2.0 Project Description

Southern California Edison Company (SCE, or the applicant) proposes to construct the Mesa 500-kilovolt (kV) Substation Project (proposed project) in Los Angeles County, California, primarily in the City of Monterey Park, with additional components located in other cities such as Montebello, Rosemead, South El Monte, Commerce, Bell Gardens, and Pasadena, as well as in portions of unincorporated Los Angeles County (Figure 2-1). The proposed project comprises the following:

- Construction of the proposed 500/220/66/16-kV Mesa Substation within an 86.2-acre site in the City of Monterey Park, California; demolition of the existing 220/66/16-kV Mesa Substation (currently occupying 21.6 acres of the site[1]); relocation of a portion of an existing 72-inch Metropolitan Water District of Southern California (MWD) waterline that traverses the same substation site; and decommissioning of 10 existing groundwater monitoring wells located within the substation site that are currently administered by the U.S. Environmental Protection Agency.[2]
- Removal, relocation, modification, and/or construction of transmission,[3] subtransmission,[4] distribution, and telecommunication structures to accommodate the new 500/220/66/16-kV Mesa Substation within existing applicant-owned properties, rights-of-way (ROWs),[5] and franchise areas located in the cities of Monterey Park, Montebello, Rosemead, South El Monte, and Commerce, and in portions of unincorporated Los Angeles County.
- Installation of a temporary 220-kV transmission structure to connect the Eagle Rock–Mesa 220-kV Transmission Line to Goodrich Substation and maintain a second line of service to the City of Pasadena.
- Replacement of an existing 220-kV double-circuit transmission structure supporting the existing Goodrich–Laguna Bell (future Laguna Bell–Mesa No. 1) and Mesa–Redondo 220-kV Transmission Lines in order to increase the capacity rating[6] of the future Laguna Bell–Mesa No. 1 220 kV Transmission Line.
- Conversion from overhead to underground of three spans of existing street light conductors within the City of Bell Gardens.

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[1] The total acreage of property owned by the applicant is 86.2 acres.

[2] Three of these groundwater monitoring wells could eventually be relocated elsewhere offsite after the proposed project is constructed; the precise locations to where the groundwater monitoring wells would be relocated is unknown. The relocation of the groundwater monitoring wells is not part of the proposed project because their eventual relocation is speculative and, if they are relocated, their future location is unknown. An eleventh well on site would not be decommissioned but would be protected during Phase 3 of construction to preserve its integrity.

[3] *Transmission lines* are designed to operate at or above 200 kV (CPUC 1995).

[4] For the purposes of this document, the term *subtransmission line* refers to a powerline designed to operate between 50 kV and 200 kV.

[5] For the purposes of this document, the term *right-of-way (ROW)* indicates an area to which the applicant would have legal access for construction and operation of the proposed utility facilities. Legal access may be acquired in various ways, including purchase, easement, or franchise agreement.

[6] *Capacity rating* is defined as the specific level of electrical loading that a system, a facility, or element can support or withstand through the daily demand cycles without loss of equipment life (Edison Electric Institute 2005).

- Minor internal modifications (equipment replacement and upgrades) within the perimeter of 27 existing substations operated by the applicant within the applicant's service area.

The applicant estimates that construction would take approximately 55 months. The construction duration does not include any potential delays due to nesting birds avoidance, weather, outage constraints, permit acquisitions, or other unpredictable events. Figure 2-1 shows the proposed project location and major components.

2.1 Location of the Proposed Project

The components of the proposed project have been subdivided into three geographical areas (Figure 2-1):

- **Main Project Area:** comprises the proposed Mesa Substation site (including MWD water pipeline relocation) and associated transmission, subtransmission, distribution, and telecommunication lines proposed within the cities of Monterey Park, Montebello, Rosemead, South El Monte, and in portions of unincorporated Los Angeles County.
- **North Area:** comprises the temporary installation of a 220-kV transmission structure in the City of Pasadena to temporarily connect the Eagle Rock-Mesa 220-kV Transmission Line to Goodrich Substation.
- **South Area:** comprises a proposed transmission structure replacement in the City of Commerce and the proposed conversion from overhead to underground of three spans of existing street light conductors within the City of Bell Gardens.

In addition, the proposed project includes work to be conducted at multiple existing substations operated by the applicant. Figure 2-2 provides the location of the existing transmission and subtransmission system in the applicant's service area and several substations where the applicant would conduct minor modifications that would involve equipment upgrades and/or replacement with no disturbance and temporary disturbance activities (open cut trenching, heavy equipment and vehicle use, temporary construction work). A full list of all substations that the applicant would modify and the proposed modifications at each facility is provided in Section 2.2.3, "Additional Project Features."

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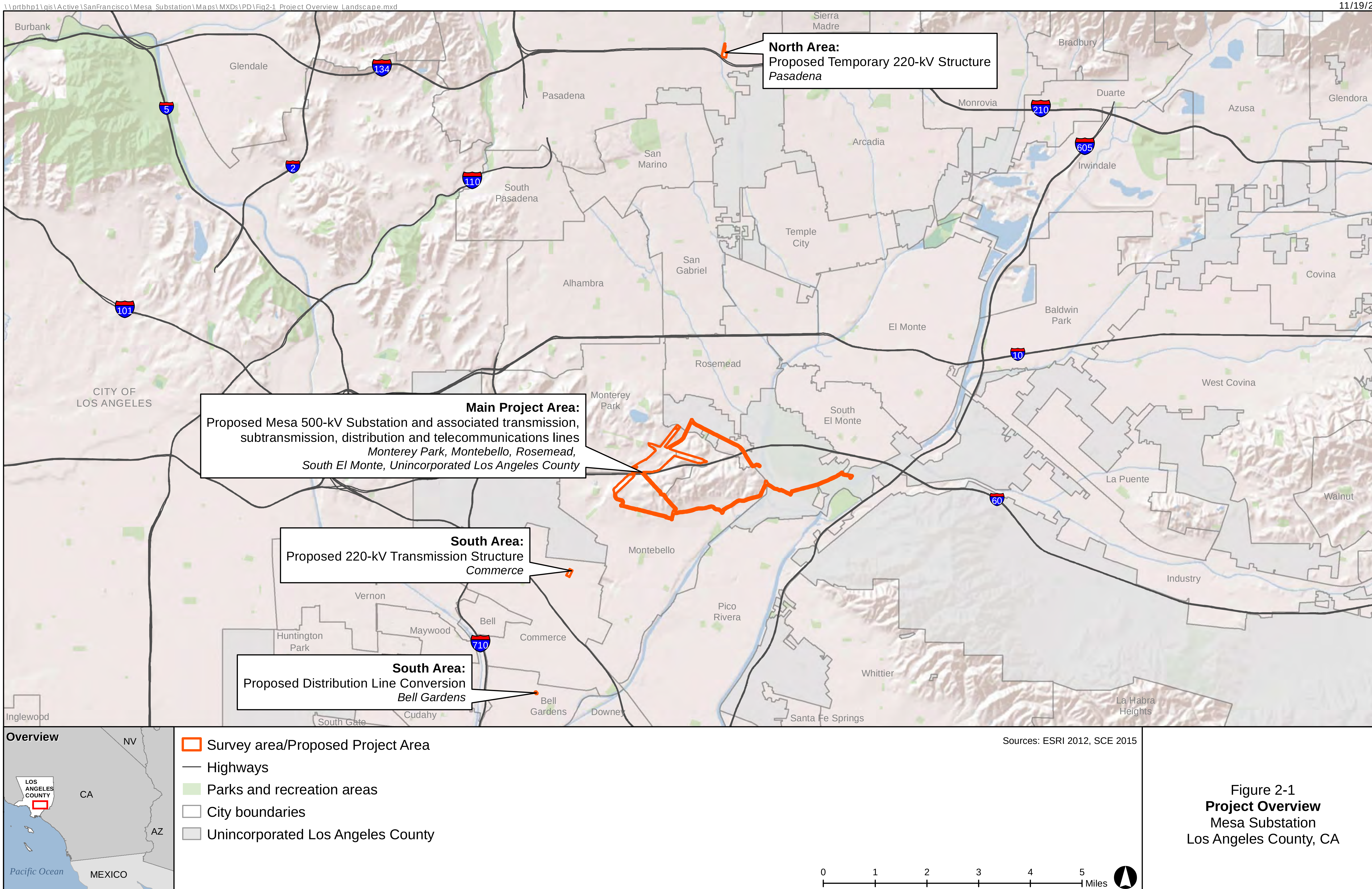

Survey area/Proposed Project Area

Highways

Parks and recreation areas

City boundaries

Unincorporated Los Angeles County

Sources: ESRI 2012, SCE 2015

0 1 2 3 4 5 Miles

Figure 2-1
Project Overview
Mesa Substation
Los Angeles County, CA

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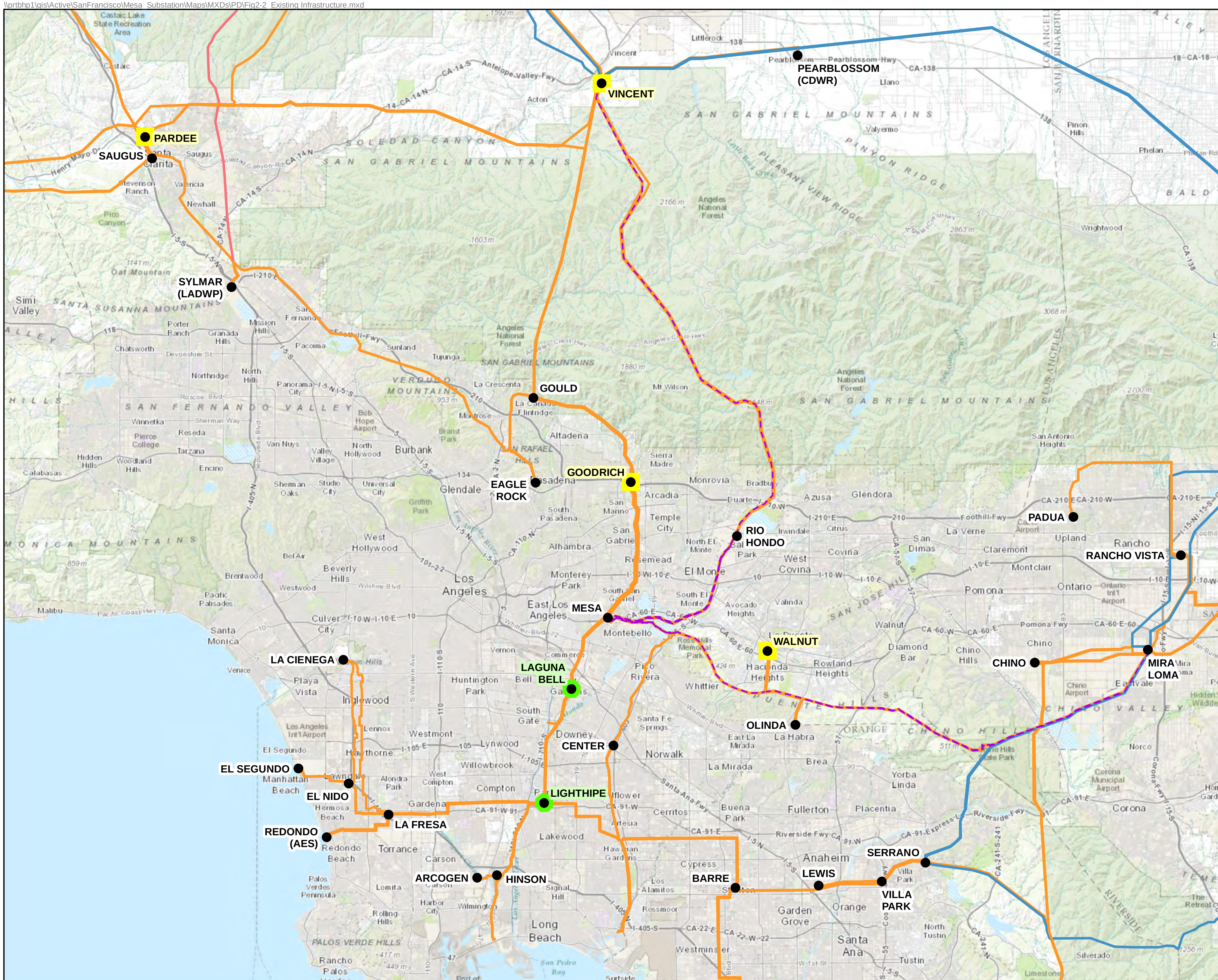

Figure 2-2
Existing Substations and Transmission Lines Associated with the Mesa 500-kV Substation Project

● Existing Substation

Proposed project modifications to existing substations

- Proposed new underground conduits at substation
- Proposed 220-kV equipment replacement

Existing Major Transmission

- 220-kV
- 500-kV
- ± 500-kV (TRTP*)
- 800-kV (LADWP**)

* Tehachapi Renewable Transmission Project (under construction)

** Los Angeles Department of Water & Power

0 5 10
Miles

Sources: ESRI 2012, SCE 2015

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2.2 Components of the Proposed Project

The components of the proposed project are summarized in Table 2-1 and shown on Figure 2-1 and Figures 2-3a to 2-3g. The following subsections describe each proposed project component and work to be conducted at each location.

Table 2-1 Components of the Proposed Project

Component	Quantity/ Dimensions	Proposed Project Specifications
Mesa 500-kV Substation		
New 500/220/66/16-kV substation	69.4 acres	• Replaces existing 220/66/16 kV Mesa Substation. • Located within applicant-owned property (86.2 acres) in the City of Monterey Park. • Staffed, automated substation. • Operating capacity: 3,360 MVA at 500/220-kV; 840 MVA at 220/66-kV; and 56 MVA at 66/16-kV. • Potential future capacity: 4,800 MVA at 500/220 kV; 1,120 at 220/66-kV; and 112 MVA at 66/16 kV.(1) • Construction would be conducted in three phases: - Phase 1: Initial Site Development (33.4 acres) and start of 220/66-kV Switchrack - Phase 2: 220/66-kV Switchrack Expansion (8 acres) - Phase 3: Existing Mesa Substation Decommissioning (40 acres) and build out of 500-kV Switchrack.
New and replaced steel switchracks	500 kV: 8.2 acres	• Height: 65 feet. Area: 650 feet long and 550 feet wide. • Positions: 6. Width per position: 90 feet.
	220 kV: 6.8 acres	• Height: 40 feet. Area: 900 feet long and 330 feet wide. • Positions: 14. Width per position: 50 feet.
	66 kV: 1.4 acres	• Height: 22 feet. Area: 460 feet long and 135 feet wide. • Positions: 20. Width per position: 22 feet.
	16 kV: 0.13 acres	• Height: 18.5 feet. Area: 162 feet long and 34 feet wide. • Positions: 18. Width per position: 8 feet.
Transformer banks	500/220 kV: 11 transformers (0.25 acres total)	• Oil-filled, single-phase, 373 MVA transformers installed in three 1120 MVA transformer banks. • 35-foot-high transformers. • 27,000 gallons of oil per transformer.
	220/66 kV: 3 transformers (0.06 acres total)	• Oil-filled, three-phase, 280 MVA transformers. • 27-foot-high transformers. • 27,000 gallons of oil per transformer.
	66/16 kV: 2 transformers (0.04 acres total)	• Oil-filled, three-phase, 28 MVA transformers installed in one transformer bank. • 14-foot-high transformers. • 25,000 gallons of oil per transformer.

Table 2-1 Components of the Proposed Project

Component	Quantity/ Dimensions	Proposed Project Specifications
New permanent buildings	Two buildings: - Operations - Test and Maintenance	• Operations building: 25 feet tall. 15,000 square feet. • Test and Maintenance Building: 35 feet tall, 16,000 square feet. • Components: pre-engineered metal building shell, metal panel exterior walls, windows, and metal doors. • Both buildings include permanent restrooms/lockers.
Mechanical and equipment rooms (MEER)	Two MEERs: - Senior - Junior	• Senior MEER: connected to 500-, 220-, and 66-kV switchracks. • Junior MEER: connected to 16-kV switchrack. • Metal framing, structural steel, concrete masonry units.
Microwave tower foundation (future use)	Four concrete piles	• Pile dimensions: 7 feet in diameter, 45 feet deep. • Separation between piles: 29 feet.
Access Driveways	Two permanent access driveways; one temporary driveway	• Main entrance: Potrero Grande Drive near Greenwood Avenue (50 feet wide). • Secondary/Emergency: East Markland Drive (25 feet wide). • Temporary construction access: Potrero Grande Drive near Atlas Avenue.
MWD water line relocation	2,700 feet removed 3,200 feet installed	• Removal of existing 72-inch-diameter waterline. • Replacement: 84-inch-diameter waterline west of the current alignment.
Telephone buildings and equipment relocation	Two sets of components	• Third-party cellular telephone buildings, tower, and antennas. • Proposed location: northwest of substation property.
Groundwater monitoring wells decommissioning	10 Monitoring Wells	• Validation of no obstructions interfering with filling and sealing each well. • Removal of the dedicated pump, associated tubing, and lines from each well. • Filling of each well casing and filter pack with sealing material consisting of a bentonite grout and by using a tremie pipe. • Drilling of the borehole to a depth of 10 feet below ground surface to remove the upper casing and annular materials. • Sealing of the resultant borehole from bottom to top with bentonite slurry.
500/220-kV Transmission Line Features (Overhead)		
Main Project Area		
500-kV transmission line	One line loop-in	• Re-align and connect the existing single-circuit Mira Loma-Vincent 500-kV line into the new proposed 500-kV switchrack at Mesa Substation.
	Up to 3 LSTs	• Remove one and relocate up to three 500-kV structures in the ROW adjacent to Mesa Substation.

Table 2-1 Components of the Proposed Project

Component	Quantity/ Dimensions	Proposed Project Specifications
220-kV transmission lines	Two line loop-in	• Re-align and connect the existing Goodrich-Laguna Bell and Laguna Bell-Rio Hondo 220-kV transmission lines into the new 220-kV switchrack at Mesa Substation.
	Eight lines relocation	• Construct new overhead getaways to relocate eight existing 220-kV transmission lines into the new proposed 220-kV switchracks at Mesa Substation.
	17 structure replacements	• Replace existing 220-kV structures in the ROW adjacent to Mesa Substation.
	35 LSTs and 4 TSPs removal	• Removal of portions of existing 220-kV transmission lines.
North Area: City of Pasadena		
220-kV transmission lines	One temporary TSP	• Install temporary TSP (110 to 140 feet tall) to connect the Eagle Rock-Mesa 220-kV transmission line to Goodrich Substation. • Work area required: 200 feet by 200 feet. • Structure would maintain a second line of service to the City of Pasadena when the Goodrich-Laguna Bell 220-kV transmission line is temporarily out of service during its reconnection to the new proposed Mesa Substation.
South Area: City of Commerce		
220-kV structure replacement	One LST	• Replace existing LST on the Laguna Bell-Mesa No. 1 220-kV Transmission Line to maintain compliance with phase to ground clearance requirements (G.O. 95) when increasing the circuit's capacity rating.
66-kV Subtransmission Line Features (Overhead and Underground)		
Main Project Area		
Relocation within Mesa Substation	16 overhead circuits	• Relocation of existing 66-kV subtransmission circuits into the new 66-kV switchrack at Mesa Substation.
Structure removal	65 poles and underground line	• Removal of 65 existing 66-kV subtransmission poles and 2,000 feet of underground conductor.
New overhead structures	24 new TSPs	• Double-circuit structures: 50 to 100 feet high, 3 to 5 feet in diameter. Concrete foundations: 5 to 7 feet diameter, 20 to 40 feet depth. • Conductor: 954 kcmil stranded aluminum conductor [(2)].
New underground structures and conduits	3.4 miles of trench and 28 new vaults	• 13 vaults within Mesa Substation site and 15 vaults outside the substation perimeter.

Table 2-1 Components of the Proposed Project

Component	Quantity/ Dimensions	Proposed Project Specifications
16-kV Distribution Lines (Underground)		
Main Project Area		
Underground lines within Mesa Substation site	Five distribution lines	• Relocation of existing 16-kV distribution lines into new proposed 16-kV switchracks.
Underground lines outside Mesa Substation site	1,300 feet of underground lines	• Four new vaults and five duct banks using six 5-inch conduits. • Duct bank dimensions: 2 feet wide and 45 inches deep.
South Area: City of Bell Gardens		
Street light source line conversion	Three spans of existing conductor	• Conversion of existing street light conductor from overhead to underground in Loveland Street, City of Bell Gardens. • Installation of approximately three pullboxes and approximately 300 feet of one 3-inch conduit between Toler Avenue and Darwell Avenue.
Telecommunications (Overhead and Underground)		
Main Project Area		
Structure relocations within Mesa Substation site	One existing and two new lines	• Reroute one existing telecommunications line to clear the Mesa Substation construction area. • Relocate existing overhead and underground telecom lines using five existing vaults and one manhole. • Install two new lines to increase circuit diversity.
Main Project Area		
Telecommunications Route 1	Total route length: 3.5 miles	• Installation of new telecom line between existing 220-kV LST near Darlington Street in the City of Rosemead and North Wilcox Avenue in City of Montebello. • This route would use existing manholes and utility poles. • Proposed new cable: - Overhead: 2.7 miles (existing poles) - Underground: 0.8 miles (new conduit)
Telecommunications Route 2	Route lengths: 2A: 2.4 miles 2B: 1.5 miles Total: 3.9 miles	• Installation of new telecom line using existing structures along two parallel routes: - **Route 2A:** starts in the southwestern limit of Mesa Substation site (City of Monterey Park) and ends at the intersection of North Montebello Road and Lincoln Avenue, near Harding Substation (City of Montebello). - **Route 2B:** starts southeast the Mesa Substation site in North Wilcox Avenue and ends at the intersection of North Montebello Road and Lincoln Avenue, near Harding Substation (City of Montebello). • Existing telecommunications line would be removed from Route 2A prior to installation of new telecommunications line on Route 2B; then, new telecommunications line would be added to Route 2A. • Overhead route: 3.0 miles • Underground route: 0.9 miles

Table 2-1 Components of the Proposed Project

Component	Quantity/ Dimensions	Proposed Project Specifications
Telecommunications Route 3	Total route length: 4.2 miles	• New telecommunication line between an existing 220-kV LST in the Whittier Narrows Natural Area near Durfee Avenue (Unincorporated Los Angeles County) and the intersection of North Montebello Road and West Avenida De La Merced (City of Montebello) then to continue to Mesa substation transitioning back to existing conduit and existing overhead. • New overhead route: 3.9 miles. • New underground route: 0.3 miles.
Duct banks and vaults along Telecommunications Routes	18 existing vaults and 5 new vaults; 1.8 miles of new duct bank	• Installation of existing and new underground duct banks. • Duct banks: two 5-inch conduits per bank, spacers and concrete. • Vaults: 5 feet wide by 5 feet long and 6 feet deep.
Minor Modifications to Existing Substations		
Vincent, Pardee, and Walnut Substations[3]	Telecom line rerouting	• Installation of new conduits within substation perimeter to provide diverse fiber optic routes. • Maximum duration: 2 weeks per location. • Export Quantities: - Vincent and Walnut Substations: 10 cubic yards. - Pardee Substation: 5 cubic yards. • Vehicle use: 50 trips per week.
Laguna Bell Substation	220-kV equipment replacement	• Replacement of 220-kV switchrack equipment and upgrade of line protection for the future Laguna Bell-Mesa No. 1 and No. 2 transmission lines. • Duration: 7 weeks (Phase 1: 4 weeks; Phase 2: 3 weeks). • Vehicle use: - Phase 1: 100 trips per week. - Phase 2: 25 trips per week. • No land disturbance associated with equipment replacement and upgrades.
Lighthipe Substation	220-kV equipment replacement	• Replacement of 220-kV switchrack equipment and upgrade of line protection for the 220-kV Lighthipe–Mesa transmission line. • Duration: 7 weeks (Phase 1: 4 weeks; Phase 2: 3 weeks). • Vehicle use: - Phase 1: 100 trips per week. - Phase 2: 25 trips per week. • No land disturbance associated with equipment replacement and upgrades.

