4. Project Description

4.1 Project Title

SCE Banducci Substation Project
SCE Application No. A.12-11-011

4.2 Project Sponsor's Name and Address

Southern California Edison Company
2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770

4.3 Lead Agency Name and Address

California Public Utilities Commission
Energy Division
505 Van Ness Avenue, Third Floor
San Francisco, California 94102

4.4 Lead Agency Contact Person and Phone Number

Jensen Uchida, Project Manager
Energy Division
Phone: (415) 703-5484
E-mail: Jensen.Uchida@cpuc.ca.gov

4.5 Project Location

The proposed 3.3-acre Banducci Substation would be located on a 6.3-acre site in south central Kern County, west of the City of Tehachapi. The site is at the southeast corner of Pelliser Road and unimproved Dale Road in the community of Cummings Valley (see Figure 4-1, Project Location). The Proposed Project site is in close proximity to the existing Correction-Cummings–Kern River #1 66 kV subtransmission line. Two new subtransmission segments would be constructed on new and replaced poles along Pelliser Road, Highline Road, and within the substation perimeter. A total of 30 miles of fiber optic conduit and cable would be installed in a loop between the proposed Banducci Substation and the existing Cummings and Monolith Substations, located approximately 6 and 12 miles east of the Proposed Project site, respectively.

4.6 Surrounding Land Uses and Setting

The Proposed Project is located entirely within unincorporated Kern County, California. In general, the land surrounding the Proposed Project is rural with mountainous areas to the north and south. The City of Tehachapi is the only incorporated city in the project area. It is located approximately 10 miles east of the Cummings Valley and portions of the proposed telecommunication routes for the Proposed Project would be within the City limits.

The proposed Banducci Substation site has a history of general agricultural use. The vicinity of the site is also in agricultural use, with occasional isolated farm residences along local roads. The nearest cluster of residential development to the site is the community of Stallion Springs, approximately 2 miles southwest of the project site. The community of Bear Valley Springs is located in a separate valley approximately 3 miles northwest of the proposed Banducci Substation site. The California Correctional Institution is located approximately 1.6 miles northeast and east of the proposed substation site within the City of Tehachapi.

Several residences are located near the proposed telecommunications routes. The closest of the residences are one single family residence located off Highline Road just north of the Proposed Telecommunications Route #1 and several clusters of residences located just east and west of the Proposed Telecommunications Route #2 along South Curry Street and South Mill Street in the City of Tehachapi.

4.7 General Plan Designation

The Proposed Project would be entirely within Kern County. Although the Proposed Project would not be subject to local plans and policies, this assessment considers project consistency with the federal, state, and local plans, including the Kern County General Plan and the Greater Tehachapi Area Specific and Community Plan (GTASCP), consistent with CPUC General Order 131-D (Kern County, 2009 and 2010).

The proposed Banducci Substation site would be located on land designated as Intensive Agriculture by the Kern County General Plan and the GTASCP (Kern County, 2009). "Public utility uses" is an allowed use in the Intensive Agriculture designation. The proposed telecommunications routes would be located on lands designated in the Kern County General Plan as Residential, Incorporated Cities (within the City of Tehachapi), Resource Reserve, and Intensive. Public utility uses are consistent with these General Plan designations as well.

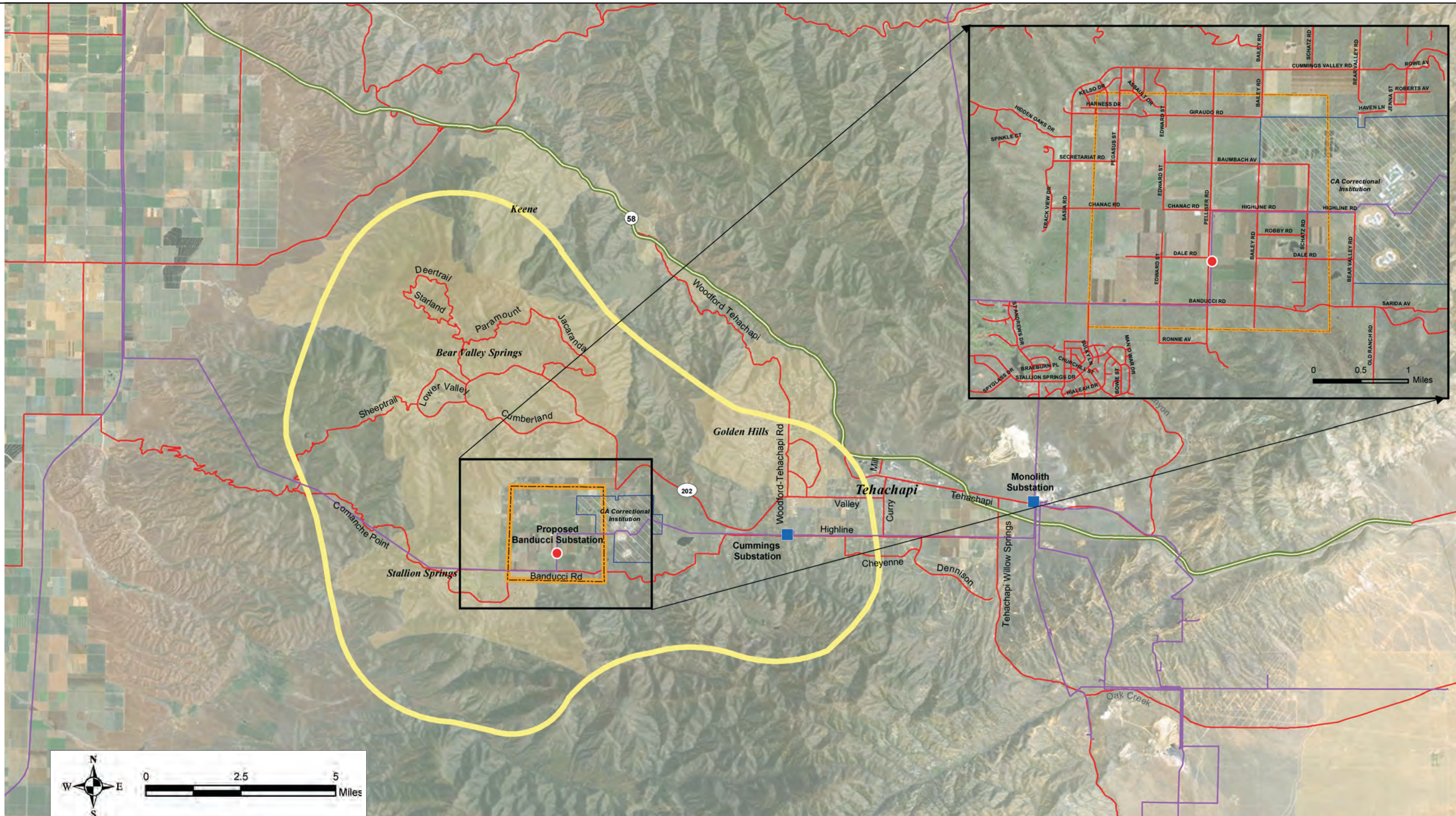
Four potential staging yard locations have been proposed. Temporary staging yards for use during construction would be located on the Banducci Substation property, and on previously disturbed land North of Highline Road and in Highwind Substation. These would be within the Intensive Agriculture land use designation (Kern County, 2009). The Tehachapi Service Center in the City of Tehachapi would also be used as a staging yard. It is designated for light industrial, residential, and manufacturing uses, with commercial and utility-related land uses.

4.8 Zoning

Most of the Substation Study Area (see Figure 4-1) is in Kern County and is zoned A (Exclusive Agriculture). A small area at the northwest corner of the study area is zoned E2-1/2 (Estate 2.5 acres, Residential Suburban Combining). A portion of the California Correctional Institution property is in the eastern part of the study area. It is within the City of Tehachapi and is zoned A (Agriculture), which was its zoning designation when the property was annexed in 1998.

Proposed Project components would be located within or adjacent to the following zoning districts:

- Banducci Substation property (substation and staging yard), North of Highline Road staging yard, and Highwind Substation staging yard (in Kern County):
  - A (Exclusive Agriculture).
- Tehachapi Service Center staging yard (in Tehachapi):
  - M-2 (Light Industrial)



Aspen Environmental Group

Source: SCE, 2014a.

Legend

- Proposed Banducci Substation
- Existing SCE Substation
- Banducci Electrical Needs Area
- Existing Subtransmission Lines
- Freeway / Major Highway
- Major Road / Minor Highway
- Substation Study Area
- CA Correctional Institution

Figure 4-1
Project Location

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- Telecommunications routes (in Kern County and Tehachapi):

  Agriculture:
  - A (Exclusive Agriculture)
  - A-1 (Limited Agriculture)
  - A WE (Exclusive Agriculture) (Wind Energy Combining)

  Commercial:
  - C-2 (Central Commercial)
  - C-2 PD (Neighborhood Commercial) (Precise Development Combining)
  - C-2 PD SC (Neighborhood Commercial) (Precise Development Combining) (Scenic Corridor Combining)
  - C-3 (General Commercial)

  Residential:
  - E(1) RS MH (Estate – I acre) (Residential Suburban Combining) (Mobilehome Combining)
  - E(2 1/2) RS (Estate – 2-1/2 acres) (Residential Suburban Combining)
  - E(5) (Estate – 5 acres)
  - E(5) RS (Estate – 5 acres) (Residential Suburban Combining)
  - E(2 1/2) RS MH (Estate – 2-1/2 acres) (Residential Suburban Combining) (Mobilehome Combining)
  - E(5) RS MH (Estate – 5 acres) (Residential Suburban Combining) (Mobilehome Combining)
  - E(10) RS MH (Estate – 10 acres) (Residential Suburban Combining) (Mobilehome Combining)
  - E(20) RS MH (Estate – 20 acres) (Residential Suburban Combining) (Mobilehome Combining)
  - MP (Mobilehome Park)
  - R-1 (Low Density Single Family Residential)
  - R-2 (Medium Density Residential)
  - RSP (Recreation, School, Public Use)

  Other:
  - M-1 (Light Industry)
  - M-2 (Heavy Industry)
  - M-2 PD (Medium Industrial) (Precise Development Combining)
  - OS (Open Space)

4.9 Project Overview

4.9.1 Project Objectives

SCE has identified the fundamental objectives of the Proposed Project 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.
- **Add capacity to serve long-term forecasted electrical demand requirements in the Cummings Valley** (including Bear Valley Springs and Stallions Springs communities) in 2016.
- **Maintain system reliability within the Electrical Needs Area (ENA).** Line failures, maintenance outages, or failure of system components arise from unpredictable events caused by weather, earthquakes,

traffic accidents, or other unforeseen natural or manmade catastrophes. The addition of distribution lines and electrical capacity would ensure reliable service for the ENA's approximately 7,250 metered customers by offering more points at which to intervene in the event of these system failures.

- **Provide greater operational flexibility to transfer load between circuits and substations within the ENA.** Having an additional substation within 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 conditions, thus improving operational flexibility. These facilities would also 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.** Due to the higher than expected load growth in the Cummings Valley (3-4 percent per year in the last 5 years), SCE has had to drop load, resulting in multiple rolling power outages in the communities of Bear Valley Springs and Stallion Springs. The proposed Banducci Substation would be located closer to these loads and the new 12 kV distribution circuits would be shorter and would serve less load than the existing configured circuits, thereby improving overall voltage to SCE's customers in these communities.
- **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.**

4.9.2 Purpose and Need

Currently, the Cummings 66/12 kV Substation on Highline Road at Adelante Street west of Tehachapi serves the entire ENA. Equipment includes a set of three single phase transformers that reduces voltage from 66 kV to 12 kV and three 12 kV distribution circuits with a total capacity of 24.4 MVA. The amount of electrical load that can be served in the ENA is limited to the maximum amount of electrical power that Cummings 66/12 kV Substation can deliver. In the past five years, the area has seen load growth of approximately 3 to 4 percent per year, primarily within the communities of Bear Valley Springs and Stallion Springs. Figure 4-1 (Project Location) provides an overview of the Proposed Project area, including the ENA and the existing Cummings and Monolith Substations.

Until late July 2007, the maximum operating limit of the transformers at Cummings Substation was 19.5 MVA, when peak demand in the ENA grew to 21.8 MVA in 2006 and 23.6 MVA in 2007. On July 25, 2006, SCE had to drop approximately 3.6 MVA of load, which resulted in multiple rolling power outages. SCE has increased Cummings Substation's maximum operating limit to 24.4 MVA and transferred approximately 6.5 MVA of electrical demand to the existing Monolith 66/12 kV Substation, located 6.5 miles east of Cummings Substation, on Williamson Road near East Tehachapi Boulevard.

