CHAPTER 2: PROPOSED PROJECT DESCRIPTION

To meet the Purpose and Need, the Proposed Project would primarily consist of the construction, operation, and maintenance of a new approximately 10-mile double-circuit 230 kV transmission line, a new 230 kV substation (Wildlife Substation), a new 230/69 kV substation (Wilderness Substation), and five new 69 kV subtransmission line segments integrated into the City of Riverside Public Utilities' (RPU's) existing subtransmission system—a project in the hundreds of millions of dollars. Total length of the new 69 kV subtransmission lines would be approximately 11 miles. In addition to these primary Proposed Project components, the Proposed Project would include:

- Improvements to existing 69 kV substations to accommodate the proposed 69 kV subtransmission lines,
- Protective relay improvements at Mira Loma and Vista Substations,
- Relocation and undergrounding of some existing distribution lines, and
- Installation of several new telecommunication line pathways for control and integration of both the new transmission and subtransmission lines.

In several areas, development of these project components would require the creation of new rights-of-way (ROWs), acquisition of new lands, purchase of easements from private property owners, land use conversions, and land exchanges.

To provide a basis for identifying and evaluating potential environmental impacts and the significance of impacts, this chapter presents a description of the Proposed Project and construction methodologies. Specific topics include:

- Characterization of the regional and local setting
- Project objectives developed to support the Purpose and Need (Chapter 1)
- Project components
- Design characteristics
- Construction, including methods, equipment, personnel estimates and schedule
- Operations and maintenance
- Economic characteristics of the Proposed Project
- Environmental protection standard practices
- Mitigation measures

Information developed under these specific topics was used to identify and assess specific impacts associated with the Proposed Project's construction, operation and maintenance. Environmental conditions of the Proposed Project area, issues, and impact analysis are discussed in detail in Chapter 3. The relationship between Proposed Project impacts and related impacts associated with past, present and probable future projects is discussed in Chapter 4. Chapter 6 provides information on alternatives development, including alternatives that were evaluated and eliminated from detailed consideration, as well as those alternatives studied in detail and compared to the Proposed Project. The Proposed Project presented in this chapter was selected from a range of alternatives because it best fulfilled the objectives.

2.1 PROJECT SETTING

The regional setting for the Proposed Project includes northwest Riverside County, with project components located within unincorporated sections of Riverside County, as well as the more urbanized City of Riverside. Cities and communities in Riverside County within the northern and western areas of the regional setting include Norco, Eastvale, Jurupa, and Mira Loma in addition to the City of Riverside (see Figure 2.1-1). The 230 kV transmission line element of the Proposed Project would be located within the City of Riverside, the City of Norco, and the unincorporated County of Riverside; 69 kV subtransmission lines and both the Wildlife and Wilderness Substations would be located entirely within City of Riverside city limits.

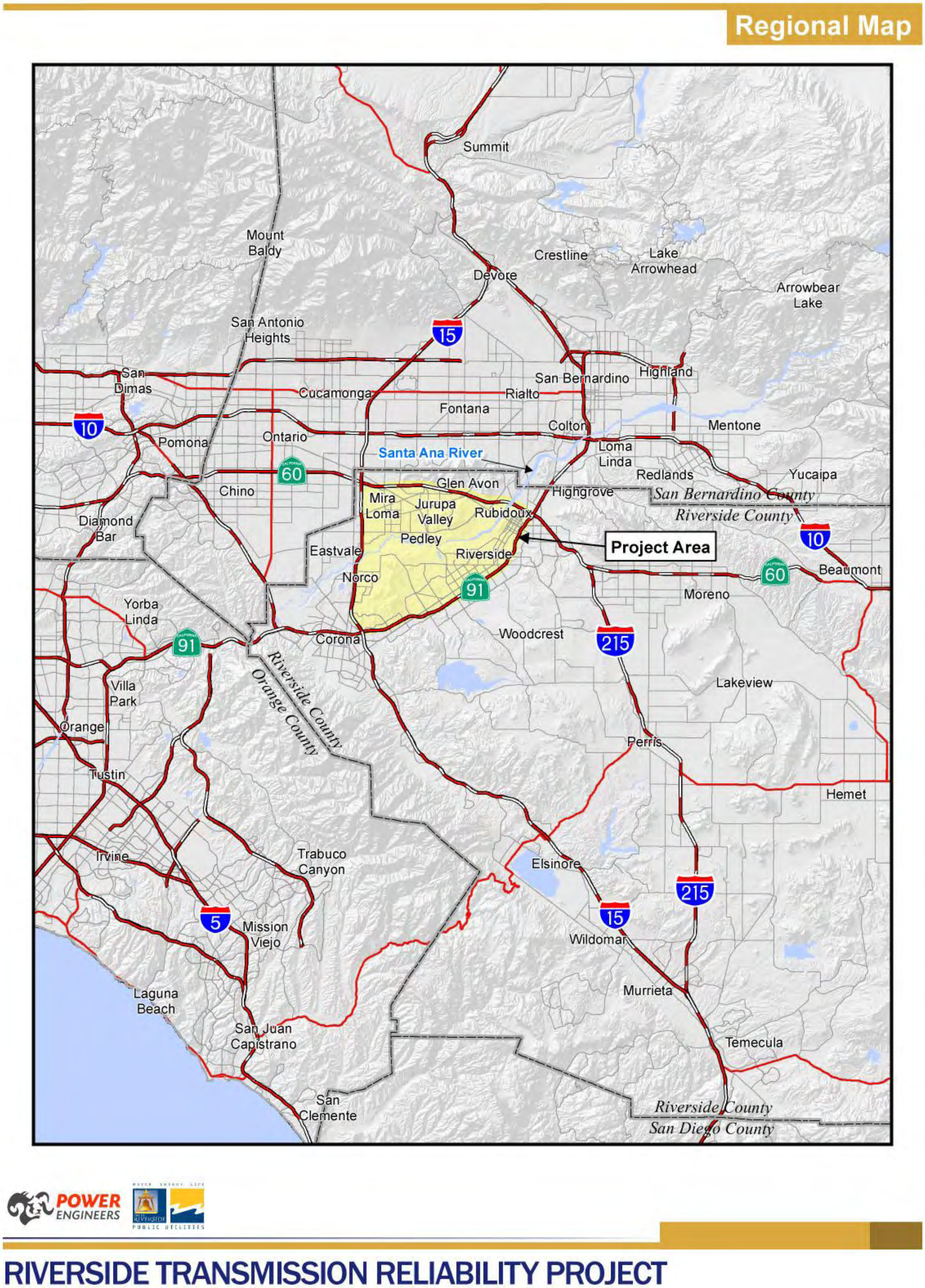
2.1.1 PROJECT AREA

The Proposed Project area is located in the western and northern sections of the City of Riverside and extends north into unincorporated areas of western Riverside County. The Proposed Project area is bordered to the north by State Highway 60 and the existing Mira Loma to Vista Southern California Edison (SCE) Transmission Lines, to the west by Interstate 15, and to the south and east by State Highway 91. The Santa Ana River roughly divides the Proposed Project area into northern and southern halves.

The natural topography of the Proposed Project area is valley lowland intersected by a sinuous river corridor, isolated bluffs, and rolling hills, and surrounded by mountain ranges. Elevations within the Proposed Project area range from 680 to over 1,900 feet above mean sea level (MSL); however, Proposed Project components would be located in relatively level portions within this area. The Proposed Project area is almost entirely developed; the only remaining large areas of native habitats occur along the Santa Ana River and in the nearby Jurupa Mountains.

The Proposed Project area is characterized by rural, urban, and suburban development intermixed with agriculture and undeveloped lands. Extensive areas in the central portion of the Proposed Project area (Santa Ana River floodplain) are preserved open space, set aside for recreation, wildlife, and protected species. Rapid population growth in the Proposed Project area has resulted in increased development with accompanying changes in land use.

FIGURE 2.1-1. REGIONAL MAP



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2.2 PROJECT OBJECTIVES

The following objectives were developed in support of the Proposed Project Purpose and Need (see Chapter 1):

- Provide sufficient capacity, in a timely manner, to meet existing electric system demand and anticipated future load growth;
- Provide an additional point of delivery for bulk power into the RPU electrical system, thereby reducing dependence on Vista Substation and increasing overall reliability (see Figure 1.4-2 in Chapter 1);
- Split and upgrade the subtransmission electrical system as a function of prudent utility practice;
- Meet Proposed Project need while minimizing environmental impacts; and
- Meet Proposed Project need in a cost-effective manner.