Table 2-1 Components of the Proposed Project

Component	Quantity/ Dimensions	Proposed Project Specifications
Other substations	Equipment upgrades	• Upgrade 220-kV and 66-kV protection relays and/or telecommunications equipment inside existing relay houses and/or MEERs. • No land disturbance associated as works would involve replacement of relays on existing support racks. • Vehicle use: 5 vehicle trips (mainly crew vehicles) would be associated with each satellite location.

Notes:

(1) The acreage associated with transformer pads is analyzed in the EIR, but one space would not contain a transformer bank. A full analysis of potential future capacity would be speculative, as the applicant has indicated in the Proponent's Environmental Assessment that capacity would be expanded based on future demand, which is not defined and is often unpredictable in the long term given the number of variables affecting demand, such as energy efficiency, distributed generation, and demand response.

(2) 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. In general, a larger diameter conductor is capable of greater electrical carrying capacity than smaller diameter conductor (Grigsby 2001).

(3) The applicant would conduct conduit installation work at Goodrich Substation as part of a separate project currently being negotiated with the City of Pasadena. However, the applicant has stated that if this separate project does not come to fruition, the identified conduit work would be performed as part of the Mesa 500-kV Substation Project, as indicated in Attachment 3-B of the Proponent's Environmental Assessment. In either case, the estimated construction duration, export quantities, and vehicle trips would be similar to the values shown for Vincent and Walnut Substations. At the moment of publication of this Draft EIR, the applicant is still negotiating with the City of Pasadena the proposed conduit installation. Therefore, the Draft EIR analyzes impacts of conduit installation at Goodrich Substation as part of the proposed project.

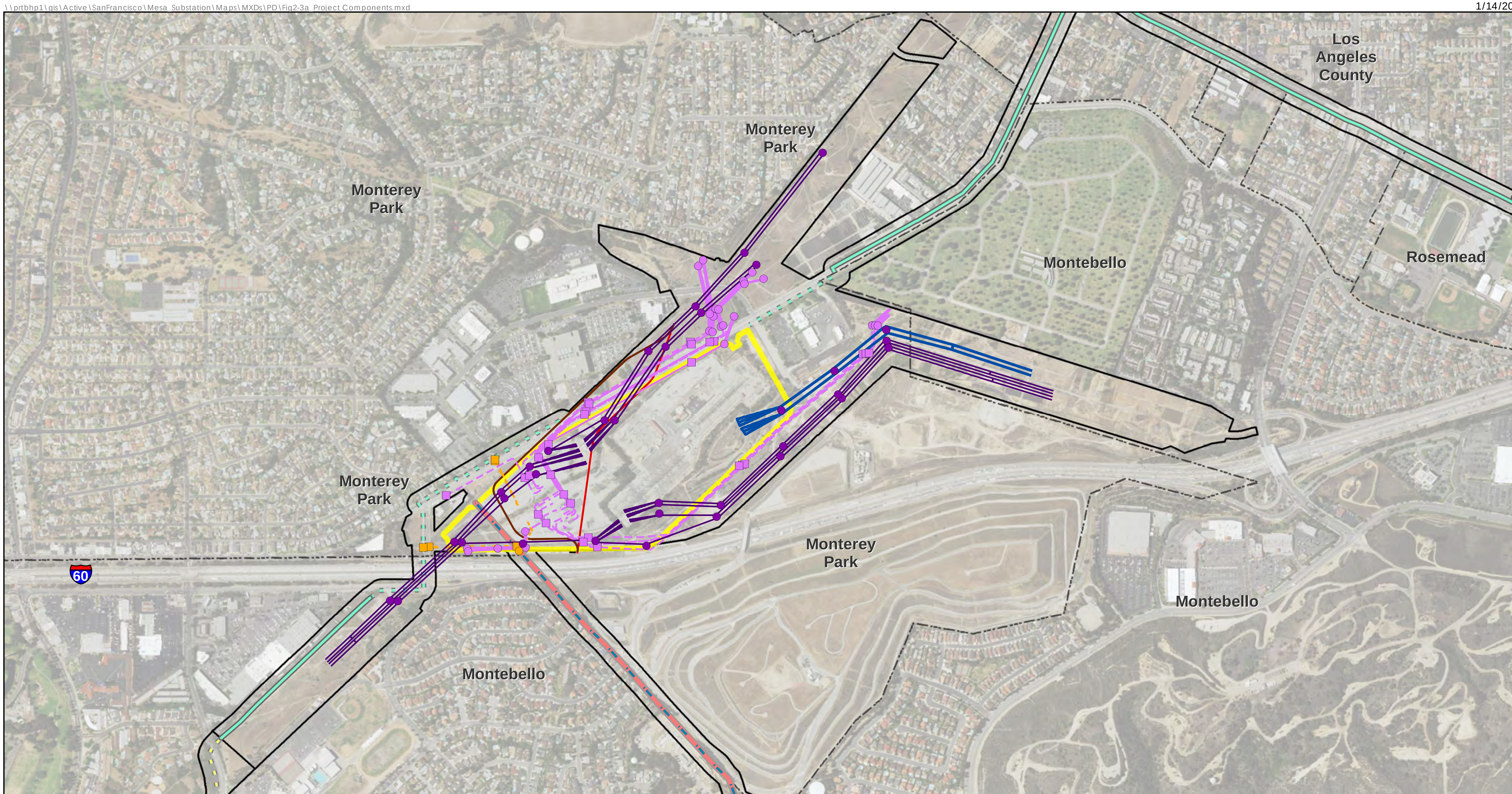
Key:

cmil circular mil
kV kilovolt
kcmil 1,000 circular mil units (see definition in the Notes section above)
LST lattice steel tower
MEER Mechanical Electrical Equipment Room
MVA megavolt amperes
ROW right-of-way
TSP tubular steel pole

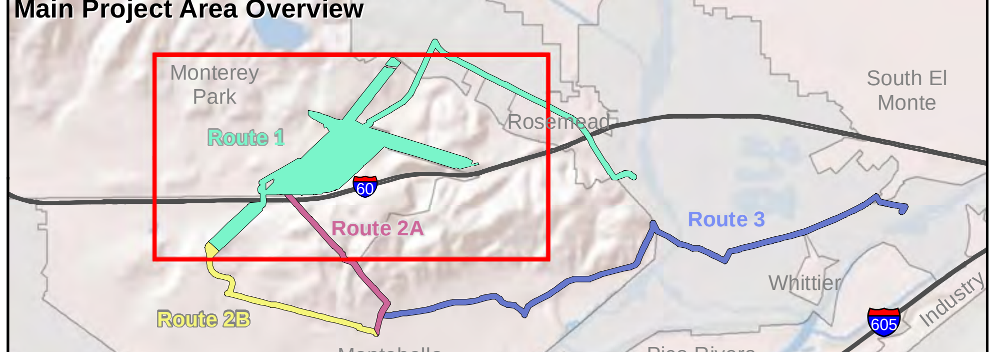
2.2.1 Mesa Substation Main Project Area

The applicant currently operates the 220/66/16-kV Mesa Substation, which occupies approximately 21.6 acres of applicant-owned property in the City of Monterey Park, in Los Angeles County, also known as the Mesa Substation site. In addition, as shown in Figures 2-2 and 2-3a, the applicant operates various transmission, subtransmission, distribution, and telecommunication lines that connect to and/or run through the existing Mesa Substation site.

The proposed project would replace existing structures and lines within the Mesa Substation site to allow existing electrical circuits to connect to the new proposed substation configuration. In addition, the proposed project would connect existing 500-kV and 220-kV circuits that currently pass through the existing substation site without connecting to the existing configuration.



Main Project Area Overview



- Transmission structure
- Subtransmission structure
- Subtransmission vault area
- Distribution structure
- Distribution vault
- MWD Middle Feeder pipeline
- Existing alignment
- Proposed alignment
- Transmission line: 220-kV (Overhead)
- Transmission line: 500-kV (Overhead)
- Subtransmission Line: 66-kV (Overhead)
- Subtransmission Line: 66-kV (Underground)
- Distrbution line (Underground)
- Substation area proposed boundary
- Survey area
- City boundary

Telecommunications
- Route 1 (Overhead)
- Route 1 (Underground)
- Route 2a (Overhead)
- Route 2a (Removed)
- Route 2b (Underground)

0 500 1,000
Feet

Sources: ESRI 2012, SCE 2015

Figure 2-3a
Project Components
Main Project Area -
Mesa Substation Site
Los Angeles County, CA

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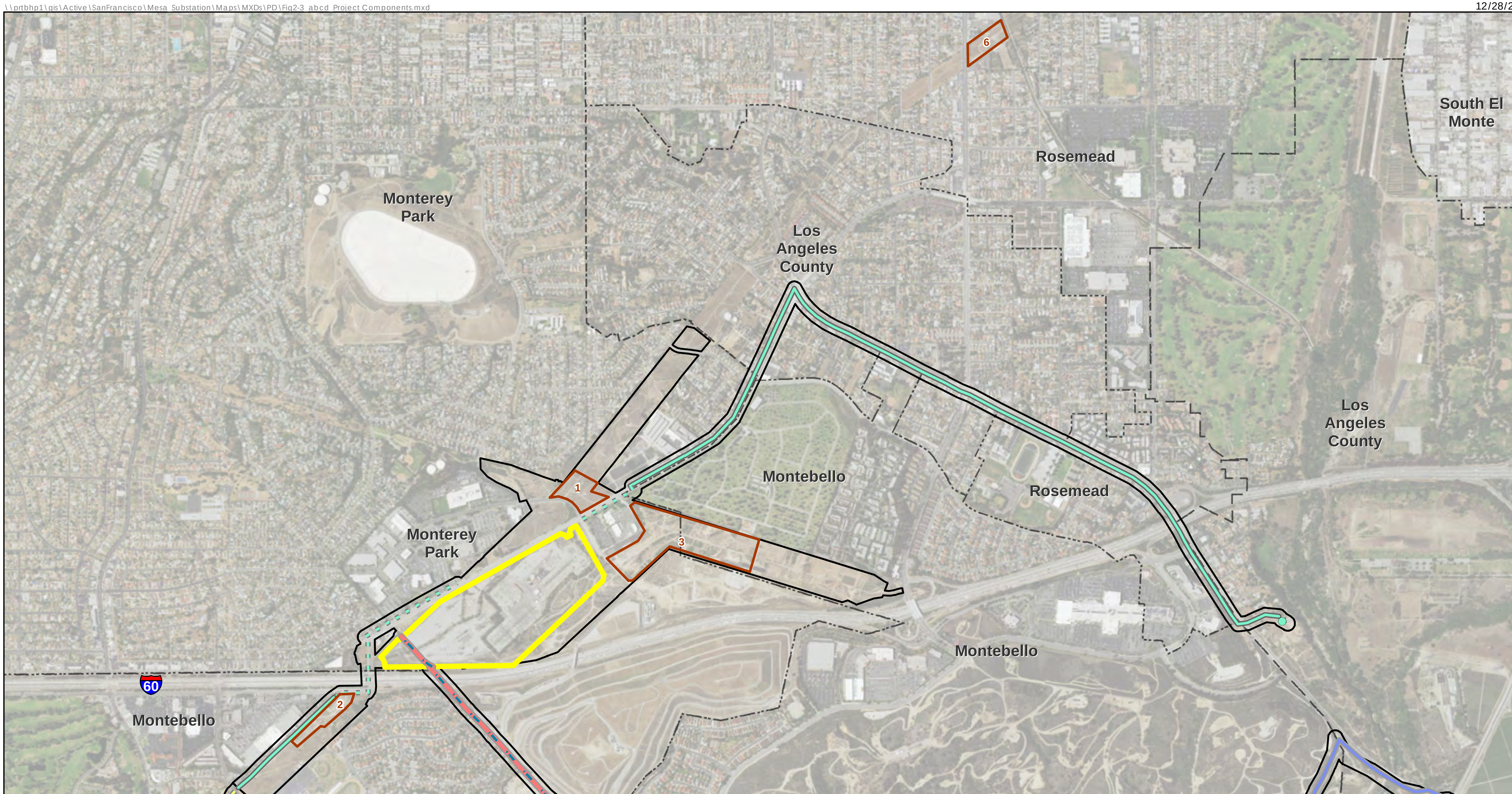
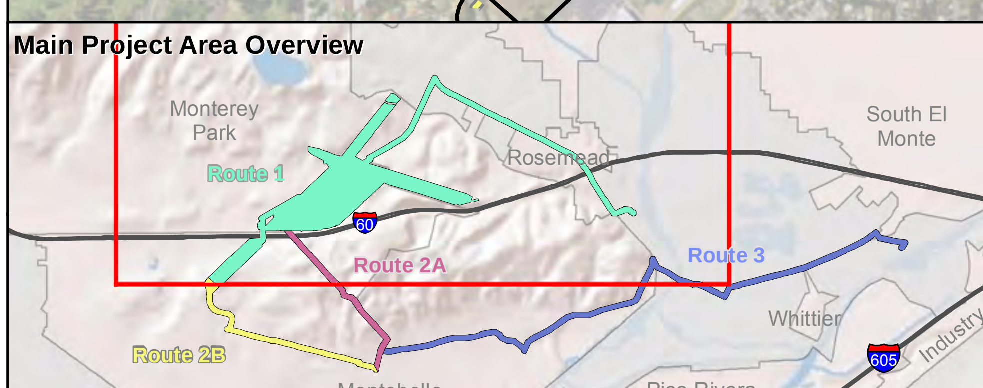


Main Project Area Overview



- Manhole
- Substation area proposed boundary
- Staging yard
- Survey area
- City boundary

Telecommunications
- Route 1 (Overhead)
- Route 1 (Underground)
- Route 2a (Overhead)
- Route 2a (Removed)
- Route 2b (Underground)
- Route 3 (Overhead)

Sources: ESRI 2012, SCE 2015

0 500 1,000
Feet

Figure 2-3b
Project Components
Main Area – Telecommunications
Route 1
Los Angeles County, CA

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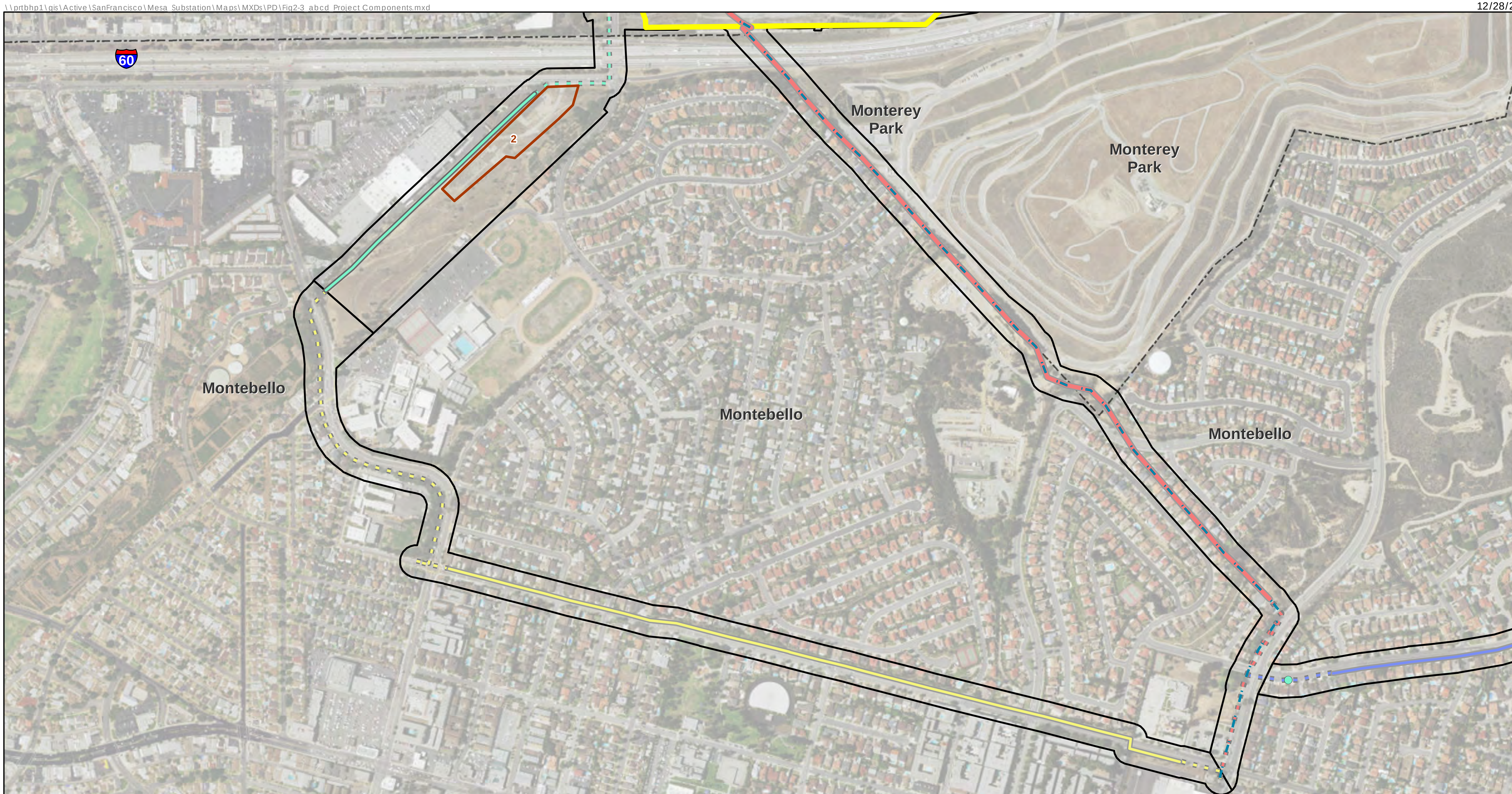
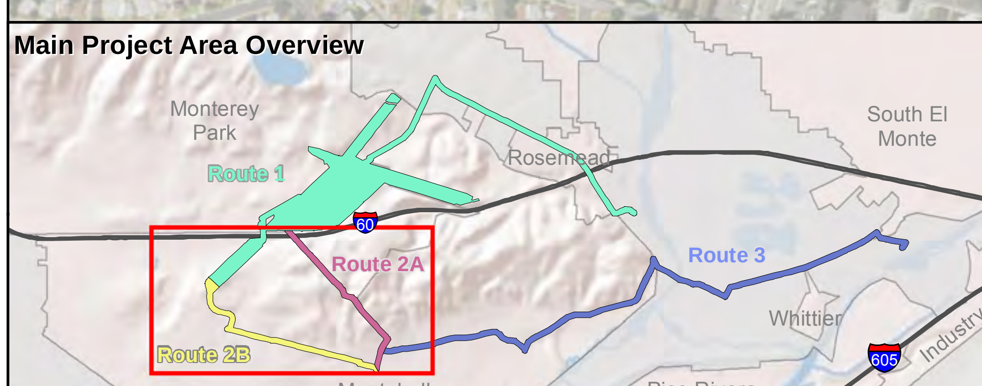
12/28/2015





- Manhole
- Substation area proposed boundary
- Staging yard
- Survey area
- City boundary

Telecommunications

- Route 1 (Overhead)
- Route 1 (Underground)
- Route 2a (Overhead)
- Route 2a (Underground)
- Route 2a (Removed)
- Route 2b (Overhead)
- Route 2b (Underground)
- Route 3 (Overhead)
- Route 3 (Underground)

Sources: ESRI 2012, SCE 2015

0 500 1,000
Feet

Figure 2-3c
Project Components
Main Area – Telecommunications
Routes 2A and 2B
Los Angeles County, CA

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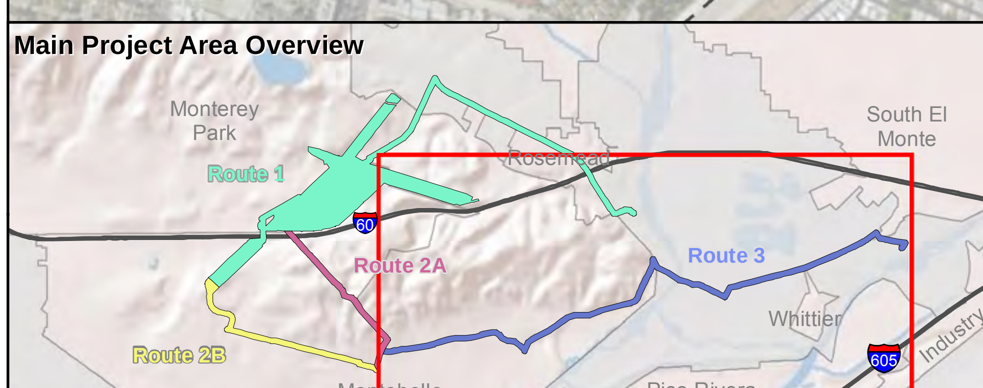
Main Project Area Overview



- Manhole
- Staging yard
- Survey area
- City boundary

Telecommunications
- Route 1 (Overhead)
- Route 1 (Underground)
- Route 2a (Overhead)
- Route 2a (Underground)
- Route 2a (Removed)
- Route 3 (Overhead)
- Route 3 (Underground)

Sources: ESRI 2012, SCE 2015

0 500 1,000
Feet

Figure 2-3d
Project Components
Main Area – Telecommunications
Route 3
Los Angeles County, CA

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- Manhole
- Telecommunications line (Underground)
- Staging yard
- Survey area

Sources: ESRI 2012, SCE 2015

0 500
Feet

Figure 2-3e
Project Components
North Area – Temporary
220-kV Structure
Los Angeles County, CA

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- Transmission structure: 220-kV lattice steel tower
- Staging yard
- Survey area

0 500
Feet

Figure 2-3f
Project Components
South Area – Proposed
220-kV Structure
Los Angeles County, CA

Sources: ESRI 2012, SCE 2015

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Distrbution line: underground street light

Survey area

Sources: ESRI 2012, SCE 2015

0 500
Feet

Figure 2-3g
Project Components
South Area – Proposed
Distribution Line Conversion
Los Angeles County, CA

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2.2.1.1 Proposed Mesa Substation

The proposed 500/220/66/16-kV Mesa Substation would require a total area of approximately 69.4 acres to replace the existing 220/66/16-kV Mesa Substation and connect existing 500-kV and 220-kV circuits to the proposed new configuration. The proposed new Mesa Substation would be staffed and automated, operating at 3,360 MVA at 500/220-kV, 840 MVA at 220/66-kV, and 56 MVA at 66/16-kV. The capacity of the proposed substation would be expandable to a maximum of 4,480 MVA at 500/220-kV, 1,120 MVA at 220/66-kV, and 112 MVA at 66/16-kV, depending on future need.[7] The build-out of the proposed Mesa Substation would include the following (Figure 2-3a):

- Four steel switchracks, one for each operating voltage at the substation: 500-kV, 220-kV, 66-kV and 16-kV;
- Three sets of transformer banks, containing a total of 16 oil-filled transformers (11 transformers for 500/220-kV; three for 220/66-KV, and two for 66/16-kV);
- Five capacitor banks connecting to the proposed switchracks (three for 66-kV and two for 16-kV);
- Subtransmission and distribution getaways (i.e., underground conduits that leave the substation);
- Operations Building and Test and Maintenance Building;
- Two Mechanical and Electrical Equipment Rooms (MEERs);
- Electrical supply and lightning;
- Grounding and counterpoise;
- Fire protection and water retention basins;
- Two entrances, gates, parking, and perimeter wall;
- Foundation for a future microwave communications tower; and
- Restrooms, connection to the City of Monterey Park sewer system, water supply, and landscape.

