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3 PROPOSED PROJECT DESCRIPTION

3.1 PROJECT LOCATION

The location of the major project components are discussed below.

3.1.1 Artesian Substation

The existing 69/12kV Artesian Substation is an approximately 2.0 acre industrial zoned site located within an urbanized area in the City of San Diego (see Figure 3-1, Proposed Project Vicinity Map and Figure 3-2, Proposed Project Overview Map). The substation is bounded by the street Camino Del Sur to the north, an apartment complex to the south, a stormwater retention basin and existing SDG&E transmission corridor to the west, and an approximately 4-acre undeveloped, SDG&E-owned (commercial zoned) parcel to the east.

3.1.2 Power Line Location

As shown in Figures 3-1 and 3-2, the Proposed Project components are located in the western portion of San Diego County, with elements within both the City and unincorporated County of San Diego, California. The Proposed Project 69kV reconductor route (approximately 2.2 miles) traverses developed residential, industrial, open space, and commercial areas, as well as designated farmland – though the area surrounding this farmland is developed. Also, the reconductor alignment crosses a stream at seven points. The Proposed Project would involve facilities located within existing ROW, franchise position (city/county roadways), and SDG&E fee-owned property.

3.1.3 Other Affected Substations

The Proposed Project would also require minor modifications at the existing Bernardo and Rancho Carmel Substations (both of which are also located in the City of San Diego). Like the Artesian Substation, the existing Bernardo Substation is an approximately 2.0 acre industrial zoned site. It is bounded by industrial enterprises to the west, south, and east and open space to the north. The Rancho Carmel Substation is located on an approximately 1.0 acre industrial site. It is bounded by industrial enterprises to the south and west and developed residential to the north and east.

3.2 EXISTING SYSTEM

3.2.1 Artesian Substation

The existing Artesian Substation is a 69/12kV air insulated substation with two existing 69/12kV transformers and a 69kV grounding transformer. The Artesian Substation is currently connected to two 69kV power lines (TL6939 and TL6920) and 6 distribution lines[1]. An existing SDG&E electric utility corridor is located immediately west of the Artesian Substation site, and contains an existing 230kV transmission line and a 138kV power line that both currently bypass the existing Artesian Substation. Figure 3-3, Existing Artesian Substation Site, contains an overview of the existing Artesian Substation site. Appendix 3-A contains detailed information for the existing Artesian Substation, including substation equipment and layout/arrangement.

3.2.2 Bernardo Substation

The Bernardo Substation is an existing 69/12kV substation located approximately 2.2 miles east of the Artesian Substation. The Bernardo Substation contains connections to four 69kV power lines and 19 distribution lines. The Bernardo Substation is currently connected to the Artesian Substation via one existing 69kV power line (TL6939).

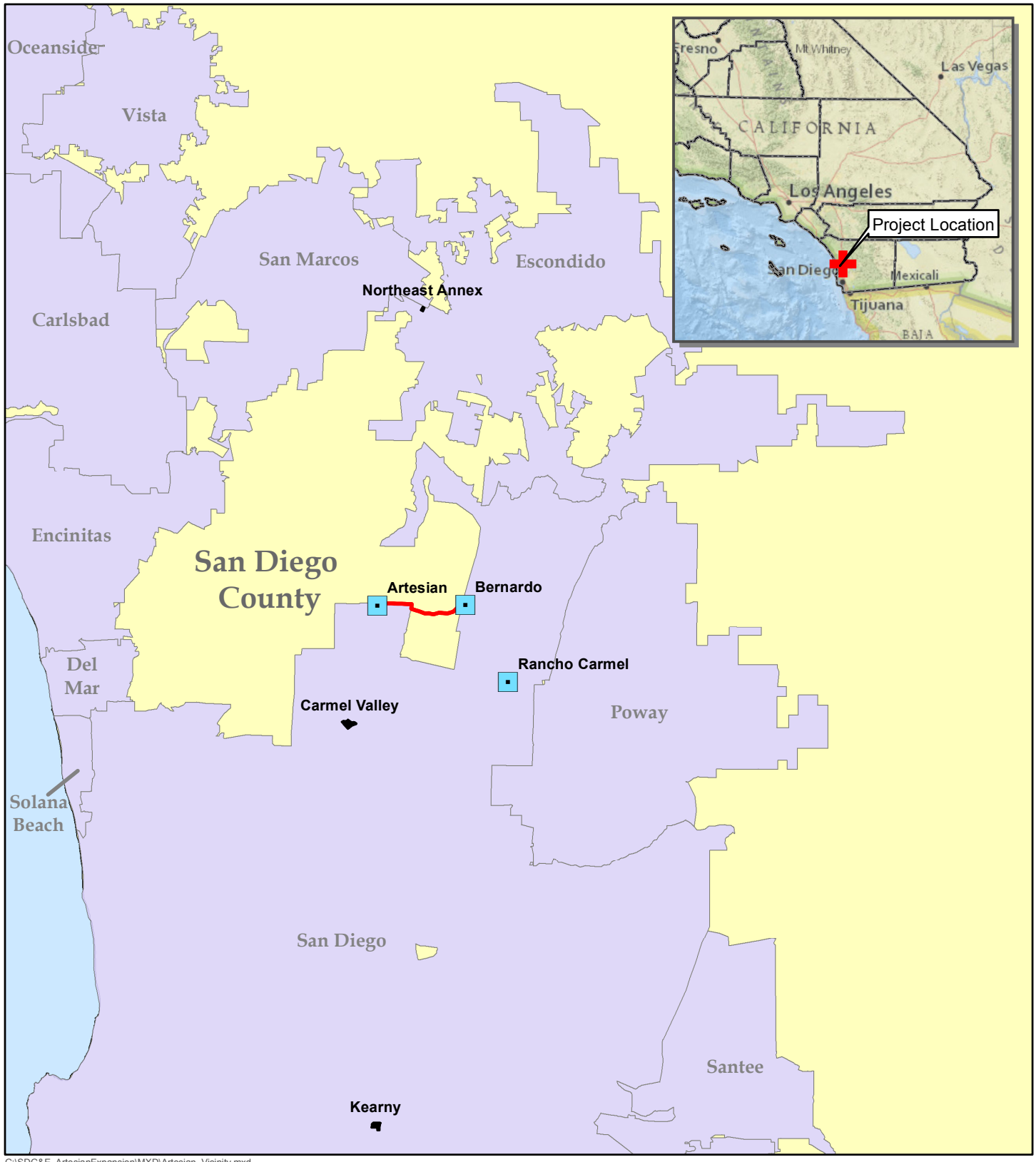
3.2.3 Rancho Carmel Substation

The Rancho Carmel Substation is an existing 69/12kV substation that is located approximately 2.2 miles southeast of the Bernardo Substation. The Rancho Carmel Substation is connected to two 69kV power lines and 8 distribution lines. The Rancho Carmel Substation is connected to the Bernardo Substation by one 69kV power line (TL633).

3.2.4 Transmission and Power Lines

As stated above, there are currently two 69kV power lines (TL6939 and TL6920) that connect to the existing Artesian Substation, and there is one 69kV, one 138kV, and one 230kV line located immediately adjacent to the Artesian Substation that currently do not connect to the substation. There is one 69kV power line (TL6939) that connects the Artesian and Bernardo Substations and one 69kV power line (TL633) that connects the Bernardo and Rancho Carmel Substations. TL6920 connects the Artesian Substation with the Sycamore Canyon Substation, and represents the primary source of the current Artesian 69/12kV Substation. The existing and proposed transmission and power line system are depicted on Figure 3-4, Existing and Proposed System Configuration.

[1]CPUC General Order 131-D distinguishes between distribution lines ("designed to operate under 50 kV"), power lines ("designed to operate between 50 and 200kV"), and transmission lines ("designed to operate at or above 200 kilovolts").



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- Proposed Project Substation
- Proposed Project Power Lines[1]
- Staging & Storage Yard
- Incoporated Cities of San Diego County

[1] New 230kV connection at Artesian and ~500-foot 69kV reconductor at Rancho Carmel are not shown due to scale.

Artesian 230kV Substation Expansion Project
Proposed Project Vicinity Map
Figure 3-1

N
0 1.5 3 Miles

Sources: TRC, 2015; SDG&E, 2015; Cal-Atlas, California Counties; National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC

8/1/2016

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BACK OF FIGURE 3-1

Artesian 230kV Substation Expansion Project

Proposed Project
Overview Map
Figure 3-2

Project Features

- Project Structure
- Foundation Cable Pole (New)
- Overhead Work Only (Existing Structure)
- Pier Foundation Pole (New)
- Remove From Service (Existing Structure)
- Overhead Work; New Underground Cable
- Overhead 69kV Power Line (Reconductor)
- Overhead 69kV Power Line to be Removed
- Overhead 230kV Transmission Line Loop-in (New)
- Underground Distribution Line (New)
- Underground Distribution Line to be Removed
- Underground Power Line (New Cable in New Trench)
- Underground Power Line (New Cable in Existing Conduit)
- Stringing / Pulling Site
- Work / Staging Area
- Other Project Areas
- Artesian Expansion
- Municipal Boundary

* Guard Structures, Access roads, Distribution Features, and Vaults not shown

TRC

SDGE
A Sempra Energy utility

7/29/2016

0 500 1,000 1,500 Feet

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BACK OF FIGURE 3-2

Artesian 230kV Substation Expansion Project

Existing Artesian Substation Site

Figure 3-3

Existing Artesian

Proposed Expansion Site

N

100 feet

SDGE
A Sempra Energy utility

3/4/2016

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BACK OF FIGURE 3-3

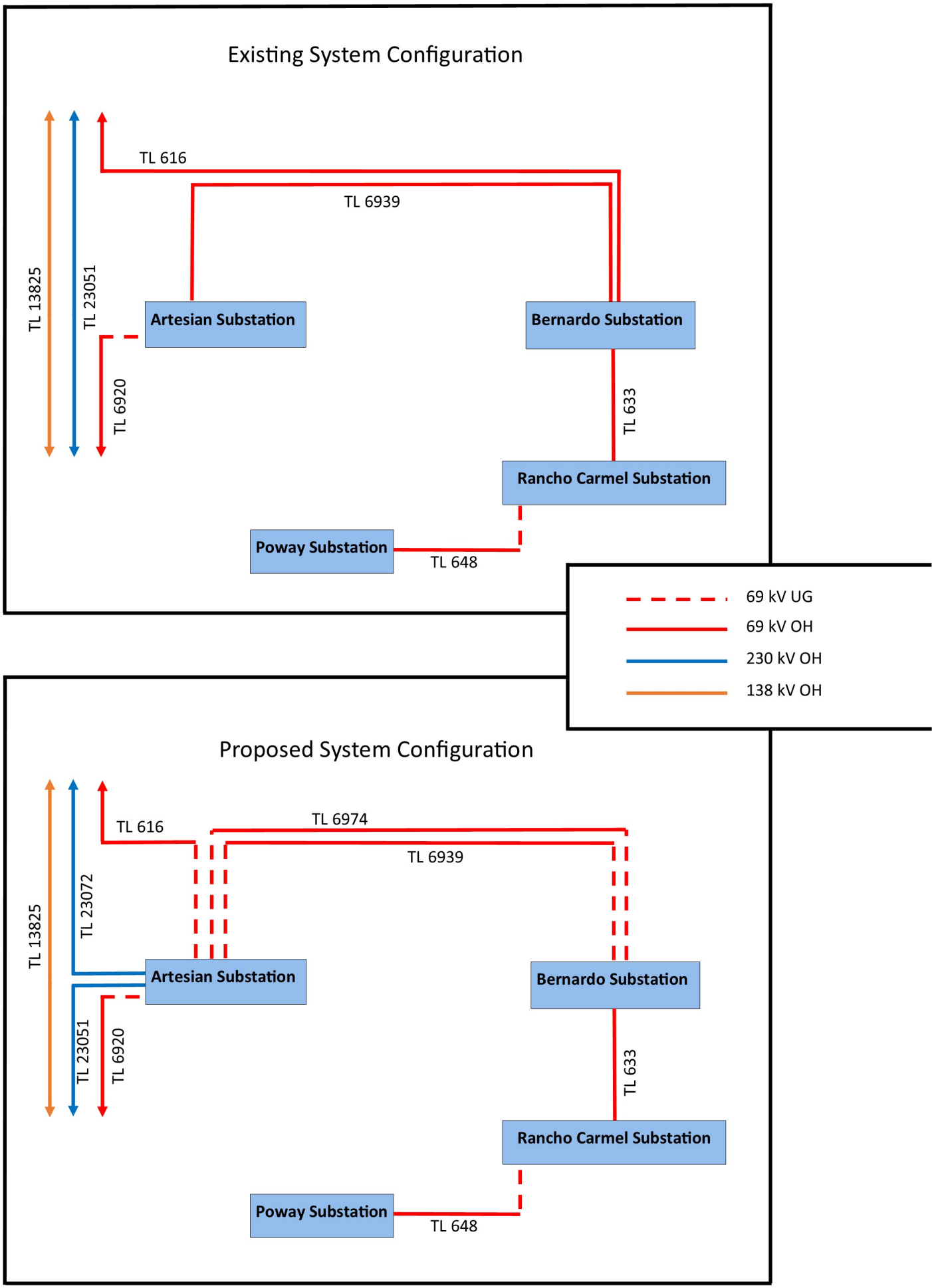

Figure 3-4: Existing and Proposed System Configuration

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BACK OF FIGURE 3-4

3.3 PROJECT OBJECTIVES

The Artesian 230kV Substation Expansion, along with the 69kV upgrades, are required to mitigate NERC thermal violations (Category P1 NERC Violations) in the Poway Area Load Pocket. The Poway Area Load Pocket, which includes five 69/12 kV distribution substations[2] located in the Poway, 4S Ranch, Rancho Peñasquitos, Carmel Mountain Ranch and Black Mountain Ranch Communities, is expected to grow by as much as 15 percent over the next 10 years (refer to Table 2-1). To address the NERC thermal violations and support the load growth demand, SDG&E proposes to expand the existing Artesian Substation to enable an addition of a 230/69kV yard to alleviate the existing 69kV congestion at the existing Sycamore Canyon Substation. Additional detail on the purpose, need, and objectives of the Artesian Substation Expansion Project (Proposed Project) is provided in Section 2.0, Proposed Project Purpose and Need.