These objectives should guide the lead agency in developing a range of reasonable alternatives to the Proposed Project or to the location of the Proposed Project, and should aid the decision makers in preparing, if necessary, findings or statements of overriding consideration [CEQA Guidelines Section 15124 (b)].

2.3 PROJECT COMPONENTS

To meet the objectives described above, the Proposed Riverside Transmission Reliability Project (RTRP) concept was refined and a specific set of Proposed Project components developed in consideration of an array of engineering and environmental constraints. The Project concept and a general description of proposed components are provided below. A more detailed presentation of electrical and physical characteristics of the Proposed Project may be found in Section 2.4.

The Proposed Project would add a new source of transmission capacity to the City by construction of a new double-circuit 230 kV transmission line that would extend from the existing Mira Loma – Vista #1 230 kV Transmission Line to the proposed Wildlife Substation. This new double-circuit 230 kV transmission line would provide additional capacity to the City by interconnecting at the proposed Wildlife Substation, which would be constructed, owned and operated by SCE. To transfer increased capacity to the City, the proposed RPU-owned Wilderness Substation would be constructed immediately adjacent to Wildlife Substation and would transform or "step down" power from 230 kV to 69 kV.

With SCE providing a second point of delivery for bulk power to the City of Riverside's electrical system, RPU would split its 69 kV subtransmission system into an eastern system served from the existing Vista Substation and a western system served from Wilderness Substation. To facilitate this, several 69 kV subtransmission lines would be constructed within the City by adding circuits to existing routes or by constructing new lines. Upgrades would be made at various existing RPU substations, as well. Overall layout of the Proposed Project and its components is illustrated in Figure 2.3-1.

2.3.1 SCE 230 KV TRANSMISSION LINE

Under the Proposed Project, approximately ten miles of new double-circuit 230 kV transmission line would be constructed that would “loop” the existing Mira Loma – Vista #1 230 kV Transmission Line into the proposed Wildlife Substation. The “loop” would be created by connecting each of the new circuits into the existing single-circuit line between Mira Loma and Vista Substations (see Figure 2.3-2). The interconnection would occur at approximately the point where the Mira Loma – Vista #1 Transmission Line crosses Wineville Avenue, east of Interstate 15 (I-15). From here, the new double-circuit line would run south and then west to roughly follow I-15 south, cutting east at 68th Street to a Santa Ana River crossing point within Goose Creek Golf Course. It would then continue east, mostly within the City of Riverside and parallel to the Santa Ana River. In some locations, the line would cross into the Hidden Valley Wildlife Area. Eventually the line crosses over Van Buren Boulevard, and then through the City of Riverside Water Quality Control Plant, before reaching the proposed Wildlife Substation on the south side of the Santa Ana River, east of Wilderness Avenue, as shown in Figure 2.3-3.

Several localized routing alternatives for this route were evaluated and are described in Chapter 6.

FIGURE 2.3-1. PROPOSED PROJECT

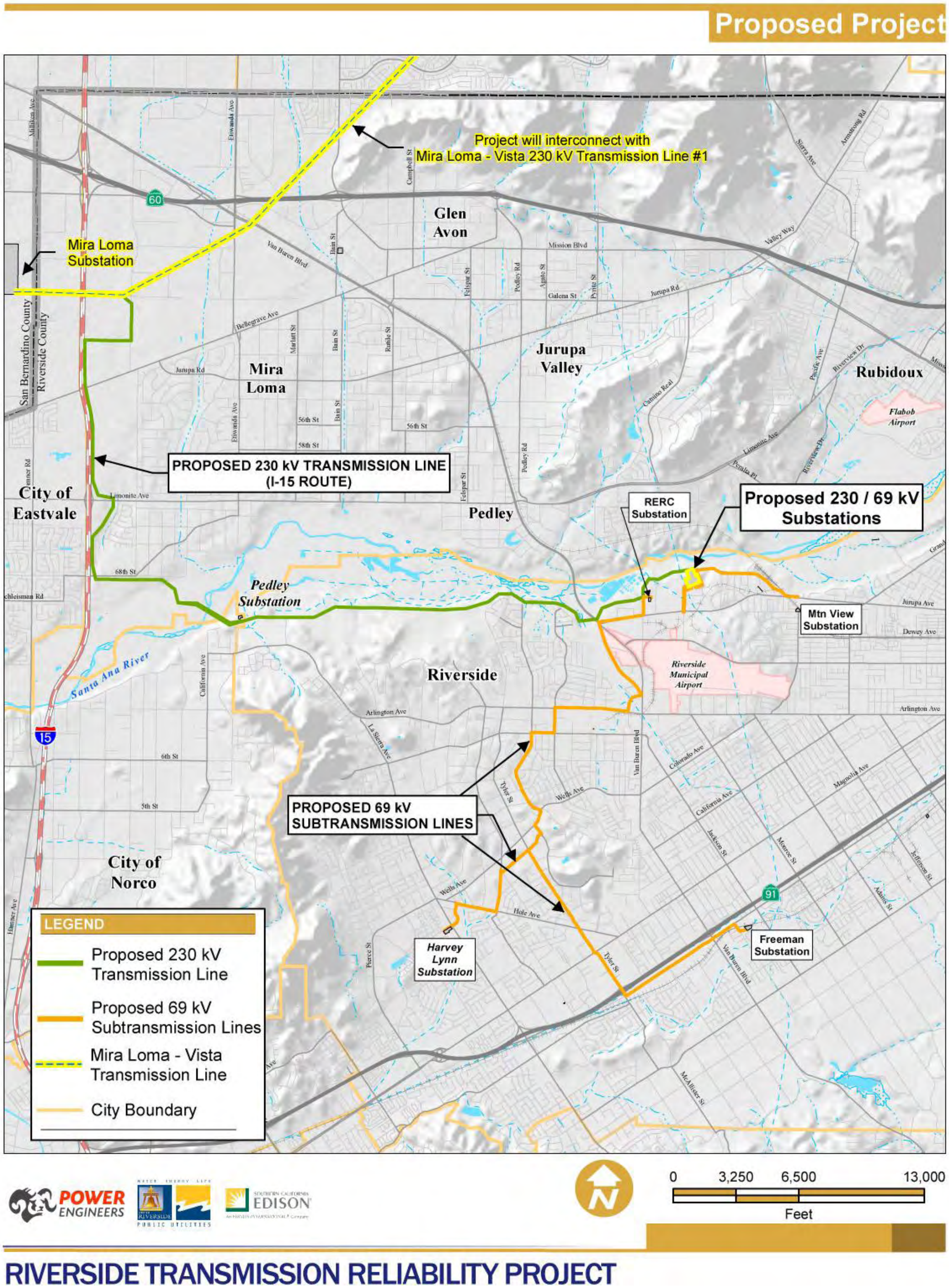

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FIGURE 2.3-2. MIRA LOMA – VISTA "LOOP"