The proposed 220/66/16-kV Mesa Substation would include the following:

- Replace existing 220/66/16-kV switchracks, three 220/66-kV transformer banks, and two 66/16-kV transformer banks.
- Loop-in the existing Mira Loma–Vincent 500-kV Transmission Line, which currently passes through the Mesa Substation site without landing on a rack position, to a new 500-kV switchrack with new overhead getaways.
- Relocate eight existing 220-kV transmission lines into a new 220-kV switchrack with new overhead getaways.

[7] The extent and timing of any future expansion would be speculative because future demand is not defined and is often unpredictable in the long term given the number of variables affecting demand, such as energy efficiency, distributed generation, and demand response.

- Loop-in the Goodrich–Laguna Bell and Laguna Bell–Rio Hondo 220-kV transmission lines, which currently pass through the Mesa Substation site without landing on a rack position, into a new 220-kV switchrack with new overhead getaways.
- Relocate 16 existing 66-kV subtransmission lines to the new 66-kV switchrack with new underground getaways.
- Relocate five existing 16-kV distribution lines to the new 16-kV switchrack with new underground getaways.
- Relocate two sets of third-party cellular telephone buildings, towers, and antennas to the northeast corner of the Mesa Substation property. This work would be performed by the third-party telecommunication owners.

Figure 2-4 shows the proposed new Mesa Substation layout. All the proposed Mesa Substation switchgear would be air insulated. Table 2-2 provides a summary of major components and structure dimensions that would be constructed within the proposed Mesa Substation site. A detailed description of these components and structures is provided below.

Table 2-2 Main Proposed Mesa Substation Components and Dimensions

Type of Structure	Approximate Number of Structures	Approximate Width (feet)	Approximate Length (feet)	Approximate Height (feet)
500-kV Switchrack	1	550	650	65
500/220-kV Transformer Area	11	30	33	35
500/220-kV Firewall	13	2	45	35
220 kV-Switchrack	1	330	900	40
220/66 kV-Transformer Area	3	25	35	27
66 kV-Switchrack	1	135	460	22
66/16-kV Transformer Area	2	25	35	14
16 kV-Switchrack	1	34	162	18.5

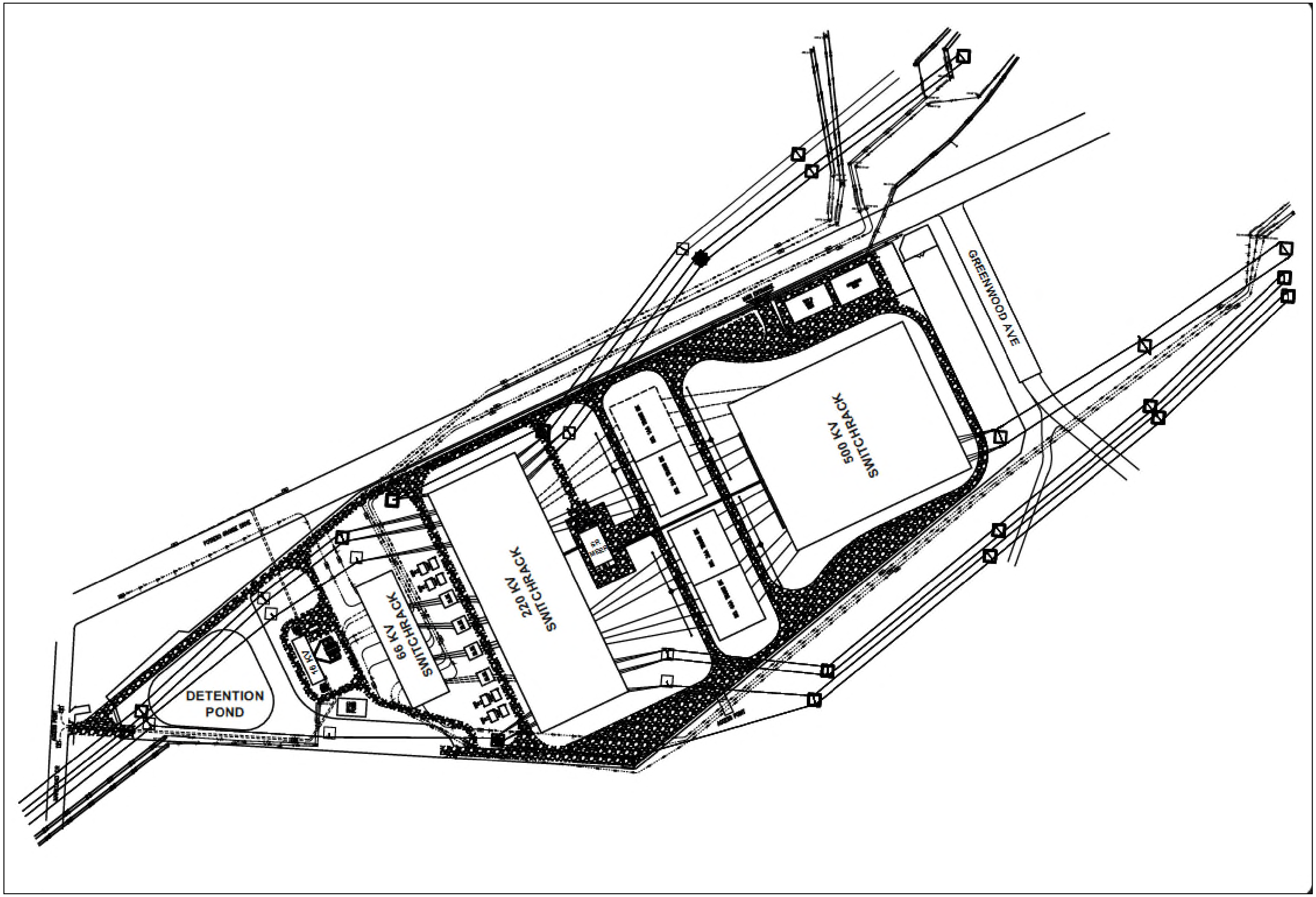
Source: SCE 2015.
Key:
kV kilovolt

Switchracks and Underground Getaways

The applicant would install four steel switchracks within the proposed Mesa Substation, as described below.

- <u>500-kV switchrack:</u> this component would be approximately 65 feet tall, 650 feet long, and 550 feet wide and would consist of a maximum of six positions to connect 500-kV transmission lines. Each of the proposed switchrack positions would measure 90 feet wide and would have circuit breakers and disconnect switches.
- <u>220-kV switchrack:</u> this component would be approximately 40 feet tall, 900 feet long, and 330 feet wide and would consist of a maximum of 14 positions to connect 220-kV transmission lines. Each position would be 50 feet wide.
- <u>66-kV steel switchrack</u>: this component would be approximately 22 feet tall, 460 feet long, and 135 feet wide. This switchrack would consist of a maximum of 20 positions to connect 66-kV subtransmission lines. Each position would measure approximately 22 feet wide.

Figure 2-4 Proposed Mesa Substation Layout



Source: SCE 2015.

- 16-kV switchrack: this component would be approximately 18.5 feet tall, 162 feet long, and 34 feet wide. This switchrack would consist of a maximum of 18 positions to connect 16-kV distribution lines. Each position would measure approximately 8 feet wide.

To connect existing and proposed underground lines to the 66-kV and 16-kV switchracks, the proposed Mesa Substation would also include 10 underground subtransmission gateways and four underground distribution getaways.

Transformers

The proposed Mesa Substation would consist of three main transformer blocks:

- 500/220-kV transformers: 11 oil-filled, single-phase, 373 MVA 500/220-kV transformers. The dimensions of the area needed for each transformer would be approximately 35 feet high, 33 feet long, and 30 feet wide (with radiators). Each transformer would contain approximately 27,000 gallons of oil.
- 220/66-kV transformers: three oil-filled, three-phase 280 MVA, 220/66-kV transformers with adjacent disconnect switches on the high voltage and low voltage sides. The dimensions of the area needed for each transformer would be approximately 27 feet high, 35 feet long, and 25 feet wide. Each transformer would contain approximately 25,000 gallons of transformer oil.
- 66/16-kV transformers: two oil-filled, three phase, 28 MVA 66/16-kV transformers with adjacent disconnect switches on the high voltage and low voltage sides. The dimensions of the area needed for each transformer would be approximately 14 feet high, 35 feet long, and 25 feet wide. Each transformer would contain approximately 3,500 gallons of transformer oil.

For fire protection within the proposed Mesa Substation transformer blocks, the applicant would install a firewall system that would consist of fire barrier panels placed between the 500/220-kV transformers and the oil spill collection system. Firewalls would be approximately 45 feet long and 35 feet tall and would have additional vertical steel columns placed between the fire barrier panels for support. For spill control and countermeasures, the applicant would install an oil spill collection system, which would consist of catch basins around transformers and underground piping that would connect the basins to a remote oil collection system and retention basin.

Capacitor Banks

The applicant would install three capacitor banks for the 66-kV switchrack and two capacitor banks for the 16-kV switchrack. Each of the 66-kV capacitor banks would be approximately 85 feet long and 38 feet wide, while the 16-kV capacitor banks would be approximately 37 feet long and 13 feet wide.

Buildings

The applicant would build a permanent Operations Building structure within the proposed Mesa Substation site. This building would be a pre-engineered metal building shell with metal panel exterior walls in earth-tone colors, green-tinted glazed windows, and metal doors painted to match the adjacent exterior building metal siding. In addition, the building would include an exterior patio at the northeast corner with translucent roof panels and perforated metal panel widescreens. The Operations Building's dimensions would be approximately 100 feet wide, 150 feet long, and 25 feet tall.

In addition, the applicant would construct a new Test and Maintenance Building, which would be similar to the Operations Building and consist of a pre-engineered metal building shell in earth-tone colors. This building would be approximately 100 feet long, 165 feet wide and 35 feet tall.

Both buildings described above would include permanent restrooms and locker rooms. The applicant would obtain applicable permits from the City of Monterey Park for modified sewer and water service required for these buildings.

Mechanical and Electrical Equipment Room

The proposed Mesa Substation would include two MEERs: one MEER connected to the proposed 500-, 220-, and 66-kV switchracks ("senior MEER"), and another connected to the proposed 16-kV switchrack ("junior MEER"). These rooms are typically constructed as pre-engineered metal buildings. Both structures would connect to the proposed switchracks through underground cable trenches and/or conduit banks.

Electrical Power Supply and Lightning

The proposed Mesa Substation would have three independent sources of 120/240 volt electrical power:

- An output from one of the 500/220-kV transformers at the proposed Mesa Substation;
- A nearby 16-kV distribution line that would be connected to the proposed Mesa Substation; and
- A 500-kilowatt, 120/240 volt, three-phase stationary backup generator, only for use in case of emergency. This emergency generator would be permitted by the applicable regulatory agencies and have a fuel storage capacity of 1,000 gallons of diesel.

In addition, the Operations Building would be provided with a separate power supply source from a nearby 16-kV distribution line, as well as an additional backup generator. These sources would also provide power to the Test and Maintenance Building.

Lighting at the proposed Mesa Substation would consist of light-emitting diode (LED) lights located in the switchracks around the transformer banks and in areas of the site where operations and maintenance activities would take place during evening hours. Maintenance lights would be controlled by a manual switch and would be in the "off" position unless being used. Maintenance lighting would be directed downward to reduce glare outside the proposed substation. A flashing orange beacon light, indicating the operation of a rolling gate of access to the proposed substation, would automatically turn on once the gate begins to open and then would turn off shortly after the gate is closed.

Microwave Tower Foundation

The proposed Mesa Substation would include a microwave tower foundation for potential future installation. The foundation would consist of four concrete piles measuring approximately 7 feet in diameter and 45 feet deep. The piles would be separated by approximately 29 feet. Construction of this tower foundation would require 10 cubic yards (CY) of concrete.

Grounding and Counterpoise

The proposed transmission structures located within the Mesa Substation site would be grounded to the substation ground grid. However, those 500-kV and 220-kV transmission line structures located more than 700 feet from the proposed Mesa Substation site boundary would require individual grounding.

When required, the applicant would install a counterpoise system to meet the adequate foundation to ground resistance criteria. A counterpoise system consists of an additional ground wire installed below ground and attached to the structure to increase conductivity between the structure and the ground.

Fire Water Retention Basin and Collection System

In the event of a fire at the proposed Mesa Substation, water used for firefighting efforts would flow toward a retention basin that would be located in the southwest corner of the site. This retention basin would be constructed from mulch, gravel, soil, and geotextile membrane layers, covering an area of approximately 1 acre and with a capacity of approximately 450,000 gallons.

Water used for fire control within the 500-kV/220-kV transformer bank area would flow into a catch basin system proposed to be installed around each transformer. This system would connect to a drainage pipe flowing into a concrete lined detention basin that would measure approximately 100 feet long, 50 feet wide, and 20 feet deep.

Substation Access, Perimeter Wall, and Parking Area

Access to the proposed Mesa Substation would be provided by new asphalt and/or concrete access driveways from Potrero Grande Drive and East Markland Drive. The main entrance at Potrero Grande Drive would be 50 feet wide, while the secondary entrance from East Markland Drive would be approximately 30 feet wide. Both entrances would have access gates. The applicant would also construct a sidewalk outside the proposed Mesa Substation site along Potrero Grande Drive and provide landscaping around the entire substation perimeter.

The proposed Mesa Substation would be enclosed by a 12-foot tall perimeter wall. The perimeter wall would be constructed in compliance with federal security requirements and the City of Monterey Park's requirements for safety, materials, and aesthetics. For security reasons, the perimeter wall would also include barbed and/or razor wire affixed near the top of the enclosure inside of the substation site, which would not be visible from the outside.

The applicant would provide parking spaces outside the proposed Operations Building and Test and Maintenance Building, including spaces designated for handicap use.

2.2.1.2 Metropolitan Water District (MWD) Waterline Relocation

Construction of the proposed Mesa Substation would involve the removal of approximately 2,700 feet of an MWD 72-inch-diameter waterline that currently runs through the middle of the proposed Mesa Substation property. This waterline traverses the Mesa Substation site in a north-south direction and crosses Potrero Grande Drive into the applicant's ROW.

The waterline would be replaced with an approximately 3,200-foot-long, 84-inch-diameter line and relocated to the west of its original configuration. The applicant would coordinate with the MWD in advance of construction and would follow the MWD's construction specifications. Section 4.12, "Public Services and Utilities," discusses the impacts and logistics associated with the pipeline relocation.

The applicant anticipates that the proposed relocation of the MWD waterline would take approximately six to nine months. During that time, the applicant anticipates that the existing waterline would remain in service until the proposed new line is ready to be connected. At the time of the waterline relocation, the MWD would utilize alternate resources to maintain service, if needed. The MWD supplies water to the southern portion of unincorporated Los Angeles County, including the unincorporated areas in the vicinity of the proposed project. This pipeline also serves the cities of Compton and Long Beach, as well as the Central Basin Municipal Water District, Upper San Gabriel Valley Municipal Water District, and Three Valleys Municipal Water District (MWD 2015). Thus, it is anticipated that the water source to serve customers would be the same, but could be delivered to customers via a different pipeline.

The proposed relocation of the waterline within Potrero Grande Drive may require temporary lane closures. The applicant would obtain an encroachment permit from the City of Monterey Park and would implement the traffic control measures required as part of this permit.

2.2.1.3 Transmission Line Features

The proposed project would involve the removal and replacement of existing transmission structures, the installation of new structures, and their connection to the proposed Mesa Substation. Most of the proposed work would be conducted within the Main Project Area. The following proposed 500-kV and 220-kV transmission features would be modified and/or installed as part of the proposed project. The number of transmission structures that would be removed and installed is provided in Table 2-1.

500-kV Transmission Features

The applicant would remove one and relocate up to three existing 500-kV overhead structures in the transmission ROW adjacent to the existing Mesa Substation and modify existing access roads, as needed. The proposed 500-kV features would involve:

- Removal of an existing overhead portion of the Mira Loma–Vincent 500-kV Transmission Line;
- Re-alignment of the existing overhead Mira Loma–Vincent 500-kV Transmission Line with up to three new lattice steel towers (LSTs); and
- Connection of the existing overhead single-circuit Mira Loma–Vincent 500-kV Transmission Line into the new 500-kV switchrack positions in the proposed Mesa Substation site, resulting in the Mesa–Mira Loma and Mesa–Vincent 500-kV transmission lines.

220-kV Transmission Features

The applicant would replace, remove, and relocate multiple existing 220-kV structures within the proposed Main Project Area. The proposed 220-kV features would involve:

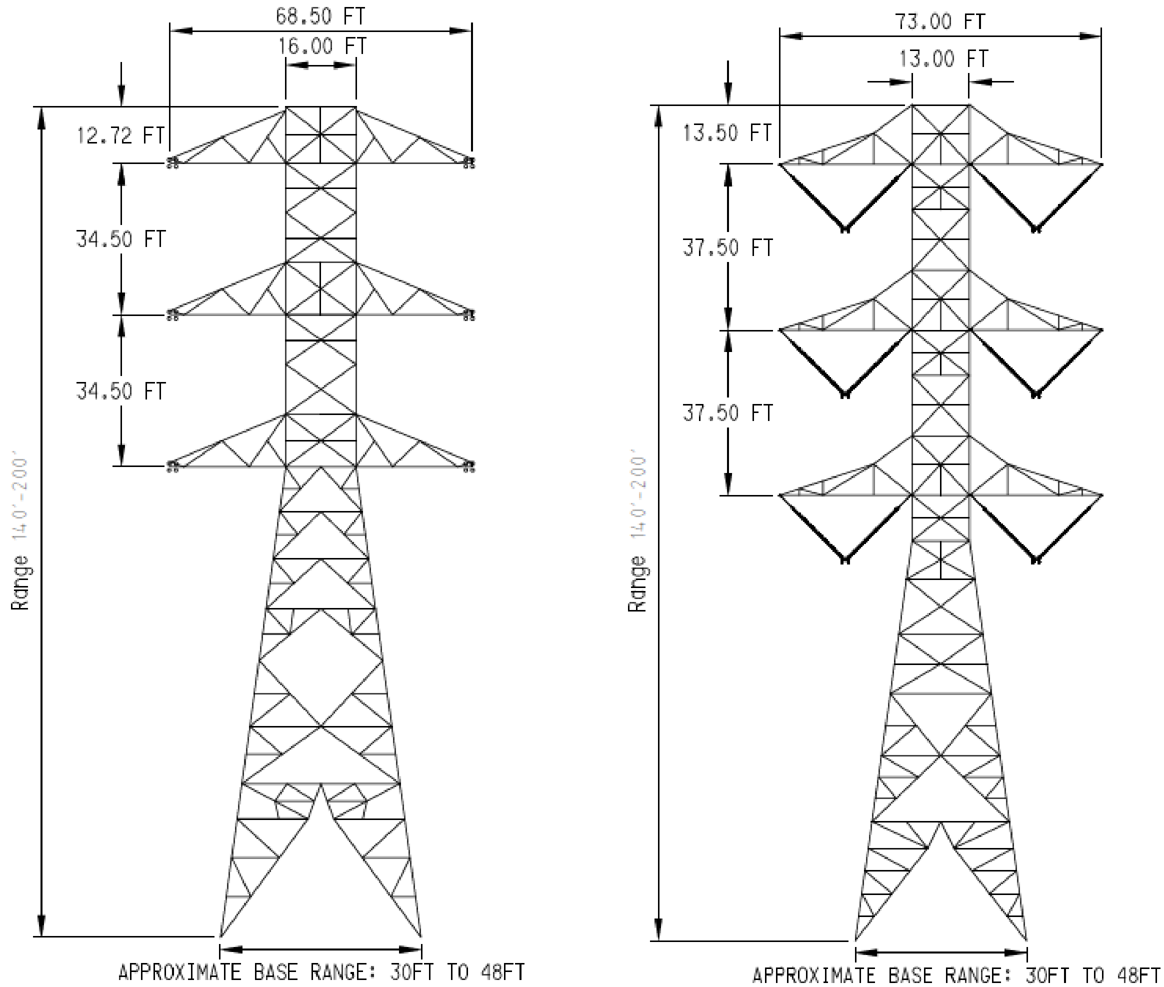
- Replacement of up to 17 existing 220-kV overhead structures in the transmission ROW adjacent to the Mesa Substation site and modification of access roads, as needed;
- Removal of portions of the existing overhead 220-kV transmission lines, including approximately 35 existing single- and double-circuit[8] LSTs and approximately four tubular steel poles (TSPs);
- Relocation of eight existing overhead 220-kV transmission lines into the new 220-kV switchrack by constructing new overhead getaways from their existing alignment to Mesa Substation forming the following circuits:
  - Center–Mesa 220-kV Transmission Line
  - Eagle Rock–Mesa 220-kV Transmission Line
  - Lighthipe–Mesa 220-kV Transmission Line
  - Mesa–Redondo 220-kV Transmission Line
  - Mesa–Rio Hondo 220-kV Transmission Line
  - Mesa–Vincent No. 1 220-kV Transmission Line
  - Mesa–Vincent No. 2 220-kV Transmission Line
  - Mesa–Walnut 220-kV Transmission Line
- Connection of the existing overhead Goodrich–Laguna Bell and Laguna Bell–Rio Hondo 220-kV transmission lines into the new 220-kV switchrack in the proposed Mesa Substation site by constructing new overhead getaways from the existing transmission line alignment to Mesa Substation.

Transmission Structures

As noted above, the proposed project would use LSTs for 500-kV transmission (double-circuit structures) and TSPs and LSTs for 220-kV transmission (single- and double-circuit structures). Figures 2-5 and 2-6 describe each structure type proposed by the applicant. Approximate dimensions of the proposed transmission structures are summarized in Table 2-3. Specific tower height and spacing would be determined by the applicant upon final engineering and would be constructed in compliance with California Public Utilities Commission (CPUC) General Order (GO) 95. All proposed project transmission features would be designed consistent with the Avian Power Line Interaction Committee (APLIC) avian protection guidelines and best management practices (BMPs) for the operation of power lines.

[8] Alternating-current electrical transmission systems use at least three conductor systems to transmit electricity, also known as phases. The proposed single-circuit 220-kV transmission structures would support three conductor cables. By comparison, the proposed double-circuit 220-kV transmission structures would support six conductors.

Figure 2-5 Proposed 500-kV Structures: Configurations and Dimensions



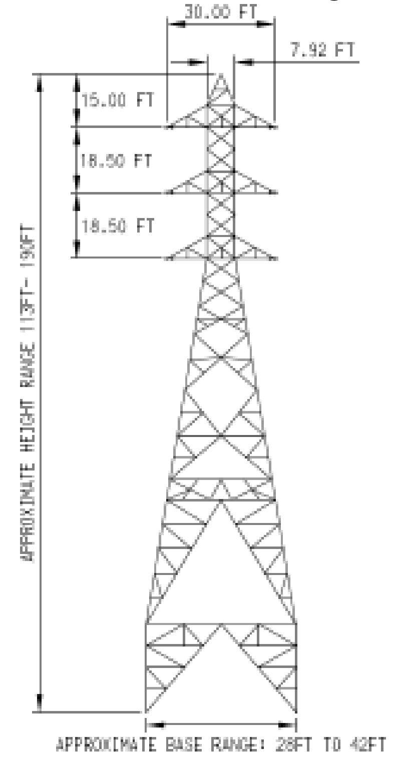
Typical 500-kV Double Circuit LST (Dead-end structure)

Typical 500-kV Double Circuit LST (Suspension structure)

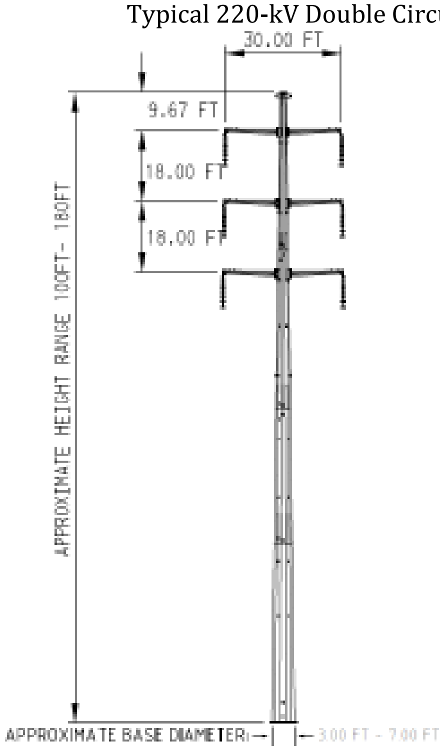
Source: SCE 2015.