The Proposed Project would relieve Cummings Substation by transferring the load of Bear Valley Springs and Stallion Springs to the proposed Banducci 66/12 kV Substation, which would provide 56 MVA of capacity, with the potential to expand to 112 MVA if necessary. Three additional proposed 12 kV distribution circuits would be installed to help maintain reliability by increasing the capacity available from which to draw power from during normal peak and abnormal emergency conditions. Ultimate build out capacity for the proposed Banducci Substation with four transformers would be a maximum of 16 separate 12 kV distribution circuits.

4.10 Project Components

4.10.1 Banducci Substation

The proposed Banducci Substation would be a new unstaffed, automated, 66/12 kV, 56 MVA low-profile substation. The dimensions of the walled substation would be approximately 440 feet by 326 feet. The substation would have the potential to expand capacity to 112 MVA as necessary.

The substation footprint would encompass approximately 3.3 acres of an approximately 6.3-acre parcel in the unincorporated Cummings Valley area of Kern County. The proposed site is located at the south-east corner of Pelliser Road and unimproved Dale Road, as shown in Figure 4-1 (Project Location). Figure 4-2 (Proposed Banducci Substation Layout and Plan) illustrates the proposed substation equipment lay-out, which would be designed to meet California Building Code and the IEEE 693, Recommended Practices for Seismic Design of Substations.

4.10.1.1 66 kV Switchrack

The proposed 66 kV low-profile steel switchrack would be approximately 25 feet high, 82 feet wide, and 186 feet long and would have an operating and transfer bus. The switchrack would consist of eight 22-foot-wide positions:

- One switchrack position would be used to terminate the newly created Banducci-Correction-Cummings 66 kV Subtransmission Line.
- One switchrack position would be used to terminate the newly created Banducci–Kern River #1 66 kV Subtransmission Line.
- Two switchrack positions would be used to terminate the 66/12 kV transformer banks (Bank No. 1 and Bank No. 2).
- One switchrack position would be used for the 66 kV bus tie position.
- Three switchrack positions would remain vacant for future needs.

The operating and transfer buses would each be 186 feet long and would consist of two 2,156 thousand circular mils (kcmils) aluminum conductor steel reinforced (ACSR) conductors for each of the three elec-trical phases.

The two 66 kV subtransmission line positions and the two 66 kV transformer bank positions would each be equipped with a circuit breaker and three group-operated horizontal mount disconnect switches. Surge arresters and 66 kV potential transformers (PTs) would be installed on the line positions. The 66 kV bus tie position would be equipped with a circuit breaker and two group-operated horizontal mount disconnect switches. Three 66 kV bus PTs would be connected to the operating bus through a three-phase group-operated disconnect switch.

4.10.1.2 66/12 kV Transformers

Banducci Substation's initial transformation would consist of two 28 MVA, 66/12 kV load tap changing (LTC) transformers with adjacent group-operated disconnect switches on the high-voltage and low-voltage sides, surge arresters, and neutral current transformers. Two 12 kV underground power cables would connect the transformers to the 12 kV switchrack positions via two power cable trenches. The transformer equipment area's dimensions would be approximately 25 feet high, 113 feet long, and 42 feet wide. Based on SCE's current forecast for 2012–2021 peak demand, SCE does not foresee adding additional transformer capacity at Banducci Substation during the 10-year planning horizon.

4.10.1.3 12 kV Switchrack

The 12 kV low-profile steel switchrack would be approximately 17 feet high, 34 feet wide, and 126 feet long and would have an operating bus and a transfer bus. The 14-position switchrack would consist of the following:

- Six 12 kV positions, each equipped with a circuit breaker and either six or nine disconnect switches. Three of these positions would be assigned to 12 kV circuits, two positions would be assigned to transformer banks, and one position would be assigned to a bus tie between the operating bus and transfer bus.
- Four 12 kV positions would be equipped with three disconnect switches each.
- Four 12 kV positions would be vacant for future use.

At maximum capacity (with four transformers operating), the Banducci Substation could be built out to accommodate a maximum of 16 separate 12 kV distribution circuits.

4.10.1.4 Capacitor Banks

There would be a total of two 12 kV, 4.8 megavolt-ampere reactive (MVAR), low side capacitor banks installed at the substation. Each 12 kV capacitor bank area would be approximately 17 feet high, 27 feet long, and 13 feet wide. Each 12 kV capacitor bank would be equipped with a circuit breaker and three current-limiting reactors.

4.10.1.5 Mechanical and Electrical Equipment Room (MEER)

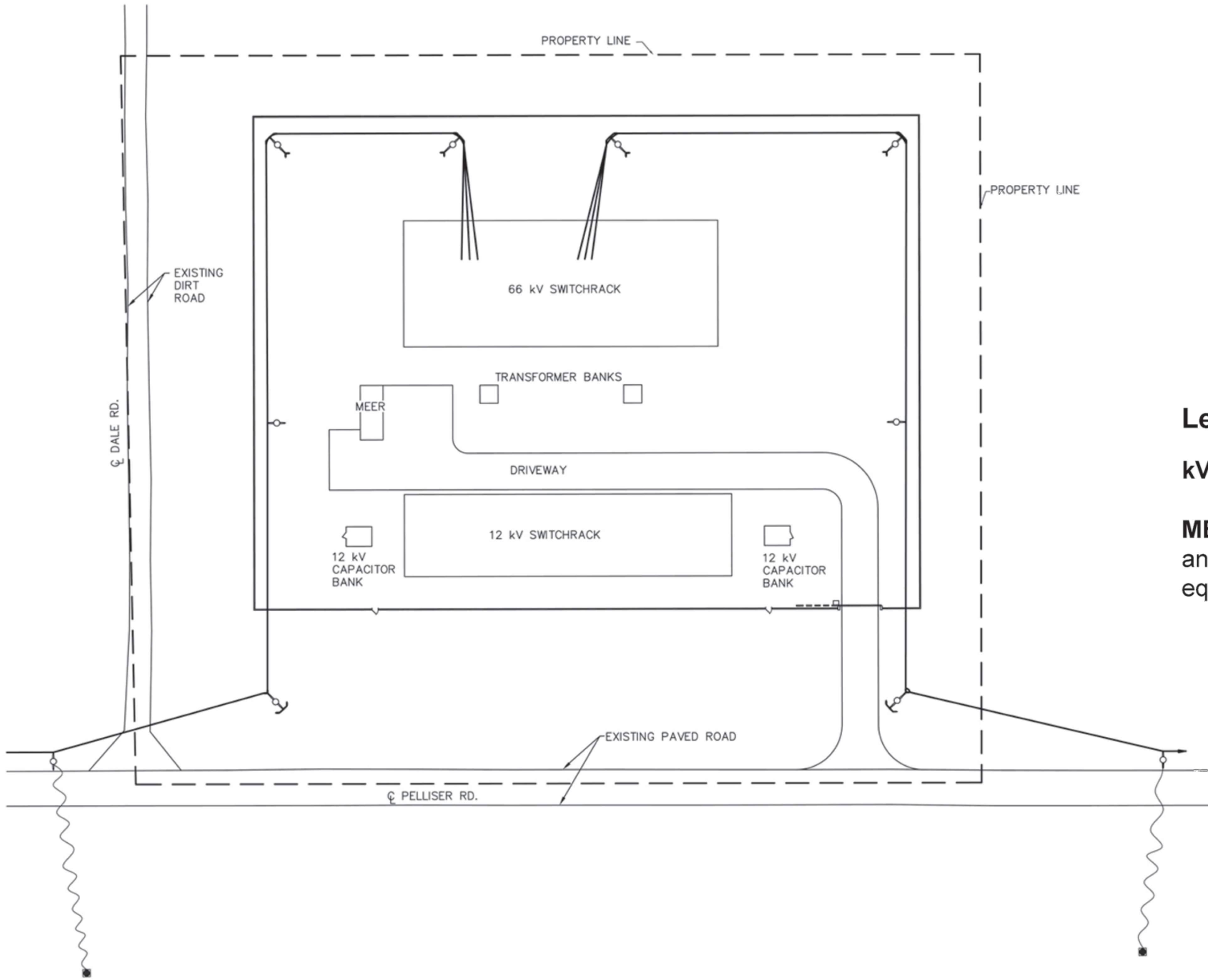
The MEER is a pre-fabricated structure approximately 10 feet high, 38 feet long, and 15 feet wide. SCE anticipates that the steel-structure MEER would have a desert-tan roof and sidewalls and that the roofline, wall joints, and doorway would have roman-bronze trim. The MEER would be equipped with heating, ventilation, and air-conditioning (HVAC) units and would house protective relaying equipment, telecommunications equipment, substation automation and control equipment, batteries, and associated equipment. Control cables would be installed in trenches to connect the MEER to the 66 kV and the 12 kV switchracks.

4.10.1.6 Perimeter and Landscaping

The substation would have a light-colored, decorative, pre-cast or concrete masonry material perimeter wall enclosing the substation on all sides. On at least three sides, this 8-foot high wall would have barbed wire affixed near the top of the inside of the perimeter enclosure. The barbed wire would not be visible from outside. Prior to commencing construction, SCE would develop an appropriate drought-resistant landscaping plan and perimeter wall design that would be submitted to Kern County with the ministerial grading permit application for the Proposed Project.

4.10.1.7 Lighting

Lighting at the proposed Banducci Substation would consist of low intensity LED (light emitting diodes) lights located in the switchracks, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. The maintenance lights would be



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kV – kilovolt

MEER – mechanical and electrical equipment room

Source: SCE, 2014a.

Figure 4-2
Proposed Banducci Substation Layout and Plan

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directed downward to reduce glare outside the facility. A light at the site's rolling gate would automatically turn on once the gate begins to open and would turn off shortly after the gate is closed.

4.10.1.8 Drainage

Existing drainage at the Proposed Project site slopes from southeast to northwest. As part of construction of the Proposed Project, runoff would be diverted around the enclosed bank towards the natural drainage pattern.

SCE would prepare final engineering drawings for grading and drainage and would submit these to Kern County to obtain ministerial grading permits. If required by Kern County ministerial grading or water quality standards, an earthen retention basin would be included in the site plan. SCE also would prepare a Spill Prevention Control and Countermeasure (SPCC) Plan in accordance with 40 Code of Federal Regulations (CFR) Parts 112.1-112.7, which would include features such as curbs/valves, trenches, berms, and retention ponds (if required), or other features/structures designed and installed to contain spills, should they occur.

4.10.1.9 Restroom Facilities

Currently, there is no water source adjacent to the site and no sewer service available. Therefore, a permanent stand-alone restroom equipped with self-contained water- and waste-holding tanks would be installed within the substation perimeter wall. The restroom enclosure would be a maximum of approximately 10 feet high, 14 feet long, and 14 feet wide and would be maintained by an outside service company.

4.10.2 Modifications at Cummings and Monolith Substations

At Cummings Substation, a self-contained equipment cabinet housing telecommunications equipment and the appropriate HVAC equipment would be installed within the fence line of the existing substation. The new equipment cabinet would be approximately 78 inches high, 39 inches wide, and 24 inches deep. Additional conduit would be installed to connect the fiber optic telecommunications cable to the new cabinet at Cummings Substation and to the existing communications room at Monolith Substation.

In addition, new protective relay and communication equipment would be added to the existing MEER at Monolith Substation and to the existing equipment cabinet at Cummings Substation.

4.10.3 66 kV Subtransmission Lines

4.10.3.1 Subtransmission Route

The existing Correction-Cummings–Kern River #1 66 kV Subtransmission line lies in close proximity to the proposed Banducci Substation site. The proposed 66 kV subtransmission line route would entail opening the existing Corrections-Cummings–Kern River #1 66 kV Subtransmission Line on Pelliser Road south of Dale Road and looping it into the substation. Two independent source line segments would be created by looping in the existing Correction-Cummings–Kern River #1 66 kV Subtransmission Line. These would be the new Banducci–Kern River #1 66 kV Subtransmission Line to the south and west of the substation and the new Banducci-Correction-Cummings 66 kV Subtransmission Line to the north and east. The 66 kV subtransmission line routes and the locations of removed, replaced, and new poles are shown in Figure 4-3 (Subtransmission Line Routes and Poles).

4.10.3.2 Subtransmission Structures

To loop the existing Correction-Cummings–Kern River #1 66 kV Subtransmission line into and out of the proposed substation, six new tubular steel poles (TSPs), two new TSP guy stubs, two new light-weight steel (LWS) poles, and seven new wood poles would be installed. The approximate dimensions of the proposed structure types are illustrated in Figure 4-4 (Subtransmission Structures) and summarized in Table 4-1 (Typical Subtransmission Structure Dimensions).