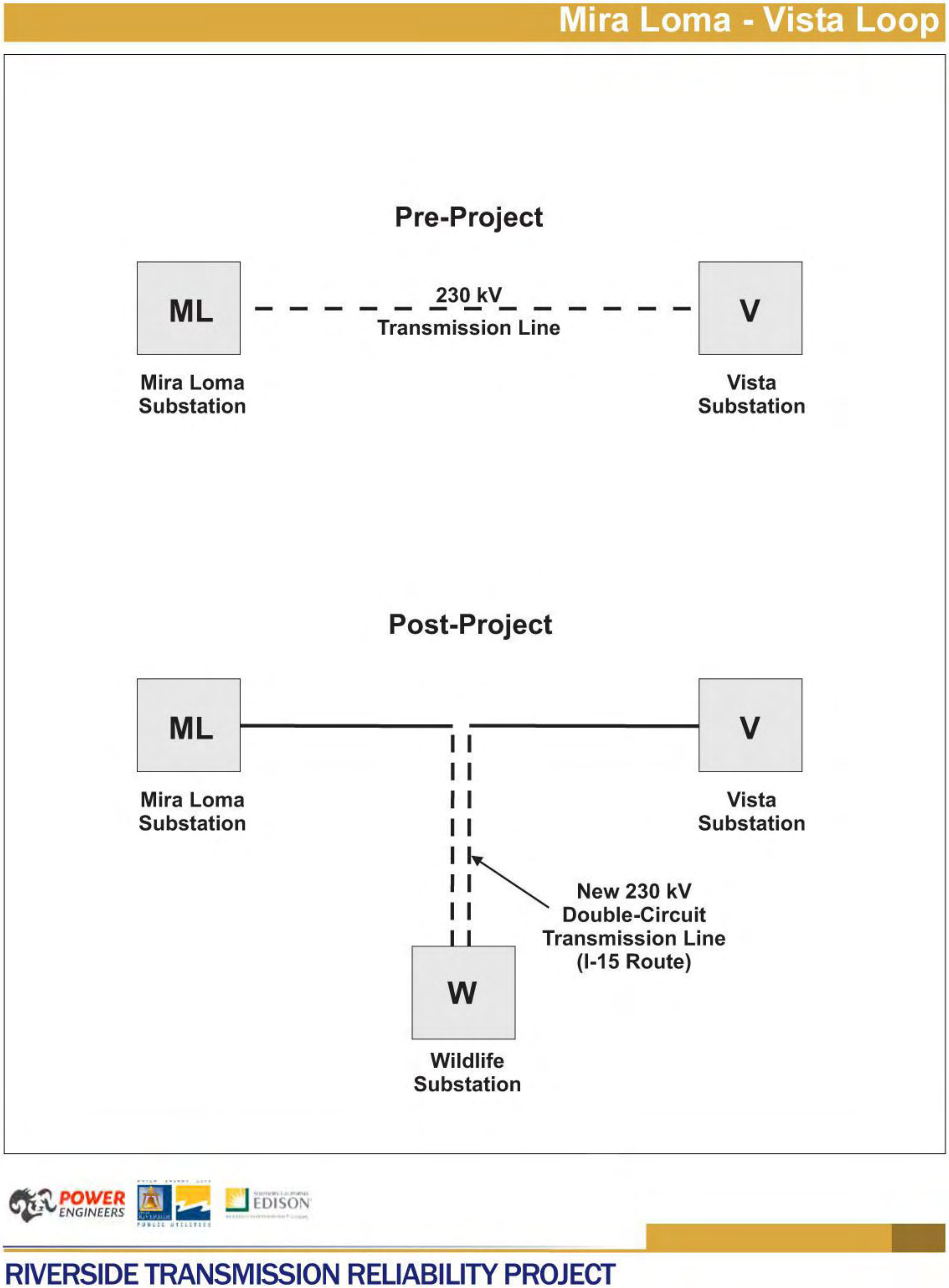

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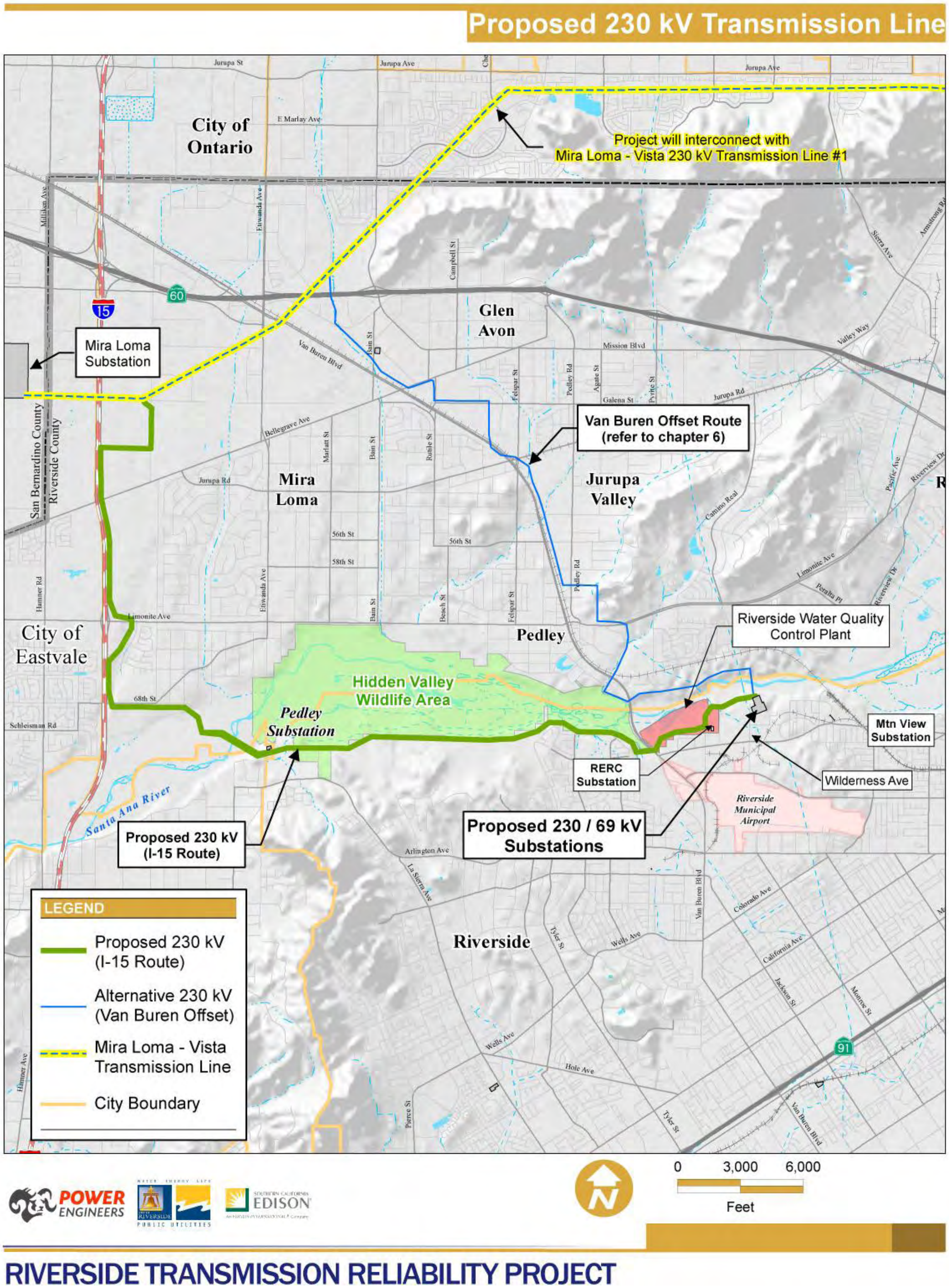
FIGURE 2.3-3. PROPOSED 230 KV TRANSMISSION LINE



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2.3.2 RPU 69 KV SUBTRANSMISSION LINES

The following paragraphs describe several new 69 kV subtransmission lines that are proposed as part of the RTRP and would need to be constructed between 69 kV substations, or between 69 kV substations and other existing 69 kV subtransmission lines within the City. In some instances, the subtransmission lines constructed would create "electrical circuits" that are not part of the construction of the Proposed Project, but would be involved in the Proposed Project's operation. This occurs when new subtransmission lines interconnect or "loop into" existing subtransmission lines. The electrical circuits that would be created by the construction of each subtransmission line are also described below. Refer to Figure 2.3-4 for specific locations of the 69 kV subtransmission lines and Figure 1.4-3 in Chapter 1 for new electrical circuits created by the proposed 69 kV subtransmission lines.

New 69 kV subtransmission lines associated with the Proposed Project are proposed in three discrete areas of RPU's subtransmission system and are described in the following three general descriptions below. Depending on presence and type of existing facilities in each of these Proposed Project areas and electrical system design requirements, the new construction would consist of one of the three following configurations: 1) two new subtransmission lines on new poles; or 2) one new subtransmission line on new poles; or 3) one new subtransmission line adjacent to an existing subtransmission line on existing or newly replaced poles. For ease of discussion and clarity, these proposed types of construction are described by specific segments and are shown on Figure 2.3-4.

1. Wilderness – Jurupa Avenue
   - Segment A: One (1) double-circuit 69 kV subtransmission line along west side of Wilderness Ave.
   - Segment B: One (1) double-circuit 69 kV subtransmission line along east side of Wilderness Ave.
2. Riverside Energy Resource Center (RERC) – Harvey Lynn/Freeman
   - Segment A: One (1) double-circuit 69 kV subtransmission line from RERC Substation to intersection of Tyler St. and Mull Ave.
   - Segment B: One (1) single-circuit from intersection of Tyler St. and Mull Ave. to Harvey Lynn Substation
   - Segment C: One (1) single-circuit from intersection of Tyler St. and Mull Ave. to Freeman Substation
3. Wilderness – Mountain View
   - One (1) double circuit 69 kV subtransmission line between Wilderness Substation and the vicinity of Mountain View Substation

Each of these discrete 69 kV Proposed Project areas is further defined below.