Note: Dead-end structures are higher-strength structures used at the termination point of powerlines that are designed to support the high-tension forces associated with the length of the line leading up to the termination port. Higher-strength structures are also installed where powerlines change direction.

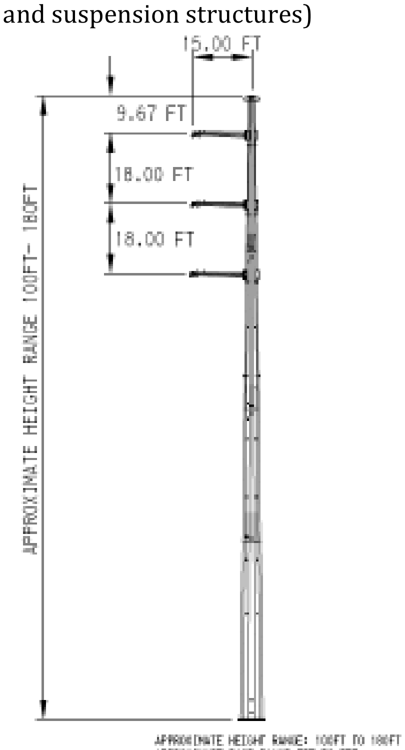
Figure 2-6 Typical 220-kV Structures: Double Circuit Configurations and Dimensions



Typical 220-kV Double Circuit LST (Dead-end and suspension structures)



Typical 220-kV Double Circuit LST
(Dead-end and suspension structures)



Typical 220-kV Single Circuit TSP
(Dead-end and suspension structure)

Source: SCE 2015.

Table 2-3 Typical Project Transmission Structure Dimensions

Type of Structure	Proposed Number of Structures	Approximate Height Above Ground (feet)	Approximate Footing or Pole Diameter (feet)	Approximate Auger Hole Depth (feet)	Approximate Auger Diameter (feet)
500-kV LST	3	140 to 200	5 to 7	30 to 60	7 to 9
220-kV LST	26	113 to 190	3 to 7	30 to 60	5 to 9
220-kV TSP	6	100 to 180	3 to 7	30 to 60	5 to 9

Source: SCE 2015.
Note: All data provided in this table are approximated dimensions based on the applicant's planning-level assumptions. Final dimensions may change following final engineering conducted by the applicant based on construction practices, standards, and specifications. The applicant would be required to comply with California Public Utilities Commission General Order 95, the Avian Power Line Interaction Committee Guidelines, and other applicable environmental and permitting requirements prior to construction of these structures.
Key:
kV kilovolt
LST Lattice Steel Tower
TSP Tubular Steel Pole

The applicant would design the proposed transmission structures consistent with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). Also, the applicant would evaluate the potential of collisions of avian species with the proposed transmission features, in accordance with the APLIC's guidance as described in *Reducing Avian Collisions with Power Lines: The State of Art in 2012* (APLIC 2012).

The applicant would install 29 LSTs as part of the proposed project. The LSTs would be all steel structures with a dulled galvanized finish. Each LST would have a minimum footprint of approximately 784 square feet and a maximum footprint of 2,304 square feet. These structures would extend between 113 and 200 feet above ground. Each LST would be attached to four concrete foundations that would be approximately 3 to 7 feet in diameter and would extend underground to a depth of 30 to 60 feet with about 1 to 4 feet of concrete visible above ground. The LSTs would require an average of approximately 200 CY of concrete per structure, or 5,800 CY of concrete in total.

The applicant would install six TSPs as part of the proposed 220-kV transmission features. The TSPs would be steel structures with dulled galvanized finish. Each TSP would be 3 to 7 feet in diameter at the base and would extend 100 to 180 feet above ground. The TSPs would be attached to concrete foundations that would be 5 to 9 feet in diameter and would extend underground 30 to 60 feet with 2 to 4 feet of concrete above ground. The TSPs would require an average of 88 CY of concrete per structure, or 528 CY of concrete in total.

Federal Aviation Administration Requirements

Pursuant to Title 14, Part 77 of the Code of Federal Regulations (CFR), the applicant would be required to file notifications to the Federal Aviation Administration (FAA) for transmission and subtransmission structures exceeding the maximum height requirements for safe aircraft operations. The FAA would conduct an analysis of the applicant's notifications and issue a determination to address any issues identified relating to the proposed project structure design, such as reducing height, marking structures with aviation lighting, or using marker balls on wire spans between structures. The FAA generally recommends the use of marking or lighting for structures exceeding 200 feet in height above ground level; however, these measures are sometimes recommended for structures that are less than 200 feet in height but located within close proximity to an airport or high-density aviation environment. Specific requirements for the installation of lighting and marker balls on transmission and subtransmission structures are specified in FAA Advisory Circular AC70/7460-1L. Since FAA determinations for permanent structures are typically valid for 18 months, the applicant would file notifications to the FAA upon completion of final engineering and before construction starts.

2.2.1.4 66-kV Subtransmission Line Features

The applicant would remove, relocate, and install overhead and underground 66-kV subtransmission features within the Main Project Area, which includes transmission ROW and franchise areas adjacent to the proposed Mesa Substation. The proposed 66-kV subtransmission features would involve:

- Removal of 65 existing overhead 66-kV structures and approximately 2,000 feet of underground cable;
- Installation of 24 overhead 66-kV structures, 17,000 feet of underground duct, and 15 vault structures within adjacent transmission ROW and franchise areas, and modification of existing access roads, as necessary; and
- Relocation of 16 overhead 66-kV subtransmission circuits into the new 66-kV switchrack at the Mesa Substation Site with new underground getaways:
  - Mesa–Anita–Eaton 66-kV Subtransmission Line
  - Mesa–Laguna Bell-Narrows 66-kV Subtransmission Line
  - Mesa–Narrows 66-kV Subtransmission Line
  - Mesa–Newark No. 1 66-kV Subtransmission Line
  - Mesa–Newark No. 2 66-kV Subtransmission Line
  - Mesa–Newark-Ramona 66-kV Subtransmission Line
  - Mesa–Ravendale-Rush 66-kV Subtransmission Line
  - Mesa–Repetto 66-kV Subtransmission Line
  - Mesa–Repetto-Wabash 66-kV Subtransmission Line
  - Mesa–Rosemead No. 1 66-kV Subtransmission Line
  - Mesa–Rosemead No. 2 66-kV Subtransmission Line
  - Mesa–Rush No. 2 66-kV Subtransmission Line
  - Mesa–Rush No. 3 66-kV Subtransmission Line
  - Mesa–San Gabriel 66-kV Subtransmission Line
  - Rio Hondo–Amador-Jose-Mesa 66-kV Substransmission Line
  - Walnut-Hillgen–Industry-Mesa-Reno 66-kV Subtransmission Line

Relocating these existing 66-kV Subtransmission Lines into the proposed Mesa Substation site would involve the removal of existing overhead structures; installation of new underground line segments in new duct banks and vault structures; and installation of new overhead segments supported by single- and double-circuit TSPs and lightweight steel (LWS) poles.

Overhead Subtransmission Structures

The proposed 66-kV overhead subtransmission components would use 24 TSP structures. The TSPs would be steel structures with a dulled finish and approximately 3 to 5 feet in diameter at the base, extending approximately 50 to 100 feet above ground. These structures would be attached to concrete foundations that would be 5 to 7 feet in diameter, extending underground approximately 20 to 40 feet, and having up to 4 feet of concrete visible above ground. Each TSP would use 14 to 63 CY of concrete. These structures would be designed consistent with the *Suggested Practices for Avian Protection on Power Lines: The State of Art in 2006* (APLIC 2006). Figures 2-7 and 2-8 show the typical subtransmission TSP structure dimensions, as proposed by the applicant. The applicant would consult with the FAA in the event this agency requires notifications for the proposed 66-kV structures.

Underground Subtransmission Features

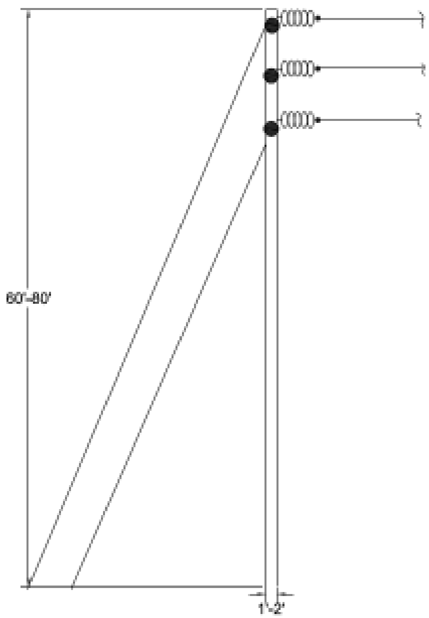
The proposed project includes the installation of approximately 28 underground vaults and 3.3 miles of underground subtransmission lines in new duct banks outside of the Mesa Substation perimeter. Table 2-4 summarizes the dimensions of the proposed underground subtransmission structures. Work area dimensions and methods for underground construction are described in Section 2.3.3.3, "Underground Construction." A total of 13 vaults would be installed within the Mesa Substation site and 15 vaults outside the Mesa substation perimeter. Figure 2-9 shows the typical subtransmission vault and duct bank design, as proposed by the applicant.

Table 2-4 Underground Structure Dimensions

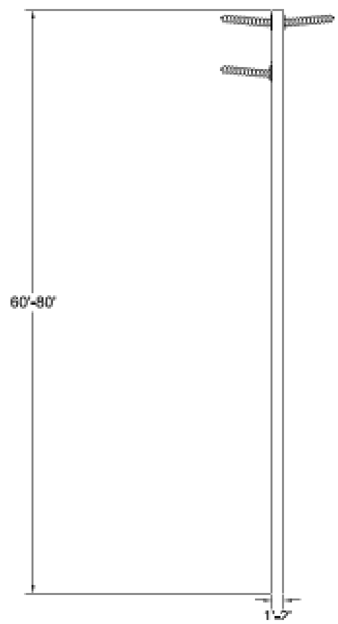
Type of Structure	Approximate Number of Structures	Approximate Structure Dimensions (feet)(1), (2)		
		Width	Length	Depth
Subtransmission Vault	15	10	20	8
Subtransmission Duct Bank	10	2	18,000	5
Telecommunications Vault	5	5	5	6
Telecommunications Duct Bank	6	2	1,600	3
Distribution Vault	4	7	18	8
Distribution Duct Bank	4	2	900	5

Source: SCE 2015.
Notes:
(1) Trenches for duct bank installation would generally be 24 inches wide and 60 inches deep; however, the applicant would adjust trench dimensions would to meet the California Division of Occupational Safety and Health requirements.
(2) Vault excavations would generally be 15 feet wide, by 25 feet long and 15 feet deep; however, the applicant would adjust excavation dimensions to meet the California Division of Occupation Safety and Health requirements.

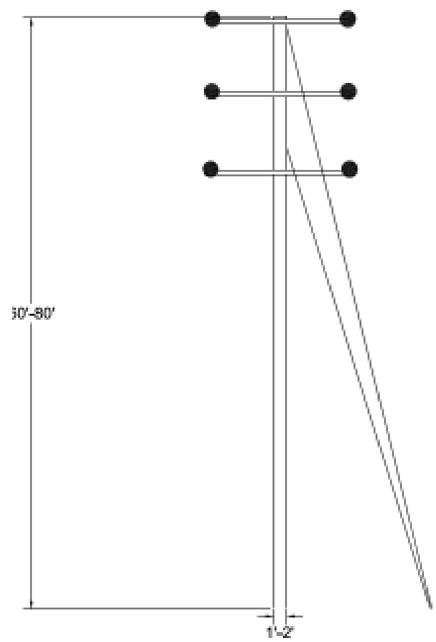
Figure 2-7 Typical 66-kV Single Circuit Subtransmission Structures



Typical 66-kV Single Circuit Dead-End Wood Pole



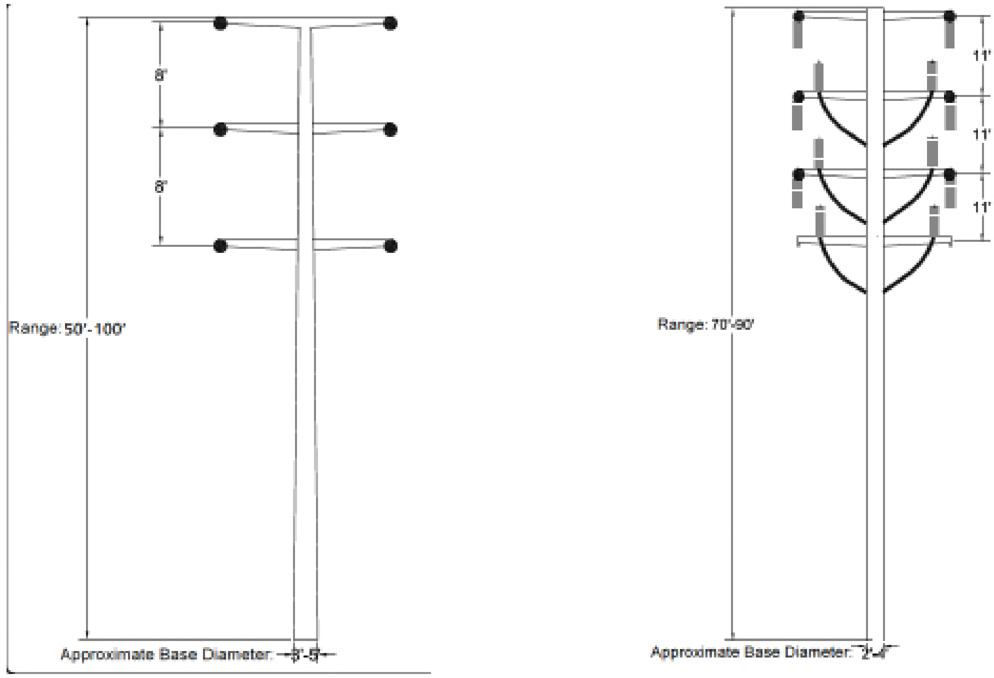
Typical 66-kV Single Circuit Suspension Wood Pole



Typical 66-kV Double Circuit Dead-End Wood Pole

Source: SCE 2015.

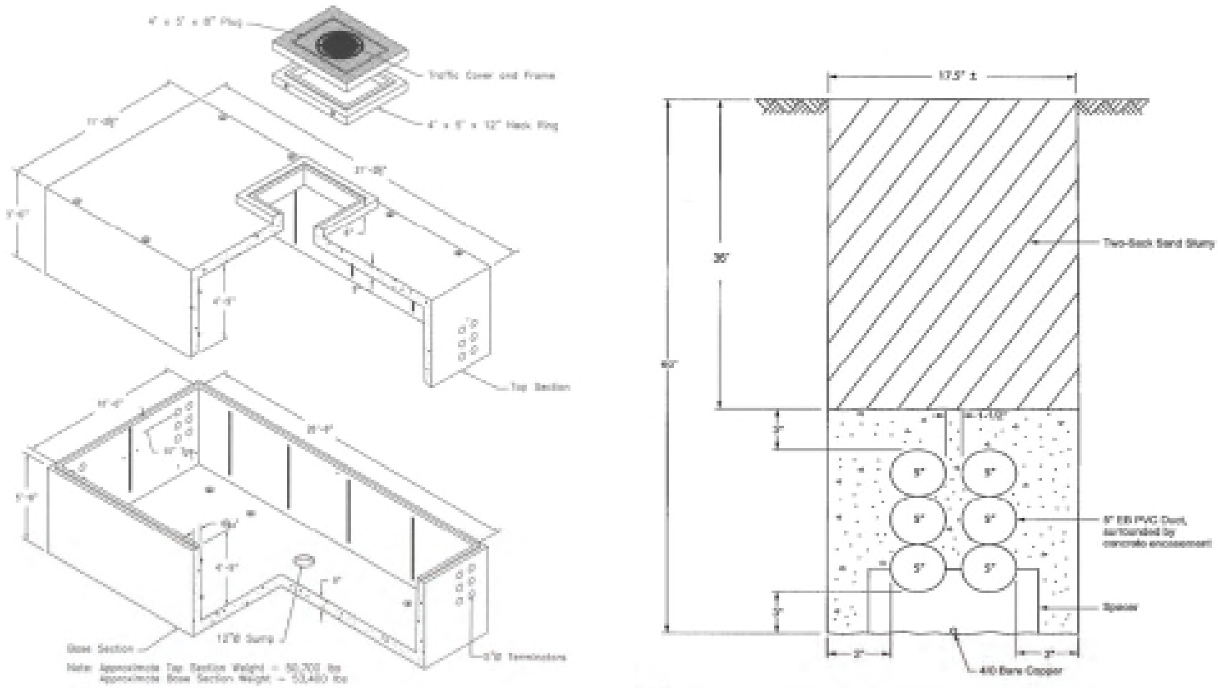
Figure 2-8 Typical 66-kV Double Circuit Subtransmission Structures



Typical 66-kV Double Circuit TSP (no underbuild) Typical 66-kV Double Circuit TSP Riser

Source: SCE 2015.

Figure 2-9 Typical Underground Vault and Duct Bank Configuration



Typical Underground Vault Configuration Typical Underground Duct Bank Configuration

Source: SCE 2015.

2.2.1.5 16-kV Distribution Features

The proposed project would relocate five existing underground 16-kV distribution lines within the proposed Mesa Substation site and install approximately 1 mile of underground distribution cables in new duct banks within the Main Project Area.

The proposed 16-kV distribution line construction works within the Mesa Substation site would involve relocation of the following five existing 16-kV distribution circuits:

- Arboles 16-kV Distribution Line,
- Cerveza 16-kV Distribution Line,
- Coronado 16-kV Distribution Line,
- Lomas 16-kV Distribution Line, and
- Picador 16-kV Distribution Line.

These five 16-kV distribution circuits would be placed in an underground conduit system. The proposed Mesa Substation could accommodate up to 12 16-kV distribution circuits; however, the location and configuration of these distribution circuits are unknown, and it is unknown whether any would be installed. The additional seven distribution circuits that could potentially be connected to the Mesa Substation are therefore not analyzed as part of the proposed project.

The proposed project would also install underground 16-kV distribution lines within the Main Project Area, outside the proposed Mesa Substation. Approximately 1 mile of underground distribution cables would be installed in new duct banks. At a minimum, the duct banks would measure 2 feet wide by 5 feet deep and would each consist of six 5-inch conduits, conduit spacers, and concrete. Four new vaults would be installed measuring approximately 7 feet wide by 18 feet long by 8 feet deep. Figure 2-9 shows the typical distribution vault and duct bank design, as proposed by the applicant.

The applicant may construct additional distribution circuits from the proposed Mesa Substation to locations in their service area, as needed. The applicant would determine the need for future distribution circuits based on criteria such as location of the current load growth, existing electrical distribution facilities in the area, and location of roads and existing ROW owned by the applicant. These potential additional circuits are not considered as part of the proposed project because they are uncertain future activities currently not proposed for approval and that are not reasonably foreseeable.

2.2.1.6 Telecommunications

The proposed Mesa Substation Site would include the following telecommunications components:

- Reroute of one existing overhead telecommunications line to clear the Mesa Substation construction area.
- Relocation of existing overhead and underground telecommunication lines, including telecommunication structures, from the existing Mesa Substation to its point of termination

within the proposed Mesa Substation site, which would include the use of approximately five existing vaults and one existing manhole.

- Installation of two new telecommunication lines into Mesa Substation to meet the increased circuit diversity needed to support protection requirements.

The applicant would also construct additional telecommunications components within the Main Project Area. These components are described in Section 2.2.2, "Telecommunications Routes."

2.2.2 Telecommunications Routes

The proposed project would include the reconstruction of existing telecommunications line elements primarily within existing ROWs operated by the applicant within the Main Project Area, along the three different segments or routes. These routes are shown on Figures 2-3b to 2-3d and are described below.

2.2.2.1 Telecommunications Route 1

The applicant would install new telecommunication cable along a 3.5-mile route, crossing sections of the City of Rosemead, Unincorporated Los Angeles County, and the cities of Montebello and Monterey Park. This route would connect an existing 220-kV LST located near the intersection of San Gabriel Boulevard and Darlington Street (City of Rosemead) and existing structures southwest of the Mesa Substation site on North Wilcox Avenue (City of Montebello). This telecommunication route would be installed on existing overhead structures (wood poles, LWS poles, and LSTs) and existing manholes and underground conduits. The applicant would install 0.2 miles of new conduit, which would connect to a riser on existing subtransmission lightweight steel pole. This route is depicted in Figure 2-3b.

2.2.2.2 Telecommunications Route 2

The proposed Telecommunications Route 2 would involve the removal, re-route, and installation of new telecommunication lines between Mesa Substation (City of Monterey Park) and existing structures located on North Montebello Boulevard, near Harding Substation (City of Montebello). As part of the proposed project, the applicant would install and operate two diverse routes between Mesa Substation and the intersection of North Montebello Boulevard and West Lincoln Avenue, near Harding Substation; these routes have been identified as Routes 2A and 2B (Figure 2-3c), as described as follows:

- **Telecommunication Route 2A** would connect Mesa Substation to existing telecommunications circuitry near Harding Substation by using existing overhead structures located along the western boundary of the Operating Industries, Inc. (OII) Landfill Superfund Site in the City of Montebello. The applicant would first remove the existing telecommunications cable along this route while replacing the structures where the existing cable ends at Mesa Substation, then reinstall new cable over the same overhead structures until the intersection of Montebello Boulevard and Lincoln Avenue.
- **Telecommunications Route 2B** would start on existing underground conduits southwest of the Mesa Substation site on North Wilcox Avenue and then continue on overhead structures along W Lincoln Avenue until the intersection with North Montebello Boulevard.

In order to maintain diverse telecommunication routes during the proposed project construction, the applicant would first remove existing telecommunication line components from Route 2A and install them over Route 2B. Once Route 2B is complete, new telecommunication line components would be installed along Route 2A.

In total, for both Telecommunications Routes 2A and 2B, the applicant would install 3.9 miles of new telecommunications cable on existing overhead structures, as well as in existing and new underground conduits between Mesa Substation and the intersection of North Montebello Boulevard and Lincoln Avenue near Harding Substation. Installation of overhead telecommunications line would include the use of existing manholes and overhead structures (wood poles, LWS poles, and LSTs).

In addition, the applicant would remove and re-route existing overhead and underground telecommunications cable along Telecommunications Route 2A. The proposed removal would be conducted along a 1.2-mile segment (1.0 miles overhead and 0.2 miles underground), while the re-routing would occur along a 1.4-mile segment (0.9 miles overhead and 0.5 miles underground).