3.4 PROPOSED PROJECT

The Proposed Project includes the following main components:

- Within SDG&E's fee-owned property, build a new 230/69kV air insulated substation (AIS) at the existing 69/12kVArtesian Substation site (2.4 acres);
- Within SDG&E's fee-owned property adjacent to the existing Artesian substation site, relocate, rebuild and expand the existing 69kV facility with a new AIS substation (3.5 acres);
- Loop in existing 230kV TL23051 into the new 230kV substation yard at Artesian Substation.
- Reconductor an existing double-circuit 69kV power line (2.2 miles) located between the Artesian and Bernardo Substations, including the replacement of existing wood pole structures with new steel pole structures as needed, and the removal of some existing pole structures from service;
- Construction of new underground 69kV powerline getaways (0.8 mile) outside the existing Artesian and Bernardo Substations;
- Minor distribution line upgrades, including the removal of existing distribution underbuild[3] and wood pole structures; and
- Minor modifications at the existing Bernardo (2.1 acres) and Rancho Carmel (1.3 acres) Substations within the existing footprints.

Each of these Proposed Project components is discussed in detail within the following sections. The Proposed Project Objectives are discussed within Section 2.0 of this PEA.

[2] From south to north: Pomerado, Poway, Rancho Carmel, Bernardo, and Artesian Substations.
[3] "Underbuild" refers to the practice where lower voltage conductor (typically distribution) is located on higher voltage pole structures, placed between the ground and the higher voltage lines.

3.5 PROJECT COMPONENTS

3.5.1 Transmission Lines

The Proposed Project would include an existing 230kV transmission line (TL23051) and two 69kV overhead power lines. The 230kV transmission line (TL23051), which lies to the west of the existing Artesian Substation, would be connected to the proposed 230/69kV component of the Artesian Substation via two new steel tubular poles. These connections are expected to be approximately 200 feet. The existing double-circuit 69kV power line is approximately 2.2 miles long. This segment is supported by approximately 36 double-circuit wood monopole structures which require replacement, new installation, and removal. This segment will support two circuits (power lines) that will be designated TL6974 (new) and TL6939 (existing). The 69kV overhead power lines will connect to the Artesian and Bernardo Substations via underground 69kV getaways. Existing 69kV underground getaways for two other existing 69kV power lines (TL616 and 6920) will also be extended to connect to the relocated Artesian 69/12kV substation yard (east parcel).

SDG&E-owned fiber optic cable currently co-located on structures near the Bernardo Substation will either be converted to an underground position along with the 69kV power line or left in place on the wood overhead pole structures. If the fiber optic cable is left in place on the wood overhead pole structures, the pole structures will be topped[4] above the fiber optic cable. The fiberoptic cable may be upgraded (reconductored), if needed. These structures will be accessed via existing SDG&E access roads and paved city streets.

Table 3-1: Transmission, Distribution, and Power Line components summarizes length and type of relevant transmission and power lines for the Proposed Project. Further details regarding transmission and power lines are described in Section 3.5.3. Appendix 3-B depicts all proposed power line elements, including proposed routes and alignments, proposed pole structure locations, and locations of pole structures to be removed.

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[4] A "topped" structure is a structure that is partially removed, where the top portion of the structure is cut off and only the lower portion is left in place.

Table 3-1: Transmission, Distribution, and Power Line Components

Component Description	Approximate Length of New Line(s)	Line Type
TL23051/23072 – Artesian Substation Loop-in	250 feet (each)	Overhead
TL 616 – Artesian Substation Getaway	1,515 feet	Underground
TL6939– Artesian Substation Getaway	600 feet	Underground
TL6974 – Artesian Substation Getaway	555 feet	Underground
69kV Reconductor (TLs 6939 & 6974)	2.2 miles (each)	Overhead
TL6939 – Bernardo Substation Getaway	600 feet	Underground
TL6974 – Bernardo Substation Getaway	530 feet	Underground
TL 6920 – Artesian Substation Getaway	680 feet	Underground
TL 648 – Cable Replacement at Rancho Carmel Substation	600 feet	Underground
Distribution Line Circuit C1100	1,200 feet	Underground
Notes: Table contents based upon preliminary engineering. Source: SDG&E		

3.5.2 Poles/Towers

Pole and Tower Metrics

The number of installations, replacements, and removals, as well as typical pole dimensions are summarized below in Table 3-2: Typical Pole Metrics and Table 3-3: Transmission, Distribution, and Power Line Structures. Detailed information including unique pole identification numbers, typical drawings/diagrams, and pole-for-pole replacements can be found in Appendix 3-D.

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Table 3-2: Typical Pole Metrics

Pole Type	Typical Height (feet)	Typical Depth[2] (feet)	Approximate Pole Diameter (feet)		Typical (Average) Work Area (square feet)			
			Pole Base	Pole Top	Installation/ Replacement[3]	Removal from Service[4]	Pole Top Only	Permanent
230 kV Tubular Steel Pole	130	40	5-6	2-3	22,500	N/A[5]	N/A	2,600
69 kV Wood Monopole	65	15	2-3	1	N/A	1,260	1,260	N/A
69 kV Wood Cable Pole	65	15	2-3	1	N/A	1,260	1,260	N/A
69 kV Steel Tubular Pole (direct bury)	75	20	2-3	1	1,260	N/A	1,260	60
69 kV Steel Tubular Pole (pier foundation)	75	30	2-3	1	5,625	N/A	1,260	60
69 kV Steel Cable Pole	83	30	3-5	1.5	22,500	N/A	1,260	200
69kV Wood Distribution-only Poles	45	15	2-3	1	N/A	1,260	1,260	N/A
69kV Wood Communication-only Poles	27	15	2-3	1	N/A	1,260	1,260	N/A
69kV Wood Stub Poles	20-69	15	2-3	1	N/A	1,260	1,260	N/A
69kV Steel Stub Poles	25	15	2-3	1	N/A	1,260	1,260	N/A

Notes:
Table contents are typical, and do not necessarily represent any specific project feature. Final engineering and design will determine final structure metrics.
Source: SDG&E

Table 3-3: Transmission, Distribution, and Power Line Structures

Structure/Pole Type[1]	Installed	Utilized in place	Removed[2]
230kV Tubular Steel Poles	2	0	0
69kV Wood Monopole	0	20	13
69kV Wood Cable Poles	0	2	1
69kV Tubular Steel Poles	14	0	0
69kV Steel Cable Poles	5[3]	0	0
Wood Distribution-Only Poles	0	2	1
Wood Communication-Only Poles	0	0	2
Wood Stub Poles	0	0	4
Steel Stub Poles	0	0	2
69kV Underground Splice Vaults	5	0	0
Distribution Switches, Intercepts, & Pads	3	0	0

Notes: Table contents based upon preliminary engineering.
[1] Refer to Appendix 3-C for typical pole structures diagrams. Refer to Appendix 3-B for pole structure locations. Refer to Appendix 3-D for pole structure details (height, structure type, etc...)
[2] Of the 23 pole structures to be removed, 14 will be replaced by new steel pole structures and 9 will be removed from service).
[3] These new steel pole structures will replace existing wood pole structures (refer to Appendix 3-D)
Source: SDG&E

Raptor Safety and Structure Design

The Proposed Project will include installation, removal, and replacement of existing structures. Pole-for-pole replacement will occur on some, but not all, removed structures. Replacement structures will be placed in line with removed structures. For locations of each replacement structure, refer to Appendix 3-B. No specialty poles are proposed as a part of the Proposed Project. New structures will use both pier foundations and direct bury. For the Proposed Project, the average span length between structures will be approximately 250 feet. Permanent impacts to avian species covered under the MBTA could occur from potential electrocution from the new transmission line. Electrocution of avian species, especially raptor species with large body sizes and wing spans, can result when an avian species that is perching, landing, or taking flight from a utility pole completes the electrical circuit with wing contact between two conductors. Electrocution of avian species also can result through simultaneous contact with energized phase conductors and other equipment, or simultaneous contact with an energized wire and a grounded wire. In addition to SDG&E's current construction standard, which includes increased phase spacing and cover-ups to reduce avian mortality from electrocution, the Proposed Project would remain in compliance with the Avian Power Line Interaction Committee's (APLIC) Suggested Practices for Avian Protection on Power Lines to reduce the potential for electrocution to both avian and other wildlife species. CPUC General Order 95,

which governs overhead power and transmission line design, includes mandatory phase spacing that meets or exceeds the APLIC standards.

3.5.3 Conductor/Cable

3.5.3.1 Above Ground Installation

Transmission Lines

The Proposed Project will connect an existing 230kV transmission line (TL23051) to the expanded Artesian Substation. As described in Section 3.5.1, SDG&E operates an existing 230kV transmission line that is located immediately adjacent to the existing Artesian Substation site (refer to Figures 3-2 and 3-4 as well as Appendix 3-B). As part of the Proposed Project, two new 230kV drop-pole structures (tubular steel poles) will be installed and the 230kV transmission line will be connected to the new 230/69kV yard at the Artesian Substation site. These poles will have 3 conductors and will be spaced approximately 18 feet apart (horizontally and vertically). The minimum clearance from the lowest conductor to the ground is 25 feet where only pedestrian access is present, and a minimum of 30 feet in all other locations. Table 3-2 contains dimensions for the proposed new transmission line pole structures. The new overhead 230kV transmission line connection would be approximately 200 feet in length. There are currently no other utilities collocated with TL23051 where it will be connected with the Artesian Substation.

Power Lines

In order to increase the rating of the existing 69kV power lines currently located between the Artesian and Bernardo Substations[5], the existing alignment will be reconductored.[6] The segment to be reconductored is approximately 2.2 miles in length, and consists of approximately 36 existing double-circuit wood monopole structures located between the Artesian and Bernardo Substations (refer to Figure 3-2 and Appendix 3-B). The existing conductors along this approximately 2.2-mile segment are 636 and 1033.5 thousand circular mills (kcmil)[7], aluminum conductor, steel reinforced (ACSR) conductor and will be reconductored (replaced) with 636 kcmil heat resistant aluminum alloy conductor invar reinforced (ZTACIR).[8] Following the construction of the Proposed Project, this 69kV power line (connecting the Artesian and

[5] Note that one of the existing 69kV lines within this corridor does not currently connect to the Artesian Substation. As part of the Proposed Project, the end line will be connected to the Artesian 69/12kV yard.

[6] The term "reconductor" refers to a process where existing overhead conductor is replaced with newer, typically higher ampacity conductor. The reconductor process typically does not require significant alterations to the support structures (poles). However, some structures may require replacement.

[7] A circular mil (cmil) is a standard unit of measure used for electrical systems that refers to the area of the cross section of larger conductor sizes. One cmil is equal to the area of a circle with a 1-mil diameter, and 1 kcmil is equal to 1,000 cmils. Large conductor sizes rated for use on electrical transmission lines are generally 0.6-inches to 2-inches in diameter. 636-kcmil conductor is approximately 0.56-inches in diameter and 1033.5-kcmilconductor is approximately 0.87-inches in diameter.

[8] In general, ZTACIR is a special conductor designed for high-temperature, low-sag applications which allows the line to be operated at higher ampacities than typical ACSR wires.

Bernardo Substations) will support two circuits (power lines) that will be designated TL6974 (new) and TL6939 (existing).

The 2.2-mile reconductor will result in the replacement of 14 existing 69kV wood monopoles with new 69kV steel tubular poles (9 direct bury and 5 concrete pier foundation), the removal of nine existing 69kV wood monopoles from service (not replaced by new steel tubular poles), and the utilization of 22 existing wood monopoles in place[9] (refer to Appendix 3-B). All new 69kV steel monopole structures will be made of weathering steel, which has a brown or rust-colored hue. All existing and new pole structures will utilize polymer insulators. All new 69kV tubular steel poles will have 3 conductors per circuit and will be spaced approximately 6 feet apart (horizontally and vertically). The typical span length is 300 – 400 feet, and the minimum clearance from the lowest conductor to the ground is 25 feet where only pedestrian access is present, and a minimum of 30 feet in all other locations.

The power line components are summarized in Table 3-1, Transmission, Distribution, and Power Line Components, and are further described in the following subsections. All project-related power line pole structures are summarized in Table 3-2, Typical Pole Metrics and Table 3-3, Transmission, Distribution, and Power Line Structures. Appendix 3-B depicts all proposed power line elements, including proposed routes and alignments, proposed pole structure locations, and locations of pole structures to be removed.

3.5.3.2 Below Ground Installation

New 69kV Getaways at Artesian Substation

In order to connect existing overhead 69kV power lines TL616 and TL6939 and new TL6974 to the Artesian Substation, three new steel cable poles and new underground duct packages will be installed north of the Artesian Substation. The three new, single circuit steel 69kV cable poles (P03, P04 and P05 – refer to Appendices 3-B and 3-C) will be installed to transition the 69kV conductor from an overhead to an underground position. Approximately 3,000 total feet (between all three lines) of new trench and duct package will be installed between three (3) new cable poles and the relocated 69kV substation yard, along with three (3) new splice vaults. New 69kV cable pole structures will be dull galvanized steel pole structures. The new underground cable will be 3,000 kCMIL XLPE copper conductor. Typical drawings for the underground trench can be found in Appendix 3-D.

New 69kV Getaways at Bernardo Substation

An approximately 600-foot segment of existing double-circuit 69kV power line located northwest of the Bernardo Substation will be relocated to an underground position (refer to Figure 3-2 and Appendix 3-B). The new TL6939 and TL6974 underground getaways will be

[9] Structures that are utilized in place will require only pole top work. Pole top work typically involves the replacement of conductor and insulators. The structure itself (and any existing ancillary support such as guy -wires or stub poles) will remain in place and unchanged.

500600 feet in length. The new underground cable will be 3,000 kCMIL XLPE copper conductor.

SDG&E-owned fiber optic cable currently co-located on these pole structures will either be converted to an underground position along with the 69kV power line (proposed design) or could left in place on the wood overhead pole structures. If the fiber optic cable is left in place on the wood overhead pole structures, the pole structures will be topped[10] above the fiber optic cable and the fiber optic cable may be upgraded (reconductored), if needed. These structures will be accessed via existing SDG&E access roads and paved city streets.

Underground Getaway at Rancho Carmel Substation

An approximately 600-foot segment of underground 69kV power line getaway at the Rancho Carmel Substation will be upgraded. Existing 69kV power line TL648 currently connects from the substation to structure E24 in an underground position. This segment of 69kV power line needs to be upgraded to 3,000 kCMIL XLPE copper (existing conductor is 1,750 kCMIL XLPE aluminum). New cable will be installed between pole structure E24 and the existing bay position within the substation (refer to Appendix 3-B).