Wilderness – Jurupa Avenue

Segments A and B

Segments A and B of the Wilderness to Jurupa Ave. subtransmission lines are proposed to consist of a double-circuit 69 kV subtransmission line constructed from the proposed Wilderness Substation to the existing double-circuit 69 kV subtransmission line located along Jurupa Ave. and originating from RERC Substation. The double-circuit lines would exit Wilderness Substation to the south and would be constructed along both sides of Wilderness Ave. within public ROWs. Segment A would be located on the west side of Wilderness Ave. to Jurupa Ave. and Segment B would be located on the east side of Wilderness Ave. to Jurupa Ave. Both lines would then interconnect to the existing 69 kV double-circuit line (refer to Figure 2.3-5). Total length of Segment A would be 1,647 feet, and Segment B 1,588 feet.

FIGURE 2.3-4. RERC – HARVEY LYNN/FREEMAN

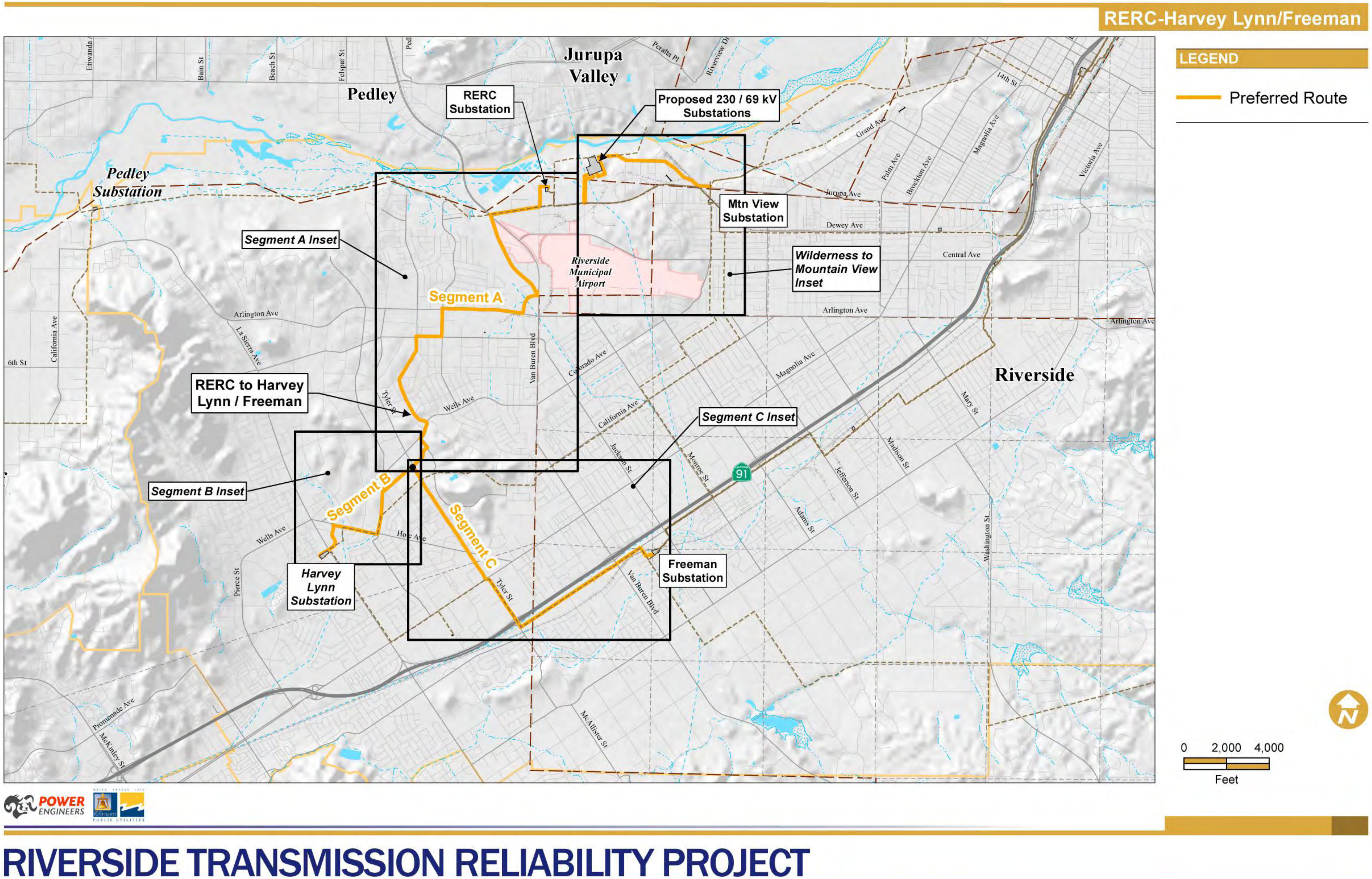

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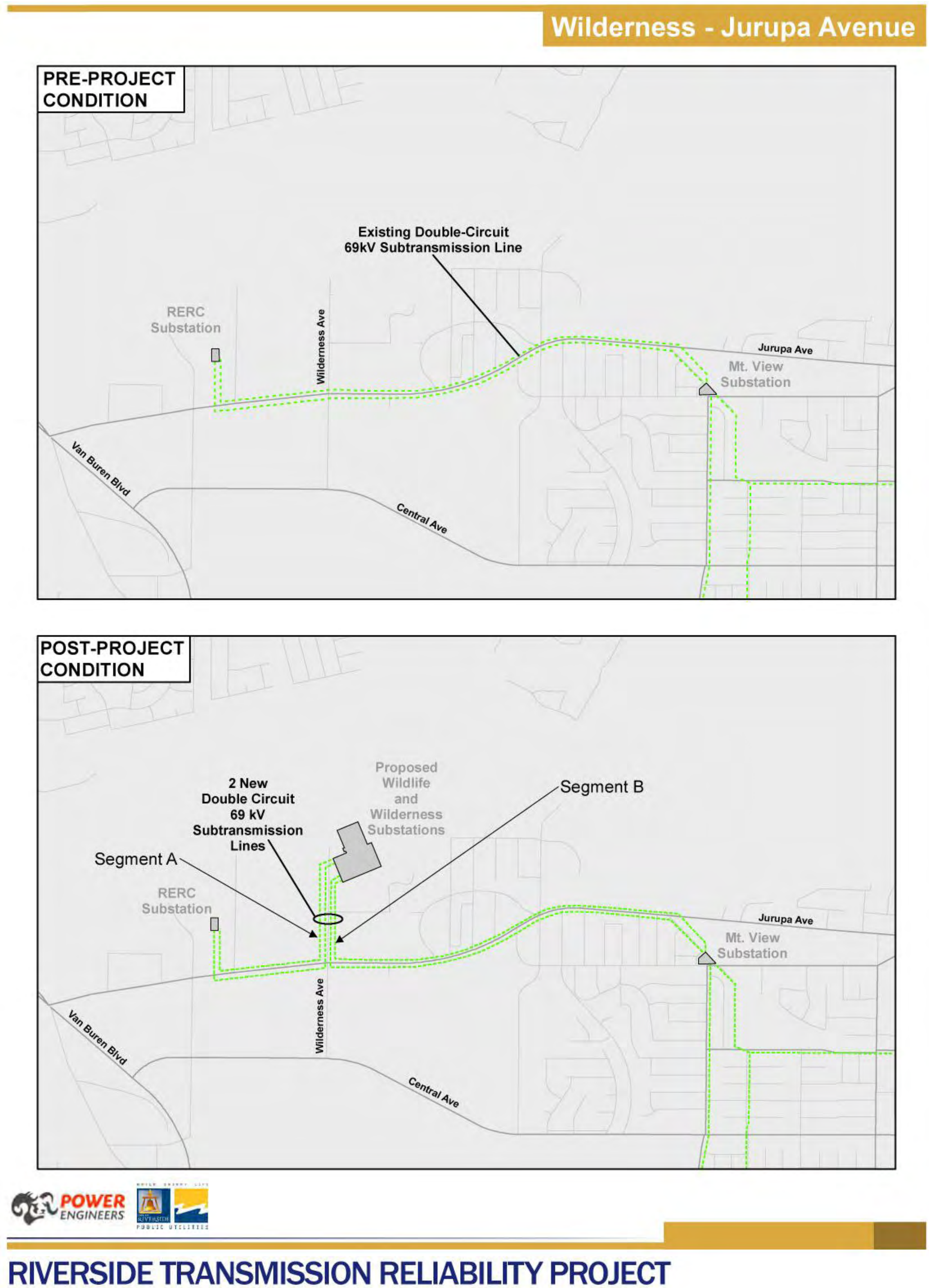
FIGURE 2.3-5. WILDERNESS – JURUPA AVENUE