2.2.2.3 Telecommunications Route 3

The proposed Telecommunication Route 3 would consist of a 4.2-mile cable segment crossing areas in unincorporated Los Angeles County and the cities of Rosemead and Montebello. This route would connect an existing 220-kV LST located in the Whittier Narrows Natural Area near Durfee Avenue (in unincorporated Los Angeles County) with an existing manhole located on the intersection of West Lincoln Avenue and North Montebello Boulevard, near Harding Substation (City of Montebello) and then would connect with Telecommunication Routes 2A and 2B, which continue to Mesa Substation using existing conduit and existing overhead structures. The proposed Telecommunications Route 3 installation would use two new manholes, as well as existing manholes and overhead structures (wood poles, LWS poles, and LSTs). This route is depicted in Figure 2-3d.

Overhead Telecommunications Structures

The proposed telecommunication routes would be installed on existing wood poles, LWS poles, and LSTs. The applicant would not install any new overhead structures as part of the proposed project.[9] The existing structures would support a 0.5-inch-diameter fiber optic cable. The lowest cable would be approximately 20 to 30 feet above the ground. The average span length between overhead structures would be approximately 150 to 200 feet.

Underground Telecommunications Features

The proposed project would include installation of approximately 2.9 miles of underground telecommunications cable in existing and new underground duct banks. The proposed duct banks would consist of two 5-inch conduits, conduit spacers, and concrete. In addition, the applicant would use approximately 9,400 feet of existing underground conduits and 18 existing vaults. Five new vaults would be constructed measuring 5 feet wide by 5 feet long by 6 feet deep. Table 2-4

[9] In response to Data Request #1 Question #10, the applicant clarified that as a result of a wood pole analysis performed on April 13, 2015, a total of 46 wood poles must be replaced as part of the applicant's ongoing deteriorated pole replacement program. Therefore, no wood poles would be replaced as part of the Mesa 500-kV Substation Project scope.

summarizes the dimensions of the duct banks and telecommunications vaults, as proposed by the applicant.

2.2.3 Additional Project Features

2.2.3.1 Proposed 220-kV Structures in North and South Areas

North Area: Temporary 220-kV Structure (City of Pasadena)

The proposed project would involve the installation of a steel pole structure and conductor to temporarily connect the Eagle Rock–Mesa 220-kV Transmission Line to Goodrich Substation and maintain a second line of service to the City of Pasadena during the line outage required to loop-in the existing Goodrich–Laguna Bell 220-kV Transmission Line to Mesa Substation.

Modifications at Goodrich Substation would require a temporary loop-in of the Eagle Rock–Mesa 220-kV Transmission Line, which would include installation of a 110- to 145-foot-tall temporary structure and conductor to connect this transmission line into an existing switchrack position within Goodrich Substation. The work area for this structure would be approximately 220 feet by 220 feet, and a temporary staging area would be established for material and equipment storage.

The applicant has indicated that the proposed modifications at Goodrich Substation may also include conduit installation work required to provide diverse telecommunication routes at this location. Currently, the applicant plans to complete conduit installation as part of a separate project under negotiation with the City of Pasadena. The applicant has indicated that technically the proposed conduit installation work at Goodrich Substation would be needed with or without the proposed project. At the moment of publication of this Draft EIR, the applicant is still negotiating with the City of Pasadena the proposed conduit installation. Therefore, the Draft EIR analyzes impacts of conduit installation at Goodrich Substation as part of the proposed project.

South Area: 220-kV Structure Replacement (City of Commerce)

The applicant proposes to replace an existing double-circuit 220-kV LST supporting the existing Goodrich-Laguna Bell (future Laguna Bell–Mesa No. 1) and Mesa–Redondo 220-kV Transmission Lines with a new, taller 220-kV LST in order to maintain clearance requirements established in GO 95 when increasing the future Laguna Bell–Mesa No. 1 220-kV Transmission lines capacity rating.

For the proposed replacement of the existing LST on the Goodrich–Laguna Bell 220-kV transmission line, the applicant would use Flotilla Street (at its intersection with Garfield Avenue) as an access roadway.

2.2.3.2 Conversion of Street Light Source Line (City of Bell Gardens)

In the South Area, the applicant also proposes to convert an existing street light source line from overhead to underground between three street lights on Loveland Street within the City of Bell Gardens. This conversion would occur below one span of the Lighthipe–Mesa 220-kV Transmission Line. This work would require the installation of approximately three pull boxes[10] and

[10] A pull box consists of a metal box with a blank cover that is commonly installed in an accessible place in a run of conduit to facilitate the pulling in of wires or cables.

approximately 300 feet of 3-inch conduit heading west from the intersection of Toler Avenue and Loveland Street. The new conduit would be generally routed along the north side of the existing paved street area, immediately adjacent to the concrete curb and gutter.

2.2.3.3 Modifications at Existing Substations

In addition to the proposed project components described above, the applicant would conduct equipment replacements and upgrades within the perimeter of existing substations. The proposed modifications and would involve the following:

- Reroute existing telecommunications lines inside the perimeter fence lines of Vincent, Pardee, and Walnut Substations to improve circuit diversity. Proposed conduit installation works at Vincent and Walnut Substations would last 2 weeks and export up to 10 CY of excavation materials. The proposed works in Pardee Substation would last 1 week and export up to 5 CY of excavated soil. All works at substations would require 50 vehicle trips per week.
- Replace various 220-kV line termination equipment, including, but not limited to, wave traps, circuit breakers, and disconnect switches at Laguna Bell Substation. The proposed work at the Laguna Bell Substation would not involve ground disturbance and would be performed in two phases: the first phase to remove, replace, and install equipment in the 220-kV switchrack positions to accommodate the proposed Laguna Bell–Mesa No. 1 and No. 2 220-kV transmission lines; and a second phase to upgrade existing distribution and transmission line protection equipment. The proposed work would have a maximum duration of 7 weeks and require 475 vehicle trips in total.
- Replace various 220-kV line termination equipment including, but not limited to, wave traps, circuit breakers, and disconnect switches at Lighthipe Substation. The proposed works at the Lighthipe Substation would not involve ground disturbance and would be performed in two phases: the first phase to remove, replace, and install equipment in one 220-kV switchrack position; and a second phase to upgrade line protection for the Lighthipe–Mesa 220-kV Transmission Line. The proposed work would have a maximum duration of 7 weeks and require 475 vehicle trips in total.
- Upgrade 220-kV line protection relays and/or telecommunications equipment inside existing MEERs at 11 substations (Table 2-5). The proposed upgrades would not involve ground disturbance, as all work would take place in existing structures within the substation. A maximum of 5 vehicle trips (mainly crew vehicles) would be used at each location.
- Upgrade 66-kV line protection relays and/or telecommunications equipment inside existing MEERs at 16 substations (Table 2-5). The proposed upgrades would not involve ground disturbance, as all work would take place in existing structures within the substation. A maximum of 5 vehicle trips (mainly crew vehicles) would be made to each location.

Table 2-5 summarizes the proposed modifications within the perimeter of existing substations.

Table 2-5 Proposed Modifications at Existing Substations

Substation	Location	Proposed Modifications							
		New Structures and Equipment			Upgrades Inside Substation MEER				
		Install new fiber optic conduits	Install a temporary 220-kV structure	Replace circuit breakers, disconnects, and line risers	Reconfigure/add communication channels	Remove wave trap(s)	Update/upgrade/test/ reconfigure relays	Conduct end-to-end testing	Conduct in service testing
Goodrich	Pasadena	X[1]	X		X		X	X	X
Walnut	Industry	X			X		X	X	X
Pardee	Valencia	X							
Vincent	Near Palmdale	X			X		X	X	X
Laguna Bell	Commerce			X	X	X	X	X	X
Lighthipe	Long Beach			X	X	X	X	X	X
Mira Loma	Ontario				X		X	X	X
Center	Norwalk				X		X	X	X
Redondo	Redondo Beach				X	X		X	X
Rio Hondo	Irwindale				X		X	X	X
Eagle Rock	Eagle Rock						X	X	X
Anita	Arcadia						X	X	X
Eaton	Pasadena						X	X	X
Fairfax	Los Angeles						X	X	X
Garfield	Pasadena						X	X	X
Narrows	Pico Rivera						X	X	X
Newmark	Monterey Park						X	X	X
Ravendale	Temple City						X	X	X
Repetto	Monterey Park						X	X	X
Rosemead	Rosemead						X	X	X
Rush	Rosemead						X	X	X
San Gabriel	San Gabriel						X	X	X
Vail	Commerce						X	X	X
Wabash	East Los Angeles						X	X	X

Table 2-5 Proposed Modifications at Existing Substations

		Proposed Modifications							
		New Structures and Equipment			Upgrades Inside Substation MEER				
Substation	Location	Install new fiber optic conduits	Install a temporary 220-kV structure	Replace circuit breakers, disconnects, and line risers	Reconfigure/add communication channels	Remove wave trap(s)	Update/upgrade/test/ reconfigure relays	Conduct end-to-end testing	Conduct in service testing
Hillgen	Industry								X
Industry	Industry								X
Jose	Commerce								X
Amador	El Monte								X

Key:
MEER Mechanical Electrical Equipment Room
Note:
(1) The applicant plans to complete underground conduit installation at Goodrich Substation as part of a separate project under negotiation with the City of Pasadena. However, if negotiations do not lead to the expected results, the applicant would install underground conduits at Goodrich Substation as part of the proposed project.

2.3 Construction of the Proposed Project

The following subsections describe the construction activities associated with the proposed project. Unless otherwise indicated, the following construction descriptions apply to all proposed project components.

2.3.1 Staging Yards and Work Areas

Construction of the proposed project would require the establishment of temporary staging yards and construction work areas.

The applicant would use two types of staging yards: those required for substation construction, and those required for the construction of transmission, subtransmission, distribution, and/or telecommunications features. In some instances, the use of these areas could be combined. Staging yards would be used as reporting locations for workers, vehicle and equipment parking, and material storage. These areas could also have construction trailers for supervisory and clerical personnel and could be lit for staging and security purposes. In addition, normal maintenance and refueling of construction equipment would also be conducted at staging yards. All refueling and storage of fuels would be performed in accordance with the Storm Water Pollution Prevention Plan (SWPPP).

Each staging yard would be 5 to 25 acres in size. Preparation of these areas would include installation of temporary perimeter fencing and, depending on existing ground conditions at the site, minor grading, blading, brushing, and/or compaction of soil, as well as the application of gravel or crushed rock. Following the completion of construction of the proposed project, any land that may be disturbed at the staging yard would be restored as close to preconstruction conditions as possible or to the conditions agreed upon between the landowner and the applicant. The applicant anticipates using one or more of the staging yards, as listed in Table 2-6.

Table 2-6 Proposed Staging Yards

Staging Yard	Location	Condition	Dimensions (acres)	Nearest Use/ Project Component
1	Northwest of the intersection of Potrero Grande Drive and Saturn Drive	Disturbed	4.95	Mesa Substation Project Site
2	Southwest of the intersection of Via Campo and North Vail Avenue	Disturbed and Undisturbed	3.80	Mesa Substation Project Site
3	Southeast of the intersection of Potrero Grande Drive and Greenwood Avenue	Disturbed	23.90	Mesa Substation Project Site
4	North of Goodrich Substation	Disturbed	1.50	Temporary 220-kV transmission line loop-in at Goodrich Substation
5	Laguna Bell ROW Yard	Disturbed	7.6	Mesa Substation Project Site
6	San Gabriel Boulevard Yard	Disturbed	3.6	Mesa Substation Project Site
7	Santa Anita Avenue Yard	Disturbed	21	Mesa Substation Project Site

Source: SCE 2015.
Key:
kV kilovolt
ROW right-of-way

Materials commonly stored at the staging yards would include, but would not be limited to, construction trailers; construction equipment; portable sanitation facilities; steel bundles; steel/wood poles; conductor reels; telecommunications cable reels; hardware; insulators; cross arms; signage; consumables (such as fuel and filler compound); waste materials for salvaging, recycling, or disposal; and materials used according to BMPs, such as straw wattles, gravel, and silt fences.

Based on the type of equipment or facilities used at the staging yards, the applicant may require the use of a temporary power supply. If existing distribution facilities are available, the applicant may use a temporary service and meter to supply electrical power to one or more staging yards. If the electrical service is not available on a permanent basis, the applicant may use a portable generator on an intermittent basis, as required in one or more staging areas.

A majority of materials associated with the construction efforts would be delivered by truck to designated staging yards and then transported by truck to the construction work areas or, in some cases, materials may be delivered directly to the work areas. Construction work areas (i.e., areas temporarily used for construction activities for project components) would be located at or near each related structure within the applicant's or public ROWs. In addition to being the location for construction, these areas may also be used to temporarily stage project-related equipment and/or materials.

Installation of the proposed new overhead transmission and subtransmission structures would require cleared and level surface laydown/work areas for safe structure installation and support of heavy vehicular traffic. Vegetation removal and grading would be conducted to ensure that water would run toward the direction of natural drainage. In addition, drainage at each structure installation area would be designed to prevent ponding and erosive water flows that could damage the structure footings.

Erection of the proposed overhead transmission and subtransmission structures may also require the use of temporary crane pads. These pads would be located within the laydown/work area and adjacent to each applicable structure site. Each temporary crane pad may be cleared of vegetation and/or graded to provide level surface for crane operations.

Helicopters would use Staging Yards 1 through 4. No additional helicopter staging yards are anticipated to be needed at this time other than Staging Yards 1 through 4, as the proposed helicopter would only be used during the 500-kV and 220-kV conductor stringing process and not for structure assembly or erection.

2.3.2 Substation Construction

2.3.2.1 Site Preparation

Prior to construction of the proposed Mesa Substation, the applicant would conduct site preparation activities such as vegetation clearing, grading, installing a temporary chain-link fence around the substation perimeter, and constructing a new driveway to provide access to the construction equipment and vehicles. Prior to commencement of the proposed substation, the applicant would also develop a landscaping plan, consulting with the City of Monterey Park Department of Community and Economic Development (Building Division).

Vegetation Clearing

The proposed vegetation clearing activities would remove approximately 20 acres of existing on-site vegetation, including trees located along the frontage and within the fence line of the existing Mesa Substation site. The equipment proposed for clearing and vegetation removal activities would include mowers, excavators, front-end loaders, and bulldozers.

Grading

The proposed grading area would cover approximately 85.1 acres. The existing Mesa Substation site would be over-excavated, and the on-site soil would be re-compacted to prepare the area for site development. Site development and grading activities would be based on the applicant's geotechnical investigations to achieve the desired on-site pad elevation and foundation support while maintaining adequate site drainage. Site grading would be accomplished primarily with bulldozers and backhoes, which would condition, cut and fill, and blend the native soils and the desired pad elevations. Whenever feasible, excavated soil that would be used for backfill would be stored on site, adjacent to areas that will require fill. If needed, backfill material would be stored at one of the three staging yards identified adjacent to the proposed Mesa 500-kV Substation site.

Access Driveways and Ground Surface Improvements

To provide access to the site during substation construction activities, the applicant would construct a new driveway from East Markland Drive, which would provide secondary and emergency access to the proposed Mesa Substation site during all phases of substation construction. The driveway off of East Markland Drive would be about 25 feet wide. The applicant would also construct a temporary access driveway from Potrero Grand Drive, near the intersection with Atlas Avenue; this driveway would be used only in Phases 1 and 2 of construction and would have temporary swinging gates installed to increase site security. It would be about 25 feet wide. Once Phase 3 begins, the applicant would establish the primary substation access driveway from Potrero Grande Drive closer to Greenwood Avenue. This driveway would be about 150 feet wide. During substation operations, each permanent access driveway (Potrero Grande Drive, Greenwood Avenue, and East Markland Drive) would have a rolling gate installed to control access to the Mesa 500-kV Substation site. The access roads from the driveways would be graded flat to a width of approximately 30 feet to allow for safe operation of construction equipment and delivery and removal of materials to and from the site.

The applicant would pave the proposed access driveways (approximately 19 acres), which would require approximately 15,000 CY of asphalt and/or concrete. In addition, the surface of the substation site would be overlain with approximately 30,000 CY of 0.75-inch gravel, covering an area of approximately 52 acres.

Drainage Control

The applicant would prepare and implement a drainage plan in compliance with the jurisdictional agency requirements to minimize potential surface water and erosion impacts during the proposed site preparation and construction. Existing drainage structures, facilities, and devices would be modified, removed, and/or relocated to meet post-development hydrology conditions. As part of the proposed Mesa Substation drainage control design, the applicant would construct water inlets and pipes to collect and divert stormwater runoff.

The existing Mesa Substation site drains by sheet flow to ephemeral drainages at the southwest corner of the site. These ephemeral drainages connect to storm drains that connect to the Rio Hondo Channel, which flows into the Los Angeles River. The applicant would construct a retention basin in the southwest corner of the proposed Mesa Substation site and would implement site and source control BMPs into the design to help mitigate surface runoff. Drainage systems would be constructed along the perimeter of the substation to direct interior runoff to the retention basin.

The applicant would implement a SWPPP that includes BMPs such as stabilization of permanent cut and fill slopes for the proposed substation site, access roads, and retention basin during construction, as well as the use of landscaping around the perimeter of the proposed Mesa Substation.

Groundwater Well Decommissioning

Prior to the proposed Mesa Substation construction, the applicant would decommission 10 existing groundwater monitoring wells currently operated by the OII Landfill.[11] These wells are located

[11] A total of 11 groundwater monitoring wells are located within the proposed Mesa Substation site. Ten of these wells would be decommissioned. The remaining well, specifically location OI074A would be left in place until Phase 3 grading work begins and would be temporarily protected in place during construction. Three of these groundwater monitoring wells could eventually be relocated elsewhere offsite after the proposed project is constructed; the precise locations to where the groundwater monitoring wells would be relocated is unknown. The relocation of the groundwater monitoring wells is not part of the proposed

within the Mesa Substation site boundaries and were installed to a depth below the groundwater surface so the water can be sampled and tested for the presence of landfill-related chemicals. Figure 2-10 identifies the groundwater well decommissioning locations.

The applicant would decommission the 10 existing groundwater monitoring wells following the general requirements established in the California Department of Water Resources (CDWR) Bulletin 74-90, California Well Standards. To avoid future contamination of groundwater, the applicant would perform decommissioning activities in a manner compatible with the well design. Well decommissioning activities would begin immediately upon issuance of a Notice to Proceed by the CPUC to allow for grading of the substation site. The work at each groundwater well would take between four and eight hours, with all wells decommissioned over a period of 5 to 10 business days. Well decommissioning would include:

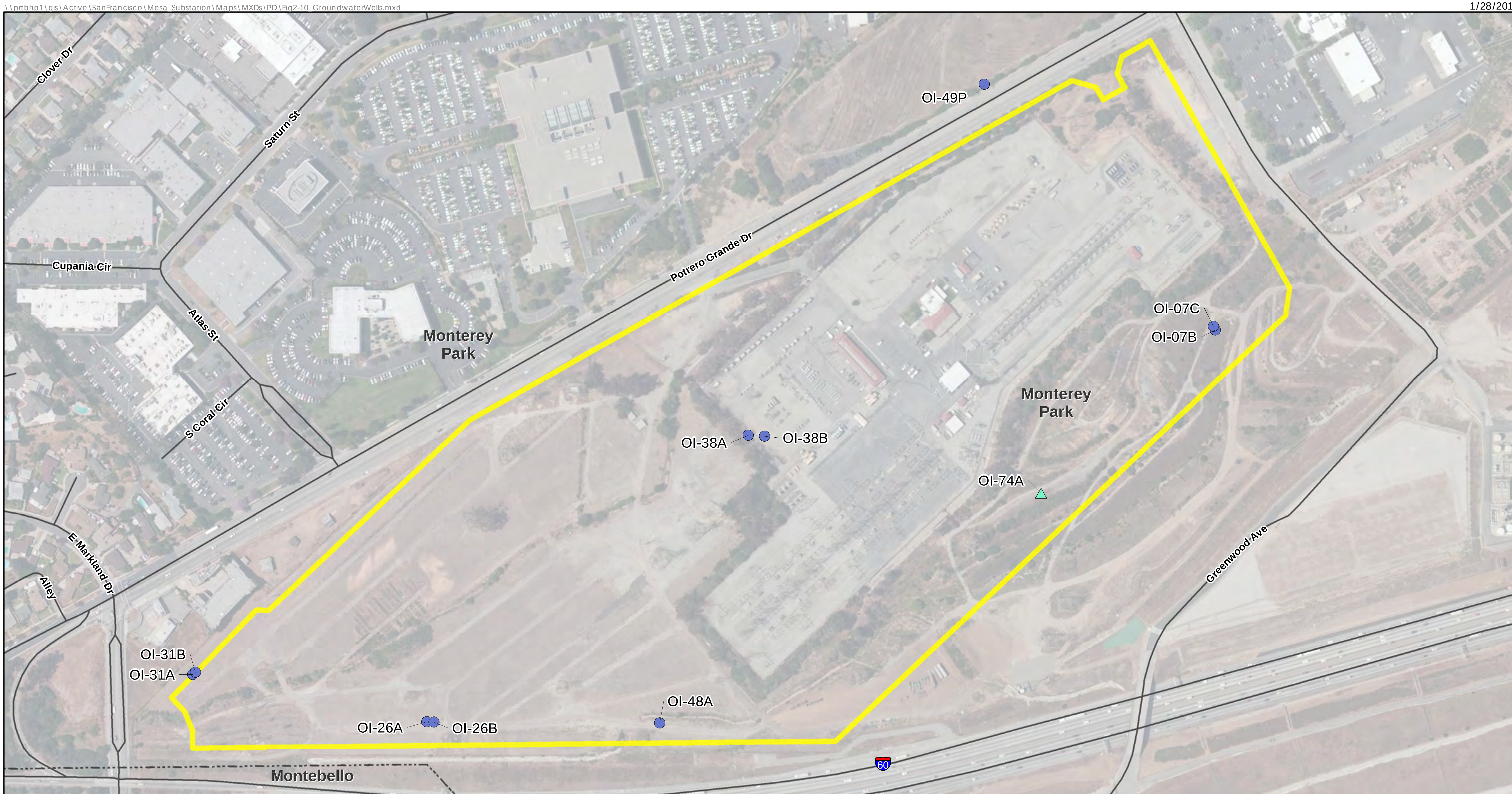
1. **Well design verification**: Prior to well decommissioning, the applicant's contractor would verify the depth of construction to ensure that there are no obstructions that would interfere with filing and sealing of the well.
2. **Equipment removal:** Once this is verified, the dedicated pump, associated tubing, and lines would be removed from the well. Equipment would be decommissioned by steam cleaning prior to initiation of well abandonment. Necessary precautions would be taken to prevent contaminated water, mud, clay, or drilling additives from entering the wells.
3. **Sealing:** The well casing[12] and filter pack would be filled from the bottom of the well upward with bentonite grout (sealing material) by using a tremie method[13]. After the well is completely filled with sealing material, the pressure pumping method would be employed to force sealing material through the well screen into the void space of the filter pack. The well casing and sand pack pore-space volumes would be calculated and compared to actual volume of grout material used to seal the well in order to ensure the well and sand pack are properly sealed.
4. **Over-drilling:** Once sealed, the borehole of the well would be drilled to a depth of 10 feet below ground surface to remove the upper casing and annular materials. The outside diameter of the drill casing would be equal to or greater than the diameter of the initial well boring. The resultant borehole would be sealed from bottom to top with bentonite slurry,

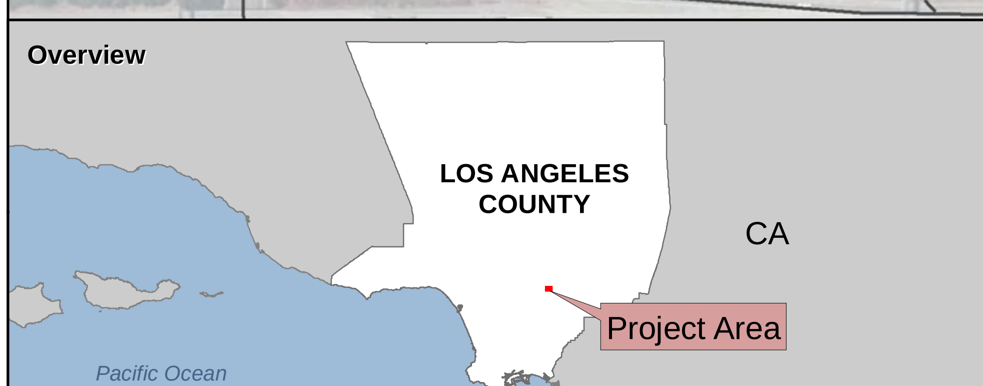
The sealing material would consist of a mix of Type I or Type II Portland cement, powdered bentonite, and water. The weight of cement grout would be sufficient to prevent flow of water into the well from any aquifer penetrated. To ensure that grout ingredients would be mixed to a uniform consistency free of lumps, the applicant's contractor would use a portable grout mixer designed specifically for continuous mixing and pumping of the specified sealing material onsite.

project because their eventual relocation is speculative and, if they are relocated, their future location is unknown.