Table 4-1. Typical Subtransmission Structure Dimensions

Pole Type	Approximate Diameter	Approximate Height Above Ground	Maximum Auger Hole Depth	Maximum Auger Diameter
Light Weight Steel (LWS) Pole	Top 10 to 12 inches Bottom 24 to 36 inches	65–75 feet	10 feet	30 inches
Tubular Steel Pole (TSP)	Top 18 inches Bottom 36 inches	35–65 feet	NA	N/A
TSP Concrete Foundation	3 to 10 feet	18–24 inches	40 feet	10 feet

Source: SCE, 2014a.
Note: Specific pole height and spacing would be determined upon final engineering and would be constructed in compliance with CPUC General Order 95.

All 66 kV subtransmission facilities would be designed to be avian-safe in accordance with the *Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006* (Avian Power Line Interaction Committee, 2006).[1] All 66 kV subtransmission facilities would be evaluated for potential collision risk and, where determined to be high risk, lines would be marked with collision reduction devices in accordance with *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994* (Avian Power Line Interaction Committee, 1994). (SCE, 2014a)

The LWS poles would be dull galvanized gray in color and installed with conductor and polymer insulators. Both of the LWS poles would be constructed with horizontal polymer post type insulators to attach the 66 kV subtransmission conductor. Four of the wood poles would be installed with horizontal post type insulators to attach the 66 kV subtransmission conductor. The other three wood poles would be installed with wood cross arms and polymer suspension insulators to attach the 66 kV subtransmission conductor. Six of the TSPs would all be dead-end structures to support the approximate 90 to 105 degree angles in the 66 kV subtransmission line. The insulators would be polymer dead-end insulators. The other two TSPs would be guy stubs to support the angle of the conductor on the wood poles.

Upon completion of the installation of the proposed TSPs, wood poles, and LWS poles outside of the proposed substation, the existing overhead distribution conductors and third-party utilities that exist at that time would be transferred to the new structures, or existing structures would be relinquished and utilities on those structures would remain in place.

4.10.4 12 kV Distribution Lines

SCE is proposing to construct three new 12 kV distribution circuits, and at ultimate build-out, the proposed substation could accommodate a total of 16 separate 12 kV distribution circuits. The first 12 kV distribution circuit would exit the proposed Banducci Substation to the northwest and extend approximately 150 feet to a new distribution vault and telecommunications manhole installed on the project parcel.

[1] *Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006* published by the Edison Electric Institute and the Avian Power Line Interaction Committee in collaboration with the Raptor Research Foundation. This document can be found at http://www.aplic.org.

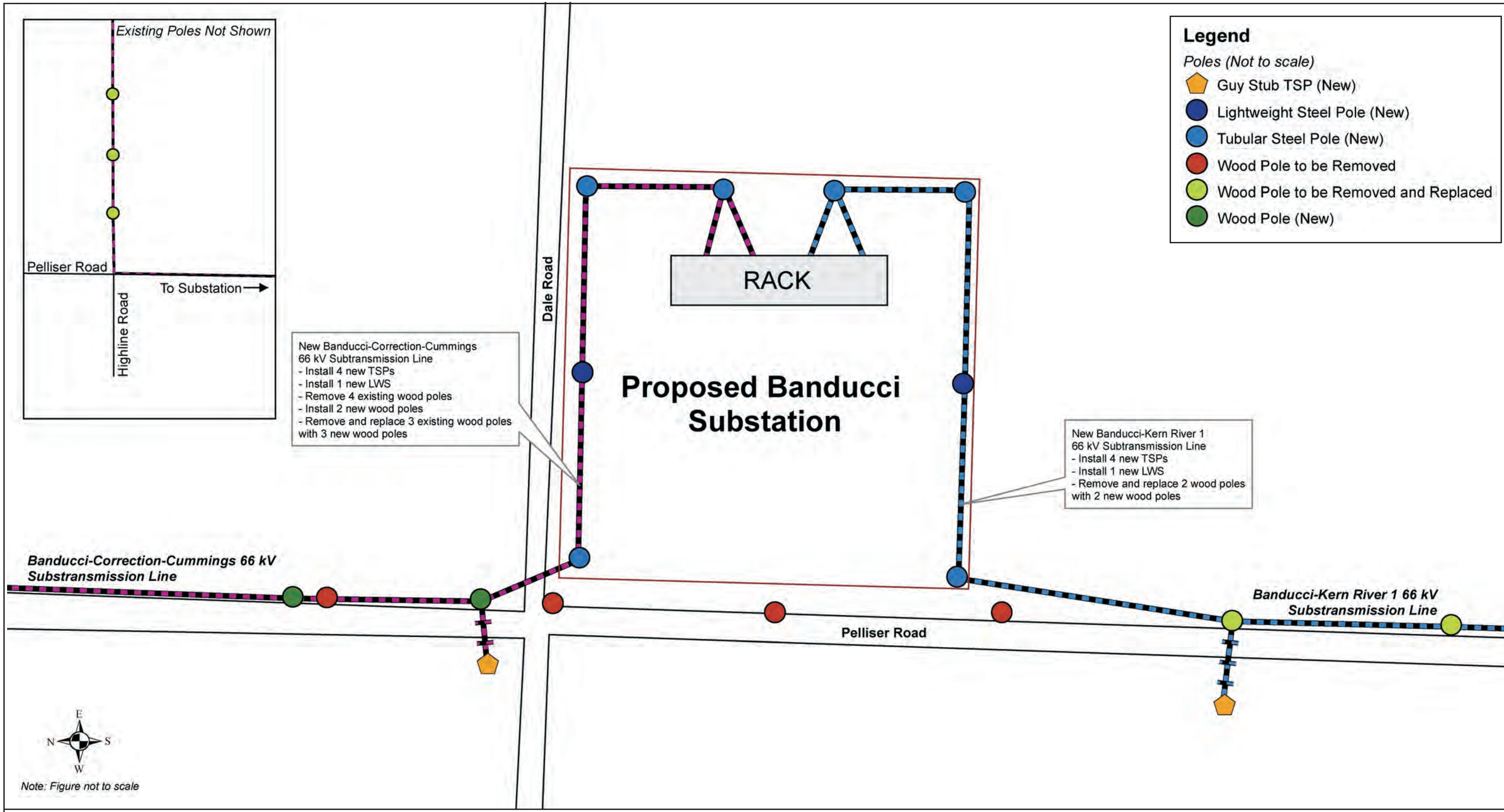

Figure 4-3
Subtransmission Line Routes and Poles

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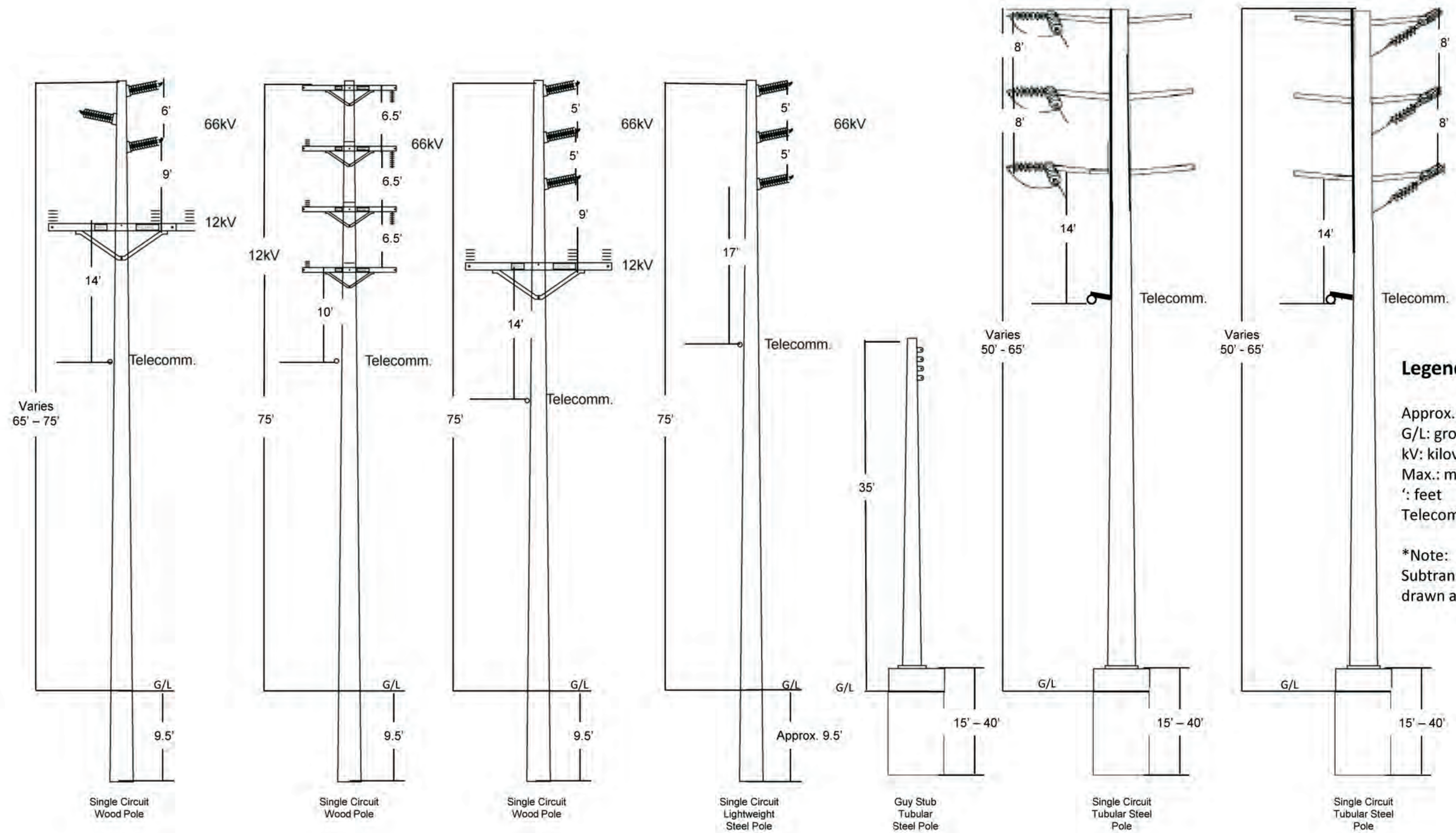

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Approx.: approximately
G/L: ground level
kV: kilovolt
Max.: maximum
': feet
Telecomm: telecommunication

*Note:
Subtransmission structures not drawn at scale

Aspen Environmental Group

Source: SCE, 2014a.

Figure 4-4
Subtransmission Structures

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The second 12 kV distribution cable would be installed in the second duct bank and would exit the proposed Banducci Substation enclosure to the southwest for approximately 150 feet to a location where a second new distribution vault would be installed on the project parcel.

The third distribution circuit would be installed in the same duct bank as the first up to the new northern vault. The distribution cable would then continue underground for approximately 2,800 feet to the corner of Highline Road and Pelliser Road. From there, the underground distribution cable would extend east approximately 450 feet and then rise on a to-be-replaced existing wood pole with a new 12 kV overhead switch.

4.10.5 Telecommunications Lines

Telecommunications infrastructure would be added to connect the proposed Banducci Substation to SCE's telecommunications system and would provide Supervisory Control and Data Acquisition (SCADA), protective relaying, data transmission, and telephone services for the proposed Banducci Substation and associated facilities.

New telecommunications equipment would be installed within the MEER at the proposed Banducci Substation and within the existing MEER at Monolith Substation. In addition, approximately 28 miles of overhead fiber optic telecommunications cable would be installed on 751 existing poles, 39 of which are scheduled to be replaced prior to attaching new fiber optic telecommunications cable to them. The new poles would be similar in size to the existing poles. They would be buried to a depth of approximately 6 to 9 feet below the ground surface and would be 38 to 50 feet high and approximately 12 to 18 inches in diameter at ground level and would taper toward the top of the pole.

Approximately 4 miles of underground fiber optic telecommunications cable would be installed in 17 existing vaults and seven new 5 feet x 5 feet x 8 feet manholes. Overhead and underground fiber optic telecommunications cables would be installed on or in new and existing structures. The two proposed telecommunications routes are shown in Figure 4-5) (Proposed Telecommunication Routes) and are described below.

Proposed Telecommunication Route #1 is approximately 14.5 miles long and would connect the proposed Banducci Substation to the existing Cummings Substation on Highland Road and then continue to the existing Monolith Substation east of Tehachapi, as described below.

The proposed fiber optic telecommunications cable would:

- Exit the proposed Banducci Substation to the west and extend north in approximately 2,800 feet of new conduit to Highline Road.
- Continue east on Highline Road in approximately 450 feet of new conduit and then transition to an overhead position on an existing pole.
- Continue east overhead on Highline Road for approximately 6 miles then transition into an underground position from an existing pole.
- Continue east in approximately 270 feet of new conduit into the existing Cummings Substation.
- Exit the existing Cummings Substation to the east in 240 feet of new conduit, then transition to an overhead position on an existing pole.
- Continue east overhead for approximately 6.5 miles to Jameson Street.