In order to maintain 69kV service to the Rancho Carmel Substation from TL648 during underground cable replacement, TL648 will be temporarily connected to the existing bay position via a shoo-fly structure that will be installed within the substation fence-line. The temporary shoo-fly structure will support a temporary overhead connection of TL648 from existing pole structure E24 to the substation bay position. The temporary shoo-fly structure will be removed following completion of the underground cable replacement.

Distribution Lines

The Proposed Project will include minor distribution line upgrades at the Artesian Substation and along Rancho Bernardo Road, as further described below. The minor distribution line upgrades will shift existing distribution lines from an overhead to underground position. Distribution lines will utilize 1,000 kCMIL aluminum conductor cable (PECN-PEJ or USA 2 [600 volt]).

<u>Artesian Substation Minor Distribution Upgrades</u>

Existing 69kV pole structures R05 and R07, as well as distribution-only pole structures E02, E03, and R06 currently support distribution circuit C1100 in an overhead position. Following the completion of the Artesian Substation 69kV underground getaways, these distribution lines will need to be relocated and/or replaced. In order to achieve the functional replacement of the removed overhead distribution lines, new underground connections will be installed, including approximately 800 total feet of new underground distribution line (new cable in existing trench and conduit - refer to Appendix 3-B). One new distribution pad-mounted 4-way switch will be

[10] A "topped" structure is a structure that is partially removed, where the top portion of the structure is cut off and only the lower portion is left in place.

installed approximately 40 feet west of an existing manhole located outside and north of the Artesian Substation.

In addition to the removal of the existing overhead distribution, approximately 400 feet of existing underground distribution line located near structures R08 and R09 will be removed from service as it will no longer be required following the construction of the distribution upgrades listed in the preceding paragraph (refer to Appendix 3-B).

Other Minor Distribution Line Upgrades

Existing 69kV pole structures along Rancho Bernardo Road at locations P07 and P08 currently support distribution underbuild that will need to be relocated prior to the new steel pole structures being installed at locations P07 and P08. Approximately 370 feet of new underground distribution line and approximately 300 feet of new trench will be installed between location P08 (where it will connect with existing underground distribution lines) and an existing distribution meter location approximately 20 feet northeast of pole structure P07. One new pad-mounted transformer will be installed in-line with the new underground distribution line, approximately 25 feet southeast of pole structure P07 (refer to Appendix 3-B).

3.5.4 Substations

Substation construction will consist of grading and site development (Artesian Substation only), below grade construction, above grade construction, and testing/energization. Specific construction activities at each Project Substation site are described in the following subsections.

3.5.4.1 Artesian Substation

As stated in Section 2.0, Purpose and Need, the Artesian Substation will be expanded to allow connection to TL23051 and create a second 230 kV source into the Poway Area Load Pocket. The construction of the Proposed Project at the Artesian Substation site will occur within the existing property boundary and the adjacent, SDG&E-owned parcel to the east. Following construction, a 230/69kV yard and a 69/12kV yard will comprise the expanded Artesian Substation. Dimensions of major substation equipment are shown on the general arrangement and elevation drawings provided within Appendix 3-A.

69/12kV Substation Yard

The Artesian Substation 69/12kV initial configuration will be designed to include the following components:

- One new concrete masonry block control shelter will be installed to house the substation's relays, controls, and batteries. This shelter will measure approximately 50 feet by 32 feet by 12 feet high.
- A 69kV yard with double 69kV busses and four bays of breaker and a half configuration. Each bay will consist of three breakers, six disconnects, and monitoring transformers. Four bays of single breaker – single bus will also be installed.
- Four 69kV power lines installed with underground getaways.

- Two 69/12kV, 30 mega volt ampere (MVA) transformers will be relocated and installed along with two 69kV SL&P transformers – all with oil spill containment basins and installed in a single breaker/single bus configuration.
- The existing 12kV (distribution) switchgear will stay in its current location with one of the existing switchgear being replaced with a new duplicate section immediately north of its current location. The existing distribution conduit package will be intercepted into the new switchgear.
- An AT&T communication line and SDG&E fiber communication lines will be upgraded from the current lines installed at the existing Artesian Substation.
- A microwave tower consisting of an approximately 50-foot tall monopole will be installed near the control shelter.

Substation lighting will be installed in the yards with the purpose to:

- Allow for safe entry and exit from the substation;
- Allow for safe driving around busses/racks, corners, and roadways; and
- Allow for a preliminary visual inspection of the substation.

Lights are not for security and are not to be left on at night. Lighting designs will result in approximately 0.5 foot-candles in walkway areas with high pressure sodium used for gate entry lighting only, and metal halide used for all yard lights. Different light types will be used for the wall/control shelters and deadend structures, if necessary. All lights will be shielded.

The ultimate Artesian Substation 69/12kV configuration will be designed to include the following components, in addition to the components of the initial arrangement listed above:

- Two additional 69/12kV, 30 MVA transformers with oil containment basins (when these are installed, the 69kV SL&P transformers will be removed).
- Two additional 12kV capacitors in the east yard.
- In the east yard, two additional ¼ sections of 12kV switchgear with four 12kV circuit positions terminating inside each section of the switchgear. .
- Additional relay and protection equipment inside the masonry block control shelters.
- Three spare positions which can be used for one additional 69kV feed from a future 230/69kV transformer and two additional 69kV power lines or three additional power lines.

230/69kV Substation Yard

The Artesian Substation 230/69kV initial configuration will be designed to include the following components:

- A 230kV yard with double 230kV busses and two bays of breaker and a half configuration. Each of the bays will consist of three breakers, six disconnects, potential transformers, and protection equipment, an approximately 55-foot line deadend structure

plus a 10-foot static mast and an approximately 55-foot transformer deadend structure with a 10-foot static mast. This equipment will be of AIS design.

- One 230/69kV, 224 MVA transformer will be installed with oil spill containment basin. One approximately 55-foot steel deadend structure plus a 10-foot static mast will be installed at the transformer location to terminate the 230kV bank leads. One approximately 20-foot tall termination stand will be installed to terminate the 69kV underground bank leads into the 69kV yard.
- Each 230kV main bus will consist of two approximately 40-foot tall high bus deadend structures.
- Two 230kV transmission lines will be installed overhead into the line deadend structures.

The ultimate Artesian Substation 230/69 kV configuration will be designed to include the following components, in addition to the components of the initial arrangement listed above:

- The Proposed Project's spare 230kV position will accommodate either one 230/69kV, 224 MVA transformer or one additional 230kV transmission line. If the transformer is installed, it will be with an oil spill containment basin and one fire wall, approximately 52 feet long by 30 feet tall, will be installed between the second and first transformers.
- One additional approximately 20-foot termination structure will be installed to terminate the 69kV bank leads underground into the 69kV yard.
- A noise wall approximately 35 feet tall will be installed south and extend to the east and west of the 230/69kV transformers. This wall will reduce the noise of the 2nd transformer to acceptable levels at the south property line.

The anticipated site development scope of work for the Artesian Substation is further described in Section 3.7.4.1 and is depicted on the preliminary grading plans included in Appendix 3-A.

3.5.4.2 Bernardo Substation

Minor upgrades are required at the existing Bernardo Substation in order to facilitate the required 69kV reconductor work between Bernardo and Artesian Substations. The minor work at the existing Bernardo Substation will not require any site development work at the substation site. The proposed work will require rearrangements and trenching inside the existing substation boundary, but will not require additional grading or other site development activities. All existing structures, with the exception of two wood monopole structures that will be removed from service, will be unchanged.

3.5.4.3 Rancho Carmel Substation

Minor upgrades are required at the existing Rancho Carmel Substation in order to upgrade the line rating for the existing 69kV power line between Poway and Rancho Carmel Substations. The minor work at the existing Rancho Carmel Substation will not require any site development work at the substation site. The proposed work will require rearrangements inside and outside of the existing substation boundary, but will not require additional grading or other site development activities.

3.6 RIGHT-OF-WAY REQUIREMENTS

SDG&E currently owns right-of-way (ROW) that runs along the existing 230kV and 69kV lines (see Appendix 3-E, Project ROW Map). The existing 69kV reconductor ROW is 20-24 feet wide and approximately 2.2 miles long. The existing 230kV ROW is 200 feet wide and extends all the way to the Sycamore Canyon Substation. SDG&E currently has valid easements and franchise agreement rights to construct the proposed new 230kV, 69kV and 12kV facilities included as part of the Proposed Project. All substation related work, including the expansion of the Artesian Substation, will be conducted on SDG&E owned property. No additional land or ROW is required for the Proposed Project.

3.7 PROJECT CONSTRUCTION

This section includes an overview of the typical methods that would be used for construction of the Proposed Project. Specifically, this section describes typical construction methods for overhead and underground facilities, substation construction and alteration, and temporary construction work areas.

3.7.1 General Construction (For All Projects)

3.7.1.1 Staging Areas

The Proposed Project includes 3 temporary construction staging and storage yards (refer to Appendix 3-B), resulting in a total area of approximately 26 acres (including 5 acres for the Carmel Valley Staging Yard which is located on an approximately 25-acre parcel). The staging yards may be used for various construction support activities, including refueling areas for vehicles and construction equipment by a mobile fueling truck, pole assemblage, open storage of material and equipment, construction trailers, portable restrooms, parking, and lighting. If power is required at the staging yard sites, it will be provided by either a temporary connection to adjacent distribution line facilities, or by small, portable diesel generators. Construction workers typically meet at the staging yard each morning and park their vehicles at the yard. In-ground fencing would be installed at the staging yards wherever it is not already installed. Gravel, class II base, or other BMPs may be used to line the ground at staging yards to avoid the creation of unsafe mud conditions and unnecessary sediment transport off site.

SDG&E has attempted to identify a reasonable number of staging yards commensurate with the size, location, and scope of the Proposed Project. Past staging yards were identified, as well as large undeveloped areas near one or more portions of the Proposed Project that have been previously disturbed and/or graded. While SDG&E has exercised reasonable diligence in identifying potential construction staging yards, there is no guarantee that the identified staging yards would be available by the time the Proposed Project is set to begin construction. Other potential staging yards may be identified as part of the environmental review process, final engineering, or construction. SDG&E will also utilize the Artesian Substation (existing [western] parcel as well as the expanded [eastern] parcel) for temporary staging of materials and equipment during construction.

Staging Yard No. 1 (Carmel Valley Road)

It is anticipated the Carmel Valley Road Staging Yard will act as the primary staging yard during construction of the Proposed Project. The Carmel Valley Road Staging Yard is a 5-acre site located on a larger parcel (approximately 25 acres) at the corner of Carmel Valley Road and Camino Del Sur. The staging yard is on a relatively flat area and has been previously grubbed and graded. Access to this staging yard will be via Camino Del Sur. SDG&E has contacted the land owner, and has received permission to include the property as a potential staging yard for the Proposed Project as part of the PTC and CEQA review processes.

Storage Yard No. 2 (Kearny Mesa Yard)

The Kearny Mesa Yard is an existing SDG&E-owned facility where space is available for the temporary storage of construction materials and equipment. The Kearny Mesa Yard is 18.6 acres in size, pre-graded and grubbed, and located approximately 13 miles south of the Proposed Project (refer to Figure 3-1 and Appendix 3-B). Access to this staging yard will be via Complex Street or Overland Avenue.

Storage Yard No. 3 (Northeast Storage Facility)

The Northeast Storage Facility is an existing SDG&E-owned facility where space is available for the temporary storage of construction materials and equipment. The Northeast Storage Facility is 3.8 acres in size, is pre-graded and grubbed, and is located approximately 7.5 miles north of the Proposed Project (refer to Figure 3-1 and Appendix 3-B). Access to this staging yard will be via Mission Road.

3.7.1.2 Work Areas

Work areas would be required for construction/installation of new facilities, removal of existing facilities, and storage and staging of construction equipment and materials. Each of these temporary work areas are described below. Table 3-4, Temporary Work Areas Summary, outlines the estimated total work area required for construction of the Proposed Project. The locations of temporary work areas can be found in Appendix 3-B, but are subject to modification or additional sites may be identified during construction in order to safely and efficiently conduct the work.

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Table 3-4: Temporary Work Areas Summary

Work Area Type	Estimated Number	Estimated Total Area (Acres)[1]
Material Storage and Staging Yards[2]	3	26
Construction Staging Areas	19	1.0
Stringing Sites	14	0.5
Underground Cable Pulling Sites	8	0.3
Pole Structure Work Areas[3]	68	4.3
Guard Structures	23	0.03
Underground Construction (69 kV)[4]	0.9 mile	1.6
Artesian Substation and Expansion	1	6.0
Bernardo Substation	1	2.1
Rancho Carmel Substation	1	1.3
Total	**N/A**	**43.1**

Notes:
Table contents based upon preliminary engineering.
[1] Work area values do not include overlap. For example, some stringing sites overlap with substation work areas. However, these overlap areas are only counted towards one type of work even though they are utilized for more.
[2]Includes Kearny Mesa and Northeast Annex Storage Yards as well as the anticipated 5-acre portion of Carmel Valley Road Staging Yard (25-acre) property.
[3]Includes work areas for pole installation (21), pole removals (23), and top-of-pole work (24).
[4]Includes the sum of all proposed underground lines (i.e. two lines traveling along the same street adjacent to each other are two separate lengths) and a typical work space/width of 15 feet.
Source: *SDG&E*

Construction Staging Areas

In addition to the staging areas and storage yards identified in Section 3.7.1.1, SDG&E will also utilize 18 small temporary construction staging areas located at various locations along the Proposed Project alignment (refer to Appendix 3-B). Temporary staging areas for the Proposed Project are typically 0.01 acre in size (12 feet by 50 feet), but may be as large as 6,500 square feet. Temporary construction staging areas differ from full staging yards in that they would not have power (either generators or temporary distribution connections), would not be fenced, would not include modular office or meeting spaces, and would not include certain types of activities such as vehicle maintenance, hazardous materials storage, or water storage. Temporary construction staging areas will only be used to support specific, short-term construction activities, and may only be utilized for a fraction of the overall construction duration. These temporary construction staging areas will be accessed via existing access roads and City/County streets.

Overhead Stringing and Underground Pulling Sites

It is anticipated that 22 stringing/pulling sites will be used to construct the Proposed Project. Refer to Appendix 3-B for these stringing/pulling site locations. All stringing/pulling sites lie within SDG&E ROW and/or City/County franchise property and will be accessed via existing access roads or City/County streets. Stringing sites are typically 20 feet by 100 feet while pulling sites are typically 15 feet by 75 feet. Minor vegetation clearing may be required for some of the

stringing sites. Detailed information regarding work at these sites can be found in Sections 3.7.2.1 and 3.7.3.2.