[12] A casing is a large-diameter pipe lowered into an open hole and cemented in place to protect fresh water formations, isolate a zone of lost returns, or isolate formations with significantly different pressure gradients.

[13] A tremie placement method consists of using a pipe through which concrete is placed below groundwater level.





Groundwater well status
- To be retained
- To be decommissioned

Substation area proposed boundary

City boundary

Sources: SCE 2015
Basemap: NAIP 2014

0 500 Feet

Figure 2-10
Groundwater Wells
Mesa Substation
Los Angeles County, CA

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2.3.2.2 Construction Phases

Following site preparation, development of the proposed Mesa Substation site would involve the construction of new or expanded below-grade and above-grade facilities. Below-grade facilities would include a ground grid, cable trenches, equipment foundations, substation perimeter foundations, conduits, duct banks, vaults, and basements. Above-ground facilities would commence after the below-grade structures are installed and would include buses (i.e., common wires, often of high capacity, to which several power users are connected, or a common source of power for several related electrical loads), capacitor banks, switchracks, disconnect switches, circuit breakers, transformers, steel support structures, perimeter wall, gates, guard shack, the MEERs, the Operations Building, the Test and Maintenance Building, and other facilities. The applicant would design the proposed Mesa Substation and equipment consistent with the latest edition of the California Building Code and the Institute of Electrical and Electronic Engineers Standard 693, *Recommended Practices for Seismic Design of Substations*.

Construction of the proposed above-ground and below-ground facilities would require phasing to accommodate the continued operation of the existing Mesa Substation. As the new substation equipment is constructed and the new power line alignments are tied into the new switchracks, the equipment at the existing substation would be removed and the site would be graded for installation of the new switchracks and associated equipment. Once all of the new power line alignments are tied into the new switchracks, construction crews would decommission the existing substation site. This process would involve removing the existing materials around the existing substation site, and eventually the equipment within the existing substation.

Construction of the proposed Mesa Substation would occur in three phases, as shown in Figure 2-11 and described below. Table 2-7 shows grading quantities, workforce, and vehicle trips by substation construction phase.

Table 2-7 Grading Quantities, Workforce, and Vehicle Trips by Substation Construction Phase

Mesa Substation Construction Phase[(1)]	Fill Quantity (CY)	Cut Quantity (CY)	Import/ Export Quantity (CY)	Source/ Destination	Maximum Number of Trips per Day		
					Grading Truck Trips	Other Truck Trips	Workers' Vehicle Trips
Phase 1	250,000	150,000	100,000	Quarry within 45 miles of site	100	430	242
Phase 2	5,000	70,000	(65,000)	Stockpile for Phase 3	N/A	125	84

Table 2-7 Grading Quantities, Workforce, and Vehicle Trips by Substation Construction Phase

Mesa Substation Construction Phase[(1)]	Fill Quantity (CY)	Cut Quantity (CY)	Import/ Export Quantity (CY)	Source/ Destination	Maximum Number of Trips per Day		
					Grading Truck Trips	Other Truck Trips	Workers' Vehicle Trips
Phase 3	325,000	375,000	(50,000)	Landfill within 45 miles of site	100	196	155

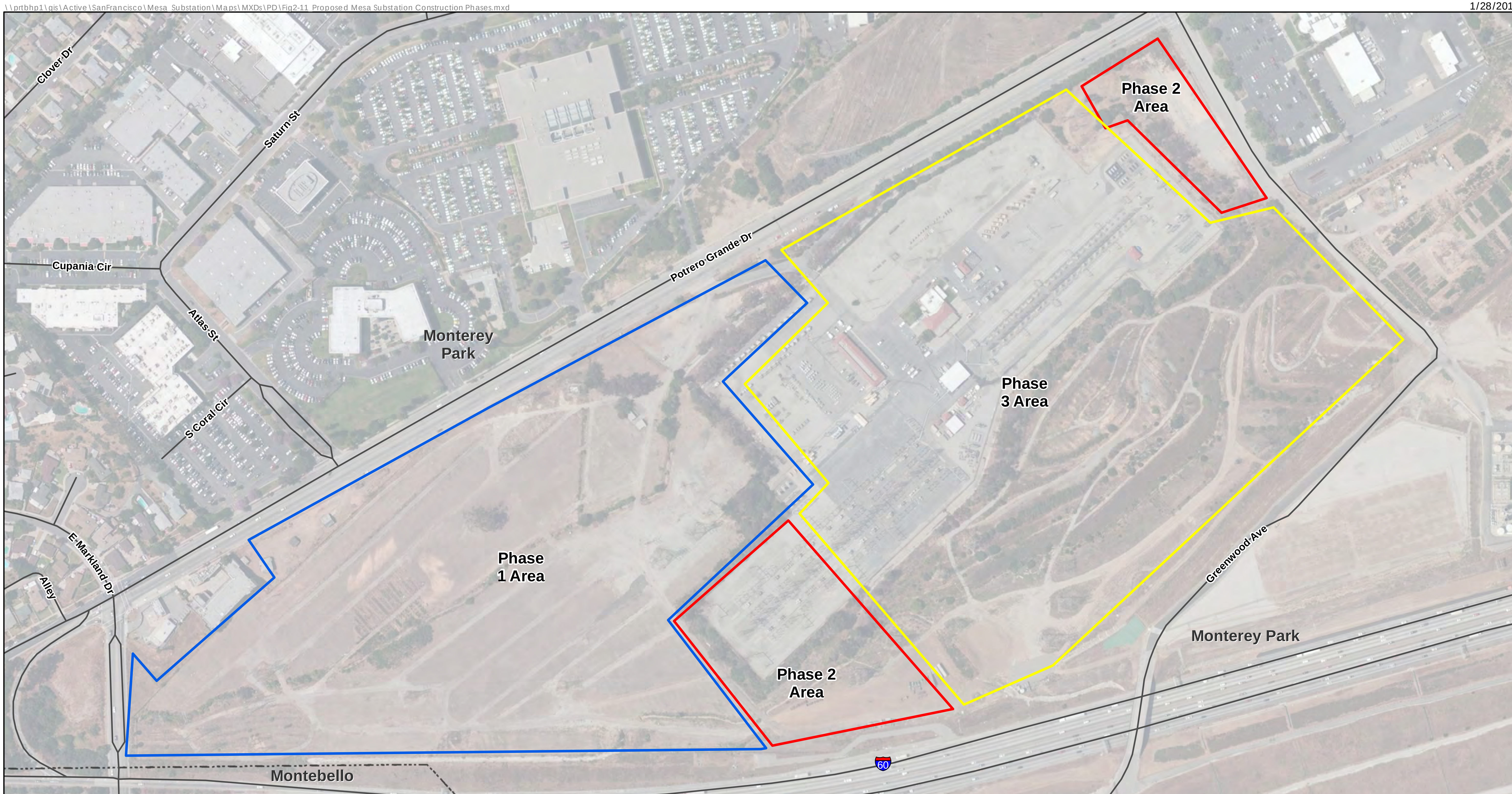
Key:
CY cubic yards
N/A not applicable
Note:
(1) The applicant currently anticipates that the land disturbance per phase breaks down to approximately 36 acres for Phase 1; 7 acres for Phase 2; and 29 acres for Phase 3. At the moment of publication of this environmental impact report, the boundaries for the total disturbance area for each phase are not precise, as some of the activities and grading areas may overlap between construction phases. In addition, the applicant's construction sequencing plan may result in modifications to what areas are constructed in a particular phase, and therefore the associated acreages.

Phase 1: Initial Phase

Initial construction activities would occur within the existing Mesa Substation site and also outside of the proposed substation fence. Originally, the applicant expected that Phase 1 would occur between the second quarter of 2016 and fourth quarter of 2018. At the moment of publication of this Draft EIR, Phase 1 is anticipated to begin in early 2017. Phase 1 would involve the following activities:

- Relocation of the MWD water pipeline;
- Removal of vegetation;
- Removal of equipment stored on site[14];
- Installation of temporary fencing; and
- Construction of the following project components:
  - The first eight 220-kV switchrack positions,
  - The entire 66-kV and 16-kV switchracks,
  - Two 220/66-kV transformer banks,

[14] This equipment consists of the existing 220-kV capacitor bank and related support equipment located within the Mesa Substation area. Once removed, the equipment would be primarily scrapped. After the removal of all insulating mineral oil (which is often reprocessed and used for other electrical equipment, otherwise it would be disposed of), the steel components would be transported to a salvage yard for dismantling and recycling. Any associated concrete (foundations, cable trench, etc.) would be demolished and could be used on-site as fill material or may be disposed of in an appropriate manner.



Phase Area

- Phase 1
- Phase 2
- Phase 3
- City boundary

Temporary Land Disturbance per Substation Construction Phase

Construction Phase	Acres
Phase 1	33.4
Phase 2	8.0
Phase 3	40.0

Source: SCE 2015
Basemap: NAIP 2014

0 500 Feet

Figure 2-11
Proposed Mesa Substation Construction Phases
Mesa Substation
Los Angeles County, CA

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- Two 66/16-kV transformer banks,
- Two 66-kV capacitor banks,
- Two 16-kV capacitor banks, and
- The necessary underground and overhead facilities to connect the relocated 220-kV, 66-kV, and 16-kV circuits.

This phase also includes, but is not limited to, activities such as:

- Mass grading. This phase involves the import of approximately 100,000 CY of fill to develop the western portion of the proposed Mesa Substation Site. Haul trucks would operate periodically and as needed. The applicant anticipates that in general, no more than 100 truck trips per day would be required during the Phase 1 grading activities.
- Access road construction, including retaining walls;
- Construction of two MEERs;
- Assembly and erection of various transmission and subtransmission structures, including:
  - Eight 220-kV LSTs,
  - Ten 66-kV TSPs and six 66-kV vaults,
  - Four 66-kV duct banks and four vaults,
  - Five 16-kV duct banks, and four vaults, and
  - Five telecommunication manholes and six duct banks,
- Construction of the Operations Building.

The transformers would be delivered by heavy-transport vehicles and installed on the transformer foundations. The applicant would implement traffic control when necessary.

Retaining Walls

Two temporary retaining walls would be constructed during initial site grading in the southwest portion of the Mesa Substation site, near the existing 220-kV LSTs. These walls would create sufficient space to assemble and erect the replacement towers. When the new towers are constructed, the retaining walls would be removed and grading around those areas would be completed.

In addition, the applicant would construct two permanent retaining walls within the Mesa Substation site. One wall would be located on the north side of the substation along Potrero Grande Drive and would be approximately 1,500 feet long and approximately 18 feet tall. The second wall would be located on the northeast side of the substation along Greenwood Avenue, approximately 250 feet long with a maximum height of 16 feet. In both cases, the substation perimeter wall would be mounted to the top of the retaining wall. In these cases, the exterior view of the substation, looking from either Potrero Grande Drive or Greenwood Avenue, would only consist of the substation perimeter wall.

16-kV Getaway Construction

Construction of the proposed distribution gateways for 16-kV circuits would involve the following activities within the Mesa Substation site:

- Underground cable trenching;
- Vault and duct bank installation;
- Pulling the electrical distribution cables through the cable trench, vaults, and duct banks;
- Making pothead terminations at the switchrack;
- Splice cable segments at each vault; and
- Use a pothead termination at any structures where the distribution lines would transition from underground to overhead.

For installing the distribution cable inside the Mesa Substation site, the applicant would follow the procedures described in Section 2.3.4, "Distribution Line Construction."

Telecommunications

The proposed telecommunications lines within the Mesa Substation site would be installed by using both overhead and underground structures, following the same construction procedures described in Section 2.3.5, "Telecommunications Route Construction."

Phase 2: 220/66-kV Extension

Phase 2 would involve construction of the following project components:

- Extension of the new 220-kV switchrack;
- One 220/66-kV transformer bank;
- One 66-kV capacitor bank; and
- The necessary underground and overhead facilities to connect the relocated 220-kV and 66-kV circuits.

This phase would include, but is not limited to, the following activities:

- Decommissioning and removal of the western portion of the existing 220-kV switchrack;
- Grading and civil improvements, including the detention basin and other drainage improvements;
- Construction of the southern portion of the new 220-kV switchrack; and
- Assembly and erection of various transmission and subtransmission overhead structures, including:
  - Ten 220-kV LSTs, and
  - Nine 66-kV TSPs, nine vaults, and five duct banks.

Phase 2 would occur between the second quarter of 2018 and first quarter of 2019.

The transformers would be delivered by heavy-transport vehicles and installed on the transformer foundation. The applicant would implement traffic control when necessary.

Phase 3: Final Phase

Phase 3 includes the following activities:

- Decommissioning and demolition of the remaining of the existing Mesa Substation site;
- Constructing the new 500-kV switchrack on the eastern portion of the substation site; and
- Connecting the 500-kV transmission lines to the new Mesa Substation.

This phase would also include, but is not limited to, the following activities:

- Structural and civil demolition and access road construction, including retaining walls;
- Installation of foundations and piping for three 500/220-kV transformer banks, including Spill Prevention, Control, and Countermeasure Plan facilities;
- Construction of the Test and Maintenance Building; and
- Assembly and erection of various transmission overhead switchracks and two 500-kV LSTs.

Phase 3 would occur from the first quarter of 2019 through the fourth quarter of 2020. Post-construction testing would occur after the proposed Mesa Substation is operational, through the second quarter of 2021.

2.3.3 Transmission and Subtransmission Line Construction

2.3.3.1 Access and Spur Roads

The proposed project's access roads would generally follow the existing transmission and subtransmission line routes. Roads associated with these routes are classified in two groups: access roads and spur roads. Access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along the transmission and subtransmission routes. Spur roads lead from access roads and terminate at one or more structure sites due to terrain conditions and topographic constraints.

Construction, operation, and maintenance of the proposed project would require the use of existing public roads and existing transmission access roads to the maximum extent possible. The applicant would use approximately 5.6 miles of unpaved access roads existing within their property and existing ROWs would be used to access the proposed project work areas. When necessary, the applicant would also improve existing roads and/or construct new roads to support the proposed project activities, in accordance with technical specifications and safety construction practices.

Road improvement or rehabilitation activities would involve vegetation clearing, blade-grading, grubbing, mowing, and soil re-compacting to remove surface irregularities and support heavy construction and maintenance equipment. Other additional upgrades to existing roads may include the protection of existing underground utilities, such as the use of soil cover and steel plates.

Construction of new access roads generally includes activities similar to those described for the rehabilitation of existing roads, but may also include the following additional requirements, depending on the existing terrain conditions and final engineering design:

- **Relatively flat terrain with grades up to four percent:** construction activities may also require clearing, grubbing, and constructing drainage improvement.
- **Rolling terrain with grades of five to 12 percent:** construction activities may also require cut and fill in excess of 2 feet in depth, benched grading, drainage improvements (e.g., v-ditches, downdrains, and energy dissipaters), retaining walls, and slope stability improvements (e.g., geogrid reinforcement).
- **Mountainous terrain with grades over 12 percent:** construction activities would also require significant cut and fill depths, benched grading, drainage improvements, and slope stability improvements.

In the event the applicant needs to establish temporary unpaved access roads to support the project activities, construction of temporary roads would include vegetation clearing, blade-grading, grubbing, and re-compacting.

In general, access roads would have minimum drivable width of 14 feet with 2 feet of shoulder at each side, as determined by the existing terrain conditions and required drainage design. The road width would be widened up to 8 feet along curved sections, resulting in a total road width of 22 feet at certain locations. Access road gradients would be leveled so that sustained grades do not exceed 14 percent. In addition, roads would typically have turnaround areas around each transmission or subtransmission structure location. In cases where a turnaround is not practical, the applicant would construct an alternate configuration to provide safe ingress/egress of vehicles to access the structure location. When practical, the applicant could use turnaround areas for the dual purpose of structure access and construction pad areas, and these could also remain as a permanent feature for operation and maintenance activities.

2.3.3.2 Overhead Line Construction

Pull and Tension Sites

The applicant would use approximately 40 temporary set-up locations for overhead conductor pulling, tensioning, and splicing. The area needed for each set-up location would be variable and depend upon the local terrain conditions. Following completion of the proposed conductor stringing and splicing activities, the applicant would restore the land at these temporary work areas to its previous condition.

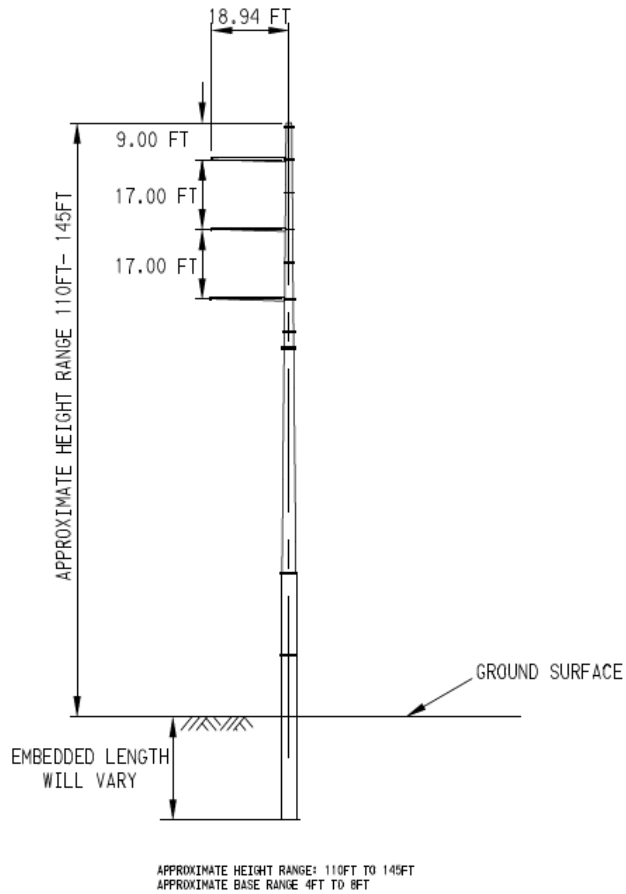
Wire conductor stringing operations for overhead transmission and subtransmission lines are generally conducted at pulling and tensioning sites. A wire pull corresponds to the length of any given continuous wire installation process between two selected points along the overhead transmission or subtransmission line. In general, pulling and tensioning sites would be located in line with the direction of the overhead conductors to be installed and would be established at a distance that is approximately three times the height of the adjacent structures.

Stringing operations consist of wire pulling equipment located at one end of the wire pull and a tensioner with wire reel stand truck at the other end. The proposed pulling and tensioning sites would also be used to install splices (temporary and permanent), as well as anchoring and dead-end hardware during stringing operations.

Temporary Structures

The applicant would use temporary power line or shoo-fly structures during construction to maintain electrical service to the area while allowing portions of a permanent line to be taken out of service or installed, and ensuring safe working conditions during construction activities. These temporary structures would consist of steel poles approximately 2 to 6 feet in diameter and 55 to 130 feet above ground, and wood poles approximately 2 to 4 feet in diameter and 55 to 100 feet above ground, which would be removed once construction activities are complete. Figure 2-12 shows the typical dimensions of the proposed temporary structures. Final configuration of these structures would be determined by the applicant after final engineering.

Figure 2-12 Typical Temporary Structure Configuration



Typical 220 kV Single-Circuit Dead-End Shoo-Fly Structure
Source: SCE 2015.

To ensure sufficient electric power supply at substations within the proposed project area during construction, the applicant would use temporary structure configurations during the following activities[15]:

- MWD waterline relocation;
- Mesa–Vincent No. 1 220-kV circuit installation; and
- Temporary 220-kV transmission line loop-in at Goodrich Substation.

Temporary steel pole structures typically consist of separate base and top sections that would be assembled in temporary laydown areas. Depending on the terrain conditions, pole installation could be conducted either by sections or as a complete structure, by using a line truck with an attached boom. The base structures would be directly installed in holes excavated by an auger or backhoe. The top section would consist of cross arms, insulators, and wire-stringing hardware. When the base is secured, the upper section would be installed on top of the base. Temporary wood poles used would also be directly installed in holes excavated by an auger or backhoe. Excavated materials would be used as fill, following the applicant's proposed measures for erosion and sediment control and stormwater pollution prevention during construction.

Following construction activities at each site, the applicant would remove all temporary structures and components. The holes resulting from pole removal would be backfilled using excavated soil from other construction areas.

Removal of Existing Structures

The applicant would remove a number of existing structures, conductors, and associated hardware as part of the proposed project. Prior to the removal of existing structures, the applicant would transfer any existing transmission, subtransmission, distribution, or telecommunication lines to the temporary structures described above. Any remaining facilities that the applicant would not reuse would be removed and transported to a disposal facility.

Transmission and Subtransmission Structure Installation

Lattice Steel Tower

Installation of the proposed project's LSTs would follow two steps: foundation installation and structure assembly.

Foundation Installation

Each LST foundation would consist of four concrete footings. Concrete would be poured at each footing location, and the actual footing diameters and depths would depend on the soil conditions and topography at each site. The foundation installation process would consist of the following activities:

- **Foundation footings excavation.** LSTs typically require four excavated holes of 3 to 7 feet in diameter and 30 to 60 feet deep. On average, each LST footing would project

[15] The applicant has indicated that additional temporary configurations may be required as engineering design is under development at the moment of publication of this DEIR.

approximately 1 to 4 feet above the ground level. Prior to drilling for LST footings, the applicant would contact Underground Service Alert to identify any existing underground facilities in the construction zone. After drilling, the excavated material at each LST location would be distributed at the site, used to backfill excavation from the removal or nearby structures, and/or used in the rehabilitation of existing access roads.

- **Concrete pouring.** Following excavation, the applicant would set steel-reinforced rebar cages, verify survey positions, and place concrete and stub angles. Rebar cages and stub angle components would be assembled and delivered to each structure location from staging areas, or assembled directly at each site. Depending on the type of structure, soil conditions, and topography at each site, LST foundations would require an average of 200 CY of concrete delivered to each structure location. To control potential ground caving and to stabilize the sidewalls at each hole from sloughing, the applicant may use water, fluid stabilizers, drilling mud, and/or casings. If fluid stabilizers are necessary, the applicant would add mud slurry in conjunction with the drilling. The concrete for the foundation would be pumped to the bottom of the hole, displacing the mud slurry. The slurry would be collected in a pit adjacent to the foundation and/or vacuumed directly into a truck to be reused or disposed at an off-site facility.
- **Concrete sampling and strength testing.** The applicant would take samples at the time of concrete pouring and conduct control testing of samples to ensure that the designed structure strength is achieved. The applicant anticipates that the concrete mix would take 20 to 30 days to reach the designed strength. Once attained, the construction crews would be authorized to assemble the structure.