- Continue north overhead for approximately 1 mile to an existing pole outside the existing Monolith Substation, where the fiber optic telecommunications cable would transition to an underground position.
- Continue west in approximately 160 feet of new conduit into the existing Monolith Substation.

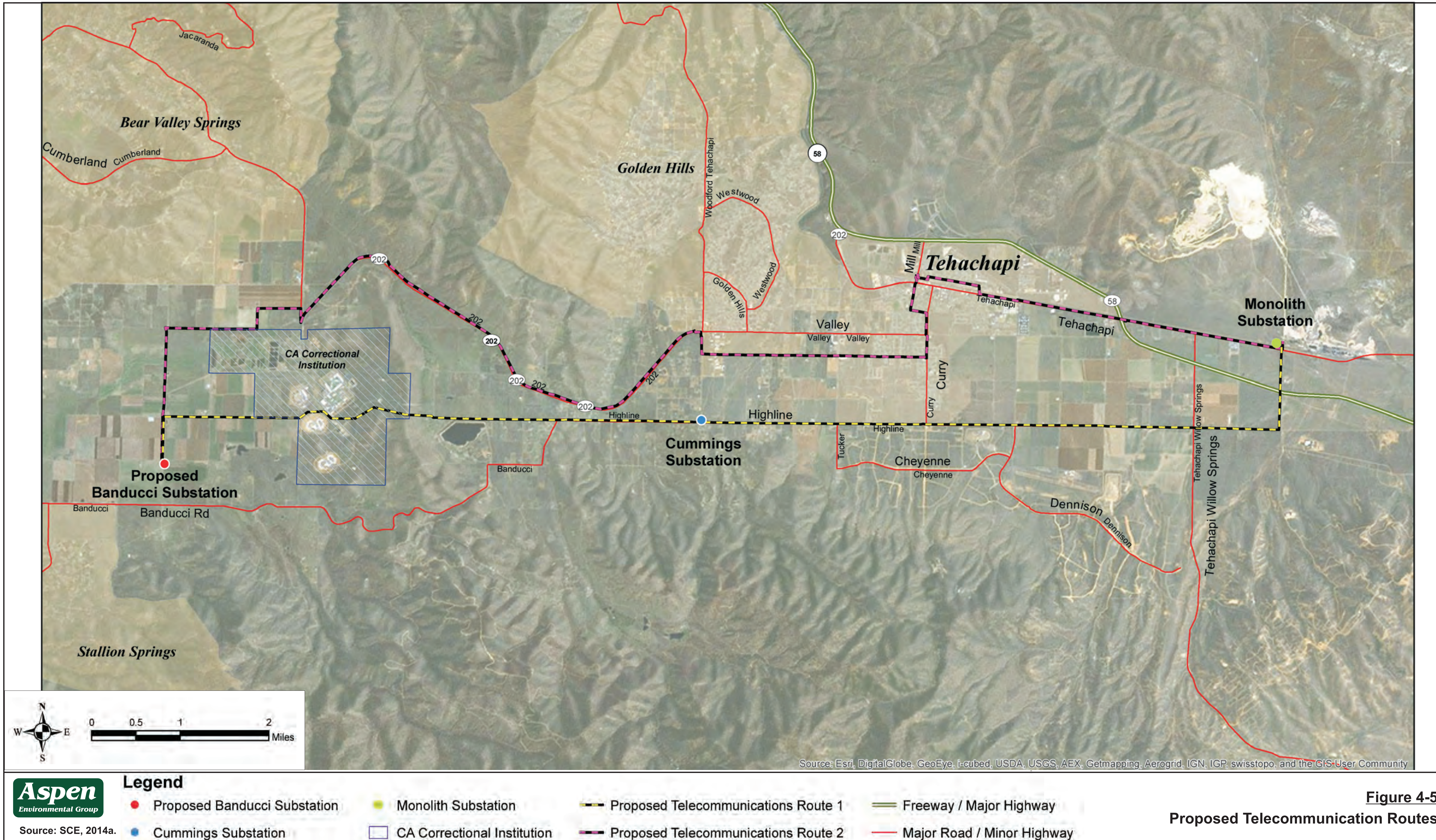
Proposed Telecommunication Route #2 is approximately 17.5 miles long and would connect the Banducci Substation to the existing Monolith Substation.

The proposed fiber optic telecommunications cable would:

- Exit the proposed Banducci Substation to the west and turn north in approximately 290 feet of new conduit and then transition to an overhead position on a new wood riser pole on Pelliser Road.
- Continue north overhead on Pelliser Road for approximately 1.5 miles.
- Continue east overhead on Giraudo Road for approximately 2 miles to West Valley Boulevard.
- Continue east on West Valley Boulevard overhead for approximately 6 miles to Woodford-Tehachapi Road, and transition to an underground position on an existing pole.
- Continue south on Woodford-Tehachapi Road underground in approximately 810 feet of proposed conduit to an existing pole, where it would transition to an overhead position.
- Continue south overhead for approximately 1,000 feet to Cherry Lane (Commercial Street).
- Continue east overhead for approximately 2.5 miles to South Curry Street.
- Continue north on South Curry Street, west on West C Street, and north on South Mill Street overhead for approximately 1 mile to an existing pole, where it would transition to an underground position.
- Continue east on West H Street underground in existing conduit for approximately 1,000 feet, then transition to an overhead position on an existing pole.
- Continue east along Tehachapi Boulevard overhead for approximately 1 mile to Dennison Road, where it would transition to an underground position on an existing pole.
- Continue east in a proposed conduit on Tehachapi Boulevard for approximately 240 feet to an existing vault.
- Continue east on Tehachapi Boulevard underground for approximately 3 miles, where it would enter Monolith Substation through an existing conduit.

4.10.6 Staging Yards

Construction of the Proposed Project would require the establishment of up to four temporary staging areas or yards. These would be used as a reporting location for workers and for vehicle and equipment parking and material storage. The yards may house construction trailers for supervisory and clerical personnel. SCE may use one or more of the yard locations shown in Figure 4-6 (Potential Staging Areas) and listed in Table 4-2.



Aspen Environmental Group

Source: SCE, 2014a.

Figure 4-5
Proposed Telecommunication Routes

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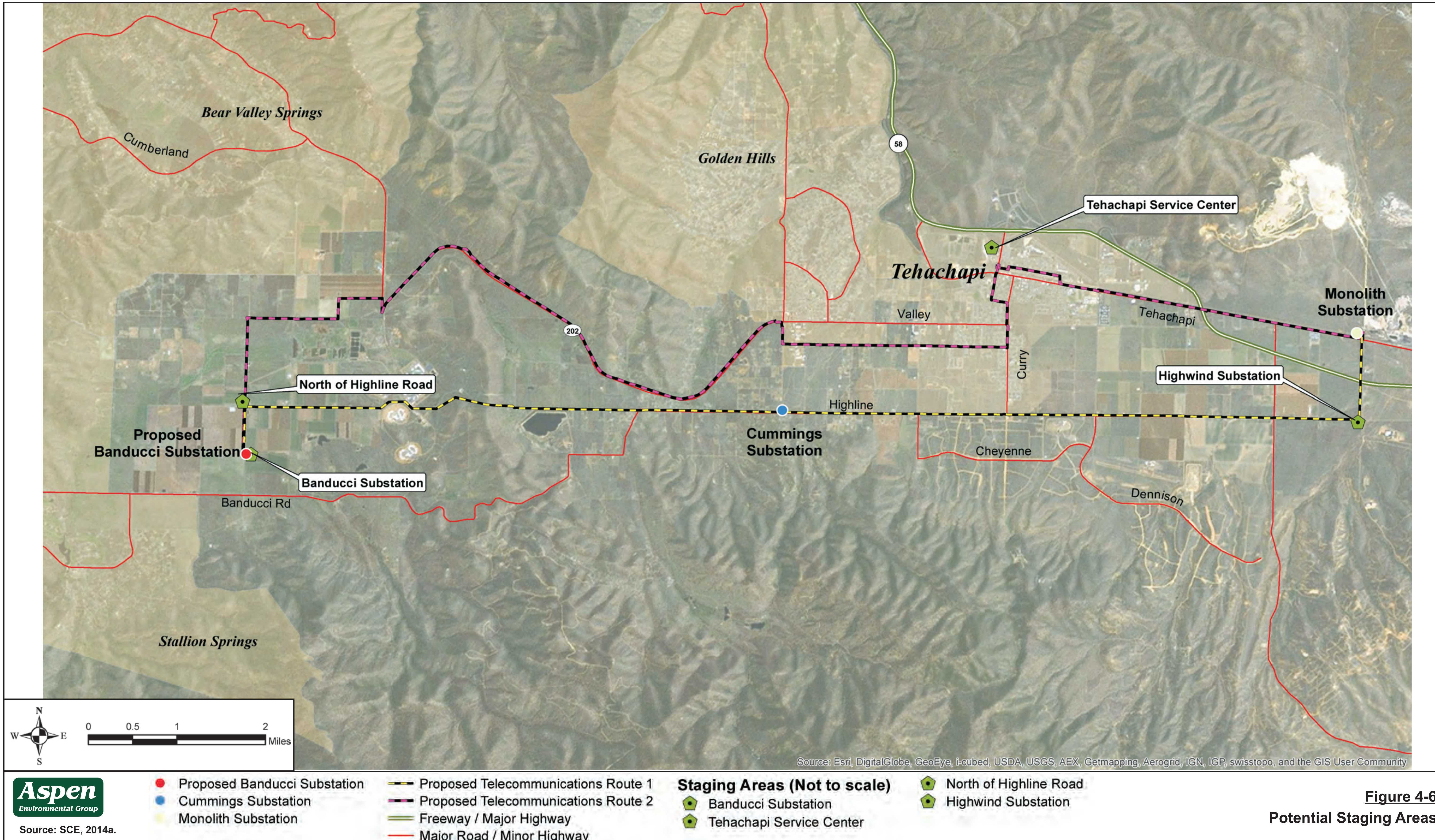

Figure 4-6
Potential Staging Areas

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Table 4-2. Potential Staging Yard Locations

Yard Name	Location	Condition	Approximate Area	Project Component
Banducci Substation	Banducci Substation property	Graded property	1 acre	Substation/ Subtransmission
Tehachapi Service Center	Tehachapi Service Center in City of Tehachapi	Previously disturbed	0.5 acres	Telecommunications/ Distribution
North of Highline Road	Northwest corner of the intersection of Pelliser Road and Highline Road	Previously disturbed	1 acre	Subtransmission
Highwind Substation	Southwest corner of Steuber Road and Highline Road	Previously disturbed	1 acre	Telecommunications

Materials commonly stored at the substation construction staging area would include portable sanitation facilities, circuit breakers, disconnect switches, lightning arresters, transformers, vacuum switches, steel beams, rebar, foundation cages, conduit, insulators, conductor and cable reels, pull boxes, and line hardware.

Materials commonly stored at the subtransmission and/or telecommunications construction staging yards would include construction trailers; construction equipment; portable sanitation facilities; steel bundles; steel/wood poles; conductor reels; overhead ground wire (OHGW) or overhead optical ground wire (OPGW) reels; hardware; insulators; cross arms; signage; consumables (such as fuel and filler compound); waste materials for salvaging, recycling, or disposal; and best management practice (BMP) materials (straw wattles, gravel, and silt fences). Fuel stored at a site generally is used for small generators for power tools and is usually less than 25 gallons.

4.10.7 Project Access

During construction, the substation site and the subtransmission lines in the vicinity of the proposed Banducci Substation site would be accessed via Pelliser Road. Access to other project components would be via public access or over existing SCE land rights. The Banducci Substation Staging Yard would be accessed via Pelliser Road. The North of Highline Road and Highwind Substation Staging Yards would be accessed via Highline Road. The Tehachapi Service Center Staging Yard would be accessed via North Mill Street.

Depending on final engineering and construction requirements, temporary access rights may be acquired from private land owners to provide sufficient work space for any field activity. SCE would use overland access from the edge of paved or dirt roads to access pole locations and temporary construction areas, such as pole work areas, stringing setup-areas, and staging area locations. Overland access routes would also occur within the temporary work areas for the poles. No additional access roads or spur roads would be necessary.

4.10.8 Right-of-Way Acquisition

The Proposed Project would require the acquisition in fee of approximately 6.3 acres for the substation footprint as well as a setback to provide for future road improvements, landscaping, access, parking, subtransmission tie-in, and 12 kV distribution routes. Access to the other project components would be via public access or over existing SCE land rights. The proposed 66 kV subtransmission lines would tie into the proposed Banducci Substation from the existing 66 kV subtransmission line along Pelliser Road, which is located within the public right-of-way (ROW) where SCE holds franchise rights.