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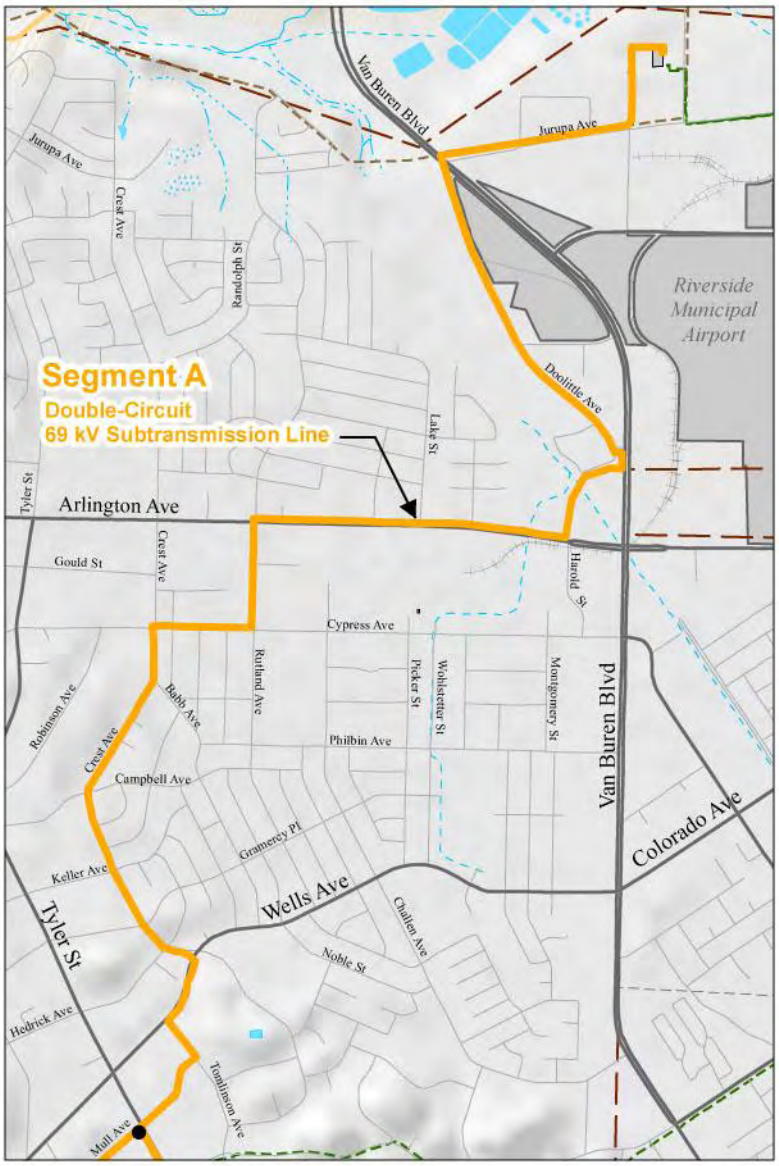
RERC – Harvey Lynn/Freeman

Subtransmission lines would be needed as part of the Proposed Project to connect the RERC Substation to both Harvey Lynn and Freeman Substations. Those proposed subtransmission lines would be single-circuit connections between the substations but would be constructed utilizing both double-circuit and single-circuit poles. The descriptions of these subtransmission lines are described below within Segments A, B, and C, and are shown on Figures 2.3-6a through 2.3-6c.

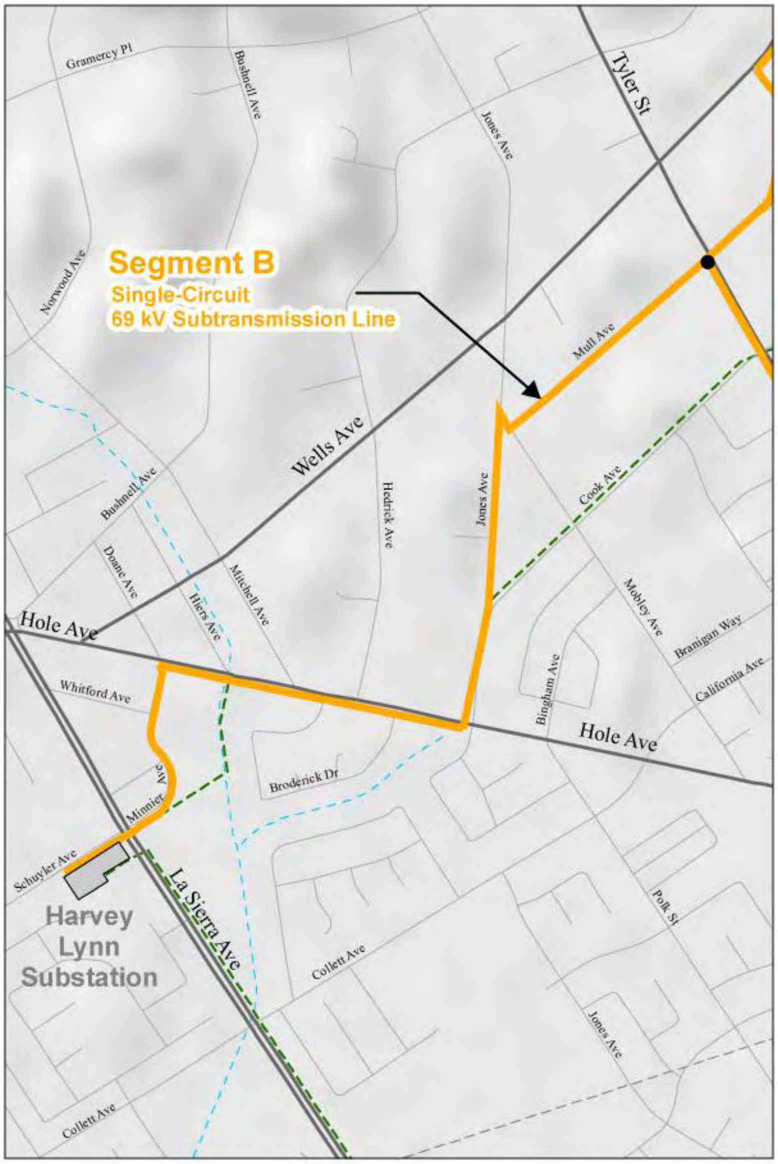
FIGURE 2.3-6A. RERC – HARVEY LYNN/FREEMAN SEGMENT A



Segment A

Proposed Segment A of the RERC to Harvey Lynn/Freeman sub-transmission line would be constructed with double-circuit 69 kV poles that would carry both the RERC – Harvey Lynn and RERC – Freeman 69 kV subtransmission lines. From RERC Substation, Segment A would cross over the southern perimeter of the Riverside Water Quality Control Plant and then proceed south on Acorn Ave. and west on Jurupa Ave. At the intersection of Jurupa Ave. and Van Buren Blvd., Segment A would continue south along Doolittle Ave. and then Van Buren Blvd. to Arlington Ave., where it would head west for approximately one mile. At the intersection of Arlington Ave. and Rutland Ave., Segment A would turn south and then west on Cypress Ave. to Crest Ave. continuing south along Crest Ave. At the intersection of Crest and Wells Avenues, the line would follow Wells to the intersection of Wells Ave. and Tomlinson Ave., following Tomlinson for a short distance before turning southwest onto Mull Ave. and continuing to the intersection with Tyler St. At this intersection, Segment A ends by "splitting" the circuits into two separate single-circuit subtransmission lines (Segments B and C as described below). The total length of the RERC-Harvey Lynn/Freeman Segment A would be 4.4 miles.

FIGURE 2.3-6B. RERC – HARVEY LYNN/FREEMAN SEGMENT B



Segment B

Proposed Segment B of the RERC to Harvey Lynn/Freeman subtransmission line consists of a single-circuit 69 kV sub-transmission line beginning from the intersection of Mull Ave. and Tyler St. Segment B would continue southwest along Mull Ave., continue southwest along Mull Ave., then northwest on Mobley Ave., and then south along Jones Ave. At the intersection of Jones Ave. and Cook Ave., Segment B would join an existing single-circuit 69 kV subtransmission line and would be placed on double-circuit poles continuing to Hiers Ave., where it would leave the existing 69 kV line, and then rejoin it along Minnier Ave., continuing to Harvey Lynn Substation. This segment would have a length of 1.5 miles.