Pole Structure Work Areas

In order to accommodate construction equipment and activities during pole installation and removal and while transferring the power line conductors, temporary construction areas will be required at each pole structure location.

It is anticipated that each of the direct-bury steel 69kV poles, removal poles, and overhead work only poles will require an approximately 20-foot-diameter work area (approximately 314 square feet); each of the 69kV foundation steel poles will require an approximately 75 foot by 75 foot work area (approximately 5,625 square feet); and each of the 230kV pier foundation steel pole structures and 69kV pier foundation steel cable pole structures will require an approximately 150 foot by 150 foot work area (approximately 22,500 square feet).

The work areas for each type of pole foundation will generally be centered around the existing pole location. However, actual work areas will vary in shape and size and will be determined based on site conditions and access requirements in order to provide a safe and adequate work area for construction workers, and to avoid and minimize impacts to sensitive resources. The on-site biological monitor, as appropriate, will assist construction crews in locating pole work areas that avoid and minimize impacts to sensitive resources. For purposes of analysis, temporary impact areas for 69kV direct-bury steel poles, removal from service poles, and overhead work only poles include the work area as previously described, and an additional potential impact area (approximate total of 1,260 square feet) to account for minor modifications made in the field during construction.

The positioning of construction equipment within work areas (typically line trucks, bucket trucks, and crane trucks) will involve the placement of approximately four outriggers (per vehicle) with dimensions of approximately two feet wide by three feet long (6 square feet) per outrigger for line trucks, and four feet wide by four feet long (16 square feet) per outrigger for crane trucks. The location of the outriggers will be evaluated by the onsite biological monitor prior to their placement in order to avoid and minimize impacts to sensitive resources.

In addition to temporary construction work areas, new 230kV poles would require a permanent maintenance pad, but the dimensions can vary depending upon site access and topography. These areas are considered a permanent work space and would be kept relatively flat and un-vegetated. Any work space not required for safety during operation and maintenance would be restored, as feasible, to approximate pre-construction conditions following the completion of the Proposed Project.

Permanent Work Areas

With the exception of the expanded Artesian Substation parcel, the Proposed Project is located entirely within existing utility corridors and franchise areas that currently feature permanent work pads and access roads,. Operation and maintenance of the Proposed Project would utilize these existing work areas and roads, as well as limited additional permanent work areas that would remain following completion of construction activities. Table 3-5, Summary of Permanent Work Areas, outlines the anticipated permanent work areas that would be created as a

result of the proposed Project. It is important to note that the permanent work areas described in Table 3-5 would be contained within the temporary pole structure work areas.

Table 3-5: Summary of Permanent Work Areas

Work Area	Approximate Number	Approximate Area (acres)
Artesian Substation Expansion	1	3.53
Access Road Widening	1	0.23
Detention Basin Expansion	1	0.68
New Pole Structure (230kV) Operation Work Pads[1]	2	0.15
New Permanent Access Roads[2]	1	0.13
Splice Vault Man Holes[3]	6	0.0

Notes:
Table contents based upon preliminary engineering and are subject to change.
[1] Note that permanent pole structure operation work pads would be contained within the temporary pole structure installation work areas described in Section 3.7.1.2 and Table 3-4.
[2]A substation perimeter access road will be installed along the south and west sides of the Artesian Substation. The impact area (0.13 acres) reflects only the southern portion as the western portion overlaps with pole, maintenance pad, and detention basin impacts areas.
[3] Vault man holes are 36 inches in diameter. The vast majority of splice vaults are located below ground and therefore only the size of man hole opening is counted above as part of the permanent work area.

Source: *SDG&E*

Guard Structures

Prior to installing the new overhead conductor, SDG&E would utilize temporary guard structures at road crossings and other locations where the new conductor could come in contact with existing electrical and communication facilities, or vehicular and/or pedestrian traffic in the event the line accidentally falls during stringing operations. The anticipated guard structure locations are shown on the detailed route map in Appendix 3-B. Different types of guard structures may be used, depending on the site conditions. Guard structures typically consist of directly embedded wood poles with a cross-beam attached to side extensions (refer to Appendix 3-C for a photograph of a typical wood-pole guard structure). In some locations, such as paved areas, a boom or bucket truck may be used as a guard structure. Installation of guard structures would require the temporary use of 72 square feet of area with no permanent impacts. Where embedded wood guard structures are used, an auger would be used to excavate the holes where the wood poles would be installed and a crane or line truck would lift the poles into place. These holes would be approximately 3 feet wide and 10 feet deep. No concrete foundations are required to set the guard poles and no grading or other site work is anticipated. The temporary guard poles would be removed following the completion of conductor stringing operations and the holes would be backfilled with excavated soil.

Underground Power Line Construction

The majority of the underground power line construction included as part of the Proposed Project would typically require approximately 25 feet (width) of temporary work space. At vault locations, approximately 30 feet (width) of temporary work space would be required for installation of the new underground cable splices. These work areas are located outside the Artesian and Bernardo Substations. Refer to Section 3.7.3.1 for more information regarding underground power line work areas.

3.7.1.3 Access Roads and/or Spur Roads

Proposed Project access road metrics are provided within Table 3-6, Approximate Access Road Metrics. Foot paths (0.07 mile), overland travel (0.12 mile), and existing access roads (4.0 miles) will be utilized to access components of the Proposed Project. In addition, some public roads will be used and will require traffic control at guard structure locations. These roads include Camino Del Sur, Babcock Street, Coyote Bush Drive, Four Gee Road, Rancho Bernardo Road, 4S Ranch Parkway, Dove Canyon Road, Goldentop Road, and Camino San Bernardo. Most of the existing SDG&E access roads needed for the Proposed Project lie along the overhead power line alignment. These existing access roads provide access to the existing 69kV structures between Artesian and Bernardo Substations. There is an existing access road northwest of the existing Artesian Substation that allows access to various structures. The next existing access road runs along Artesian Road. This road, in concert with many small foot paths and overland paths, provides access to structures R03 through R16 (see Appendix 3-B). An existing access road north of Camino Del Sur provides access to structures P09 through E14. The remainder of the structures are accessed via existing access roads that use parking lots of commercial buildings. In addition to the use of existing access roads, foot paths, and overland paths, the Proposed Project will widen an existing access road west of the existing Artesian Substation, within existing SDG&E ROW, and create new substation perimeter roads on the existing SDG&E property.

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Table 3-6: Approximate Access Road Metrics

Road Type	Description	Distance (miles)	Area[1] (acres)
Existing Dirt Road[2]	Existing graded access road that may need minor smoothing, grading, or clearing and would not contribute to impacts.	2.31	3.36
Existing Paved Road	Existing access road that has been paved and would not contribute to impacts.	1.61	N/A
Foot Path & Overland Travel (Temporary)	Overland access will require no preparation and is characterized by flat, grassy areas. Foot paths may require minor trimming to traverse. Construction crews would be selective with which paths they choose to use.	0.20	0.29
Widen Existing Paved Road	An existing access road that will be widened from approximately 20 feet to 35 feet	0.08	0.004[3]
New Unpaved Roads (Permanent)	New substation perimeter roads along the southern and western sides of the expanded Artesian Substation	0.20	0.46

Notes:
[1]Based on typical road width of 12 feet
[2] Distance and area do not include the existing, unpaved access road that will be widened.
[3] Acreage based on the difference between existing and new widths.

Proposed Project facilities would be constructed within the existing SDG&E ROW easements and substation properties. Construction would use SDG&E access roads[11] and public roadways to access these facilities (refer to Appendix 3-B). Most work areas are accessible by vehicle on unpaved SDG&E maintained access roads or by overland travel[12]. To enable crews and equipment to access the associated poles, maintenance (i.e. smoothing or refreshing) of the existing access roads and/or vegetation clearing may be necessary to improve some existing access roads and to re-establish unmaintained access roads. Access road construction and maintenance will be conducted using a bulldozer and soil compactor vehicles. In some areas, public roads would be used to access transmission line pole structures. Pursuant to *SDG&E's Subregional NCCP*, SDG&E is not required to withdraw mitigation credits for maintenance (i.e., re-establishing) of existing access roads. Based upon preliminary engineering, no new roads would be required for access to transmission or power line structures. Vehicles will remain

[11] For the purposes of this document, the term "access road" refers to typically unpaved SDG&E roads that connect to existing public streets and provide access to structures.
[12]Overland travel refers to temporary vehicular access across un-improved areas. Overland travel areas are not graded or subjected to other earthwork improvement. Following construction these areas are returned to an approximate pre-construction state.

within existing access roads, previously disturbed areas, and designated temporary work areas, where feasible. Minor adjustments to the access requirements may be necessary at the time of construction due to site conditions, construction requirements, and other factors.

As part of the Artesian Substation expansion, a new unpaved access road would be constructed along the outside perimeter of the west and south walls of the site. In addition, the existing paved access road on the west side of the existing substation would be widened. It is not anticipated construction of these access roads would require closure of public roadways.

3.7.1.4 Helicopter Access

It is not anticipated that helicopters would be used during construction of the Proposed Project. If a helicopter must be used, it would likely be a light- or medium-duty helicopter to assisting stringing the 69kV reconductor.

3.7.1.5 Vegetation Clearance

It is anticipated that the Proposed Project will require brush removal and trimming during construction activities, in order to establish work areas for pole installation and stringing activities and re-establish foot paths/overland paths. As summarized in Table 5.4-5: Anticipated Impacts to Natural Communities, construction of the Proposed Project would result in both permanent and temporary impacts to vegetation communities, including Annual Brome Grassland, California Sagebrush-California Buckwheat Scrub, Disturbed California Sagebrush-California Buckwheat Scrub, Restored California Sagebrush-California Buckwheat Scrub, and Restored/Disturbed California Sagebrush-California Buckwheat Scrub. Vegetation would be cleared using a mower; weed whacker; shovel; rake; lopper; or chainsaw, placed in steel bins, and disposed of at appropriate facilities. SDG&E would implement NCCP Operational Protocols which include monitoring during clearing. The implementation of these protocols would avoid or reduce impacts to vegetation communities to a less than significant level. It is not anticipated that any trees would be removed to construct the Proposed Project.

3.7.1.6 Erosion and Sediment Control and Pollution Prevention during Construction

Soil disturbance would occur at pole installation locations and trenching outside the Artesian and Bernardo Substations. A list of potentially impacted soils can be found in Table 5.6-3. As described in Section 3.7.2.2, these areas would require vegetation clearing, minor grading, and excavation of 20 to 90 cubic yards of soil. Trenching and installation of the underground getaways could result in 200 to 300 cubic yards of excavated material per day. Approximately ninety percent of all grading will occur at the Artesian Substation. The substation will be graded 36 inches below ultimate pad grade and then backfilled per geotechnical recommendations.

SDG&E plans to adhere to National Pollutant Discharge Elimination System (NPDES) – Construction General Permit requirements. This permit, which applies to projects of one acre or more, is meant to control the discharge of pollutants from point sources. The Construction General Permit requires the applicant develop a Storm Water Pollution Prevention Plan (SWPPP) which includes a selection of Best Management Practices (BMPs) to control erosion and discharge of sediments. Furthermore, the BMPs included in the SWPPP must be monitored and revised throughout the construction process as needed. In addition, SDG&E would also implement their *BMP Manual and Operational Protocols*. This manual includes BMPs that

reduce impacts to soil loss and helps ensure BMP usage is consistent with applicable rules and regulations.

Dewatering

Although not anticipated, dewatering may be necessary in some locations. Prior to construction, SDG&E will acquire coverage under the General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit) from the SWRCB and prepare a SWPPP. The SWPPP will detail project information, dewatering procedures, storm water runoff prevention control procedures, monitoring and reporting procedures, and BMPs.

Cut and Fill Summary

It is anticipated that construction of the Proposed Project would result in up to approximately 32,650 cubic yards of cut and 550 cubic yards of fill. Table 3-7, Proposed Project Cut and Fill Summary, contains a breakdown of the anticipated cut and fill requirements by Proposed Project component.

Table 3-7: Proposed Project Cut and Fill Summary

Project Component	Cut	Fill	Net Export
Artesian Substation (eastern and western parcels)	23,700	100	23,600
Bernardo Substation	--	--	--
Rancho Carmel Substation	--	--	--
Detention Basin Expansion	5,750	450	5,300
Stringing Sites	--	--	--
Staging Yards	--	--	--
Construction Staging Areas	--	--	--
New Transmission and Power Line Pole structures (21 new structures)	500	--	500
New Underground Power and Distribution Lines (Vaults and Trenching)	2,700	--	2,700
Totals	***32,650***	***550***	***32,100***

Notes:
Table contents based upon preliminary engineering. All values in cubic yards. Values rounded to the nearest 50 cubic yards.
Source: SDG&E

Final civil engineering for the Proposed Project has yet to be completed, therefore final cut and fill may differ from the estimates provided above. Actual cut and fill grading amounts may vary depending upon field conditions and final detailed engineering. Soil may be re-used onsite within existing ROW where extensive grading and excavation is not required in areas of existing

access roads and work pads. Excess soil from excavation may also be transported to a local recycling or appropriately permitted waste disposal facility if the soil is not re-used onsite or otherwise recycled. Excess soil would be re-used onsite wherever possible and only transported offsite as the final option.

Site Development

The Artesian Substation (including access road and retention basin expansions) will require site development, including grading. It is not anticipated that 69kV power line or 12kV distribution line construction will require site development or grading. Additional details for the Artesian Substation site development are provided in Section 3.7.4.1 and Appendix 3-A.

3.7.1.7 Cleanup and Post-Construction Restoration

SDG&E would restore all areas that are temporarily disturbed by the Proposed Project activities (including stringing sites, structure removal sites, and staging areas and yards) to near preconstruction conditions following the completion of construction and as consistent with fire break clearance requirements. There will be no impacts to natural drainage patterns or wetlands, impacts to vegetation, staging yards, access roads, and public roads may occur, and are discussed in Chapter 5. Restoration activities shall occur under the direction of a Habitat Restoration Specialist. Temporarily disturbed areas where native vegetation is impacted, which do not need to be maintained in a cleared state, shall be enhanced, either through vegetation restoration, habitat reclamation, or a combination of the two. Habitat reclamation involves the elimination of existing exotic vegetation (i.e., weed abatement) to facilitate the natural re-colonization of a native habitat. Habitat restoration entails a range of techniques including but not limited to: seeding, imprinting, soil and plant salvage. The specific technique, type of equipment, and number of personnel will depend on how large the area is to be restored and the condition of the habitat, including the soil. Post-construction activities shall also include erosion control as well as trash and debris removal immediately following the completion of construction. Where land is rented from private land owners (such as staging yards), post-construction restoration may be completed in consultation with the landowner. All disturbed areas such as access roads and staging yards shall be re-graded to existing contours using a grader. Trenches within public roadways shall be restored using rollers, pavers, graders, and concrete trucks.