Proposed Telecommunication Route #1 is proposed primarily within existing SCE easements or franchise areas, but is subject to final engineering requirements and may require a permit from the Union Pacific Railroad (UPRR) and/or California Department of Transportation (Caltrans) to cross their facilities. Proposed Telecommunication Route #2 is anticipated to require two permits to cross over UPRR railroad facilities, a Caltrans permit, and the acquisition of approximately four private easements. See Section 4.15 (Other Permits and Approvals) of this IS/MND for a list of required permits.

4.11 Project Construction

4.11.1 Staging Yard Construction

Preparation of staging yards would include temporary perimeter fencing and, depending on existing ground conditions at the site, grubbing and/or grading to provide a level and dense surface for the application of gravel or crushed rock. Sites would be graded such that runoff would flow in the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive flows. The graded area would be compacted to support heavy vehicular traffic.

Staging yards may be lit for staging and security, with temporary power supplied from existing distribution facilities if they are available or a portable 49 horsepower generator if full time power is not needed. Normal maintenance and refueling of construction equipment would be conducted at these yards. All refueling and storage of fuels would be in accordance with a Storm Water Pollution Prevention Plan (SWPPP) prepared by SCE prior to construction.

4.11.2 Land Disturbance and Access

Land disturbance would include all areas affected by construction of the Proposed Project. It is estimated that the Proposed Project would permanently disturb approximately 6.44 acres and would temporarily disturb approximately 34.61 acres. The estimated amount of land disturbance for each project component is summarized in Appendix B of this IS/MND.

Activities associated with providing temporary access could include vegetation clearing, blade-grading, grubbing, mowing, and re-compacting. The number of locations where this would be required would depend on final engineering, topography, and availability of suitable terrain that would provide safe access for construction. These access locations are typically grassy areas that are relatively flat. They would not be maintained by SCE after the project construction is completed, but instead utilized on an as-needed basis for operation and maintenance.

4.11.3 Substation Construction

The 6.3-acre substation site would be graded to form a level site. The proposed substation site would be over excavated to the prescribed depth per the grading plan and the estimate 10,000 cubic yards of excavated soil would be placed as fill where needed, compacted to 90 to 95 percent compaction, and tested throughout the site to verify the compaction rate. It is estimated that approximately 10,000 cubic yards of soil also would be imported to the substation site as fill.

Once the grading elevation and soil compaction rates are verified, construction the ground grid and a permanent block wall around the proposed Banducci Substation would be installed. This would include drilling and digging of holes for the foundations and installing conduit and foundations to establish the completed ground grid. Approximately ¾ inch rockdust would be placed 4 inches deep throughout the substation except in areas to be paved. Table 4-3 lists the surface materials and their approximate square footage and volumes required for construction of the new substation.

Table 4-3. Substation Ground Surface Improvement Materials and Volumes

Element	Material	Approximate Surface Area (sq.ft.)	Approximate Volume (cu.yd.)
Site fill	Soil	270,700	20,000
Site cut	Soil		10,000
Import	Soil		10,000
Substation equipment foundations	Concrete	2,000	140
Substation drainage swales	Concrete	12,000	375
Cable trenches/duct bank	Concrete	1,900	100
66 kV bus enclosures	Asphalt concrete	4,100	75
Internal driveways	Asphalt concrete	12,800	158
	Class II aggregate base	12,800	277
External driveway	Asphalt concrete	3,000	37
	Class II aggregate base	3,000	65
Substation rock surfacing	Rock, nominal diameter 1–1.5" per SCE standard, 4" depth	143,500	1,772
Block wall foundation	Concrete	3,940	330

Source: SCE, 2014a.

Erection of the structures may also require establishment of a temporary crane pad. The crane pad would occupy an area of approximately 50 feet by 50 feet and be located adjacent to each applicable structure within the laydown/work area used for structure assembly. The decision to use a separate crane pad would be determined during final engineering for the Proposed Project and the selection of the appropriate construction methods to be used by SCE or its contractor.

New underground conduit and structures would typically be installed with a backhoe. The trench would be 12 to 18 inches wide and a minimum of 36 inches deep. Polyvinyl chloride (PVC) conduit would be placed in the trench and covered with approximately 3 inches of concrete slurry, then backfilled and compacted. For manholes and pull boxes, a hole would be excavated 8 to 9 feet deep, 7 to 8 feet long, and 7 to 8 feet wide. The manhole or pull box would be lowered into place, connected to the conduits, and backfilled with concrete slurry.

A three-man construction crew using three pick-up trucks at the site would perform installation work inside the MEER at the proposed Banducci Substation. Additionally, a three-man construction crew using three pick-up trucks would perform installation work inside the MEER at both Cummings Substation and Monolith Substation.

Section 4.11.8 provides the anticipated equipment and workforce required for the project.

4.11.4 66 kV Subtransmission Line Construction

The new subtransmission structure locations and temporary laydown/work areas would first be graded and/or cleared of vegetation as required to provide a reasonably level and vegetation free surface for structure installation. Sites would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could damage structure footings. The graded area would be compacted and would be capable of supporting heavy vehicular traffic.

Erection of pole structures may require the establishment of a temporary crane pad. The crane pad would occupy an approximately 50 feet by 50 feet area and adjacent to each applicable structure. It would be within the laydown/work area used for structure assembly. The pad may be cleared of vegetation and/or graded as necessary to provide a level surface for crane operation. The decision to use a separate crane pad would be determined during final engineering for the Proposed Project and the selection of the appropriate construction methods to be used by SCE or its contractor.

4.11.4.1 Tubular Steel Pole Installation

Each TSP would require a drilled, poured-in-place, concrete footing to create the structure foundation. The hole would be drilled using truck or track-mounted excavators. Excavated material would be temporarily stored in the staging yard prior to being salvaged, recycled, or disposed. Following excavation of the footings, steel-reinforced cages would be set and concrete poured. Foundations in soft or loose soil or those that extend below the groundwater level may be stabilized with drilling mud slurry. In this instance, mud slurry would be placed in the hole during the drilling process to prevent the sidewalls from sloughing. Concrete would then be pumped to the bottom of the hole, displacing the mud slurry. Depending on site conditions, the mud slurry brought to the surface would be collected in a pit adjacent to the foundation or vacuumed directly into a truck to be reused or discarded at an appropriate off-site disposal facility.

TSPs consist of multiple sections. The pole sections would be placed in temporary laydown areas at each pole location. Depending on conditions at the time of construction, the top sections may come pre-configured with the necessary cross arms, insulators, and wire stringing hardware, or may be configured on the ground at the site or after pole installation. A crane would be used to set each steel pole base section on the prepared foundation. If existing terrain around the TSP location is not suitable to support crane activities, a temporary crane pad would be constructed within the laydown area. When the base section is secured, the subsequent section(s) of the TSP would be slipped in place on top of the base section. The pole sections may be spot welded together for additional stability. Depending on the terrain and available equipment, the pole sections also could be pre-assembled into a complete structure prior to setting the poles. TSP guy poles would be installed similar to TSP installation.

4.11.4.2 Wood Pole Installation

Each wood pole would require a hole to be excavated using an auger, backhoe, or hand tools. Excavated material would be temporarily stored in the staging yard prior to salvage, recycling, or disposal. The wood poles would be placed in a temporary laydown area at each pole location. While on the ground, (if not preconfigured) the wood poles may be configured with the necessary cross arms, insulators, and wire-stringing hardware before being set in place. The wood poles would be installed in the holes, typically by a line truck with an attached boom.

4.11.4.3 Lightweight Steel Pole Installation

Each LWS pole would require a hole to be excavated using either an auger or excavated with a backhoe. Excavated material would be temporarily stored in the staging yard prior to salvage, recycling, or disposal. LWS poles consist of separate base and top sections and may be placed in temporary laydown areas at each pole location. Depending on conditions at the time of construction, the top sections may come pre-configured with the necessary cross arms, insulators, and wire-stringing hardware, or may be configured on the ground or after pole installation. The LWS poles would be installed in the holes, typically by a line truck with an attached boom. When the base section is secured, the top section would be installed on top of the base section. Depending on the terrain and available equipment, the pole sections could also be assembled into a complete structure on the ground prior to setting the pole in place.

4.11.4.4 Pull and Tension Sites

Wire stringing activities would be conducted in accordance with SCE practices and similar to methods detailed in the Institute of Electrical and Electronics Engineers (IEEE) Standard 524-2003 (Guide to the Installation of Overhead Transmission Line Conductors). The following steps describe typical wire-stringing activities:

- *Step 1:* Planning: Determine the locations of wire pulls and wire-pull equipment set-up positions.
- *Step 2:* Sock Line Threading: A sock line (thick rope) would be threaded through wire rollers attached to cross arms. Sock line threading would continue between all structures of a particular set of spans selected for a wire pull.
- *Step 3:* Pulling: The sock line would be used to pull in the wire-pulling cable. The wire-pulling cable would be attached to the wire using a swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel.
- *Step 4:* Splicing, Sagging, and Dead-Ending: After the wire is pulled in, any required mid-span splicing would be performed. Once the splicing has been completed, the wire would be sagged to proper tension and dead-ended (secured) to structures.
- *Step 5:* Clipping-In: After the wire is dead-ended, the wire would be attached to all tangent structures.

Wire stringing and pull sites may be slightly offset and/or angled to extend outside of the right-of-way to clear unavoidable obstructions. Also, at deflection points along the 66 kV subtransmission line route, wire stringing and pull sites typically extend beyond the ROW.

The largest anticipated distance between the stringing sites would be approximately 370 feet, while the general distance between stringing sites are expected to range from approximately 75 to approximately 370 feet. Some stringing sites may overlap due to the short distance between some of the poles.

The shape and size of each pull and tension site would be determined based on site-specific local conditions.

4.11.4.5 Pole Removal

Typical pole removal includes the use of a boom truck to support the structure during dismantling and removal. Holes would be backfilled, generally by hand using native soil, compacted, and smoothed to match surrounding grade. Typical pole installation would include the use of a boom truck with an auger to first dig the required hole then set the pole.

4.11.4.6 Energizing 66 kV Subtransmission Lines

Energizing the new source lines is the final step in completing the 66 kV subtransmission line construction. The Correction–Kern River #1 section of the existing Correction-Cummings–Kern River #1 66 kV Subtransmission Line would be de-energized in order to connect the new 66 kV subtransmission line segments to the existing system. To reduce the need for electric service interruptions, de-energizing and re-energizing the existing subtransmission lines would likely occur at night when electrical demand is low. No customers would be expected to experience outages due to this action.

4.11.5 12 kV Distribution Getaway Installation

Excavation activities would generally be done using a backhoe. The anticipated dimensions for the trench would be approximately 24 inches wide and approximately 50 inches deep. Shields or trench shoring would be temporarily installed for safety to brace the walls of the trench. The conduits then would be installed using spacers to create a duct bank consisting of two columns of three stacked 5-inch conduits apiece. The temporary shoring then would be removed. Typical distribution vaults and duct banks are shown in Figures 4-7 (Typical Distribution Line Vault) and 4-8 (Typical Distribution Line Duct Bank), respectively.

Vaults would be located at various points along the duct bank. The hole excavated for a vault would typically be 3 feet greater than the vault's width and length, as well as 4 feet deeper than the vault's height. A backhoe would be used to place the excavated soil into a dump truck to haul away.

The area of disturbance would be approximately 15 feet on either side of trench and on all sides of vaults. The conduits would be encased in concrete with a minimum encasement of 3 inches on all sides. After the concrete encasement has hardened, the trench would be backfilled with a sand, cement, and water slurry with no aggregate. Precast vaults would typically be installed and backfilled with slurry. If repaving is necessary, this work would be performed in accordance with applicable requirements.

After the work of installing the duct bank, vaults, and vent pipes has been completed, at a later date SCE's contractor or SCE's cable crews would pull in the new distribution line (three single conductor 1,000 kcmil jacketed aluminum cross-linked polyethylene (CLP) cables per circuit run in one of the 5-inch conduits in the duct bank). To accomplish this, a rodder (cable pulling truck) would set up at every other vault to pull cable in both directions. At opposite ends of every other vault, cable carousels would be set up to feed cable in both directions. Distribution crews typically would install the vault grounds, rack the cables, install any switches, transformers, or other necessary equipment, and make the appropriate cable splices and terminations. Switching would be performed to put the new equipment into service. Where applicable, SCE would secure any necessary ministerial permits from the appropriate agencies.