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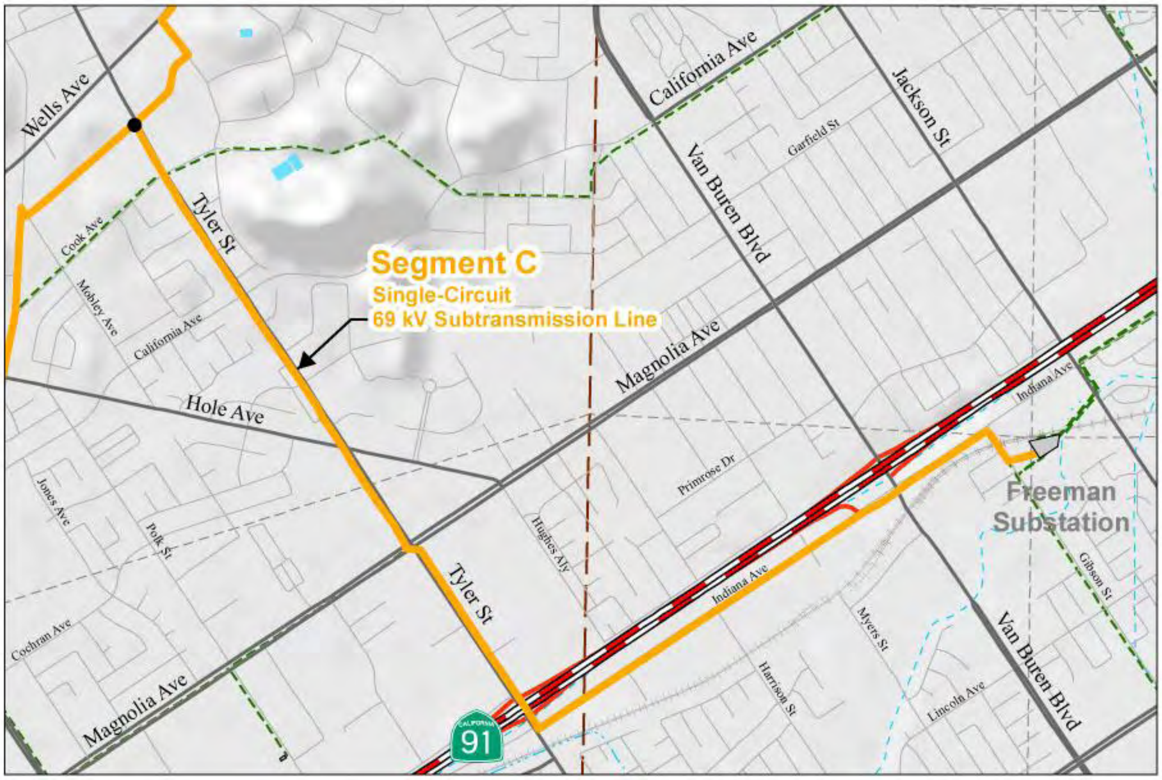
FIGURE 2.3-6C. RERC – HARVEY LYNN/FREEMAN SEGMENT C

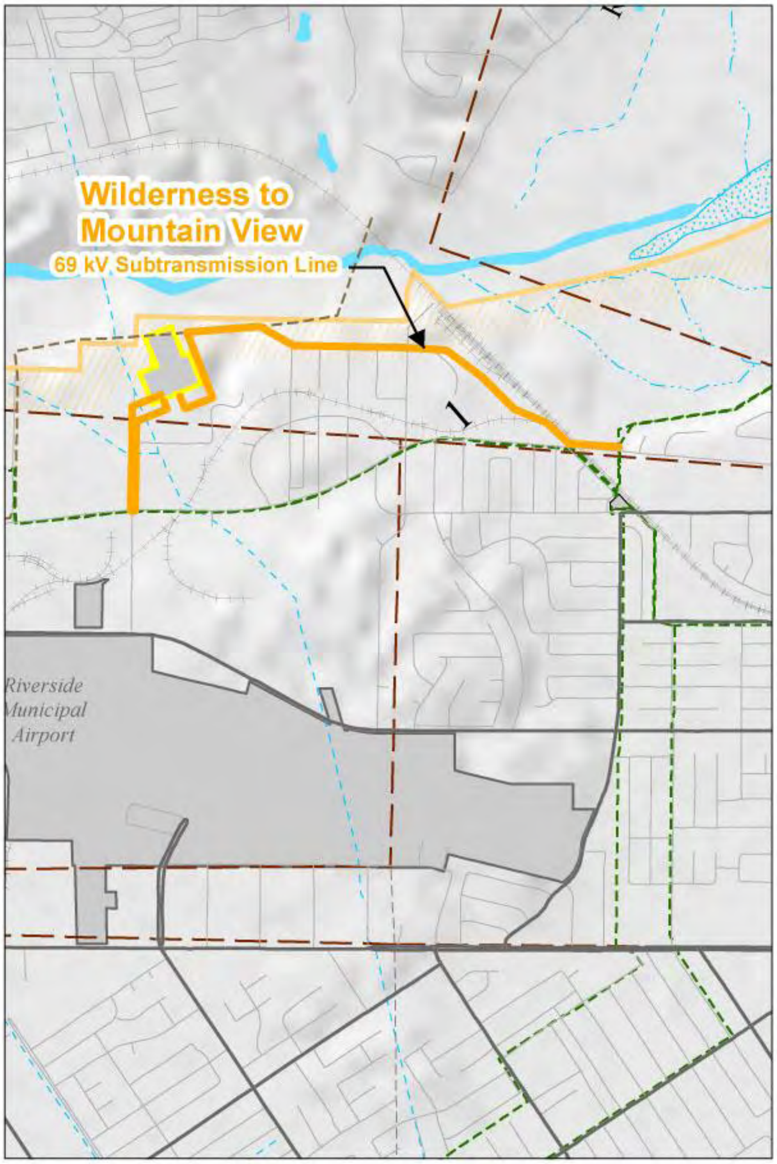


Segment C

Proposed Segment C of the RERC to Harvey Lynn/Freeman subtransmission line would begin at the same intersection as Segment B (Mull Ave. and Tyler St.). The single-circuit subtransmission line would continue south along Tyler St. on single-circuit poles to the intersection of Tyler St. and Magnolia Ave. From this location, Segment C would join with an existing 69 kV subtransmission line onto new double-circuit poles. Segment C would then continue south along Tyler St. and then east along Indiana Ave. into Freeman Substation. To extend from the end of Segment A to Freeman Substation, Segment C would have a length of 3.2 miles.

Wilderness – Mountain View

FIGURE 2.3-6D. WILDERNESS –MOUNTAIN VIEW



One double-circuit 69 kV subtransmission line is proposed for construction from the proposed Wilderness Substation to an existing 69 kV line adjacent to Mountain View Substation. The new double-circuit line would exit Wilderness Substation and parallel the Santa Ana River eastward for approximately 1,000 feet, and then travel along Industrial Avenue to the west side of the Union Pacific railroad corridor and near Martha McLean Anza Narrows Park. The line would then head southeast, parallel to but outside of the railroad ROW, and then east parallel to Jurupa Ave., to the connection point with the existing 69 kV subtransmission line near Mountain View Substation (refer to Figure 2.3-6d). This new 69 kV subtransmission line would have a length of 1.4 miles.

2.3.3 230 KV SUBSTATIONS

In order to integrate new capacity into the RPU system, the Proposed Project would require the construction of two new substations (to be called Wildlife and Wilderness Substations). Additionally, minor substation upgrades would be required at Mira Loma and Vista Substations. These proposed facilities are described below. See Section 2.4.3 for general layout of the two new substations.

Wildlife Substation

The proposed SCE 230 kV Wildlife Substation would be constructed on three acres of land currently owned by RPU and located near the northeast corner of Wilderness Avenue and Ed Perkic Street. This area is within the City limits. If the Proposed Project is approved, SCE would purchase property from RPU to accommodate the new Wildlife Substation. The proposed substation would connect to the SCE system via the proposed double-circuit 230 kV transmission line described above, and would also connect into RPU's proposed adjacent Wilderness Substation. See Section 2.4.3 for a description of the electrical and physical characteristics of the proposed Wildlife Substation.

The proposed substation would be enclosed on three sides by a ten-foot high perimeter wall constructed of light-colored decorative blocks, with the fourth side being the shared chain link fence separating Wildlife Substation from Wilderness Substation. A band of at least three strands of barbed wire would be affixed near the top of the perimeter wall inside the substation and would not be visible from the outside.

Landscaping around the proposed Wildlife Substation would be designed to filter views for the surrounding community and other potential sensitive receptors. The landscaping plan will comply with City of Riverside guidelines.