All post-construction restoration will be in compliance with the Proposed Project's SWPPP that will be prepared pursuant to applicable stormwater regulations (refer to Sections 5.6 and 5.9 for additional information). It is SDG&E's practice to re-use or recycle all old structures/poles, materials, and components following the retirement of substations, power lines, and structures/poles. Any material that cannot be re-used or recycled shall be collected in steel bins, dump trucks, or metal drums (for hazardous materials) and recycled or properly disposed of off-site. SDG&E will conduct a final survey to ensure that cleanup activities are successfully completed as required. Table 3-8, Common Destination of Retired Project Components, outlines how some removed project components are often disposed of following construction.

Table 3-8: Common Destination of Retired Project Components

Project Structure, Material, or Component	Common End Use or Destination	Estimated Quantities
Wood power line structures/poles	Sanitary disposal	74 tons
Conductor cable	Recycled	140,000 feet
Insulators	Sanitary disposal	TBD
Scrap steel, copper and other metal	Recycled	1,300 cubic yards
Concrete	Recycled	
Soils	Re-used onsite or disposed of pursuant to applicable laws	32,100 cubic yards
Batteries	Recycled	TBD
Source: *SDG&E (2016)*		

3.7.2 Transmission Line Construction (Above Ground)

3.7.2.1 Pull and Tension (Stringing) Sites

Stringing sites often refer to those temporary construction areas used during installation or removal of overhead conductor or other overhead suspended catenary wires. Pulling sites are those temporary construction areas used for the installation or removal of underground cable. Stringing sites are typically required at locations where the conductor changes direction (i.e. angle points) or approximately every 9,000 feet where the conductor maintains a relatively consistent direction. Specific to the Proposed Project, SDG&E anticipates requiring stringing sites approximately every 900 to 1,200 feet. Approximately 14 stringing sites may be required during construction of the Proposed Project. The anticipated stringing sites are depicted on the detailed route map in Appendix 3-B. Stringing sites vary in size, but are typically 75 to 150 feet long by 15 to 100 feet wide. The location of stringing sites may be modified or additional stringing sites may be identified during construction in order to safely and efficiently string wire. The anticipated stringing sites are shown on the detailed route map in Appendix 3-B.

Stringing activities typically include a tensioner, pulling rig, bucket trucks, and crew trucks. New and replaced conductor are typically transported to and from the stringing sites via large spools that are often carried on flatbed trucks (wire trucks).

3.7.2.2 Pole Installation and Removal

Pole installation and removal typically involves the following steps, as further described below:

1. Pole and foundation removal.
2. Pole top removal (if needed).
3. Pole or structure installation:
    - Pad construction (if needed),
    - Foundation construction, and
    - Structure installation.

Pole and Foundation Removal

As previously described, construction of the Proposed Project would involve the removal or replacement of certain existing wood power line pole structures (mainly wood monopole pole structures). Refer to Appendix 3-B for the location of all poles to be removed. First, the existing conductor would be removed from the poles using wire trucks and pulling rigs. Guard structures would be utilized, as needed. For the 69kV reconductor segment of the Proposed Project, the existing hardware and insulators would be removed and replaced with new polymer insulators and hardware, as needed. For pole structures that would be removed from service or replaced (refer to Table 3-3 and Appendix 3-B), the old poles and components would be dismantled by cranes, bucket truck, or by hand, and would typically be hauled away by truck. Wood poles to be removed would either be removed to full depth or cutoff approximately 2 feet below grade depending upon environmental constraints at specific locations. After the poles have been removed, any existing concrete foundations would be jack hammered to approximately 2 feet below grade, and debris would be removed. The hole would then be backfilled with soil or materials similar to the surrounding area and the site would be restored. Structural removal would typically be completed from existing work pads or other disturbed work areas located at each existing pole site or using new pole structure temporary work areas, as-needed. Existing work pads are flat, compacted areas that are kept clear of vegetation for operation and maintenance activities.

Pole Top Removal

The Proposed Project design does not include any pole top removal activities. However, existing communication wires co-located on some of the 69kV structures could require the 69kV structures to be topped (above the communication lines) if the communication wires are not relocated to an underground position with the 69kV power lines. SDG&E's proposed design is to relocate the communication lines to the underground position, therefore SDG&E does not anticipate any structures to be topped.

Pole/Tower Installation

Prior to installing the support pole structure foundations, vegetation at each of the pole structure sites would be cleared and the area would be graded either flat or in a terraced fashion, as needed. At some sites, soil may be imported as necessary to raise the elevation of the pole structure pads, and retaining walls may be needed. Material removed during the process would be spread over existing access roads and work pads as appropriate, or disposed of off-site according to all applicable laws. Holes and excavation areas shall be covered during construction with wood or metal planks to maintain a safe work environment.

<u>Construction and Maintenance Pads (as-needed)</u>

After access to each new pole structure site has been established, work pads are created that would be utilized for construction, operation and maintenance. Work areas utilized solely for construction are often simply cleared of vegetation, and grading is only undertaken where relatively flat areas are not already present. Cleared vegetation would be removed from the project site and disposed of at an approved offsite facility. Construction activities will often utilize existing flat, cleared areas such as existing access roads and previously disturbed areas. Prior to foundation construction, a graded pad will be constructed at each 230kV pole and each

69kV steel cable pole structures. Smaller voltage pole structures, such as standard 69kV pole structure types, often do not require permanent graded pads. These pads are used to provide a level surface for installation of poles as well as for long term maintenance of the pole structures. Cuts and fills are used, as needed, to produce a 2-percent sloped pad. Most of the pads will be built with the soil that is located onsite.

For pole construction within existing utility corridors, including projects that involve pole replacements, the existing maintenance pads and work areas are also often utilized for construction activities. This is the case for the Proposed Project as most of the new pole structures are located in close proximity to existing pole structures[13].

Transmission line maintenance pads (permanent work space at the base of overhead pole structures) are cleared and graded flat, and are maintained free of vegetation for the operational life of the project. As needed, retaining walls would be installed to ensure safety and stability of the transmission line maintenance pad where geologic and topographic conditions warrant.

Concrete Pier Foundations (New 69kV and 230kV Pier Foundation Structures)

For pole installation, a large auger would be used to excavate holes that could range from 6 feet to 9 feet in diameter. Foundation depth would typically range from approximately 20 to 40 feet deep, but could increase due to soil conditions. If unstable soil conditions are encountered, hole excavations may require installation of steel casings to stabilize the sides of the excavation. The casing diameter would approximately match the diameter of the excavation. The length of the casing installed would normally be to the full depth of the excavation. The length of individual sections of casing are typically limited to 20 feet so multiple sections of casing may be used on deeper foundations. Following excavation, a reinforcing steel cage and anchor bolt cage would be installed in each hole. The steel cages would typically be assembled at the materials storage and staging areas and transported to each of the pole structure sites. The anchor bolt cages would be assembled offsite and delivered to each pole structure site. Typical foundations would require approximately 20 to 90 cubic yards[14] of excavation and a slightly larger volume of concrete placed into the holes as the foundations would extend one to two feet above the ground surface. Due to their larger diameter, cable pole foundations could require up to approximately 175 cubic yards[15] of concrete. The concrete curing period is approximately one month, during which time workers would remove the concrete forms and place backfill around the foundations as needed.

Other Considerations during Foundation Construction

It is not currently anticipated that blasting would be required to complete construction of the Proposed Project. However, in some locations where significant or dense rock is present, blasting could be required.

[13] Replacement structures are typically located within 6-8 feet of the existing structure location.
[14] Assumed a typical 9-foot diameter foundation extended to depths ranging from 20 to 40 feet.
[15] Assumes an 11-foot diameter foundation extended to an extra deep excavation (50 feet) due to unstable soils.

Dewatering may also be necessary in some locations. Prior to construction, SDG&E will acquire coverage under the General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit) from the SWRCB and prepare a SWPPP. The SWPPP will detail project information, dewatering procedures, storm water runoff prevention control procedures, monitoring and reporting procedures, and best management practices (BMPs).

Structure Installation

Based upon preliminary engineering and constructability review, it is anticipated that construction of transmission and power line pole structures would be conducted utilizing ground equipment such as cranes, flatbed trucks, drill rigs and excavators. The proposed alignment contains existing access and work space which would help accommodate ground-based construction equipment.

New steel poles would be delivered to the pole structure sites in two or more sections via flatbed truck and assembled on-site using a small truck-mounted crane. The poles would typically have six crossarms or post insulators (for double-circuit pole structures) that would support one circuit on each side and six conductors (three on each side). For typical tangent pole structures, the post insulators would be bolted directly to the pole. For typical deadend pole structures, the crossarms would be bolted to the pole, and the insulators would be bolted to the crossarms. The lowest conductor will be 30 feet above ground. The minimum vertical distance between conductors is 4 feet while the minimum horizontal distance is 8 feet. After assembly, a large crane would be used to lift to set the pole sections into place. The poles will then either be directly buried or set on the anchor bolts that are embedded in the concrete foundation. The nuts on the foundation would then be tightened and secured.

3.7.2.3 Conductor/Cable Installation

Conductor Installation and Removal Process

Conductor stringing operations (which includes reconductoring activities) begin with the installation of travelers or "rollers" on the bottom of each of the insulators using aerial manlifts (bucket trucks). The rollers allow the conductor to be pulled through each pole structure until the entire line is ready to be pulled up to the final tension position. Following installation of the rollers, a sock line (a small cable used to pull the conductor) is pulled onto the rollers from structure to structure using aerial manlifts traveling along the ROW. Once the sock line is in place, it is attached to the conductor and used to pull or "string" the conductor into place on the rollers using conventional tractor-trailer pulling equipment located at pull and tension sites along the line. The conductor is pulled through each pole structure under a controlled tension to keep it elevated and away from obstacles, thereby preventing third-party damage to the line and protecting the public. This "stringing" process is conducted using areas referred to as "stringing sites." Stringing sites are typically split into two types during stringing activities; "pull sites" and "reel sites." The reel site is used to park a large spool of conductor on a wire truck while the pull site is used to position the pulling rig that pulls the conductor. Each stringing site can be used as a pull or reel site, as needed. The anticipated stringing sites are shown on the detailed route map in Appendix 3-B.

After the conductor is pulled into place, the sags between the poles are adjusted to a pre-calculated level. Pursuant to General Order 95, the line would be installed with a minimum

ground clearance of 30 feet (25 feet where there is pedestrian access only)[16]. The conductor is then clipped into the end of each insulator, the rollers are removed, and vibration dampers and other accessories are installed.

Overhead Conductor Installation Safety BMPs

During stringing of conductor over roadways and other sensitive areas, BMPs are utilized to ensure stringing activities are completed in a safe manner. The most common BMP for stringing over roadways and similar sensitive features is the use of guard structures.

As stated in Section 3.7.1.2, guard structures would be used to install the new overhead conductor at road crossings and other locations where the new conductor could come in contact with existing electrical and communication facilities, or vehicular and/or pedestrian traffic in the event the line accidentally falls during stringing operations. The anticipated guard structure locations are shown on the detailed route map in Appendix 3-B. For more detail, refer to Section 3.7.1.2, Work Areas.

Alternatively, SDG&E may use flaggers to temporarily hold traffic for brief periods of time while the overhead line is installed at road crossings. Typically, guard structures are utilized at larger crossings such as large roadways, waterways, and utility crossings. Traffic control is typically utilized for small roadway crossings. For extremely large crossings such as freeways, both guard structures and traffic control may be used, as well as netting connecting the guard structures. SDG&E will acquire all required encroachment permits and road crossing approvals, including implementation of any special guard structure procedures or requirements as directed by each oversight agency.

3.7.3 Transmission Line Construction (Below Ground)

3.7.3.1 Trenching

Trenching

All trenching activities would follow an engineered design containing plan and profile drawings showing the location and type of existing underground facilities. Prior to trenching, SDG&E or its contractor would notify other utility companies (via Underground Service Alert) to locate and mark existing underground utilities along the proposed underground alignment. Prior to excavating, SDG&E would conduct exploratory excavations (i.e., potholing) to verify the locations of existing facilities. . SDG&E would coordinate with local jurisdictions to secure excavation and encroachment permits for trenching in City and County streets, as required. If road or lane closures are required, proper traffic controls will be implemented as outlined within individual encroachment permits obtained from the local municipality, as required.

[16] At certain locations (such as large highway crossings or river/water body crossings), minimum ground clearance can vary (increase) from minimum GO 95 requirements. However, SDG&E does not anticipate any such spans will occur as part of the Proposed Project.

The duct bank would be installed using open-cut trenching techniques. No trenchless techniques (such as jack-and-bore or horizontal directional drilling) are anticipated to be used during construction of the Proposed Project. Most of the duct bank would have a double-circuit vertical duct bank configuration, with occasional transitions to a horizontal configuration to clear other utilities in highly congested areas or to fan out to termination structures at cable pole transition areas. The typical trench dimensions for installation of a 69 kV vertical duct bank would be a minimum of 6 feet deep and 3 feet wide, although depth may vary depending on soil stability and the presence of existing utilities. The trench will be widened and shored where necessary to meet California Occupational Safety and Health Administration safety requirements. Concrete saw cutting debris and slurry produced during trenching would be cleaned from the street and not allowed to reach the curb or storm drain inlet. If trench water is encountered, trenches will be dewatered using a portable pump and disposed of in accordance with acquired permits. General dewatering procedures are described in Section 3.7.1.6 and similar procedures would be implemented during underground transmission line construction.

Trenching operations would be staged in intervals so that only a maximum of approximately 300 to 500 feet of trench would be left open at any one time, or as allowed by permit requirements. This would generate approximately between 200 and 300 cubic yards per day[17] of excavated material. Steel plating would be placed over the open trenches to maintain vehicular and pedestrian traffic across areas that are not under active construction. Traffic controls will also be implemented to direct local traffic safely around work areas, as stipulated within individual encroachment permit conditions. Dewatering is not expected to occur during construction, but if it becomes necessary at any point, pump trucks and baker tanks (large water storage tanks) will be used in accordance with local jurisdiction requirements.