During construction, the applicant would use commercial ready-mix concrete supply facilities, where feasible. When the use of existing facilities is not feasible, the applicant would set up a temporary concrete batch plant in an established staging area. The necessary equipment and materials would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling the additives. The applicant would control dust emissions from the temporary concrete batch plant by watering the area, sealing silos, and performing pneumatic transfer of fine particulates between silos and the mixers.

Structure Installation

The applicant would assemble the proposed project's LSTs within the work areas at each tower site. Structure assembly would consist of the following activities:

- **Hauling and stacking of structure components.** Steel bundles required for LST assembly would be transported from the staging area to each structure location. This activity would require several trucks with 40-foot trailers and a rough terrain forklift.
- **Structure assembly.** Once delivered and stacked, the construction crew would assemble each of the sections, such as leg extensions, body panels, boxed sections, and cages/bridges.
- **Lifting and securing.** The assembled sections would be lifted into place with a crane and secured by a specialized crew.
- **Hardware installation.** Once the steel structures are assembled and secured, the construction crew would install insulators and wire rollers (required for wire or conductor installation).

Tubular Steel Pole

Foundation Installation

Each TSP foundation would consist of a concrete footing. Each footing installation would follow the sequence of activities described below:

- **Footing excavation.** Each TSP would require drilling a hole at the structure location using truck- or track-mounted excavators with various diameter augers to match the design requirements. TSP foundations would require an excavated hole of 5 to 9 feet in diameter and 30 to 60 deep. Prior to drilling for TSP foundations, the applicant or its contractor would contact Underground Service Alert to identify any existing underground utilities in the construction site. Excavated materials would be used for future backfilling at other construction sites.
- **Concrete pouring.** Once excavation is complete, the applicant would set steel-reinforced cages, verify survey positions, place anchor bolts, and pour concrete. For foundations located in soft or loose soil, or placed at depths below the groundwater, the applicant may use drilling mud slurry or temporary caissons to stabilize soils and prevent the sidewalls from sloughing. Once soils are stabilized, concrete would be pumped to the bottom of the hole, displacing the mud slurry, which would be collected in a pit adjacent to the foundation site, or vacuumed directly into a truck for reuse or disposal at an offsite facility. TSPs would require an average of 88 CY of concrete delivered to each structure location.

Similar to LST structures, during TSP foundation construction the applicant may require the use of a temporary concrete batch plant when the use of existing concrete supply facilities is not feasible. The characteristics of this temporary facility are the same as those described for the LST foundation installation.

Structure Installation

The applicant would assemble the proposed project's TSP structures within the work areas at each pole site. TSPs typically consist of multiple sections and are generally installed in the following sequence:

1. **Top section configuration.** The top section components include cross arms, insulators, and wire stringing hardware. Depending on the conditions at the time of construction, the applicant may pre-configure the top section of each TSP at the staging areas, configure these directly on the ground adjacent to the footing, or configure it after the pole has been installed.
2. **Base section installation.** The applicant would use a crane to set each TSP base section on top of the foundation.
3. **Pole assembly.** Once the base is secured, the subsequent sections of the TSP would be installed onto the base section. Some pole sections may be welded together for additional stability. Depending on the terrain and available equipment, the applicant could also pre-assemble pole sections into a complete structure prior to installation.

Transition Structures

The applicant would install transition structures following a sequence similar to that described for TSP and wood pole installation.

Guard Structures

Guard structures are temporary facilities that would be installed at road, flood control, and utility crossings for wire installation/removal activities. These structures are designed to stop the vertical movement of a conductor when it momentarily drops below a conventional stringing height. Typical guard structures are standard wood poles.

The applicant estimates that the proposed project would require 35 guard structures along the proposed transmission and subtransmission features. Depending on the overall spacing of the conductors to be installed, the proposed project would require two to four guard poles on each side of the crossing. In some cases, the wood poles would be substituted by equipped boom trucks or, at highway crossings, temporary netting would also be required. All guard structures would be removed once the conductor is installed and secured in place.

For road crossings, the applicant would obtain permits and work closely with the applicable agency prior to conducting overhead line installation/removal over existing infrastructure.

Conductor Installation

The installation of overhead conductors onto transmission and subtransmission structures is typically named wire stringing. These activities include the installation of conductors, overhead ground wire and optical ground wire, insulators, stringing devices (also known as rollers or travelers), vibration dampeners, weights, and suspension and dead-end hardware assemblies required along the entire length of the proposed transmission or subtransmission route.

The applicant would install overhead conductors for the proposed project using the following typical wire stringing sequence:

- **Planning:** The applicant would develop a wire stringing plan to determine the necessary wire pulling and tensioning sites.
- **Sock Line Threading:** This process consists of threading a lightweight sock line through the wire rollers previously installed on each subtransmission or transmission structure to secure the line for pulling. This process would be repeated at all structures. The applicant would use two techniques for installing a lightweight sock line from structure to structure: bucket truck and helicopter.
- **Pulling:** In this process, the sock line would be used to pull in the conductor pulling rope and/or cable. The pulling rope would then be attached to the conductor using a special swivel joint to prevent damage to the wire and allow it to rotate freely while it unwinds off the reel.
- **Splicing, Sagging, and Dead-Ending:** Splicing is the process of joining two or more pieces of wire together, once the conductor is pulled into the structure. After the splicing has been completed, the wire stringing crew would install the conductor to the proper tension (sagging) and attach it to the structures (dead-ending).

- **Clipping-in:** This process consists of securing the conductor to all tangent structures. To keep a uniform separation between each conductor, the wire stringing crew would also attach spacers between the bundled conductors installed for each electrical phase.[16]

2.3.3.3 Underground Construction

The proposed project would include a total of approximately 3.4 miles of new underground subtransmission lines and also would use existing underground features. For underground construction associated with the proposed project, the applicant would conduct the following activities.

Survey

Prior to initiating underground construction activities, the applicant would conduct a survey of existing underground utilities along the proposed underground subtransmission route. The applicant would use the Underground Service Alert to locate, mark, and conduct exploratory excavations, as necessary, to verify the location of existing utilities. The applicant would notify all applicable utilities and would obtain the required encroachment permits for trenching in public streets, as required.

Trenching and Duct Bank Installation

To install the proposed underground 66-kV subtransmission line features, the applicant would typically use the open-cut trenching technique, unless alternate methods are required to cross existing facilities or sensitive resources. Trenches would generally be 24 inches wide and 60 inches deep; however, trench dimensions would be adjusted to meet the California Division of Occupational Safety and Health requirements. In general, trenching activities would involve the following activities:

- Mark the location and applicable underground utilities;
- Lay out a trench line;
- Cut the asphalt or concrete pavement, as necessary;
- Excavate (with a backhoe or similar equipment) to the appropriate trench depth;
- Install a new duct bank;
- Backfill the new trench with a sand slurry mix; and
- Reuse excavated material as fill, and/or transport it to an off-site disposal facility, if required.

Trenching activities would be temporary and staged to ensure that open trench segments would not exceed the area required for duct bank installation. While constructing in public access areas, the applicant would install steel plates over open trenches to maintain vehicle and pedestrian traffic. Prior to construction activities, the applicant would also make provisions for emergency vehicle access in coordination with local agencies.

[16] Since the proposed transmission and subtransmission features would transmit alternating current, all structures consist of three electrical phases. Each phase would be associated with a set or bundle of conductors.

In the event that excess excavated materials cannot be used for the proposed project's backfilling activities, the applicant would use off-site disposal facilities located within 20 miles of the proposed project area, such as the Savage Canyon Landfill in the City of Whittier, the Azusa Land Reclamation site in the City of Azusa, or the Scholl Canyon Landfill in the City of Glendale.

Vault Installation

The applicant anticipates that each installation of each vault required for the proposed project would take approximately one week, depending on the soil conditions at each location. Vault excavations would generally be 15 feet wide by 25 feet long and 15 feet deep; however, excavation dimensions would be adjusted to meet the California Division of Occupation Safety and Health requirements. For vault installation, the construction crew would:

- Excavate a vault pit, install shoring as needed, and cover the entire bottom of it with at least 6 inches of mechanically compacted aggregate base;
- Deliver and install the vault at the excavated pit location;
- Grade rings, add and set the vault casting to match existing grade;
- Backfill the excavated area with a sand slurry mix to a point just below the top of the vault roof;
- Use excavated materials to backfill the remainder of the excavation site;
- Reuse excavated material as fill, and/or transport it to an off-site disposal facility; and
- Restore the excavated area, as required.

Underground Conductor Installation

Following vault and duct bank installation, the applicant would pull the electrical cables through the duct banks, splice the cable segments at each vault, and terminate the cables at the transmission structures where the subtransmission line would transition from underground to overhead.

To pull the cables through the duct banks, the applicant would place a cable reel at one end of the conduit segment and a pulling rig at the opposite side. The cable from the reel would be attached to a rope that would also be linked to the pulling rig, allowing transfer of the cable through the duct banks. Since the duct bank consist of polyvinyl chloride (PVC) conduits, the crew would apply a lubricant as the cable enters the ducts to decrease friction and facilitate the installation process. The crew would pull the electrical cables through the individual conduits in the duct bank at a rate of two to three segments between vaults per day. After cable pulling is completed, a splice crew would conduct splicing operations.

Alternative Underground Construction Techniques

In the event the proposed project underground components would cross existing facilities or sensitive resources, the applicant would use alternate methods that do not involve the use of open trenching, such as horizontal boring (jack-and-bore) and horizontal directional drilling (HDD). The applicant anticipates that three locations within the Main Project Area would require the use of these alternative underground construction techniques. All open excavation areas (i.e., jacking or receiving pits or HDD equipment setup area) would be located off of the paved surfaces of Potrero

Grande Drive or Greenwood Avenue (Figure 2-13). For more detail about the potential horizontal boring and HDD locations, refer to Figure 2-13. These techniques are described as follows.

Horizontal Boring

The applicant would use the horizontal boring or "jack-and-bore" technique to conduct underground construction at locations where open-cut trenching may not be permitted or feasible, such as at railroad tracks, roads, and drainage channel crossings. In particular, horizontal boring operations would be necessary in order to install the relocated MWD pipeline across Potrero Grande Drive, as shown on Figure 2-13. This would allow the work to proceed without significant traffic interruptions and would help avoid impacts to other existing underground utilities typically found in the street (i.e., water, sewer, storm drain, electrical, telephone, cable television).

Horizontal boring is a drilling operation that pushes a casing through the earth under a facility or feature being crossed, while simultaneously removing the spoils inside the casing with a rotating auger. Boring operations would begin by excavating large bore pits at the sending and receiving ends of the bore. After establishing the bore pits, the boring equipment would be delivered to the site and then installed into the bore pit at the sending end. Depending on the soil conditions, boring operations may require water to lubricate the auger. The casings would be installed at least 3 to 4 feet below the feature that would be crossed, or as required by the permitting agency. Once the casing is in place, the construction crew would install the underground duct bank by using spacers to hold the conduits in place and backfill the remaining space with a slurry mix. The casing would be left in place to protect the underground duct bank.

The applicant would set a temporary construction area for horizontal boring operations of approximately 150 feet by 150 feet at each bore pit location. Boring and receiving pits would typically measure 20 feet by 40 feet with depths between 10 feet and 20 feet, depending on the facilities or features that would be crossed. The applicant would obtain the necessary permits to conduct this specialized technique and would implement standard BMPs in compliance with the SWPPP for the proposed project.

The applicant anticipates that horizontal boring operations for the proposed project would excavate between 590 to 1,180 CY of material. Following the duct bank installation, the crew would backfill the bore pits with native materials and cover the duct bank with at least 36 inches of engineered or native fill, as appropriate. Any excess soil material would be hauled off site and disposed of at an approved disposal facility.

Depending on the construction schedule for the Monterey Park Market Place commercial development, and their expected improvements and/or modifications to the existing alignment of Greenwood Avenue, the applicant anticipates that it may also be necessary to perform a horizontal boring operation to install the subtransmission duct banks across that street in order to avoid saw-cutting a newly paved road and to help avoid impacts to other existing underground utilities typically found in the street.

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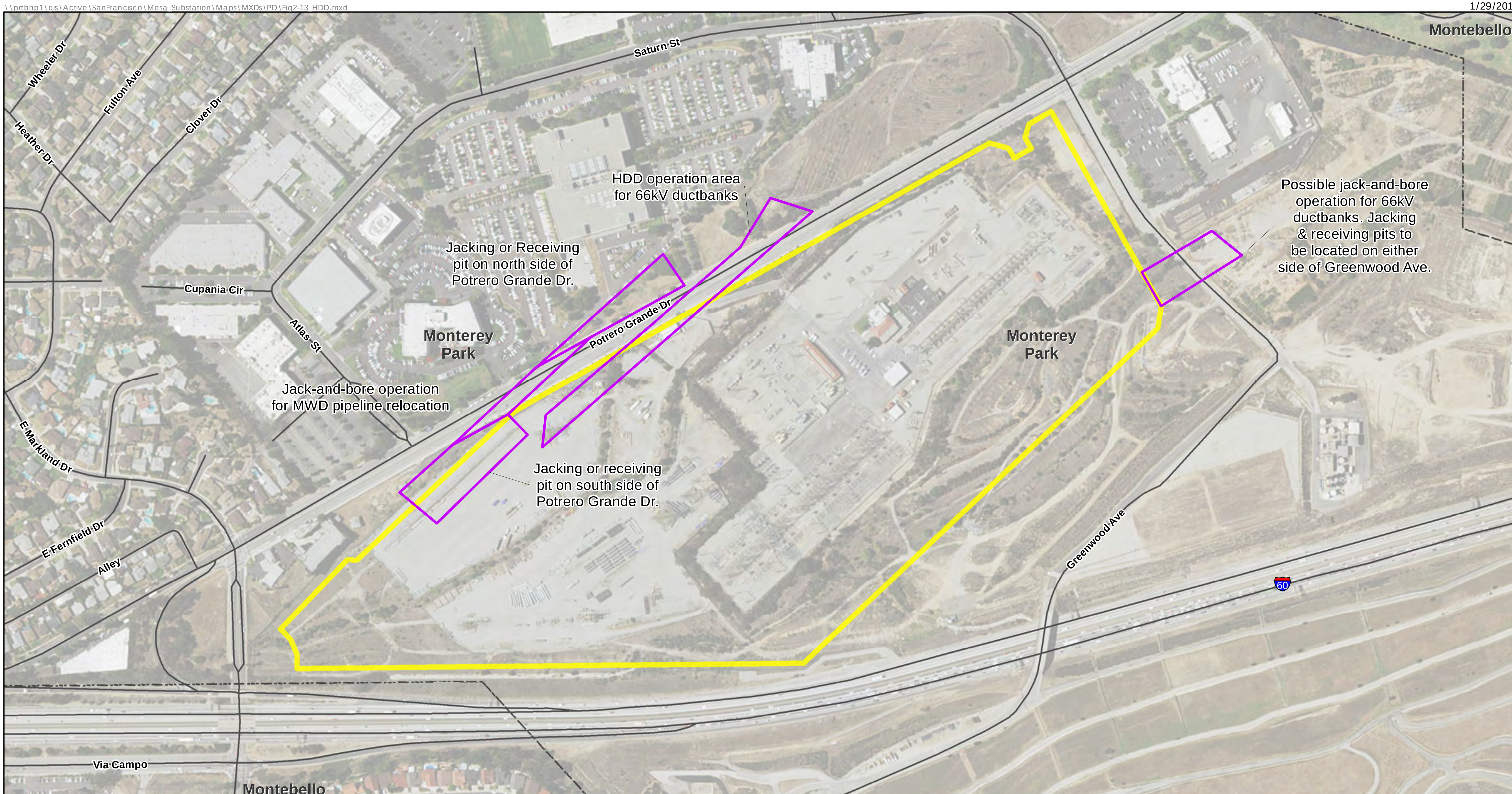

HDD and Boring Locations
Substation area proposed boundary
City boundary

Sources: SCE 2015
Basemap: NAIP 2014

0 500 Feet

Figure 2-13
HDD and Boring Locations
Mesa Substation
Los Angeles County, CA

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Horizontal Directional Drilling

The HDD operations would be required to install several of the new subtransmission duct banks from the interior of the substation to the north side of Potrero Grande Drive, in order to resolve the change in grade between those areas and to help avoid impacts to other existing underground utilities typically found in the street.

HDD is an underground horizontal boring technique that used hydraulically powered drilling equipment. It involves drilling along an arc that passes beneath the feature or facility that would be crossed. This technology uses a drilling mud (mix of water and bentonite clay) to lubricate and aid the drilling process, coat the walls of the excavation, and maintain the open hole. The drilling equipment consists of a hydraulically powered horizontal drill rig supported by a drilling mud tank and a power unit for the hydraulic pumps and mud pumps.

During the HDD process, the applicant would first drill a fluid-filled pilot bore. The first section of the drill stem has an articulating joint near the drill-cutting head that the HDD operator can control. Then the operator would add successive drill stem sections that would keep boring under the crossing section. The operator would then articulate the drill head to follow a designed path under the crossing and direct it upward to the exit point. Once the pilot hole is complete, the drilling process would unfold by pulling and pushing larger cutting heads and reamers through the bore hole until it reaches the size for inserting the steel casing.

After installing the case, the crew would install the underground duct banks by using spacers to maintain the designed separation and then backfilling the remaining space with a slurry mix. The underground conductor that would be pulled through the underground crossing would be strung on cable supports in the applicant's ROW or within additional temporary construction areas.

Prior to HDD activities, the applicant would conduct geotechnical surveys to assess the subsurface conditions and determine the type of underlying geologic strata along the bore path. Although infrequent, special consideration would be given to areas of geologic strata that may be weaker than anticipated and/or unconsolidated, to avoid potential fracture of these strata, or "frac-out," during drilling operations that could allow drilling mud to rise to the surface. In the event of a "frac-out" during boring operations, the applicant would immediately stop activities and implement a contingency plan to contain and remove the drilling mud spill.

2.3.2.4 Helicopter Use

The applicant expects to use helicopters to support the conductor stringing activities along some sections of the proposed overhead 500-kV and 220-kV transmission features. A typical helicopter model used for conductor stringing is the Hughes 500F. The applicant would conduct these activities following the Institute of Electrical and Electronics Engineers Standards 524-2003 *Guide to the Installation of Overhead Transmission Line Conductors*. Helicopters would be based at an existing aviation facility and would fly to the proposed project work areas from that location. The applicant anticipates that helicopters would be based out of either El Monte or Chino airports, where refueling would typically occur. However, there is the potential for refueling to be needed in proposed staging areas, storage and maintenance sites, and ground locations where bulk transmission conductor installation activities would occur. Helicopters may use Staging Yards 1 through 4, as needed.

Helicopters would be used at proposed staging areas (Staging Yards 1 through 4), storage and maintenance sites, and ground locations in close proximity to conductor pulling, tensioning, and splice sites, and/or within previously disturbed areas near construction sites. In addition, helicopters could land on access or spur roads within the applicant's ROW. The applicant would only use helicopters for wire stringing operations.

Flight paths would be determined by the applicant's helicopter contractor immediately prior to construction. The applicant would coordinate with and obtain approvals from the FAA Flights Standards District Office to implement an operating plan for helicopter use for the proposed project, in compliance with Title 14 CFR Part 77.

2.3.2.5 De-energizing/Energizing Transmission and Subtransmission Lines

As a final step in completing the proposed transmission and subtransmission line construction, the applicant would de-energize the existing transmission and subtransmission lines to connect the newly constructed segments into the existing system. To reduce the need for electric service interruption, the applicant may de-energize and re-energize the existing lines at night when electrical demand is lower.

2.3.4 Distribution Line Construction

Construction of the proposed project's 16-kV distribution features would consist of the following sequence of activities:

1. Open-cut trenching and installation of ducts and vaults would be performed, as described in Section 2.3.3.3, "Underground Construction."
2. The construction crew would pull the electrical distribution cable through the cable trench, duct banks, and vaults by using a cable reel at one end of the conduit segment and a pulling rig at the opposite side. The distribution cable from the reel would be attached to a rope, which would be linked to the pulling rig. The pulling rig would pull the rope and the attached cable through the duct banks. To decrease friction and facilitate the pulling process through the PVC conduits, the installation crew would apply a lubricant as the cable enters the ducts. The crew would install electrical cables for the distribution line by passing them through individual conduits in the duct bank at a rate of two to three segments between vaults per day.
3. Once cable pulling is complete, a specialized crew would splice the electrical cables together. Splicing operations would occur at each vault location and would continue until all splices are complete.

As a final step in the construction of the proposed 16-kV distribution features, the applicant would de-energize the existing 16-kV distribution lines associated with the proposed project to connect the new circuits to the existing system. To reduce the need for electric service interruption, the applicant would de-energize and re-energize distribution circuits at night when the electrical demand is lower.

2.3.5 Telecommunications Route Construction

The proposed project's overhead telecommunications routes would be installed following the procedures described in Section 2.3.3.2, "Overhead Line Construction." The underground fiber optic cables would be installed throughout the length of the underground segments by using an inner duct, which provides protection and identification for the telecommunications cable. This internal structure would be pulled in the conduit from structure to structure using a pull rope and pulling machine or truck-mounted device. Then, the crew would pull the fiber optic cable inside the inner duct using the same procedure.

To install new underground conduits and structures, the construction crew would use a backhoe. The trench would be excavated to approximately 24 inches wide and a minimum of 36 inches deep. PVC conduit would be placed in the trench and covered with approximately 30 inches of concrete slurry then backfilled and compacted. For manholes and pull boxes, a hole would be excavated between 6 to 9 feet deep, 7 and 8 feet long, and 6 and 7 feet wide. The manhole or pull box would be lowered into the hole and connected to the conduits, and then the hole would be backfilled with concrete slurry.

2.3.6 Project Land Disturbance

Table 2-8 lists approximate land disturbance due to implementation of the proposed project.

Table 2-8 Approximate Land Disturbance from Implementation of the Proposed Project

Proposed Project Component	Permanent Disturbance Area (acres)	Temporary Disturbance Area (acres)	Total Disturbance Area (acres)
Mesa 500-kV Substation and Staging Areas	69.4	121.2	190.6
500-kV/220-kV Transmission Line Features	0.7	17.0	17.7
66-kV Subtransmission Lines and 16-kV Distribution Lines	0.02	13.9	13.9
Telecommunication Routes	0.0	34.8	34.8
Access Roads	6.7	19.6	26.3
Total Proposed Project Land Disturbance	**76.8**	**206.5**	**283.2**

Source: SCE 2015.
Notes:
Disturbance calculations presented for the transmission, subtransmission, distribution, and telecommunications structures are based on the applicant's geographic information system data provided during the application review process. Due to the proximity of the proposed project components, overlapping portions of the work areas have been removed in the temporary and permanent disturbance calculations.

The disturbed acreage calculations are estimates based upon the applicant's preferred area of use for the described proposed project feature, the width of the existing ROW, or the width of the proposed ROW.

Key:
kV kilovolt
ROW right-of-way

2.4 Construction Equipment, Workforce, Schedule, and Plans

2.4.1 Construction Equipment and Workforce

The estimated duration, workforce, and daily outcome for each construction activity are summarized in Table 2-9. A list of construction equipment and vehicles and their estimated duration of use during construction is provided in Appendix C, "Air Calculations." Construction would be performed by either the applicant's construction crews or its contractors. In general, construction would occur in accordance with accepted construction industry standards. The applicant would comply with applicable local ordinances for construction activities or would request a variance from the applicable jurisdiction.