Lighting at the proposed Wildlife Substation would consist of high-pressure sodium, low-intensity lights located in the switchracks and in areas of the yard where operating and maintenance activities may take place during evening hours for emergency or scheduled work. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. The lights would be directed downward to reduce glare outside the facility. A light, indicating the operation of the rolling gate at the Wilderness Avenue entrance, would automatically turn on once the gate begins to open and turn off shortly after the gate is closed.

Wilderness Substation

The proposed new RPU 230/69 kV Wilderness Substation would be located on 6.4 acres adjacent to the southern end of SCE's Wildlife Substation. Wilderness Substation would be connected to the SCE Wildlife Substation via two short 230 kV transmission line spans over a separating fence between the two substations. The voltage would be transformed to 69 kV through two transformers located within the Wilderness Substation. Electricity would be delivered to the RPU electrical system and ultimately City customers via 69 kV subtransmission lines exiting the substation. As described above, the Wilderness Substation would be separated from the Wildlife Substation by a eight-foot chain link fence. The outside perimeter of the substation would be built with a ten-foot block wall continuous with the Wildlife Substation. Figure 2.3-7 presents a visual simulation of the proposed Wilderness Substation. Access would be obtained at the north end of Wilderness at a turnaround shared by both substations. Wilderness Substation would have a separate secure gate. Security and maintenance lighting would be minimal and directed downward as described above for Wildlife Substation. As a result of these features, the casual observer might assume that a single substation was present at the site. See Section 2.4.4 for a description of the electrical and physical characteristics of the proposed Wilderness Substation.

230 kV Substation Upgrades

Line protection relays would be replaced at both Mira Loma and Vista Substations as part of the Proposed Project. The relay replacements would be placed within an existing Mechanical and Electrical Equipment Room (MEER) within each substation.

FIGURE 2.3-7. WILDERNESS SUBSTATION SIMULATION

Viewpoint Location

Viewpoint 1

View from Wilderness Ave Looking North

Photograph Information

Time of photograph:	03:00PM
Date of photograph:	June 13, 2007
Distance to project:	75'
Weather condition:	Clear
Viewing direction:	North

Note: The photosimulations are a representation of the proposed project and are for review only, and may change pending client, public and regulatory review.

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2.3.4 69 KV SUBSTATION UPGRADES

To accommodate the proposed subtransmission lines to be added to the RPU 69 kV system, upgrades would be required at four existing RPU 69 kV substations. Proposed upgrades would include minor structure (pole) re-alignments outside of substations to accommodate modifications of substation layout. All other upgrades would take place within the existing boundaries of each substation.

The four existing 69 kV substations within the City that would require upgrades are Harvey Lynn, Mountain View, Freeman, and RERC. The proposed upgrades consist of the addition of new 69 kV power circuit breakers and associated disconnect switches and busing at RERC and Harvey Lynn Substations, as well as protective relay and control modifications to all four substations.

2.3.5 RELOCATION OF DISTRIBUTION LINES

In ten locations, the proposed 230 kV transmission line would cross existing local overhead distribution lines creating clearance or reliability issues that could not be addressed through simple route realignment. To accommodate the new 230 kV transmission line, these ten locations would require relocation (and in some cases undergrounding) of existing distribution lines. Fourteen new distribution poles would be required. A total of 5,680 feet of distribution would be re-installed underground in five discrete locations. Undergrounding would involve vault and duct construction techniques. See Figure 2.3-8 for locations of existing distribution lines that would be relocated as part of this Proposed Project component. See Table 2.3-1 for ground disturbance estimates associated with the proposed relocation of distribution lines to accommodate the 230 kV facilities. See Table 2.3-2 for equipment estimates associated with these activities.

In order to accommodate the proposed 230 kV facilities, some of the existing distribution facilities would need modifications. The following modifications are based on preliminary engineering and the facilities, as they currently exist in the field. For all locations, the calculations for the typical area of disturbance for a pole installation or removal has been designated 25 feet by 30 feet. The first eight locations presented below involve SCE-owned existing facilities. The second two locations involve existing RPU-owned facilities that would conflict with the proposed 230 kV transmission line near the Riverside Water Quality Control Plant.

SCE Relocation of Distribution Lines

Location 1-Tower Locations on Wineville South of Cantu-Galleano Ranch Road: Because of insufficient clearances presenting a conflict with existing overhead distribution facilities, the proposed route of the new 230 kV line at Location 1 would require modifications. At this location, it is necessary for the overhead facilities to be removed and relocated. Fourteen poles and the associated overhead facilities would need to be removed and replaced with underground facilities requiring approximately 2,450 feet of trenching. The trench will be approximately 24 inches wide by 48 inches deep and would contain four 5-inch conduits that will be encased in slurry and subsequently backfilled with native soil. Additionally, two 7-foot x 14-foot x 8-foot (W x L x D) vaults and one 6-foot x 12-foot x 8-foot vault would be added. The area of disturbance would be approximately 15 feet on either side of the trench. The volume of disturbance for the vaults includes addition of approximately three feet to the width and length and approximately four feet to the depth. The poles at Location 1 would be removed by trucks located on paved roads, and would therefore not be expected to result in additional, associated disturbance. The anticipated areas of disturbance at this location would be: one trench (73,280 square feet); two 7-foot x 14-foot x 8-foot vaults (3,760 square feet); one 6-foot x 12-foot x 8-foot vault (1,755 square feet).

Location 2-Tower Location West of Wineville South of Landon Drive: As existing overhead distribution facilities are currently idle (not serving load) at Location 2, their removal would not require replacement. Two poles would be removed and backfilled with native soil. The anticipated areas of disturbance at this location would be: pole removal (1,500 square feet).

Location 3-Tower Location at Bellgrave and I-15 Freeway: Because of insufficient clearances presenting a conflict with existing overhead distribution facilities, the proposed route of the new 230 kV line at Location 3 would require modifications. At this location, it is necessary for the overhead facilities to be removed and relocated underground. Approximately 450 feet of trenching would occur along with the installation of four 5-inch conduits that would be encased in slurry and subsequently backfilled with native soil, as well as one 6-foot x 12-foot x 8-foot vault. The anticipated areas of disturbance at this location would be: one trench (12,960 square feet); one 6-foot x 12-foot x 8-foot vault (1,755 square feet); pole removal (1,500 square feet).

Location 4-Tower Location South of 68th and East of Wineville: As existing overhead distribution facilities are currently idle (not serving load) at Location 4, their removal would not require replacement. One pole would be removed and backfilled with native soil. The anticipated areas of disturbance at this location would be: pole removal (750 square feet).

Location 5-Crossing Location at Pedley Substation off Arlington Avenue: Because of insufficient clearances presenting a conflict with existing overhead distribution facilities, the proposed route of the new 230 kV line at Location 5 would require modifications. At this location, two poles and overhead facilities would be relocated by removing two poles and installing two new poles. Additionally, four poles and overhead facilities would be relocated by removing them and replacing them with underground facilities. This would require approximately 600 feet of trenching and the installation of six 5-inch conduits, as well as two 7-foot x 18-foot x 8-foot vaults. The anticipated areas of disturbance at this location would be: one trench (31,872 square feet); two 7-foot x 18-foot x 8-foot vaults (4,080 square feet); pole installation (1,500 square feet); pole removal (4,500 square feet).

Location 6-Tower Location North of Julian Drive: Because of insufficient clearances presenting a conflict with existing overhead distribution facilities, the proposed route of the new 230 kV line at Location 6 would require modifications. Existing overhead facilities would be relocated by removing them and installing equivalent overhead facilities in another location. Five poles would be removed and backfilled with native soil, and five poles would be installed. The anticipated areas of disturbance at this location would be: pole installation (3,750 square feet); pole removal (3,750 square feet).

Location 7-Tower Location West of Rutland Avenue: Because of insufficient clearances presenting a conflict with existing overhead distribution facilities, the proposed route of the new 230 kV line at Location 7 would require modifications. Existing overhead facilities would be relocated by removing them and installing equivalent overhead facilities in another location.

Two poles would be removed and backfilled with native soil, and three poles, required to accommodate proposed resolution to the overhead facilities' insufficient clearance, would be installed. The anticipated areas of disturbance at this location would be: pole installation (2,250 square feet); pole removal (1,500 square feet).