Throughout trench excavation and installation of the duct bank and vaults, asphalt and concrete would be transported to a materials storage yard. Excavated soils not suspected to be impacted would be disposed of at an appropriate facility[18].

Should soil that is stained, odorous, or otherwise suspect be encountered during trenching activities, SDG&E would sample in–place, test, profile, and transport this material to an appropriately permitted disposal facility in accordance with all Federal, State and local laws and regulations.[19] The number of truck trips to transport excavated materials to storage yards and/or disposal facilities would vary based on the rate of the trenching, the area excavated to install the vaults, and proximity of the storage yards/disposal facilities to the ROW. However, up to

[17] Assumes 2 crews trenching approximately 300-500 feet per day, with average trench dimensions of 6 feet deep by 3 feet wide.

[18] The construction contractor would identify a disposal facility for clean soils and an appropriate recycling facility for recyclable construction debris.

[19] SDG&E has identified two potential hazardous and two non-hazardous waste disposal facilities. SDG&E has identified as potential hazardous waste landfills: 1) Waste Management Kettleman Hills Facility, located approximately 260 miles north of the Proposed Project in Kettleman City, California; and 2) Clean Harbor Environmental Services in Buttonwillow, California, which is located approximately 220 miles north of the Proposed Project. For non-hazardous waste, SDG&E has identified Republic Services, Otay Landfill in Chula Vista, California, located approximately 25 miles south of the Proposed Project, and Soil Safe, Inc., Soil Recycler in Adelanto, California, located approximately 110 miles north of the Proposed Project.

approximately 20 to 30 truck trips per day would be required during trenching activities at one site. Truck trips for materials transport would increase for the Proposed Project as a whole when trenching activities occur at multiple locations. Jackhammers may be used sparingly to break up sections of concrete that the saw-cutting and pavement-breaking machines cannot reach. Other miscellaneous equipment may include a concrete saw, back hoe, excavator, roller compactor, water truck, various paving equipment, and standard 1-ton pickup trucks.

Duct Bank Installation

As each section of the trench for the underground 69kV duct banks are completed, SDG&E would install the conduits (separated by spacers) and place 2,000 psi concrete around the conduits to form the duct bank encasement. The ducts would typically consist of 6-inch diameter polyvinyl chloride (PVC) conduits, which house the electrical cables, and 4-inch diameter PVC conduits for the telecommunications cable used for system protection and communication. The dimensions of the duct banks would be approximately 3 feet wide by 3 feet in height and located in the trench at a minimum depth of 3 feet from top of the encasement to the surface. Appendix 3-C contains typical duct bank diagrams and Appendix 3-B depicts the approximate location of proposed trenching.

Once the PVC conduits are installed and encased, a fluidized thermal backfill or slurry concrete would be utilized to fill most of the remainder of the trench. Finally, a compacted backfill or aggregate road base with an asphalt concrete cap will be installed to restore the road in compliance with local requirements. While the completed trench sections are being restored, additional trench would be opened further down the road. This process would continue until the entire duct bank is in place. Each duct bank would have a minimum of 36 inches of cover. Larger trenches would be excavated where vaults are installed.

Where the duct banks cross or run parallel to other utilities, a minimum radial clearance of 12 inches would be required. These utilities include gas lines, telephone lines, water mains, storm drains, and sewer lines. Where the duct banks cross or run parallel to other substructures that have operating temperatures that significantly exceed earth temperature, an increased radial clearance may be required. Such heat-radiating facilities may include other underground electrical circuits, primary distribution cables (especially multiple-circuit duct banks), steam lines, or heated oil lines. In addition, increased radial clearance may be required where the new duct banks cross other heat-radiating substructures at right angles.

Vault Installation

SDG&E would excavate and place precast concrete splice vaults during the trenching operation (refer to Appendix 3-B for vault locations and Appendix 3-C for typical vault diagram). The vaults would be used initially to pull the cables through the conduits and later to splice cables together. During operation, the vaults would provide access to the underground cables for maintenance inspections, repairs, and replacement if needed. The vaults would be constructed of prefabricated (precast) or cast-in-place, steel-reinforced concrete. Each vault typically has two manhole covers measuring approximately 36 inches in diameter. Installation of each vault would occur over an approximately one-week period with excavation and shoring of the vault pit followed by delivery and installation of the vault, filling, grouting and compacting the backfill, and repaving the excavated area. The backfill may be slurry or concrete.

Pulling Sites

Approximately 8 pulling sites may be required during construction of the Proposed Project (refer to Appendix 3-B). Pulling sites for the Proposed Project would be located approximately every 175 feet (average) along the project segments that require installation or removal of underground cable. Pulling sites can vary in size, but are typically 25 feet by 150 feet in size. The location of pulling sites may be modified or additional pulling sites may be identified during construction in order to safely and efficiently string wire.

Cable Pulling Process

After installation of the conduit and splicing vaults, SDG&E would install cables in the duct banks. Each cable segment would be pulled into the duct bank, spliced at each of the vaults along the route, and terminated at the transition area where the line transitions to the overhead sections. To pull the cable through the ducts, a cable reel is placed at one end of the section and a pulling rig is placed at the other end. Anticipated pulling site locations are shown on the detailed route map in Appendix 3-B.

The electric cables and the communication cable would be pulled through the individual ducts at the rate of approximately two segments between vaults per day. A splice trailer would be positioned adjacent to the vault manhole openings to facilitate cable splicing at the vaults after the cables are pulled through the ducts. Each splice would require approximately three working days to complete. The vaults must be kept dry at all times to keep the unfinished splices dry and prevent other impurities from affecting the cables. At each end of the underground segment, the cables will rise out of the ground and terminate on equipment within the cable pole or substation.

3.7.3.2 Trenchless Techniques: Microtunnel, Jack-and-Bore, and Horizontal Direction Drilling

The Proposed Project does not include the use of trenchless techniques, including microtunnels, jack-and-bore techniques, or horizontal directional drilling.

3.7.4 Substation Construction

3.7.4.1 Artesian Substation Expansion

Construction of the Artesian 230/69kV substation expansion will involve the following general steps, as further described below:

1. Site development
2. Construction of the relocated 69/12kV substation yard
3. Construction of the new 230/69kV substation yard
4. Upgrade of substation getaways (230kv, 69kV, and 12kV).

Site Development

The site development work will include the following:

- Demolition and/or removal of the buildings and miscellaneous structures located on the adjacent SDG&E property east of the existing Artesian Substation,
- Grading of the new (east) expanded substation site,
- Demolition of the existing substation east wall,
- Minor grading of the existing (west) substation site,
- Widening of existing unpaved access road; and
- Expansion of an existing detention basin located immediately west of the existing (west) substation.

Phase 1 – Eastern Parcel and Relocated 69kV Substation Yard

After clearing the eastern parcel of existing buildings and miscellaneous structures (fencing, concrete steps, remnant foundations, etc.), grading will be performed per design plans to prepare the site for the construction of the relocated/expanded 69kV substation yard (see preliminary grading plans in Appendix 3-A). This phase of the site development work will include grading to remove and export approximately 17,300 cubic yards excess material from the site, and import approximately 85 cubic yards of suitable material. To achieve uniform support, the underlying soils will be excavated to 36 inches below ultimate pad grade, then backfilled and compacted per geotechnical recommendations. Following grading, a security fence (which will encompass both east and west parcels), 30-foot wide east access drive, and concrete wall (approximately 4.9-feet to 5.5-feet high) will be constructed. At the end of this phase, below and above grade work will include installation of the new 69kV foundation structures, electrical structures and equipment, and the new control house.

Phase 2 – Western Parcel and New 230kV Substation Yard

After the new 69kV substation yard is energized, the existing 69kV yard (located on the west parcel) will be dismantled and extended to accommodate the new 230kV equipment. Phase two grading will produce approximately 6,400 cubic yards of excess material. Phase two site development will include completion of the north and south screen wall. This phase also includes the below and above grade work to install the new 230kV foundation deadend structures and electrical equipment.

Phase 3 – Detention Basin Expansion

Phase 3 of the substation site development will consist of expanding an existing detention basin that is located immediately west of the existing (western) substation parcel, and modification (widening) of an existing paved maintenance access road that is located immediately west of the southwestern corner of the existing substation (see Appendix 3-A and 3-B, Proposed Project Detailed Route Map). The detention basin expansion is required because the addition of the new (eastern) yard and associated new driveways will result in additional surface water runoff. The existing access road needs to be modified in order to create room for the detention basin

expansion. This third phase of site development can be accomplished concurrently with phases 1 and 2 and is expected to produce approximately 5,300 cubic yards of export material.

Phase 4 – Final Landscaping

Following completion of Phases 1 through 3 of the Artesian Substation construction, landscaping will be installed along the northern and eastern boundaries of the Artesian Substation site (refer to the Conceptual Landscape Plan in Appendix 3-A). While SDG&E will install the landscaping during construction of the Proposed Project, Black Mountain Ranch, LLC will operate and maintain the landscaping for the life of the Artesian Substation.

69/12kV Component

The Proposed Project will relocate and expand the existing Artesian 69/12kV Substation yard. The Artesian 69/12kV substation yard will be relocated to the adjacent SDG&E property located immediately east of the current 69/12kV substation site (see Appendix 3-A). The existing 12kV equipment will remain in its existing area while the future two 12kV switchgear positions will be located in the new 69/12kV yard. The new 69/12kV substation yard will be built with an ultimate buildout of four 69/12kV bank positions in single breaker/single bus configuration and positions for eight elements in four bays with breaker and half configuration (refer to substation elevation drawings in Appendix 3-A).

Following Phase One site development and grading, construction of the relocated and expanded 69/12kV substation yard will commence with the following steps:

- Below grade foundation work will be constructed for all the 69kV equipment including the control shelter, the air insulated substation equipment, the microwave tower, and the transformer 69kV termination stands.
- Below grade foundation work will be constructed for the 12kV equipment including the 69/12kV transformers (including oil containment and fire walls), and relocated switchgear pad.
- Control, telecommunication, and, security ducts will be installed.
- Power ducts (12kV and 69kV) will be constructed and stubbed outside the substation.
- Ground grid will be installed.

69kV above grade work will start construction as foundation work is completed. The substation equipment and masonry block control shelter will be constructed. The wiring of the equipment controls and protection devices is performed concurrently with construction:

- The 69kV equipment that will be installed consists of double 69kV busses and four bays of breaker and a half configuration. Each bay will consist of three breakers, six disconnects, potential transformers, protection equipment, and associated wiring and bus work. Four bays of single breaker single bus will be installed for the 69/12kV transformers and 69kV SL&Ps. Each 69kV main bus will consist of three deadend structures, approximately 30 feet tall.
- The control/protection panels, equipment, and batteries will be installed and wired in the control shelter.

- Two 69kV transformer termination stands will be constructed.
- 69kV cable will be installed.
- Station light & power transformers and their associated 12kV and secondary cable will be installed.
- Telecommunications, AT&T, lighting, and security cable will be installed.

12kV equipment will be installed as foundation work is completed. The wiring of the equipment controls and protection devices is performed concurrently with construction:

- Two 69/12kV transformers will be placed on their foundations and assembled.
- One ¼ section of switchgear will be relocated on its foundation and assembled.
- Control cable will be installed.
- 12kV cable will be installed.

230kV Component

The Proposed Project will include the construction of a new 230kV yard at the existing Artesian Substation. Once the 69/12kV substation yard is relocated to the east, then the new 230kV yard can be constructed in its place. Appendix 3-A contains a schematic of the proposed 230kV substation yard layout and elevation drawings. The new 230kV yard will be fed by a connection to an existing 230kV transmission line that is located immediately adjacent and west of the Artesian Substation site.

The approximate sequencing of work at the Artesian Substation site for all 12kV, 69kV and 230kV work will be as follows:

1. Remove the existing structures in the east yard and regrade the area (Phase 1 grading).
2. Construct the new 69kV air insulated substation facility in the eastern yard portion of the Artesian Substation site (including new control shelter and microwave tower).
3. Relocate the existing 12kV switchgear to its new northern position and intercept the existing 12kV getaways.
4. Connect and energize the following existing 69kV power lines, the order being dependent upon outage constraints and system loading:
    - Connect TL6939 to the new 69kV substation yard.
    - Connect TL6974 to the new 69kV substation yard.
    - Connect TL616 to the new 69kV substation yard.
    - Connect TL6920 to the new 69kV substation yard.
5. Energize 69/12kV transformers.
6. De-energize the existing 69kV air insulated substation.
7. Remove all 69kV equipment from the west yard.
8. Re-grade west yard (Phase 2 grading).

9. Construct the new 230kV air insulated substation.
10. The new 230kV lines (TL23051 and TL23072) will be connected into the new 230kV substation facility.
11. Adjust relays at remote ends of transmission lines as required.
12. Energize the 230/69kV transformer.

Following Phase Two site development and grading, actual construction of the 230kV substation will commence with the following:

- Below grade foundation work will be constructed for all the 230kV equipment including the equipment, and the transformer deadend structure, transformer pad and oil containment.
- Control, telecommunication, and security ducts will be installed.
- Station light & power ducts (12kV) will be constructed.
- Ground grid will be installed.

230kV above grade work will start construction as foundation work is completed. The wiring of the equipment controls and protection devices is performed concurrently with construction:

- The 230kV equipment to be installed consists of double 230kV busses and two bays of breaker and a half configuration. Each bay will consist of three breakers, six disconnects, potential transformers, protection equipment, and associated wiring and bus work.
- The control/protection panels, equipment, and batteries will be installed and wired in the control shelter.
- Two 230kV transformer deadend structures will be constructed (built with a common middle leg).
- 12kV station light and power cable will be installed from the 69kV yard.
- 230kV transmission line drops will be installed.

Equipment testing will be performed following installation of equipment, relay panels, controls, batteries, telecommunication, and station light and power system.

Power Line Substation Getaways[20]

The proposed 69kV getaways (four 69kV power lines) from the Artesian Substation will all be via new or existing underground duct banks (refer to Appendix 3-B). The specific anticipated getaway for each 69kV power line is further described below.

[20] The term substation "getaway" refers to the method by which an electrical line exits a substation, typically including the span between each line's first connection within the substation boundary and the first pole/structure/connection outside of the substation boundary.

