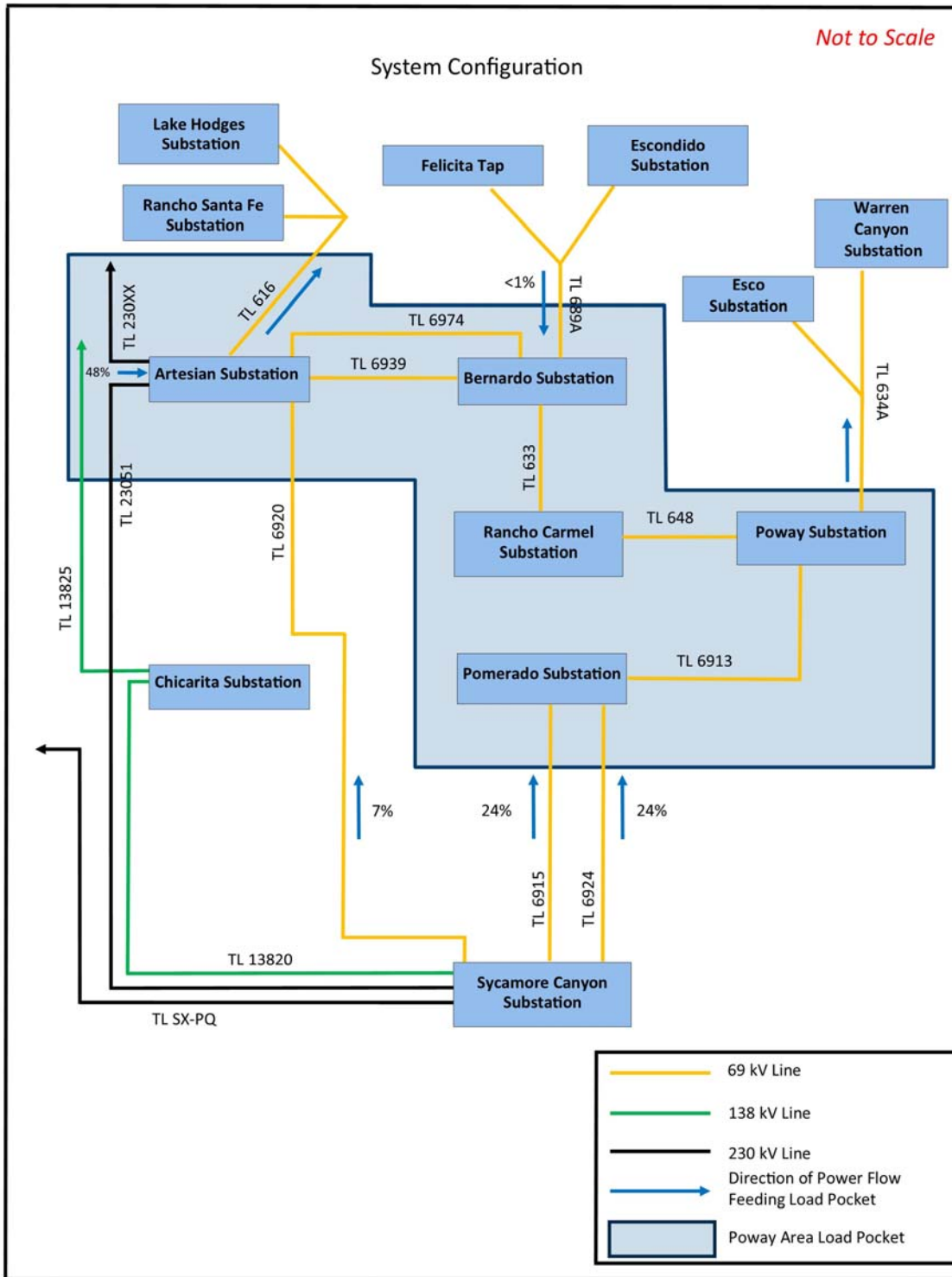


Figure 2-4: Flow Directions in Poway Area Load Pocket – Post Project



2.2.3 Objective 3: Locate Proposed Facilities within Existing Transmission Corridors, SDG&E Right Of Way, and Utility Owned Property

Another primary objective of the Proposed Project (and for SDG&E as a general rule of utility system management) is to locate new and upgraded facilities (including the proposed facilities associated with this Project) within existing SDG&E Right of Way (ROW), fee-owned property, or franchise positions and within areas that already include electric transmission and power facilities, to the extent feasible. This is consistent with state law guiding the use of existing transmission corridors, known as the Garamendi Principle⁹.

The Proposed Project would be constructed and operated utilizing existing transmission corridors, SDG&E ROW, and utility-owned property. Specifically, the primary project components would be located as follows:

- 230kV substation yard: The new 230/69kV Artesian Substation yard would be constructed and operated on existing SDG&E property at the Artesian Substation site (currently the Artesian 69/12kV substation yard).
- New 230kV source: SDG&E operates an existing 230kV transmission line which is located immediately adjacent to the Artesian Substation, within existing ROW and transmission corridor. This existing transmission line will be looped into the expanded Artesian Substation without the need for new ROW or creation of a new transmission corridor.
- Expanded Artesian 69/12kV substation: the expanded and upgraded Artesian 69/12kV substation yard would be constructed and operated on existing SDG&E-owned property located immediately adjacent to the existing Artesian 69/12kV substation yard.
- 69kV power line upgrades: The connection of TL616 to the Artesian Substation and the creation of the new Artesian to Bernardo 69kV circuit (TL6974) would both be completed utilizing a combination of existing and replacement structures located entirely within existing SDG&E ROW and franchise position (city streets).
- Other system upgrades: minor modifications at the Bernardo and Rancho Carmel substations, as well as reconductoring of a portion of existing TL648 would all be completed within existing substation properties and SDG&E ROW.

The Proposed Project therefore requires no additional ROW or other land rights. As a result, the Proposed Project would achieve Objective No. 3.

⁹ Garamendi Principle – Transmission Siting SB 2431 (Garamendi), Chapter 1457, 62, Statutes of 1988: 1. Encourage the use of existing ROW by upgrading existing transmission facilities where technically and economically feasible; 2. When construction of new transmission lines is required, encourage expansion of existing ROW, when technically and economically feasible; and 3. Provide for the creation of new ROW when justified by environmental, technical, or economic reasons defined by the appropriate licensing agency.

2.3 CONCLUSION

In the 2013 - 2014 Transmission Planning Process SDG&E identified the forecast overload of TL6915 after the N-1 of TL6924 and vice versa, violating NERC reliability standards. The Proposed Project was developed to mitigate these forecasted NERC violations. The Proposed Project was reviewed and approved by CAISO, and is included in the 2013/2014 Transmission Plan. The Proposed Project will not only mitigate the identified NERC violations but also improve transmission system reliability in the Poway Area Load Pocket by adding an additional 230kV source, and reduce 69kV congestion at Sycamore Canyon Substation.