4.11.6 Telecommunications Facilities Installation

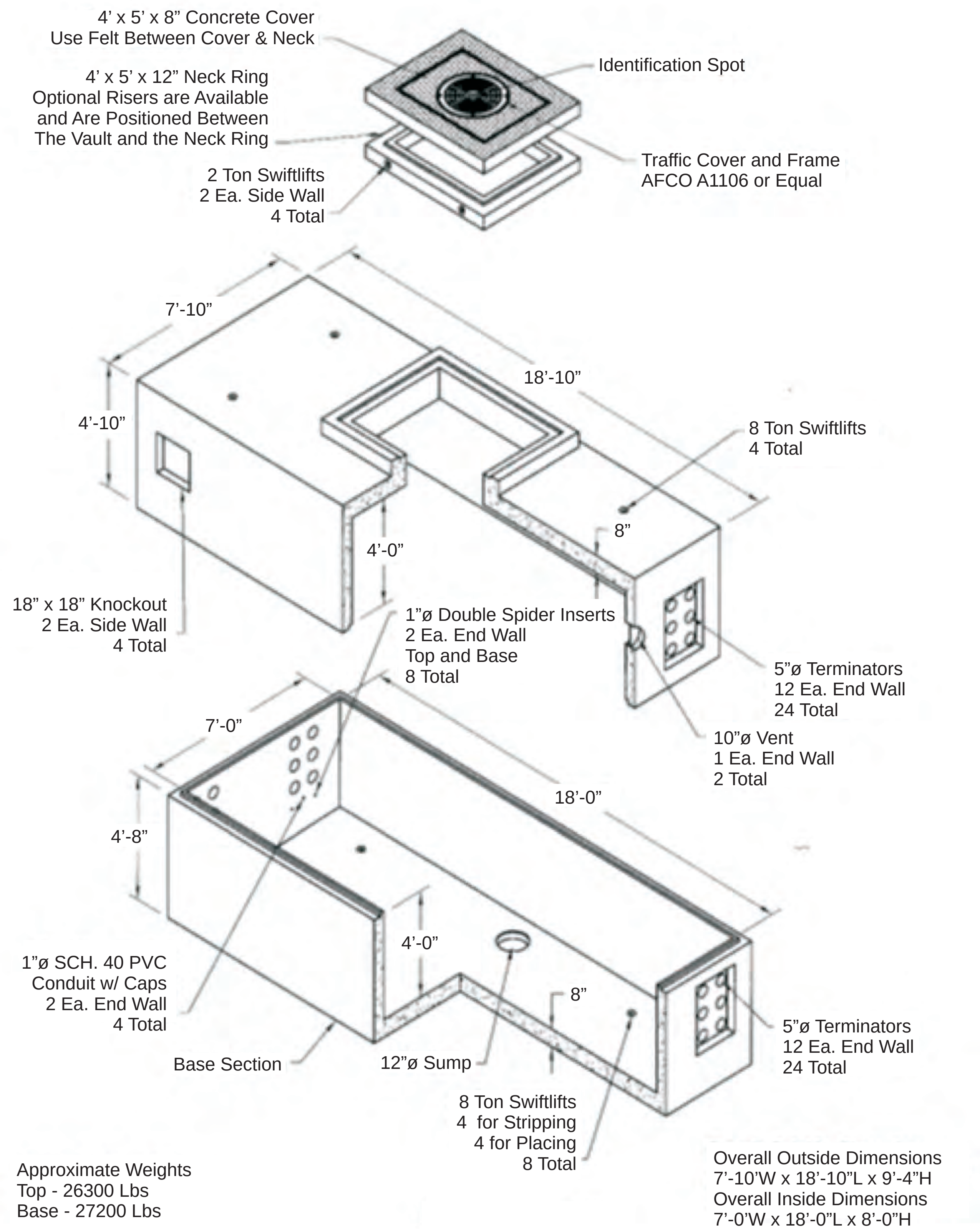
Overhead Telecommunications Facilities. Overhead fiber optic cable would be installed on overhead structures using a bucket truck and in the same manner as described in Section 4.11.4.5 (Pull and Tension Sites).

Underground Telecommunications Facilities. The fiber optic telecommunications cable would be installed throughout the length of the underground conduit and structures through an innerduct (duct installed within a conduit), which protects and identifies the cable. First, the innerduct would be pulled in the conduit from structure to structure using a pull rope and pulling machine or truck-mounted hydraulic capstan. The fiber optic cable then would be pulled inside the innerduct using the same procedure.

New underground conduit and structures typically would be installed with a backhoe. The trench would be excavated to approximately 12 to 18 inches wide and a minimum of approximately 36 inches deep. Polyvinyl chloride (PVC) conduit would be placed in the trench and covered with approximately 3 inches of concrete slurry, then backfilled and compacted. For manholes and pull boxes, a hole would be excavated approximately 8 to 9 feet deep, 7 to 8 feet long, and 7 to 8 feet wide. The manhole or pull box would be lowered into place, connected to the conduits, and backfilled with concrete slurry.

4.11.7 Cleanup and Post-Construction Restoration

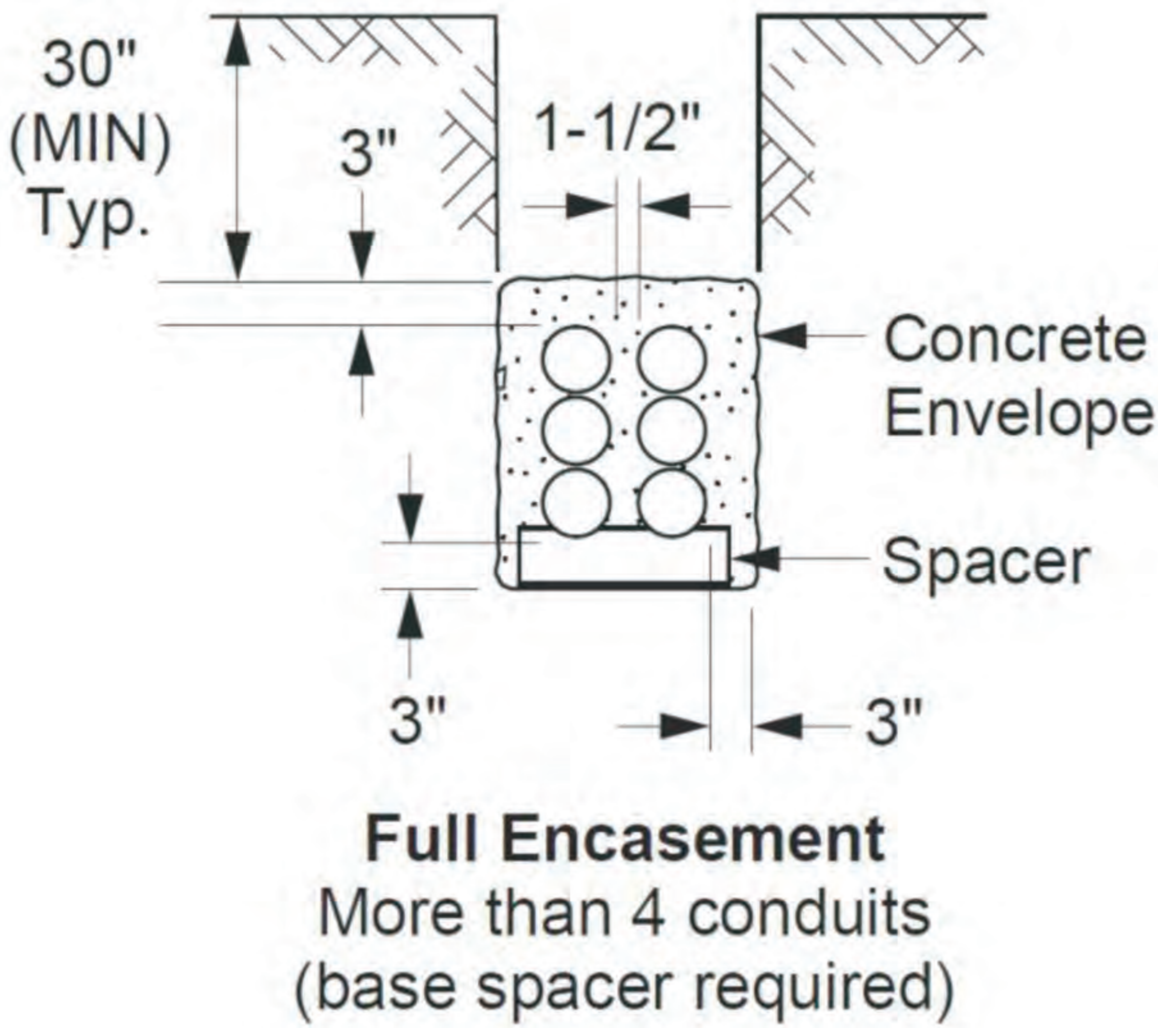
Following the completion of construction for the Proposed Project, SCE would restore all areas that would be temporarily disturbed by construction of the Proposed Project (including the material staging yards, construction setup areas, pull and tension sites, and splicing sites) to as close to pre-construction conditions as possible, or to the landowner's requirements established during lease negotiations.



Aspen Environmental Group

Source: SCE, 2014a.

Figure 4-7
Typical Distribution Line Vault



Source: SCE, 2014a.

Figure 4-8
Typical Distribution Line Duct Bank

If the restoration occurs within sensitive habitats, a habitat restoration and revegetation plan would be developed by SCE with the appropriate resource agencies and implemented after construction is complete.

4.11.8 Construction Workforce and Equipment

The number of personnel and equipment estimated to be required for construction of the Proposed Project are summarized in Table 4-4 (Construction – Typical Equipment Use). Construction would be performed by either SCE construction crews or contractors. If SCE construction crews are used they typically would be based at SCE's local facilities, such as the Tehachapi Service Center. Contractor construction personnel would be managed by SCE construction management personnel. SCE anticipates a total of approximately 50 construction personnel working on any given day. SCE anticipates that crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would vary depending on factors such as material availability, resource availability, and construction scheduling.

Construction efforts would occur in accordance with accepted construction industry standards. SCE would comply with applicable local ordinances for construction activities.

Table 4-4. Construction – Typical Equipment Use

Equipment	Use	Number of Vehicles	Days per Week of Operation	Hours per Day of Operation	Duration of Use (weeks)
Substation Construction					
Survey (2 People)					
Survey trucks	Transport construction personnel	2	5	2	1
Grading (6 People)					
Dozer	Crawler for moving earth	1	5	10	6
Loader	Used to move aside soil, gravel, and sand	2	5	10	6
Grader	Scraper to grade the construction site	1	5	10	6
Water truck	Water site	2	5	10	6
4x4 Tamper	Tamp site	1	5	10	6
Tool truck	Transport tools	1	5	4	6
Pick-up truck	Transport construction personnel	4	5	2	6
Dump truck	Transport material for construction	50	5	10	3
Chain Link Fencing (4 People)					
Bobcat	Excavate and move soil, sand, or gravel	1	5	8	2
Flatbed truck	Transport large materials or equipment	1	5	4	2
Crew cab truck	Transport construction personnel	1	5	2	2
Civil (7 People)					
Excavator	Used for digging and moving foundation material	1	5	8	15
Foundation auger	Used for digging foundation	1	5	4	15
Backhoe	Excavation of foundation and materials	2	5	8	15
Dump truck	Transport material for construction	1	5	4	18
Skip loader	Shovel site	1	5	8	15
Water truck	Water site	1	5	8	15

Table 4-4. Construction – Typical Equipment Use

Equipment	Use	Number of Vehicles	Days per Week of Operation	Hours per Day of Operation	Duration of Use (weeks)
Bobcat skid steer	For scraping and moving soil, sand, and gravel	2	5	8	15
Forklift	Lift materials	1	5	4	15
17-ton crane	Lift machinery and heavy materials	1	5	4	16
Tool truck	Transport tools	1	5	4	15
Pick-up truck	Transport construction personnel	4	5	2	15
MEER (4 People)					
Pick-up truck	Transport construction personnel	2			
Stake truck	Transport medium duty cargo loads	1	5	2	16
17-ton crane	Lift materials	1	5	4	16
Electrical (8 People)					
Scissor lifts	Aerial work platform for lifting workers and materials	1	5	4	13
Manlift	Move workers to different stories	2	5	4	20
Reach forklift	Lift construction personnel and materials	1	5	2	13
15-ton crane (line truck)	Movable crane	1	5	4	13
Tool trailer	Transport Tools	1	5	8	20
Crew truck	Transport construction personnel	2	5	2	1
70-ton crane	Lift heavy materials	1	5	4	13
Wiring (2 People)					
Manlift	Lift construction personnel	1	4	2	11
Tool trailer	Transport tools	1	4	8	11
Transformers (4 People)					
Crew truck	Transport construction personnel	2			
Low bed truck	Transformers	1	5	2	1
Maintenance Crew Equipment Check (4 People)					
Maintenance truck	Maintenance	2	5	2	4
Testing (2 People)					
Crew truck/van	Transport construction personnel	1	5	2	18
Asphalting (6 People)					
Paving roller	Used to compact soil, concrete, or asphalt	1	5	4	2
Asphalt paver	Used to lay asphalt on roads	1	5	4	2
Tractor	Used to pull heavy materials or equipment	1	5	8	3
Crew truck	Transport construction personnel	2	5	2	2
Asphalt curb machine	Used to install curb in road	1	5	2	2
Stake truck	Transport medium duty cargo loads	1	5	2	2
Dump truck	Transport material for construction	1	5	4	2
Landscaping (4 People)					
Tractor	Used to pull heavy materials or equipment	1	5	8	1
Dump truck	Transport material for construction	1	5	4	1