TL616

At the Artesian Substation, TL 616 will exit the Artesian Substation site north within a new duct package and will then travel west along Camino Del Sur, before crossing Camino Del Sur to connect with the existing overhead alignment (via new cable pole P03) and then continue north (refer to Figure 3-2 and Appendix 3-B).

TL6974 and 6939

At the Artesian Substation, TLs 6974 and 6939 will exit the Artesian Substation east within a new duct package, and will then travel north along Babcock Street, and cross Camino Del Sur, before connecting with the existing overhead alignment (via new cable poles P04 and P05 – refer to Figure 3-2 and Appendix 3-B). TLs 6974 and 6939 would then continue east towards the Bernardo Substation via the existing overhead alignment.

At the Bernardo Substation, TLs 6974 and 6939 will connect to new cable poles, P20 and P21, before crossing Rancho Bernardo Road (at each connection point) in new trenches and duct packages, traveling east along Rancho Bernardo Road, and entering the Bernardo Substation from the north (refer to Figure 3-2 and Appendix 3-B).

TL6920

TL6920 will exit the Artesian Substation west within an existing duct package, before connecting with the existing overhead alignment that continues south via existing cable pole structure E01 (refer to Figure 3-2 and Appendix 3-B). The existing duct package within the substation footprint will be extended to the relocated 69/12kV substation yard on the eastern parcel. New cable will be installed between pole structure E01 and the substation rack.

Transmission Line Substation Getaways

The new 230/69kV Artesian Substation yard will connect with an existing 230kV transmission (TL23051) line that is located immediately adjacent to the substation site (refer to Figure 3-2 and Appendix 3-B). The 230kV connections will exit the new 230/69kV substation in an overhead position directly west and connect with the existing 230kV transmission line alignment at pole structures P01 and P02.

Distribution Line Substation Getaways

All 12kV circuits will leave the Artesian Substation in their current positions (refer to Figure 3-2 and Appendix 3-B).

3.7.4.2 Bernardo Substation

Minor work within the Bernardo Substation will be required in order to facilitate the construction of the new underground power line getaway positions. Approximately 150 feet of new trenching and installation of a new 6-inch duct package will be required inside the substation footprint to accommodate the undergrounding of the TL6939 and TL6974 power line getaways. The existing 1200A disconnects will be replaced with new 2000A disconnects and existing relaying will also be upgraded, as required.

3.7.4.3 Rancho Carmel Substation

Minor work will also be required at the existing Rancho Carmel Substation. Existing 1200A line and bus disconnects will be replaced with new 2000A disconnects and existing relaying will be upgraded, as required. The 69kV bus, bus tie breaker and its respective disconnects will be replaced with 2000A equipment. Additionally, an approximately 500-foot segment of existing underground power line cable will be replaced with new cable between an existing cable pole and the existing bay position (refer to Appendix 3-B) within the existing duct package. The new underground 69kV power line cable will be 3,000 kCMIL copper (CU) cross-linked polyethylene (XLPE) underground cable. A temporary shoo-fly of TL648 will likely be required during construction. The temporary shoo-fly will allow for the replacement of the underground cable to occur with minimal outages of the TL648 power line.

3.7.5 Construction Workforce and Equipment

3.7.5.1 Construction Personnel

It is estimated that approximately 45 people per day will be required to construct the Proposed Project at its peak[21], with up to approximately 18 people working at the Artesian Substation at one time (during Phases 1(e) and 2(e) – Substation Wiring and Relay Testing). Power line construction phase would utilize various specific construction crews, including overhead crews to install structures and string the conductors, foundation crews that perform drilling and installation of concrete pier foundations, and grading crews who prepare the structure sites for construction (as needed). In addition, civil crews will perform the trench, conduit, and vault installations and cable crews will perform the cable and splice installations for the underground power line getaways. The power line construction work force would typically range from 5 to 20, depending upon which tasks are occurring at any given time. Appendix 3-F includes information about the projected (potential) work force for each phase of construction. SDG&E will supplement its workforce as required during construction from a contractor's pool of experienced personnel.

3.7.5.2 Construction Equipment

Table 3-9, Standard Construction Equipment and Usage, lists the typical construction equipment that could be utilized and their respective uses with respect to the Proposed Project scope. Appendix 3-F includes a conceptual detailed construction scenario that includes potential equipment usage and numbers.

[21] Peak of construction would occur during a combination of 1) Artesian 69/12kV substation above ground construction (Phase 1(d)); 2) Artesian 69/12kV substation wiring and relay testing (Phase 1(e)); Artesian 69kV getaway cable pulling (Phase 6(b)); Bernardo 69kV getaway trenching (Phase 7(a)); and 69kV reconductor – stringing (Phase 10(c)).

Table 3-9: Standard Construction Equipment and Use

Equipment Type	Equipment Use
2-ton flatbed trucks	Haul materials (including new poles)
25-ton crane	Set guard structures
834 Rubber Tire Compactor	Site work
Aerial bucket trucks	Access poles, string conductor, modify pole structure arms, provide guard structures, and other various uses
Aerial man-lifts	Access poles, string conductor, modify pole structure arms, tree trimming/removal and other various uses
Air compressors	Operate air tools
Backhoe	Excavate trenches
Boom truck	Access poles and other height-restricted items
Bulldozer	Repair access roads / grade substation site
Cable reel trailers	Transport cable reels and feed cables into conduit
Chipper trailer	Trimming and mulching
Compactor	Access road work
Concrete saw	Cut concrete and asphalt
Concrete truck	Transport and process concrete
Condor boom truck	Access structures over 100 feet high
Crane truck	Lift, position pole structures
Crane	Lift, position pole structures
Drilling rig/ Truck-mounted augur	Excavate for direct-bury and micropile poles and drill substation foundations
Dual bull-wheel tensioner	Pull conductor
Dump truck	Haul excavated materials/import backfill, as needed
Excavator	Excavate soils/materials (trenching)
Flatbed boom truck	Haul and unload materials
Forklift	Transport materials at structure sites and staging yards
Grader	Road construction and maintenance
Helicopter (typically light- and medium-duty)	Transport materials, string conductor, and install and remove travelers, set structures
Hydraulic press	Press together the conductor ends at dead end pole structures

Table 3-9 (cont.): Standard Construction Equipment and Use

Equipment Type	Equipment Use
Hydraulic rock-splitting/ rock-drilling equipment	Drill through rock, as needed
Jackhammer	Break concrete and asphalt
Line truck	Install clearance structures
Mechanic truck	Service and repair equipment
Mobile cranes	Load and unload materials
Mobile fueling trucks	Refuel equipment
Mobile office trailers	Supervision and clerical office
Motorized scaffolding	Position personnel
Mower	Clear vegetation
Oil Processing truck/trailer	Process transformer oil
Paver	Paving of new asphalt
Pickup trucks	Transport construction personnel
Pile drivers	Install piles
Portable generators	Operate power tools
Pulling rig	Pull conductor
Reel winders	Install conductor
Relay Vans	Haul personnel and relay test equipment
Rigging truck	Haul tools and equipment
Road grader	Road construction, maintenance, and upgrading
Rollers	Repave streets over trench and manhole locations
Splice trailer	Store splicing supplies/air condition manholes
SF6 gas cart	Process SF6 gas
Take-up trailers (sock line)	Install conductor
Tensioner	Pull conductor
Tool van	Tool storage
Tractor/Trailer Unit	Transport materials at structure sites and staging yards
Vacuum truck	Pump water and liquids, as needed
Water truck	Dust control
Wire truck	Hold spools of wire
Substation Line/crew trucks	Haul personnel, and tools
Source: *SDG&E*	

3.7.6 Construction Schedule

SDG&E estimates that construction of the Proposed Project would take a total of approximately 30 months to complete, assuming no significant delays from unforeseen/unpredictable factors such as weather and required transmission outages. Construction is anticipated to begin in August 2018 and run through January 2021 (project in-service date is anticipated to be in December 2020). The high-level conceptual construction schedule, outlined by major project component, is summarized in Table 3-10, High-Level Project Schedule.

In order to estimate certain project impacts, such as criteria pollutant emission, a conceptual detailed construction schedule was prepared. The Conceptual Detailed Construction Schedule has been included as Appendix 3-F. While SDG&E has prepared the conceptual detailed construction schedule based upon conditions known at the time of filing the PTC application, numerous factors will affect the final construction schedule and sequencing, including outage coordination and final environmental mitigation measures. SDG&E will coordinate line outages in order to maintain system reliability and construction personnel safety. Based upon preliminary engineering, SDG&E does not anticipate any project based interruption of service to customers during construction.

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Table 3-10: High-Level Approximate Project Schedule

Proposed Project Component	Approximate Duration (Months)	Anticipated Start Date [1]
Relocate 69/12kV Portion of the Artesian Substation	18	August 2018
Construct new 230/69kV Portion of Artesian Substation	10	Feb 2020
Minor Modifications at Bernardo Substation	2	September 2018
Minor Modifications at Rancho Carmel Substation	2	Nov 2018
Install New 230kV Structures and 230kV Connection to Artesian Substation	4	August 2020
Construct New Underground Power Line Getaways at Artesian and Bernardo (TL616, 6939, and 6974)	5	August 2019
Upgrade Underground Powerline Getaway at Rancho Carmel (TL648)	1	December 2018
Upgrade Underground Powerline Getaway at Artesian (TL6920)	3	August 2019
Distribution Line Upgrades	3	January 2019
Reconductor Existing 69kV Overhead Power Line between Artesian and Bernardo	6	March 2019
In-Service Date	N/A	December 2020
Clean-up and Restoration	1	January 2021

Notes:
[1] Start dates estimated and pending receipt of required approvals. Start dates for individual tasks may vary during construction in order to accommodate minor project refinements, avoidance of adverse effects to sensitive resources, or other unforeseen occurrences. Construction durations are not necessarily continuous. The high-level project schedule does not include any schedule contingencies as SDG&E is not aware of any such potential schedule restrictions at the time of the PTC filing.

Source: *SDG&E*

3.8 OPERATION AND MAINTENANCE

The Proposed Project would expand, replace and/or relocate existing electric transmission and power line facilities within existing utility corridors, utility ROW, utility owned property, and existing franchise position within city streets. The Proposed Project would also expand and re-build an existing substation and create one new power line circuit that would also be located within existing ROW and franchise position. All proposed new and relocated facilities are located in existing SDG&E ROWs and corridors that currently contain similar facilities that are operated and maintained by SDG&E, except for the new 69 kV power line getaways that would be installed underground within existing roads (franchise position). SDG&E currently operates and maintains existing facilities consistent with standard operating procedures, such as *SDG&E's Subregional NCCP Operational Protocols*, as well as other measures that have been developed and implemented by SDG&E over time to avoid and minimize environmental impacts, and to comply with applicable environmental laws and regulations. No change in SDG&E's operations and maintenance practices along the Proposed Project route is anticipated, except at the new underground 69kV vault locations. Operation and maintenance activities at the Artesian Substation would not change other than a slight increase in frequency due to the increase amount of equipment operated at the substation site. SDG&E's existing operating practices are reflected in the baseline from which impacts of the Proposed Project have been evaluated. Table 3-11, Operation and Maintenance Increase Summary, includes a summary of the required operation and maintenance activities that would occur at the Proposed Project substations and facilities following completion of construction above what is currently already conducted as part of existing conditions.

3.8.1 Artesian Substation Operation and Maintenance

The Artesian Substation will be an unmanned substation. In general, routine substation operations will be same as what occurs at the existing substation but would increase slightly due to the increase in substation equipment and facilities. The Proposed Project will require a single pickup truck visiting each substation (Artesian, Bernardo, and Rancho Carmel) several times a week for switching, as well as several larger substation construction and maintenance trucks visiting each substation several times a year for equipment maintenance. Maintenance activities will include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. In general, routine substation maintenance is expected to necessitate approximately six trips per year by a two- to four-person crew at the substation sites. Routine substation operations will require one or two workers in a light utility truck to visit the substations on a weekly basis. Typically, a major maintenance inspection will take place annually, requiring approximately 10 personnel for approximately one week.

Routine maintenance for vegetation clearing would occur on an as-needed basis for purposes of safety, access, and aesthetics. Vegetation clearing activities would typically involve the presence of one to two small maintenance vehicles and one or more employees to clear or trim vegetation to achieve the minimum working space around the substation facilities.

Table 3-11: Operation and Maintenance Increase Summary[1]

Operation or Maintenance Activity	Frequency and Duration	Required Equipment	Number of Workers
Minor Circuit Breaker Inspection & Maintenance (230kV)	One day per inspection; One inspection every three years	• 1 crew truck • 1 bucket truck • 1 pickup truck	3-6
Major Circuit Breaker Inspection & Maintenance (230kV)	1 - 2 days per inspection; One inspection every ten years	• 1 crew truck • 1 bucket truck • 1 pickup truck	3-6
230kV Transformer Electrical Test	One day per test; One test every five years	• 1 crew truck • 1 assist truck • 1 pickup truck • 1 relay van • 1 bucket truck	5-8
Tap Changer Inspection	1 - 2 days per inspection; One inspection every seven years	• 1 crew truck • 1 assist truck • 1 pickup truck • 1 relay van • 1 bucket truck	5-8
69kV underground vault inspections	One day per inspection; One inspection every three years	• 1 crew truck • 1 traffic control truck	2-4

Notes:
[1] This table only includes operation and maintenance activities that would be required above what currently exists at the Proposed Project facilities.

It is not anticipated that additional full-time SDG&E staff would be required for operation or maintenance purposes at the expanded Artesian Substation.

Safety lighting will be provided for the purpose of safe nighttime access inside the substation. Because night activities are not expected to occur more than once per year, the safety lighting inside the substation fence will normally be turned off. One hundred-watt yellow outdoor floodlights, mounted inside the substation near the entry gates will safely illuminate all substation yard light switches, and will be left on during nighttime hours. The light will be directed downward and shielded as necessary to minimize glare into surrounding properties.

3.8.2 Other General Project Operation and Maintenance Activities and Practices

SDG&E will continue to regularly inspect, maintain, and repair the new and reconstructed transmission line, power line, and distribution line facilities and substations following completion of Proposed Project construction. Operations and maintenance activities would not significantly increase in intensity, frequency or duration with implementation of the Proposed Project and would be substantially similar to existing operations and maintenance activities. Typical activities involve both routine inspections and preventive maintenance to ensure service reliability, as well as emergency work to maintain or restore service continuity. SDG&E performs aerial and ground inspections of Proposed Project facilities and patrols aboveground

components annually. Inspection for corrosion, equipment misalignment, loose fittings, and other common mechanical problems is performed at least every three years (per General Order 165) for transmission and power lines.