Table 2-9 Proposed Construction Schedule

Activity	Estimated duration (months)
Final Engineering	36
Right-of-Way/Property Acquisition	11
Permit Acquisition	12
Substation Construction	55
Transmission Line Construction	48
Subtransmission Line Construction	36
Telecommunications Construction	48
Distribution Construction	36
Cleanup	4

Source: SCE 2015

Contractor construction personnel would be managed by the applicant's construction management personnel and would be based in the contractor's existing yard or one or more staging areas established as part of the proposed project.

The applicant anticipates that an average of approximately 126 construction personnel would work on any given day with a maximum of approximately 435 construction workers on site on a given day during peak grading activities. Crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would vary depending on factors such as material availability, resource availability, weather, and construction scheduling.

2.4.2 Construction Schedule

The applicant anticipates that construction of the proposed project would take approximately 55 months. Table 2-9 presents the estimated duration of each of the proposed activities. Construction would commence following regulatory approvals, final engineering, procurement activities, and receipt of all applicable permits. Construction of the proposed project would occur primarily during daytime hours. However, it is possible that some construction could occur at night, requiring temporary artificial illumination. Lighting, if needed, would be used to protect the safety of the construction workers; lights would be oriented and shielded to minimize their effect on any nearby sensitive receptors.

2.4.3 Hazardous Materials

Construction of the proposed project would require the limited use of hazardous materials such as fuels, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations. Material Safety Data Sheets would be made available at the construction site for all crew workers.

The applicant would update the current Spill Prevention Control and Countermeasure Plan and Hazardous Materials Business Plan for the existing Mesa Substation before any new oil-containing equipment would be brought to the substation site. These updates would be conducted in compliance with 40 CFR Parts 112.1–112.7. The Spill Prevention Control and Countermeasure Plan would be updated to describe how hazardous materials released from electrical equipment would be diverted and directed toward containment structures and how containerized hazardous materials would be stored within a temporary containment area with sufficient containment capacity.

2.4.4 Waste Management

Construction of the proposed project would result in the generation of various waste materials, including wood, metal, soil, vegetation, and sanitation waste (portable toilets). Sanitation waste (i.e., human-generated waste) would be disposed of in accordance with sanitation waste management practices. Material from existing infrastructure that would be removed as part of the proposed project, such as conductor, steel, concrete, and debris, would be temporarily stored as the material awaits salvage, recycling, or disposal.

Material excavated during construction of the proposed project may be used as fill, made available for use by the landowner, or recycled or disposed of off-site. If contaminated material is encountered during excavation, the applicant would stop construction at that location, and the applicant's Spill Response Coordinator would be called to the site to make an assessment and notify the proper authorities.

The estimated quantity of solid waste that would be generated for the proposed project to be deposited at approved landfills is approximately 41,800 CY.

2.4.5 Storm Water Pollution Control

Construction of the proposed project would disturb a surface area greater than 1 acre. Therefore, the applicant would be required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ from the State Water Resources Control Board. Commonly used BMPs are storm water runoff quality control measures (boundary protection), dewatering procedures, and concrete waste management. The SWPPP would be based on final engineering design and would include all proposed project construction components.

2.4.6 Dust Control

Fugitive dust emissions from the proposed project construction sites would be subject to the control measures required by the South Coast Air Quality Management District. These measures include the use of water trucks and other dust control measures. A description of the applicant's proposed measures for fugitive dust control is provided in Section 2.6, "Applicant Proposed Measures." In addition, a detailed description of the South Coast Air Quality Management District fugitive dust control regulatory requirements is provided in Section 4.3, "Air Quality."

2.4.7 Traffic Control

Construction activities within public streets would require the use of a traffic control service, and all lane closures would be conducted in accordance with local ordinances and city/county permit conditions. These traffic control measures would be consistent with those published in the California Joint Utility Traffic Control Manual (California Inter-Utility Coordinating Committee 2010), as discussed in Section 4.15, "Transportation and Traffic."

2.4.8 Cleanup and Restoration

The applicant would clean up and restore all areas that would be temporarily disturbed by the proposed project's construction activities, including staging areas, stringing sites, and splicing locations. Restoration would be achieved to pre-construction conditions, as feasible, or to the conditions agreed upon between the landowner and the applicant following construction completion.

After construction is complete and before conducting restoration and/or revegetation works within sensitive areas, the applicant would develop and implement a habitat restoration and/or revegetation plan(s) in coordination with the appropriate resource agencies.

2.5 Operation and Maintenance

2.5.1 Ongoing Activities

The applicant would implement ongoing operation and maintenance (O & M) activities to ensure reliable service of the proposed project components, as well as the safety of the utility workers. The proposed project facilities would be subject to Federal Energy Regulatory Commission jurisdiction and under operational control of the California Independent System Operator.

O & M activities for the proposed Mesa Substation and associated transmission, subtransmission, and telecommunications lines would be similar to ongoing activities at the existing facilities. Up to approximately 50 employees would be required during operations, similar to operation of the existing substation. These operations activities are described in additional detail below.

Similarly, after the proposed substation modifications described in Section 2.2.3, "Additional Project Features," the applicant would continue operations and maintenance of these facilities following the same ongoing O & M activities.

Mesa 500-kV Substation

The proposed Mesa Substation would operate as a switching center controlled by Transmission System operators acting under the direction of the Grid Control Center. The Substation Operations Supervisor leads the switching center and all substations under its jurisdiction. Functions of the Supervisor include writing and approving switching programs, responding to unscheduled outages, and coordinating with the Grid Control Center, Distribution Operations Centers, and other System

Operators. In addition, the Supervisor generally performs remote station inspections, routine and emergency switching, logging, and reporting conditions of remote substations.

Maintenance personnel would be responsible for the substation equipment, conducting routine scheduled maintenance, and repairing of malfunctioning equipment. A separate group of staff would perform testing, setting, and maintenance of protective relays and control wirings, including test procedures for new or relocated equipment prior to connecting them into service.

Additional O & M activities at the proposed Mesa Substation would include maintenance of non-electrical facilities, including restrooms, air conditioning, and general facilities housekeeping.

Transmission, Subtransmission and Distribution Lines

The applicant would maintain the existing and proposed transmission, subtransmission, and distribution lines in compliance with the requirements of CPUC GO 95 and GO 128, as applicable, and the National Electrical Safety Code. The applicant would control operations of these lines on a remote basis by using control systems and/or manually in the field, as required. In compliance with CPUC GO 95, the applicant would conduct ground and/or aerial inspections along the proposed project transmission, subtransmission, and distribution components at least once per year. However, inspections could occur more frequently based on the field conditions and system reliability.

Transmission, subtransmission, and distribution line maintenance activities would occur on an as-needed basis and could include conductor repairs, insulator washing or replacement, repair or replacement of hardware components, pole or tower replacement, tree trimming, brush and weed control, and access road maintenance.

The applicant would perform O & M activities for overhead or above-ground facilities from existing access roads and structure pads with no additional disturbance required. Repairs to existing facilities, such as repairing or replacing damaged structures, would be infrequent but could occur outside existing permanent disturbance areas. In the event that such activities occur, the applicant would need to re-install conductors to repair damages, requiring the use of pulling and tensioning site locations, potentially in previously undisturbed areas, and the potential crossing of conductors through existing vegetation.

The applicant would also conduct routine access road inspections and maintenance on an annual basis, and/or as needed. Road maintenance activities would involve vegetation clearance for fire prevention purposes and blading to smooth over washouts, eroded areas, and washboard areas, as needed. Access road maintenance would include trimming or removal of shrubs (or brushing), cleaning ditches, moving and establishing berms, maintaining drain inlets to culverts, repairing culverts, clearing and establishing water bars, and cleaning and/or repairing over-side drains. Access road maintenance could include the installation of new storm water diversion devices on as-needed basis.

Insulator maintenance would involve periodic washing, the replacement of insulators, hardware, and other components on an as-needed basis to maintain circuit reliability. Insulator washing would involve using deionized water to prevent the buildup of contaminants (such as dust, salts, droppings, smog, condensation, etc.) and reduce the possibility of electrical arcing, which could result in circuit outages and potential fire. The frequency of insulator washing would be region-specific and based on local conditions and buildup of contaminants.

To evaluate the condition of wood pole structures, the applicant would conduct wood pole testing and treating. These inspections would require the temporary removal of soil around the base of the pole, usually to a depth of 12 to 18 inches, to check for signs of deterioration. Once the testing is finalized, the applicant would reinstall and compact all soil removed to avoid potential impacts.

In compliance with California Public Resources Code Section 4292 and fire protection practices, the applicant would maintain vegetation clearances around applicable electrical lines, poles, and/or transmission tower pads. For this purpose, the applicant would maintain a 10-foot radial clearance around non-exempt poles and a 25- to 50-foot radial clearance around non-exempt towers, as defined by California Code of Regulations Title 14, Article 4.

The applicant would also conduct a variety of repairs in response to emergency situations, such as damage resulting from high winds, storms, fires and other natural disasters, and accidents. Such repairs could include replacement of poles, transmission towers, or lines, or re-stringing conductors.

Telecommunications

The applicant would maintain and repair the proposed project's telecommunications equipment at substations on an as-needed or emergency basis (such as replacement of defective circuit boards, damaged antennas or feed lines, and equipment testing) and would also perform routine and preventative maintenance. Most of these O & M activities would occur within the equipment rooms, with no surface disturbance involved. If the proposed routine maintenance or emergency repair activities would be performed at a communications site, the applicant may need to access the site by helicopter transportation.

To maintain the proposed telecommunications cables, the applicant would perform activities such as patrolling, testing, repairing, and replacing damaged cable and hardware, which generally would involve access from existing access roads without additional surface disturbance. However, repairs at existing facilities that would require cable reinstallation could occur in undisturbed areas.

2.5.2 Electric and Magnetic Fields

Electric and magnetic fields (EMFs) occur both naturally and as a result of human activity across a broad electrical spectrum. Naturally occurring EMFs are caused by the weather and the earth's geomagnetic field. The fields caused by human activity result from technological application of the electromagnetic spectrum for uses such as communications, appliances, and the generation, transmission, and local distribution of electricity.

In 1993, the CPUC implemented decision D.93 11-013, which requires utilities to use "low-cost or no-cost" EMF reduction measures for EMFs associated with electrical facilities that require certification under CPUC GO 131-D. This decision directed utilities to use a 4 percent benchmark for low-cost field reduction measures. This decision also implemented a number of EMF measurement, research, and education programs. The CPUC did not adopt any specific numerical limits or regulation of EMF levels related to electric power facilities. The CPUC's January 27, 2006, decision (D.06-01-042) affirmed the 1993 decision on the low-cost/no-cost policy to mitigate EMF exposure for new utility transmission and substation projects. For further information about EMFs and CPUC guidelines, refer to: http://www.cpuc.ca.gov/PUC/energy/Environment/ElectroMagnetic+Fields.

SCE would incorporate the following low-cost/no-cost measures into the design of the proposed project:

- Utilizing subtransmission structure heights that meet or exceed SCE's preferred EMF design criteria;
- Utilizing double-circuit construction that reduces spacing between circuits as compared with single-circuit constructions;
- Arranging conductors of proposed subtransmission lines for magnetic field reduction; and
- Placing new substation electrical equipment away from the substation property lines closest to populated areas.

After several decades of study, there is still a lack of agreement in the scientific community regarding the potential health impacts of human exposure to EMFs from electric power facilities. Additionally, there are no federal or state standards limiting public exposure to EMFs emitted by electrical power lines or substation facilities in the state. For these reasons, EMFs are not evaluated in this EIR as an issue to be addressed under CEQA, and no related impact significance is presented in this section. EMF information provided in this EIR is intended to provide the public with a better understanding of the topic.

2.6 Applicant Proposed Measures

To avoid or reduce potential significant impacts to environmental resources, the applicant has committed to implementing the applicant proposed measures (APMs) listed below in Table 2-10. Because the applicant has committed to implementing them, APMs are considered part of the proposed project in the evaluation of environmental impacts.

Table 2-10 Applicant Proposed Measures

APM-AIR-01	**Fugitive Dust.** During construction, surfaces disturbed by construction activities would be covered or treated with a dust suppressant until completion of activities at each site of disturbance. On-site unpaved roads and off-site unpaved access roads utilized during construction within the proposed project area would be effectively stabilized to control dust emissions (e.g., using water or chemical stabilizer/suppressant). On-road vehicle speeds on unpaved roads would be restricted to 15 miles per hour.
APM-AIR-02	**Tier 3 Engines.** Off-road diesel construction equipment with a rating between 100 and 750 horsepower would be required to use engines compliant with the U.S. Environmental Protection Agency Tier 3 non-road engine standards. In the event that a Tier 3 engine is not available, the equipment would be equipped with a Tier 2 engine and documentation would be provided from a local rental company stating that the vehicle is specialized and is not available to rent. Similarly, if a Tier 2 engine is not available, that equipment with a Tier 1 engine and documentation of unavailability would be provided.

Table 2-10 Applicant Proposed Measures

APM-BIO-01	**Special-Status Plant Species.** During the appropriate phenological periods, formal pre-construction surveys for rare plants would be conducted in areas where special-status plants have the potential to occur within construction areas. Prior to construction, the locations of any special-status plants identified during the surveys would be marked or flagged for avoidance. This boundary would be maintained during work at these locations and would be avoided during all construction activities to the extent possible. Impacts to Nevin's barberry would be avoided. Where disturbance to these areas cannot be avoided, the applicant would develop and implement a Revegetation Plan. The Revegetation Plan would include measures for transplanting or replacing special-status plant species that may be impacted by construction of the proposed project. This plan would also include general measures in the event that special-status plant species are encountered prior to construction of the proposed project, as well as post-construction invasive weed management measures, where necessary, to ensure successful revegetation back to pre-construction conditions or to equivalent conditions of representative habitat immediately adjacent to the affected area.
APM-BIO-02	**Revegetation Plan.** To the extent feasible, the applicant would minimize impacts and permanent loss of riparian habitat, native trees, and other vegetation that is regulated by federal, state, or local agencies and/or that provides suitable habitat for special-status species. Impacts would be minimized at construction sites by flagging native vegetation to be avoided. If unable to avoid impacts to protected vegetation, a Revegetation Plan would be prepared in coordination with the appropriate agencies for areas of native habitat temporarily and/or permanently impacted during construction. The Revegetation Plan would describe, at a minimum, which restoration method (e.g., natural revegetation, planting, or reseeding with native seed stock in compliance with the proposed project's Stormwater Pollution Prevention Plan) would be implemented in the proposed project area. The Revegetation Plan would also include the species or habitats that could be impacted, the replacement or restoration ratios (as appropriate), the restoration methods and techniques, and the monitoring periods and success criteria, as identified in each measure.
APM-BIO-03	**Biological Monitoring.** To the extent feasible, biological monitors would monitor activities in areas with special-status species, native vegetation, wildlife habitat, or unique resources to ensure such resources are avoided.
APM-BIO-04	**Coastal California Gnatcatcher Protection.** A USFWS-approved biologist would conduct pre-construction surveys for coastal California gnatcatcher (*Polioptila californica*) no more than seven days prior to the start of ground-disturbing activities, if this work would commence between February 1 and August 30. Surveys for coastal California gnatcatchers would be conducted in suitable nesting habitat within 500 feet of the proposed project area. If a breeding territory or nest is confirmed, the USFWS would be notified, and in coordination with the USFWS an exclusion buffer would be established around the nest. Construction activities in occupied gnatcatcher habitat would be monitored by a full-time USFWS-approved biologist. Unless otherwise authorized by the USFWS, no proposed project activities would occur within the established buffer until it is determined by the biologist that the young have left the nest. Temporary and permanent impacts to coastal California gnatcatchers and their habitat would be mitigated as required by the USFWS.

Table 2-10 Applicant Proposed Measures

APM-BIO-05	**Least Bell's Vireo Protection.** The applicant would avoid ground-disturbing activities within suitable habitat for least Bell vireo's (*Vireo bellii pusillus*) during the nesting season, to the extent possible. In the event that activities within least Bell's vireo nesting habitat are unavoidable, a USFWS-approved biologist would conduct pre-construction surveys for least Bell's vireo no more than seven days prior to the start of ground-disturbing activities, if this work would commence between March 15 and September 30. Surveys for least Bell's vireo would be conducted in suitable nesting habitat within approximately 500 feet of the proposed project area. If a breeding territory or nest is confirmed, the USFWS and CDFW would be notified, and—in coordination with the USFWS and CDFW—an exclusion buffer would be established around the nest. Construction activities in occupied least Bell's vireo habitat would be monitored by a full-time USFWS- and CDFW-approved biologist. Unless otherwise authorized by the USFWS and CDFW, no proposed project activities would occur within the established buffer until it is determined by the biologist that the young left the nest. Temporary and permanent impacts to least Bell's vireo and its habitat would be mitigated as required by the USFWS and CDFW.
APM-BIO-06	**Nesting Birds.** The applicant would conduct pre-construction clearance surveys no more than seven days prior to construction to determine the location of nesting birds and territories, during the nesting bird season (typically February 1 to August 31, or earlier for species such as raptors). An avian biologist would establish a buffer area around active nest(s) and would monitor the effects of construction activities, potential noise disturbance levels, and behavior of species. Monitoring of construction activities that have the potential to affect active nest(s) would continue until the adjacent construction activities are completed, or until the nest is no longer active.
APM-BIO-07	**Avian Protection.** Electrical facilities would be designed in accordance with APLIC's *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).
APM-BIO-08	**Compensation for Permanent Impacts.** Permanent impacts to all jurisdictional water resources would be compensated at a 1-to-1 ratio, or as required by the USACE, CDFW, and Regional Water Quality Control Board.
APM-CUL-01	**Paleontological Resources Management Plan.** A Paleontological Resources Management Plan would be developed for construction within areas that have been identified as having a moderate and high sensitivity for paleontological resources. The Paleontological Resources Management Plan would be prepared by a professional paleontologist in accordance with the recommendations of the Society of Vertebrate Paleontology.
APM-NOI-01	**Transformer Noise.** The applicant would provide an engineering solution to decrease the operational noise levels of the substation transformers to 50 dBA or below, as measured at residential receptors. This may include the use of quieter transformers, a barrier wall, or another engineering solution. A feasible engineering solution would be incorporated during final engineering.

Source: SCE 2015.
Key:
APLIC Avian Power Line Interaction Committee
APM Applicant proposed measure
CDFW California Department of Fish and Wildlife
dBA A-weighted decibels
USACE U.S. Army Corps of Engineers
USFWS U.S. Fish and Wildlife Service

2.7 Potential Permitting and Consultation Requirements

Table 2-11 lists the federal, state, and local permits and consultations that may be required for construction and operation of the proposed project.

Table 2-11 Consultation and Permitting Requirements

Agency / Group	Jurisdiction	Consultation or Permit
Federal		
United States Army Corps of Engineers (USACE)	Work within Waters of the United States, including wetlands	Consultation with the USACE, Regional Water Quality Control Board, California Department of Fish and Wildlife, and USFWS for a Clean Water Act Section 404 permit. Requires Section 408 consultation.
United States Fish and Wildlife Service (USFWS)	Threatened or endangered species and conservation plans	Take authorization (if required) and consultation with the USFWS. Consultation for Section 7 or 10 of the Federal Endangered Species Act.
Federal Aviation Administration	Aircraft operation and safety in United States air space	Consultation to determine whether Congested Area Plan approval for helicopter external-load operations is required. Consultation to ensure compliance with Federal Aviation Regulations Part 77 (Objects Affecting Navigable Airspace).
State		
California Public Utilities Commission	California Environmental Quality Act review and overall approval of the proposed project	Permit to Construct for construction of electric subtransmission line facilities designed for operation at 66 kilovolts.
California Department of Fish and Wildlife	Threatened or endangered species and conservation plans	Take authorization (if required) and consultation with the USFWS. Consultation for Section 2081 of the California Endangered Species Act. Consultation for Section 1600 of the Fish and Game Code (streambed alteration agreement).
California Department of Transportation (Caltrans)	Acts on behalf of the Federal Department of Transportation pursuant to California Streets and Highways Code 660 to 711.21 and California Code of Regulations 1411.1 to 1411.6.	Caltrans requires that all work done within, under or above a state or interstate highway right-of-way obtain an encroachment permit. A Transportation Permit required for oversize and/or overweight truck loads that exceed the limits of a legal load as defined by Division 15 of the California Vehicle Code.
California State Water Resources Control Board	Storm water discharges and Clean Water Act Section 401 permit	Notice of Intent to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ and Section 401 Permit associated with issuance of a Clean Water Act Section 404 Permit.
State Historic Preservation Office, Native American Heritage Commission	Historic, cultural, and archaeological resources	Consultation regarding known cultural resources. Consultation regarding the listing of cultural or historic resources in the National Register of Historic Places or California Register of Historical Resources.

Table 2-11 Consultation and Permitting Requirements

Agency / Group	Jurisdiction	Consultation or Permit
Regional and Local		
Los Angeles Regional Water Quality Control Board	National Pollutant Discharge Elimination System permitting	As directed by State Water Resources Control Board, monitor development and implementation of Storm Water Pollution Prevention Plans (SWPPPs) and other aspects of the National Pollutant Discharge Elimination System permit and 401 certification program. SWPPPs are required for storm water discharges associated with construction activities that disturb more than 1 acre of land.
Metropolitan Water District of Southern California (MWD)	Public water pipelines	Approval to relocate water pipeline at proposed substation site. The pipeline is owned and operated by the MWD.
South Coast Air Quality Management District (SCAQMD)	Air pollution and greenhouse gas emissions including fugitive dust	Rule 403 Permit for fugitive dust. The potential use of stationary diesel generation and/or emergency fire pumps at the proposed Mesa Substation may require a SCAQMD permit.
Los Angeles County Department of Regional Planning	Significant Ecological Areas and Regional Habitat Linkages and Wildlife Corridors	Consultation with the Department of Regional Planning to determine requirements for proposed project areas that may cross Regional Habitat Linkages and Wildlife Corridors.
Los Angeles County Department of Public Health. Environmental Health District Office (East County)	Installation/relocation of wastewater treatment and septic systems.	Sewer system installation permit required for the new systems at the proposed Mesa Substation.
Los Angeles County Department of Public Works (LADPW)	Encroachment on road crossings, and other public ROWs (including excavation along ROW). Road closures.	Construction and Encroachment Permit. Joint Trench Utility Permit. Service Cut Permit.
Los Angeles County Department of Public Works	Protected trees, aqueduct crossings and grading in unincorporated areas of Los Angeles County.	Permits required for tree removal and grading for access road or work areas required to install project components within Los Angeles County jurisdiction.
	Flood control channels/storm drains.	Encroachment permit.
City of Monterey Park Division of Building and Safety	All occupied buildings constructed within the proposed Mesa Substation site.	Permit required for construction of the proposed Mesa Substation and to erect steel structures. A demolition permit may be required for removal of existing structures at the current Mesa Substation site. Permit required for design of perimeter wall to ensure consistency with the surrounding community.
Cities of Monterey Park, Montebello, Commerce, Pasadena, and Bell Gardens	Construction activities in public ROW or easements, tree protection and grading within city limits.	Encroachment, tree removal, and grading permits.

Table 2-11 Consultation and Permitting Requirements

Agency / Group	Jurisdiction	Consultation or Permit
City (other ministerial)	Flood control areas, temporary land occupancy, and staging areas, excavation, and after hours work.	Permits for crossing flood areas, temporary use/occupancy, excavation and shoring, and after hours work permits (if required).