Table 4-4. Construction – Typical Equipment Use

Equipment	Use	Number of Vehicles	Days per Week of Operation	Hours per Day of Operation	Duration of Use (weeks)
Pick-up truck	Transport construction personnel	1	5	2	1
Distribution Getaway Construction					
Civil (5 People)					
Backhoe/front loader	Excavation of foundation and materials	1	4	8	2
Dump truck	Transport material for construction	1	4	4	2
1-ton crew truck	Transport construction personnel	1	4	2	2
Cement truck	For moving and pouring cement	1	4	4	2
Paving roller	Used to compact soil, concrete, or asphalt	1	4	4	2
Asphalt paver	Used to lay asphalt on roads	1	4	4	2
Grinder	Used to grind large organic material	1	4	4	2
Vault Delivery (1 Person)					
4-ton truck with crane	Truck and crane with 25 ton capacity	1	2	4	1
Cable Pulling (7 People)					
Rodder truck	Sewer Truck	1	2	8	1
Cable carousel	Used for spooling long spans of cable	1	2	8	1
1-ton crew truck	Transport construction personnel	1	2	8	1
Cable Splicing (4 People)					
Line truck	Cable Splicing	1	4	8	2
Crew truck	Transport construction personnel	1	4	2	2
Subtransmission Construction					
Survey (4 People)					
1-ton pickup truck	Transport construction personnel	1	2	8	1
Marshalling Yard (4 People)					
1-ton truck	Transport construction personnel	3	5	3	1
Rough terrain forklift	Used to lift materials in rough terrain	1	1	6	1
Boom crane truck	Movable crane	1	1	4	1
Water truck	Water site	1	2	12	1
Semi-tractor truck	Used to pull heavy materials or equipment	1	2	7	1
Right-of-Way Clearing (5 People)					
1-ton truck	Transport construction personnel	1	1	8	1
Backhoe/front loader	Excavation of foundation and materials	1	1	6	1
Track type dozer	Right-of-Way Clearing	1	1	6	1
Motor grader	Right-of-Way Clearing	1	1	6	1
Water truck	Water site	1	1	8	1
Lowboy truck/trailer	Haul heavy equipment	1	1	4	1
Roads and Landing Work (5 People)					
1-ton truck	Transport construction personnel	1	1	8	1
Backhoe/front loader	Excavation of foundation and materials	1	1	4	1

Table 4-4. Construction – Typical Equipment Use

Equipment	Use	Number of Vehicles	Days per Week of Operation	Hours per Day of Operation	Duration of Use (weeks)
Track type dozer	Crawler for moving earth	1	1	4	1
Motor grader	Roads and Landing Work	1	1	6	1
Water truck	Water site	1	1	8	1
Drum type compactor	Roads and Landing Work	1	1	6	1
Excavator	Scraping and removing foundation materials	1	1	4	1
Lowboy truck/trailer	Haul heavy equipment	1	1	4	1
Removal of Existing Conductor (10 People)					
1-ton truck	Transport construction personnel	2	1	4	1
Manlift bucket truck	Lift construction personnel	2	1	8	1
Boom crane truck	Movable crane	2	1	8	1
Bull wheel puller	Hydrostatic cable mooring system	1	1	6	1
Sock line puller	To string cable line	1	1	6	1
Static truck/tensioner	Movable cable tensioner	1	1	6	1
Lowboy truck/trailer	Haul heavy equipment	2	1	4	1
Wood Pole Removal (10 People)					
1-ton truck	Transport construction personnel	2	1	8	1
Compressor trailer	Trailer mounted air compressor	1	1	4	1
Manlift/bucket truck	Lift construction personnel	1	1	6	1
Boom crane truck	Movable crane	1	1	6	1
Flatbed pole truck	Transport large materials or equipment	1	1	8	1
Install TSP Foundations (6 People)					
3/4-ton truck	Transport construction personnel	1	4	4	4
Boom crane truck	Movable crane	1	4	4	4
Backhoe/front loader	Excavation of foundation and materials	1	4	6	4
Auger truck	Drill mounted on a truck for drilling holes	1	4	6	4
Water truck	Water site	1	4	8	4
Dump truck	Transport material for construction	1	4	4	4
Concrete mixer truck	Mix and pour concrete	3	4	4	4
TSP Haul (4 People)					
3/4-ton truck	Transport construction personnel	1	4	8	2
Boom crane truck	Movable crane	1	4	6	2
Flatbed pole truck	Transport large materials or equipment	1	4	8	2
TSP Assembly (10 People)					
3/4- and 1-ton truck	Transport construction personnel	4	4	4	2
Compressor trailer	Trailer mounted air compressor	1	4	6	2
Boom crane truck	Movable crane	1	4	8	2
TSP Erection (10 People)					
3/4- and 1-ton truck	Transport construction personnel	4	4	4	2

Table 4-4. Construction – Typical Equipment Use

Equipment	Use	Number of Vehicles	Days per Week of Operation	Hours per Day of Operation	Duration of Use (weeks)
Compressor trailer	Trailer mounted air compressor	1	4	6	2
Boom crane truck	Movable crane	1	4	8	2
Wood/LWS Pole Haul (4 People)					
3/4-ton truck	Transport construction personnel	1	2	8	1
Boom crane truck	Movable crane	1	2	6	1
Flatbed pole truck	Transport large materials or equipment	1	2	8	1
Wood/LWS Pole Assembly (10 People)					
3/4- and 1-ton truck	Transport construction personnel	2	3	4	1
Compressor trailer	Trailer mounted air compressor	1	3	6	1
Boom crane truck	Movable crane	1	3	8	1
Install Wood/LWS Poles (10 People)					
1-ton truck	Transport construction personnel	1	3	8	1
Manlift/bucket truck	Lift construction personnel or materials	1	3	6	1
Boom crane truck	Movable crane	1	3	6	1
Auger truck	Drill mounted on a truck for drilling holes	1	3	4	1
Backhoe/front loader	Excavation of foundation and materials	1	3	8	1
Flatbed pole truck	Used for rigging and assembling a drill	1	3	8	1
Install/Transfer Conductor (10 People)					
1-ton truck	Transport construction personnel	3	4	4	1
Manlift/bucket truck	Elevation of construction personnel and materials	4	4	8	1
Boom crane truck	Movable crane	1	4	8	1
Dump truck	Transport material for construction	1	4	2	1
Wire truck/trailer	To move cable line	1	4	6	1
Sock line puller	To string cable line	1	4	6	1
Bull wheel puller	Used as a puller or a tensioner to control wire	1	4	6	1
Static truck/tensioner	Install/Transfer Conductor	1	4	6	1
Backhoe/front loader	Excavation of foundation and materials	1	4	2	1
Lowboy truck/trailer	Haul heavy equipment	2	4	4	1
Restoration/Cleanup (5 people)					
1-ton truck	Transport construction personnel	2	1	4	1
Backhoe/front loader	Excavation of foundation and materials	1	1	4	1
Motor grader	Scraper to grade the construction site	1	1	6	1
Water truck	Water site	1	1	8	1
Drum type compactor	Soil compactor	1	1	4	1
Lowboy truck/trailer	Haul heavy equipment	1	1	4	1

Table 4-4. Construction – Typical Equipment Use

Equipment	Use	Number of Vehicles	Days per Week of Operation	Hours per Day of Operation	Duration of Use (weeks)
Telecommunications Construction					
Telecom Construction Inside MEER (3 People)					
Pick-up truck	Transport construction personnel	3	5	6	6
Substructure Installation (4 People)					
Backhoe	Excavation of foundation and materials	1	5	8	7
Dump trucks	Transport material for construction	1	5	8	7
Cement truck	Mix and transport cement	1	5	8	7
Wood Pole Replacement and Transfer Facilities (6 People)					
1-ton truck	Transport construction personnel	2	5	2	8
Double bucket truck	Lift personnel	1	5	8	8
Boom truck	All construction activities	1	5	8	8
Auger truck	Drill mounted on a truck for drilling holes	1	5	4	8
Fiber Optic Cable Installation (6 People)					
Pick-up truck	Transport construction personnel	2	5	8	13
Manlift/bucket truck	Elevation of personnel and stringing wire	2	5	8	13

Source: SCE, 2014a; SCE, 2014b.

4.11.9 Construction Schedule

SCE anticipates that construction of the Proposed Project would take approximately 12 months. This does not include delays attributable to inclement weather and/or stoppages necessary to protect biological resources. Construction would commence following CPUC approval, final engineering, procurement activities, and receipt of all applicable permits.

4.12 Operation and Maintenance

The proposed Banducci Substation would be unstaffed, and electrical equipment within the substation would be remotely monitored and controlled by an automated system from SCE's Vincent Substation. SCE personnel typically would visit for electrical switching and routine maintenance. Routine maintenance would include equipment testing, monitoring, and repair. The substation would require permanent lighting for occasional use in evenings, as needed (SCE, 2014b). It is anticipated that there would be SCE personnel visiting the substation approximately two to three times per week.

The proposed subtransmission lines would be maintained in a manner consistent with CPUC General Order 165. Normal operation of the 66 kV subtransmission lines would be controlled remotely through SCE control systems. SCE inspects the energized subtransmission overhead facilities a minimum of once per year using ground and/or aerial observation. Maintenance would occur as needed and would include activities such as repairing conductors, replacing insulators, replacing poles, and access road maintenance.

4.13 Other Project-Related Activities

4.13.1 Geotechnical Studies

Prior to start of construction, SCE would conduct a geotechnical evaluation for the Proposed Project. Geotechnical site assessment and field investigation would be conducted at the substation site and new TSPs locations for the subtransmission line segments. Geotechnical studies include borings to collect soil samples for laboratory analysis and, if applicable, to determine the depth to bedrock and/or the water table. The laboratory results would be analyzed to determine the physical properties of subsurface soils, soil resistivity, and presence of hazardous materials. In addition, the results would be used for foundation design and final design of the project.

4.13.2 Environmental Surveys

After project approval, but prior to the start of construction, environmental surveys would be conducted to identify sensitive biological and cultural resources in the vicinity of the Proposed Project, including the 66 kV subtransmission line route, wire stringing locations, access roads, and staging yards. In addition, these areas would be examined for obvious signs of chemical contamination, such as oil slicks and petroleum odors. The information gathered from these surveys may be used to modify the project design to avoid sensitive resources or to implement APMs to minimize the impact to sensitive resources from project-related activities. The survey results also would be used to determine the extent to which environmental specialist construction monitoring by SCE would be required.

Biological Resource Surveys. Biological resources surveys to be completed would be as follows:

- *Sensitive plant surveys* would be conducted by a qualified botanist familiar with plants in the Cummings Valley. Surveys would focus on identifying whether state and federally listed species as well as California Native Plant Society special-status plants are present. In addition, potential habitat to support special-status plant species would be identified.

Thirty days prior to the start of ground disturbing activity, the following surveys would be conducted:

- *Clearance Surveys.* A clearance survey would be conducted no more than 30 days prior to the start of construction in a particular area to identify potential plant and animal species that may be impacted by construction activities. Clearance surveys include a field survey by a qualified botanist and wildlife biologist and would be limited to areas directly impacted by construction activities.
- *Active Nests.* Within one week prior to the start of construction in a particular area during nesting season (generally February 1 to August 31), a nesting survey would be conducted. If a nest must be moved during the nesting season, SCE would coordinate with the California Department of Fish and Wildlife and the United States Fish and Wildlife Service to obtain approval prior to moving the nest.

Cultural Resources Surveys. Most of Proposed Project areas have been surveyed for cultural resources. The unsurveyed portions of the Proposed Project would be surveyed for cultural resources prior to construction and based on final engineering, and the following actions would be taken, as necessary:

- During the surveys, any discovered archaeological resource potentially affected by construction of the Proposed Project would be evaluated for its eligibility for listing in the California Register of Historical Resources (California Register). Ideally, archaeological resources found to meet any of the California Register eligibility criteria would be avoided and preserved in place. If avoidance is not feasible, a data recovery plan would be prepared to recover scientifically consequential information from the site prior to construction of the Proposed Project. The data recovery plan would define all aspects of the data recovery program, including a research design, description of all archaeological methods and techniques to be employed in data recovery, as well as analytical and reporting procedures and required reports. Studies and reports resulting from site recordation and data recovery would be deposited with the Southern San Joaquin Valley Information Center and other appropriate agencies. Provision would be made for the appropriate curation of any artifacts and other recovered materials at a museum or other qualified repository.