3.8.2.1 Helicopter Inspections

SDG&E uses helicopters in the inspection of overhead facilities annually, or as otherwise required. SDG&E's Transmission[22] department uses helicopters for patrolling power lines during trouble jobs (e.g., outages/service curtailments) in areas that have no vehicle access or rough terrain. For patrolling during such jobs, the helicopter picks up the patrolman at the district yard. The size of the crew varies from four to 10 crewmembers, two helicopter staff, and a water truck driver to apply water for dust control at the incidental landing area. Most operations and maintenance related helicopter operations take only one day.

3.8.2.2 Transmission and Power Line Maintenance

SDG&E maintains a clear working space area around certain poles pursuant to requirements found within General Order 95 and Public Resources Code (PRC) Sections 4292 and 4293. SDG&E keeps these areas clear of shrubs and other obstructions for fire prevention purposes.

Typical power line operation and maintenance activities include security and other inspections, ROW and access repairs, pole brushing in accordance with fire break clearance requirements, herbicide application, emergency and non-emergency repairs and replacements, insulator washing, and tree trimming. These activities can be performed routinely or on an as needed basis, as applicable.

The new 69kV underground power line getaways would be inspected consistent with SDG&E's existing underground inspection and maintenance program. Maintenance activities at the splice vault locations would only occur at very infrequent intervals (approximately once every three years). The line would be accessed from five new vaults during the annual underground transmission inspection program. The inspection requires traffic control to access the vault safely, opening the vault covers and performing a visual survey from above (entry into vault with energized cables is not permitted), and use of infra-red or other diagnostic instrumentation which may be available. The inspections are typically performed by a 2 to 4 person crew, and typically require one crew truck and a traffic control vehicle, as needed. The total time to inspect each vault is expected to be less than one day under normal operating conditions. The inspection of the underground transmission line would be the same for all existing underground inspection currently completed by SDG&E throughout SDG&E's service territory.

[22] The term "Transmission" as used within this section of the PEA refers to internal SDG&E operating departments and is not intended to suggest that this department works only on electric utility lines with operational ratings at or above 200 kV.

3.8.2.3 Bernardo and Rancho Carmel Substations Operation and Maintenance

Operations and maintenance of the Bernardo and Rancho Carmel substations would continue to be operated and maintained consistent with current substation operations. Typical maintenance activities include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. A major maintenance inspection would typically take place annually, lasting approximately one week.

Operations and maintenance activities at the Bernardo and Rancho Carmel Substations will be the same as those currently required. It is not anticipated that increased activities or additional full-time SDG&E staff would be required for operation or maintenance purposes at these substations.

Routine vegetation clearing would continue to occur at each substation on an as-needed basis for purposes of safety, access, and aesthetics. Vegetation clearing activities would typically involve the presence of one to two small maintenance vehicles and one or more employees to clear or trim vegetation to achieve the minimum working space around the substation facilities.

3.9 APPLICANT PROPOSED MEASURES

In addition to the above project design features and ordinary construction/operating restrictions included as part of the Proposed Project description, SDG&E will also incorporate the APMs that have been identified and developed specifically for the Proposed Project during the preparation of the PEA. Table 3-12, Applicant Proposed Measures by Resource Area identifies the APMs that are applicable to each resource area and Table 3-13, Applicant Proposed Measures, details the complete APMs. The various resource sections of this document outline how and when the APMs will be applied to avoid or minimize impacts to a less than significant level.

Linear electric infrastructure projects, such as this one, typically traverse multiple jurisdictional boundaries, natural resource features, and habitat types. Until final design, and in some cases until installation, utility projects must remain more flexible in the definition of their ultimate configuration and placement than most non-linear projects. The Proposed Project may encounter unique topographical and natural features or site-specific engineering challenges along the transmission line ROW that could not be reasonably foreseen and specifically planned for in advance. The APMs take into consideration the potential for the Proposed Project to encounter such features and enhance SDG&E's ability to avoid or minimize future potential impacts to sensitive environmental resources.

The APMs allow for limited project design flexibility while avoiding or minimizing environmental impacts, to the extent feasible. As defined in CEQA, "feasible" is defined as being "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors" while attaining the project's basic objectives and its purpose and need.

SDG&E would be responsible for overseeing the assembly of the construction and environmental teams that would implement and evaluate the Proposed Project APMs. SDG&E maintains an environmental compliance management program to allow for implementation of the APMs to be monitored, documented, and enforced during each Proposed Project phase, as

appropriate. All of those contracted by SDG&E to perform this work would be contractually bound to properly implement the APMs to ensure their effectiveness in reducing potential environmental effects. Table 3-13 details each of the 18 APMs that will be implemented during construction, operation, and maintenance of the Proposed Project.

Table 3-12: Applicant Proposed Measures by Resource Area

Resource Area	Relevant Applicant Proposed Measures
Aesthetics	none
Agriculture and Forestry Resources	none
Air Quality	none
Biological Resources	APM BIO-1 through BIO-8
Cultural Resources	APM CUL-1 through CUL-9
Geology, and Soils	none
Greenhouse Gases	none
Hazards and Hazardous Materials	none
Hydrology and Water Quality	none
Land Use and Planning	none
Mineral Resources	none
Noise	Noise-1
Population and Housing	none
Public Services	none
Recreation	none
Transportation and Traffic	none
Utilities and Service Systems	none
Cumulative Impacts	none

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Table 3-13: Applicant Proposed Measures

APM Number	Description
BIO-1	If work is scheduled to occur within suitable burrowing owl habitat (as determined in the Biological Technical Report), burrowing owl surveys will be conducted prior to construction consistent with the Take Avoidance Surveys described in the 2012 Staff Report on Burrowing Owl Mitigation. If burrowing owls are identified within approximately 150 meters (492 feet) of the proposed work area, SDG&E will implement the recommendations of said staff report to avoid impacts to burrowing owl.
BIO-2	If the NCCP is not used as take authorization for the Proposed Project, SDG&E will account for temporary and permanent impacts to federal or state-listed species habitat at a ratio of one to one, or as required by the USFWS and/or CDFW.
BIO-3	If construction occurs during the nesting or breeding season, SDG&E will perform a site survey in the area where the work is to occur. This survey will be performed to determine the presence or absence of nesting birds. If an active nest is identified, (i.e., containing eggs or young) a suitable construction buffer will be implemented to ensure that the birds are not substantially adversely affected. If the birds are federal or state-listed species, SDG&E will consult with the USFWS and CDFW as necessary. Monitoring of the nest will continue until the birds have fledged or construction is no longer occurring on site.
BIO-4	SDG&E will conduct special status plant surveys for additional Survey Areas prior to construction.
BIO-5	SDG&E will conduct protocol-level surveys for additional Survey Areas prior to construction for the coastal California gnatcatcher, quino checkerspot butterfly, and least Bell's vireo, and will conduct burrowing owl breeding surveys.
BIO-6	Prior to the start of construction, SDG&E will conduct training of all project personnel regarding the appropriate work practices necessary to effectively implement the Proposed Project APMs, standard operating procedures, and to comply with the applicable environmental laws and regulations.
BIO-7	A biological monitor will be present during ground-disturbing and vegetation removal activities located within environmentally sensitive areas. Immediately prior to initial ground-disturbing activities and/or vegetation removal, the biological monitor will survey the site to ensure that no sensitive species will be impacted.
BIO-8	If modifications to the pole work areas are required to conduct the work, SDG&E's on-site environmental monitors, as appropriate, will assist construction crews in the field to locate pole work areas that avoid and minimize impacts to sensitive environmental resources.

Table 3-13 (cont.): Applicant Proposed Measures

APM Number	Description
CUL-1	Prior to the initiation of construction or ground-disturbing activities, all SDG&E, contractor, and subcontractor personnel would receive training regarding the appropriate work practices necessary to effectively implement the APMs and to comply with the applicable environmental laws and regulations, including the potential for exposing subsurface cultural resources and paleontological resources and to recognize possible buried resources. Training shall inform all construction personnel of the anticipated procedures that would be followed upon the discovery or suspected discovery of archaeological materials, including Native American remains, and their treatment, as well as of paleontological resources.
CUL-2	A qualified archaeologist would attend preconstruction meetings, as needed, and a qualified archaeological monitor would monitor ground disturbing activities in the vicinity of all known cultural resources within the Proposed Project area. The requirements for archaeological monitoring would be noted on the construction plans. The archaeologist's duties would include monitoring, evaluation of any finds, analysis of collected materials, and preparation of a monitoring results report conforming to Archaeological Resource Management Reports guidelines.
CUL-3	Approved work areas will be established and construction crews would be instructed to stay within the approved work areas and avoid disturbance of any culturally sensitive areas that have been identified.
CUL-4	In the event that cultural resources are discovered, the archaeologist would have the authority to divert or temporarily halt ground disturbance to allow evaluation of potentially significant cultural resources. The archaeologist would contact SDG&E's Cultural Resource Specialist and Environmental Project Manager at the time of discovery. The archaeologist, in consultation with SDG&E's Cultural Resource Specialist, would determine the significance of the discovered resources. SDG&E's Cultural Resource Specialist and Environmental Project Manager must concur with the evaluation procedures to be performed before construction activities are allowed to resume. For significant cultural resources, a Research Design and Data Recovery Program would be prepared and carried out.
CUL-5	All collected cultural remains would be cataloged and permanently curated with an appropriate institution. All artifacts would be analyzed to identify function and chronology as they relate to the history of the area. Faunal material would be identified as to species.

Table 3-13 (cont.): Applicant Proposed Measures

APM Number	Description
CUL-6	An archaeological monitoring results report (with appropriate graphics), which describes the results, analyses, and conclusions of the monitoring program, would be prepared and submitted to SDG&E's Cultural Resource Specialist and Environmental Project Manager following termination of the program. Any new cultural sites or features encountered would be recorded with the SCIC.
CUL-7	Native American monitoring may be implemented if substation, transmission, power or distribution line construction has the potential to impact identified and mapped traditional locations or places. The role of the Native American monitor shall be to represent tribal concerns and communicate with the tribal council. Appropriate representatives will be identified based on the location of the identified traditional location or place.
CUL-8	A paleontological monitor would work under the direction of a qualified Project paleontologist and would be on site to observe excavation operations that involve the original cutting of previously undisturbed deposits with high paleontological resource sensitivity (i.e., Friars and Mission Valley Formations). A paleontological monitor is defined as an individual who has experience in the collection and salvage of fossil materials.
CUL-9	In the event that fossils are encountered, the paleontological monitor would have the authority to divert or temporarily halt construction activities in the area of discovery to allow recovery of fossil remains in a timely fashion. The paleontologist would contact SDG&E's Cultural Resource Specialist and Environmental Project Manager at the time of discovery. The paleontologist, in consultation with SDG&E's Cultural Resource Specialist would determine the significance of the discovered resources. SDG&E's Cultural Resource Specialist and Environmental Project Manager must concur with the evaluation procedures to be performed before construction activities are allowed to resume. Because of the potential for recovery of small fossil remains, it may be necessary to set up a screen-washing operation on site. When fossils are discovered, the paleontologist (or paleontological monitor) would recover them along with pertinent stratigraphic data. In most cases, this fossil salvage can be completed in a short period of time. Because of the potential for recovery of small fossil remains, such as isolated mammal teeth, recovery of bulk-sedimentary-matrix samples for off-site wet screening from specific strata may be necessary, as determined in the field. Fossil remains collected during monitoring and salvage would be cleaned, repaired, sorted, cataloged, and deposited in a scientific institution with permanent paleontological collections, and a paleontological monitoring report would be written.

Table 3-13 (cont.): Applicant Proposed Measures

APM Number	Description
Noise-1	For the few locations where the Proposed Project could exceed the noise ordinance limits during construction, SDG&E would meet and confer with the City and County to discuss temporarily deviating from the requirements of the Noise Code as necessary.

3.10 REQUIRED APPROVALS

The CPUC is the lead California agency for the Proposed Project. SDG&E must comply with the CPUC's General Order 131-D, which contains the permitting requirements for the construction of the Proposed Project. This PEA is being prepared as support for an application to obtain a PTC for the Proposed Project.

In addition to the PTC, SDG&E will obtain approval for the Proposed Project from other Federal, State, and local agencies, as required. Table 3-14, Anticipated Potential Permit, Approval, and Consultation Requirements identifies these other permits, approvals, and licenses that SDG&E anticipates to be required for the Proposed Project.

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Table 3-14: Anticipated Potential Permit, Approval, and Consultation Requirements

Permit/Approval/Consultation	Agency	Jurisdiction/Purpose	Permit Status
Federal Agencies			
Federal Endangered Species Act	United States Fish & Wildlife Service	Take of listed species during installation of new facilities	TBD[1]
Lighting and Aerial Marking	FAA	Construction of overhead facilities potentially requiring aerial marking	To be submitted, not anticipated to be required
State Agencies			
Permit To Construct	CPUC	Overall project approval and CEQA review	PEA submitted concurrent with PTC application
NPDES–General Construction Permit	State Water Resources Control Board	Stormwater discharges associated with construction activities disturbing more than one acre of land.	To be submitted
California Endangered Species Act	CDFW	Take of listed species during installation of new facilities	TBD[1]
Waste Discharge Waiver or General Order	RWQCB or SWRCB	Use of Recycled Water for Construction	To be submitted
Superload (Oversize) Load Permit	Caltrans	Transport of 230/69 kV transformers (oversized loads)	To be submitted

Table 3-14 (cont.): Anticipated Potential Permit, Approval, and Consultation Requirements

Permit/Approval/Consultation	Agency	Jurisdiction/Purpose	Permit Status
Local Agencies			
Encroachment Permit and Traffic Control Plan(s)	City of San Diego	Construction within, under, or over City roadways	To be submitted
Encroachment Permit and Traffic Control Plan(s)	County of San Diego	Construction within, under, or over County roadways	To be submitted
Grading Permit	City of San Diego	Grading at the Artesian Substation expansion Site	To be submitted

Notes:
Table contents based upon preliminary engineering and are subject to change.
[1] If required, take authority would be granted through either compliance with the SDG&E Subregional NCCP or through individual permits under Section 10 of the Federal Endangered Species Act and Section 2081 of the California Fish and Game Code. Refer to Section 5.4 for additional information.

3.11 REFERENCES

San Diego Gas & Electric Company (SDG&E). July 2009. *Electric Standard Practice No. 113.1 – Wildland Fire Prevention and Fire Safety*.