- If previously undetected archaeological resources are discovered during construction of the Proposed Project, personnel would be instructed to suspend work in the vicinity of any find, and work would be redirected to avoid impacting the resource. The resource would then be evaluated for listing in the California Register by a qualified archaeologist, and, if the resource is determined to be eligible for listing in the California Register, the resource would either be avoided or appropriate archaeological protective measures would be implemented.
- In the event that human remains are encountered during preconstruction surveys or construction and cannot be avoided, the remains would be removed in accordance with CEQA Guidelines 15064.5(d) and (e).

Any built environment resources found would be fully documented using California Department of Parks and Recreation Form 523 and supplements.

Each built environment resource potentially affected by construction of the Proposed Project would be evaluated for its eligibility for listing in the California Register. Ideally, built resources found to meet any of the California Register eligibility criteria would be avoided by the Proposed Project and preserved in place. If avoidance is not feasible, each California Register eligible resource affected by the Proposed Project would be recorded to the Historic American Building Survey/Historic American Engineering Record/ Historic American Landscape Survey standards.

4.13.3 Worker Environmental Awareness Training

Prior to construction, a Worker Environmental Awareness Program (WEAP) would be developed. A presentation would be prepared by SCE and used to train all site personnel prior to the commencement of work. A record of all trained personnel would be kept.

In addition to instruction on compliance with any additional site-specific biological or cultural resource protective measures and Proposed Project mitigation measures developed after the preconstruction surveys, all construction personnel would also receive the following:

- A list of phone numbers of SCE environmental specialist personnel associated with the Proposed Project (archaeologist, biologist, environmental coordinator, and regional spill response coordinator).
- Instruction on the Eastern Kern Air Pollution Control District (EKAPCD) fugitive dust rules.
- Instruction on what typical cultural resources look like and instruction that if discovered during construction, work is to be suspended in the vicinity of any find and the site foreman and archaeologist or environmental coordinator is to be contacted for further direction.
- Instruction on the individual responsibilities under the Clean Water Act, the project Storm Water Pollution Prevention Plan (SWPPP), site-specific Best Management Practices (BMPs), and the location of Material Safety Data Sheets for the project.
- Instructions to notify the foreman and regional spill response coordinator in case of a hazardous materials spill or leak from equipment, or upon the discovery of soil or groundwater contamination.

- A copy of the truck routes to be used for material delivery.
- Instruction that noncompliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the Proposed Project.
- Instruction on Ozone Precursor Control Measures.
- Direction that site vehicles must be properly muffled.

4.13.4 Traffic Control

Construction activities undertaken within public street ROW would require the use of a traffic control service, and all lane closures would be conducted in accordance with applicable requirements. These traffic control measures would be consistent with those published in the *California Joint Utility Traffic Control Manual* (SCE, 2014a).

4.14 Applicant Proposed Measures

SCE proposes to implement measures to ensure the Proposed Project would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. SCE proposes to implement these measures during the design, construction, and operation of the Proposed Project in order to avoid or minimize potential environmental impacts.

Applicant Proposed Measures (APMs) listed in Table 4-5 are considered part of the Proposed Project and are considered in the evaluation of environmental impacts (see Section 5, Environmental Analysis and Mitigation). CPUC approval would be based upon SCE adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures identified by this Initial Study.

Table 4-5 details each APM by environmental issue area. In some cases, mitigation measures presented in Section 5 either expand upon or add detail to the APMs presented in Table 4-5, if necessary, to ensure that potential impacts would be reduced to less than significant levels.

Table 4-5. Applicant Proposed Measures (APMs)

APM Number	Issue Area
	Biological Resources
APM Bio-1	**Pre-construction Surveys and Construction Monitoring.** To the extent feasible, biological monitors would monitor construction activities in areas with special-status species, native vegetation, wildlife habitat, or unique resources to ensure such resources are avoided.
APM Bio-2	**Pre-Construction Surveys for Nesting Birds/Raptors.** SCE would conduct project-wide nesting bird surveys and remove trees and other vegetation if feasible outside of the nesting season. If a tree or pole containing a raptor nest must be removed during nesting season, or if work is scheduled to take place in close proximity to an active nest on an existing transmission tower or pole, SCE biologists would determine appropriate nesting buffers based on a project specific nesting bird management plan or consultation with the appropriate agencies.
APM Bio-3	**Burrowing Owl.** Biologists would conduct a preconstruction burrowing owl survey of the Proposed Project Study Area no more than 30 days prior to construction. Construction activities will be scheduled and planned to avoid burrowing owls and their burrows. A 250-foot buffer will be placed around active nest and the site will be avoided, where feasible. If occupied burrows cannot be avoided, an appropriate relocation strategy would be developed in conjunction with the CDFW and may include collapsing burrows outside of nesting season and using exclusionary devices to reduce impacts to the burrowing owl. Biological monitors would monitor all construction activities that have the potential to impact active burrows.

Table 4-5. Applicant Proposed Measures (APMs)

APM Bio-4	**Tehachapi Slender Salamander.** If project activities would be located within oak woodlands and ravines, construction activities would avoid displacement of rocks, logs, bark, and other debris in thick leaf litter, near talus slopes. For these areas, a biologist would be present to ensure that construction activities do not impact this species, particularly during periods of peak activity, such as rainy or wet nights with moderate temperatures.
APM Bio-5	**Avoidance of Sensitive Habitats.** SCE would minimize impacts and permanent loss of Big Sagebrush Scrub, oak woodlands, and aquatic features at construction sites by flagging native vegetation to be avoided. If unable to avoid impacts to native vegetation, a project revegetation plan would be prepared in coordination with the appropriate agencies for areas of native habitat temporarily impacted during construction.
	Paleontological Resources
APM PA-1	**Paleontological Resources Treatment Plan.** A Paleontological Resources Treatment Plan shall be developed for construction within areas that have been identified as having a high sensitivity for paleontological resources or in areas where construction activities would exceed 10 feet in depth. The Paleontological Resources Treatment Plan would be prepared by a professional paleontologist in accordance with the recommendations of the SVP.
	Hazardous Materials
APM HAZ-1	**Fire Management Plan.** A Fire Management Plan would be developed by SCE prior to the start of construction.

4.15 Other Permits and Approvals

The CPUC is the lead agency for CEQA review of this project. In accordance with CPUC General Order No. 131-D, SCE prepared and submitted a Proponent's Environmental Assessment (PEA) as part of its application for a Permit to Construct (PTC). The CPUC has exclusive authority to approve or deny SCE's application; however, various permits from other agencies may also need to be obtained by SCE to build the Proposed Project. If the CPUC issues a PTC, it would provide overall project approval and certify compliance of the project with CEQA. In addition to the PTC, Table 4-6 summarizes the permits from other federal, State, and local agencies that may be needed for the project.

Table 4-6. Permits that May Be Required for the SCE Banducci Substation Project

Agency	Jurisdiction	Requirements
FEDERAL / STATE AGENCIES		
California Public Utilities Commission	Construction, modification, or alteration of power line facilities.	Permit to Construct (General Order No. 131-D)
California Department of Transportation	For use of California State highways for other than normal transportation purposes, including construction activities completed within the ROW.	Standard Encroachment Permit
California Office of Historic Preservation	Consultation (through CEQA review process)	Cultural resources management (if appropriate)
Regional Water Quality Control Board (RWQCB) – Regions 5 and 6	Construction activities disturbing 1 acre or more of soil must submit a Notice of Intent to comply with the terms of the general permit.	National Pollution Discharge Elimination System, General Construction Storm Water Pollution Prevention Plan (SWPPP)
California Department of Fish and Wildlife	Endangered species consultation	Consultation on State-listed species; possible impacts to threatened and endangered species

Table 4-6. Permits that May Be Required for the SCE Banducci Substation Project

Agency	Jurisdiction	Requirements
LOCAL / REGIONAL AGENCIES		
Kern County and City of Tehachapi	Building and Grading Permits and Safety Requirements	Ministerial approval for construction of new facilities
	Roadway Encroachment and/or Transportation Permit	Ministerial approval for possible closure of roads for transportation of heavy or oversized equipment and construction of facilities within public roadway right-of-way
Union Pacific Railroad	Activities in area of railroad	Encroachment permit to cross railroad facilities (telecommunications components)

4.16 Electric and Magnetic Fields Summary

4.16.1 Electric and Magnetic Fields

Recognizing that there is public interest and concern regarding potential health effects that could result from exposure to electric and magnetic fields (EMF) from power lines, this document provides information regarding EMF associated with electric utility facilities and the potential effects of the Proposed Project related to public health and safety. Potential health effects from exposure to ***electric fields*** from power lines (produced by the existence of an electric charge, such as an electron, ion, or proton, in the volume of space or medium that surrounds it) are typically not of concern since electric fields are effectively shielded by materials such as trees, walls, etc. Therefore, the majority of the following information related to EMF focuses primarily on exposure to ***magnetic fields*** (invisible fields created by moving charges) from power lines.

Magnetic fields can be reduced either by cancellation or by increasing distance from the source. Cancellation is achieved in two ways. A transmission line circuit consists of three "phases": three separate wires (conductors), usually on an overhead tower. The configuration of these three conductors can reduce magnetic fields. When the configuration places the three conductors closer together, the interference, or cancellation, of the fields from each wire is enhanced, and the magnetic field is reduced. This technique has practical limitations because of the potential for short circuits if the wires are placed too close together. Close conductor spacing can also create worker safety concerns because there is a risk of workers contacting energized conductors during maintenance. The cables used in underground high-voltage transmission lines are insulated (coated) to allow the three phases to be much closer together than on overhead lines.

This Initial Study does not consider magnetic fields in the context of CEQA and determination of environmental impact. This is because (a) there is no agreement among scientists that EMF does create a potential health risk, and therefore, (b) there are no defined or adopted CEQA standards for defining health risk from EMF. As a result, EMF information is presented for the benefit of the public and decisionmakers.

After several decades of study regarding potential public health risks from exposure to power line EMF, research results remains inconclusive. Several national and international panels have conducted reviews of data from multiple studies and state that there is not sufficient evidence to conclude that EMF causes cancer. The International Agency for Research on Cancer (IARC), an agency of the World Health Organization (WHO), and the California Department of Health Services (DHS) both classified EMF as a possible carcinogen (WHO, 2001; DHS, 2002).

In addition, the 2007 WHO [Environmental Health Criteria (EHC) 238] report concluded that:

- Evidence for a link between Extremely Low Frequency (ELF, 50–60 Hz) magnetic fields and health risks is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia. However, "…virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status.…the evidence is not strong enough to be considered causal but sufficiently strong to remain a concern."
- "For other diseases, there is inadequate or no evidence of health effects at low exposure levels."

Currently, there are no applicable regulations related to EMF levels from power lines or substations. However, following a CPUC decision from 1993 (Decision [D.]93-11-013) that was reaffirmed by the CPUC on January 27, 2006 (D.06-01-042), the CPUC requires utilities to incorporate "low-cost" or "no-cost" measures to mitigate EMF from new or upgraded electrical utility facilities up to approximately 4 percent of total project cost. To comply with this requirement, SCE has incorporated such measures to reduce magnetic field levels in the vicinity of the proposed substation and subtransmission lines.

4.16.2 EMF and the Banducci Substation Project

In accordance with Section X(A) of GO 131-D, CPUC Decision No. D.06-01-042 and SCE's EMF Design Guidelines prepared in accordance with the EMF Decision, SCE will incorporate "no cost" and "low cost" magnetic field reduction steps in the design of the proposed power line and substations modification and expansion. The design guidelines include the following measures recommended by SCE to reduce the magnetic field strength levels from electric power facilities:

For Proposed Banducci 66 kV Subtransmission Line Route Segment 1, SCE would:

- Utilize structure heights that meet or exceed SCE's EMF preferred design criteria; and
- Utilize subtransmission line construction that reduces the space between conductors compared with other designs.

For Proposed Banducci 66 kV Subtransmission Line Route Segment 2, SCE would:

- Utilize structure heights that meet or exceed SCE's EMF preferred design criteria; and
- Utilize subtransmission line construction that reduces the space between conductors compared with other designs.

For Proposed Banducci 66/12 kV Substation, SCE would:

- Place major substation electrical equipment (such as transformers, switchracks, buses and underground duct banks) away from the substation property lines; and
- Configure the transfer and operating buses with the transfer bus closest to the nearest property line.

Further information regarding EMF and the Banducci Substation Project can be found in Appendix F, Field Management Plan: Banducci 66/12 kV Substation Project, which was submitted to the CPUC as part of SCE's application (A.12-11-011). SCE's application (A.12-11-011) and Proponent's Environmental Assessment are available for public review at the CPUC Energy Division CEQA Unit and on the project website at:

http://www.cpuc.ca.gov/Environment/info/aspen/banduccisubstation/banduccisubstation.htm