Location 8-Wildlife Substation: Due to conflict with existing overhead distribution facilities (i.e., proposed Wildlife Substation is to be constructed where distribution line exists), the proposed route of the new 230 kV line at Location 8 would require modifications. Some overhead facilities would be removed and relocated underground. The remaining overhead facilities would be relocated by removing the existing overhead facilities and installing equivalent overhead facilities in another location, which would be routed around the substation. Five poles would be removed and backfilled with native soil, and four poles required to accommodate the conflict would be installed. At this location, approximately 500 feet of trenching would occur along with the installation of two 5-inch conduits that would be encased in slurry and subsequently backfilled with dirt, as well as one 6-foot x 12-foot x 8-foot vault. The anticipated areas of disturbance at this location would be: one trench (14,560 square feet); one 6-foot x 12-foot x 8-foot vault (1,755 square feet); pole installation (3,000 square feet); pole removal (3,750 square feet).

RPU Relocation of Distribution Lines

Location 9-Structure Locations through the southwestern portion of the City of Riverside Water Quality Control Plant: In this area, the proposed 230 kV transmission line would roughly parallel an existing RPU distribution line. Because of insufficient clearances, the existing line would require modifications including relocation and undergrounding of existing conductors, and the installation of supporting underground vaults. At seven pole locations in this area, wooden structures and associated overhead facilities would need to be removed and replaced with underground facilities requiring approximately 1,680 feet of open trench construction. The trench would be approximately 24 inches wide by 48 inches deep and, upon re-filling, would contain four 5-inch conduits containing the electrical conductors. Conduits would be encased in slurry and subsequently backfilled with native soil. A work area of approximately 15 feet surrounding all excavations would be required during construction. Required vaults would include two 7-foot x 14-foot x 8-foot vaults and one 6-foot x 12-foot x 8-foot vault. The volume of excavation disturbance for the vaults includes approximately three additional feet of width and length, and approximately four additional feet of depth. Relocation activity for Location 9 would occur along paved roads or within the boundary of the City of Riverside Water Control Plant in a paved area and a fully disturbed area of bare soil and unmaintained sparse weedy ground cover. Existing distribution poles would be removed by trucks located along paved roads and in areas of already-bare ground. As a result, no additional ground disturbance is expected. The anticipated areas of surface disturbance at this location would be 53,760 square feet for the trench and 5,515 square feet for the vaults.

Location 10-Structure Locations near the southeast boundary of the City of Riverside Water Quality Control Plant: In this area, the proposed 230 kV transmission line would cross an existing RPU distribution line perpendicularly at approximately mid-span. An existing distribution pole is located within a few feet of the proposed 230 kV centerline. Because of insufficient clearances, the existing line would require modifications, including relocation and undergrounding of existing conductors and the installation of supporting underground vaults. A single wooden structure and associated overhead facilities (adjacent spans) would need to be removed and replaced with underground facilities requiring approximately 240 feet of open trench construction. The trench would be approximately 24 inches wide by 48 inches deep and, upon re-filling, would contain four 5-inch conduits containing the electrical conductors. Conduits would be encased in slurry and subsequently backfilled with native soil. A work area of approximately 15 feet surrounding all excavations would be required during construction. Required vaults would include two 7-foot x 14-foot x 8-foot vaults and one 6-foot x 12-foot x 8-foot vault. The volume of excavation disturbance for the vaults includes approximately three additional feet of width and length, and approximately four additional feet of depth. Relocation activity for Location 10 would occur along a paved road in a fully disturbed area of pavement, bare soil, gravel and single landscaping shrubs. The existing distribution pole would be removed by trucks located along paved roads and in areas of already-bare ground. As a result, no additional ground disturbance is expected. The anticipated areas of surface disturbance at this location would be 768 square feet for the trench and 3,760 square feet for the vaults.

TABLE 2.3-1. DISTRIBUTION LINE RELOCATION GROUND DISTURBANCE ESTIMATES.

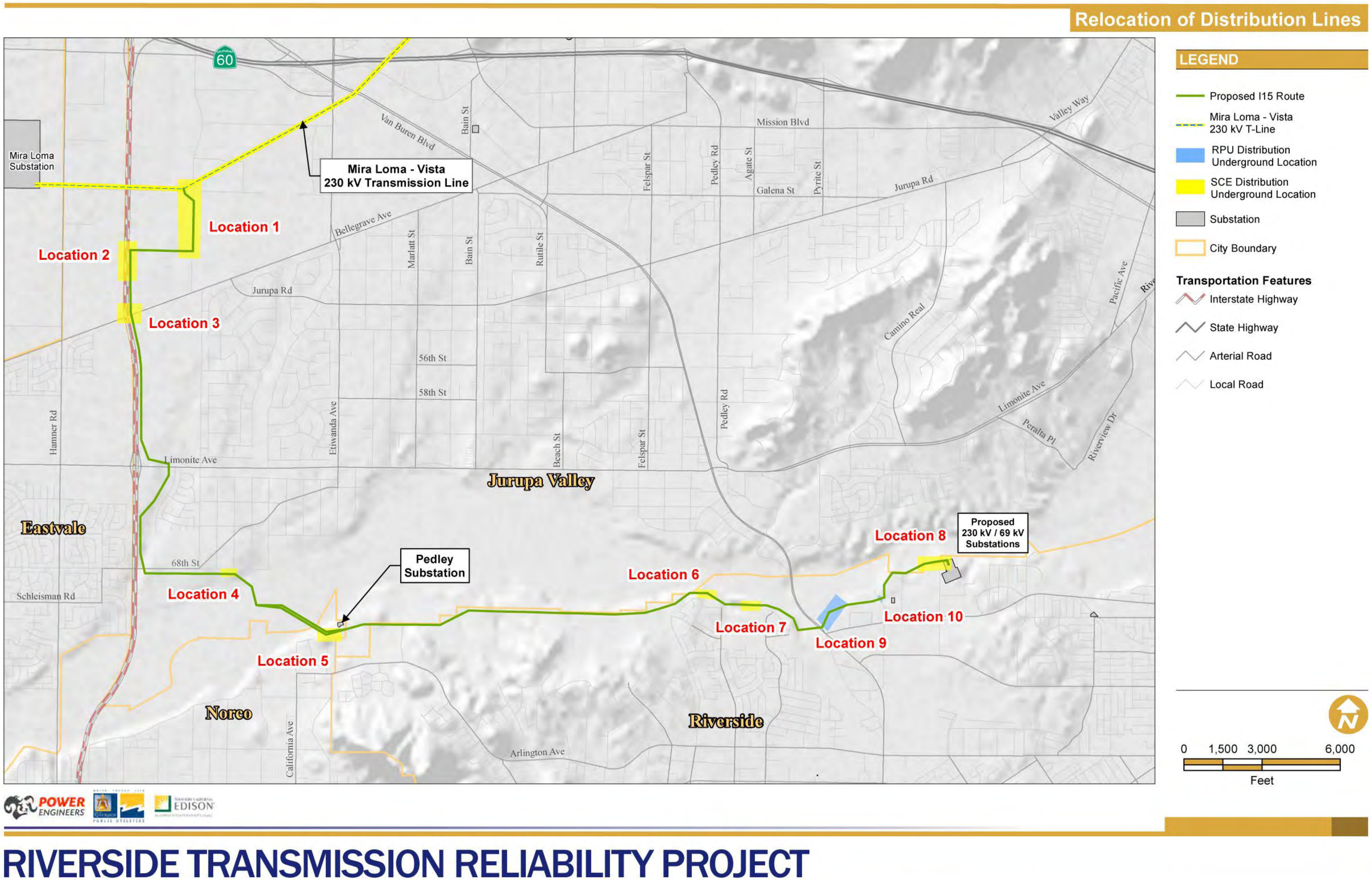
Location		Detail	Qty	L (ft)	W (ft)	D (ft)	cu. ft.	Volume cu. yds.	Area sq. ft.
1	Trench	2,450’							
	Volume		1	2,401	2	4	19,208	711	
	Area		1	2,311	32				73,952
	Vaults	(2) 7'x14'x8', (1) 6'x12'x8'							
	Volume		2	17	10	12	4,080	151	
	Volume		1	15	9	12	1,620	60	
	Area		2	47	40				3,760
	Area		1	45	39				1,755
2	Pole Removal								
	Area		2	25	30				1,500
3	Trench	450’							
	Volume		1	435	2	4	3,480	129	
	Area		1	405	32				12,960
	Vaults	(1) 6'x12'x8'							
	Volume		1	15	9	12	1,620	60	
	Area		1	45	39				1,755
	Pole Removal								
	Area		2	25	30				1,500
4	Pole Removal								
	Area		1	25	30				750
5	Trench	600’							
	Volume		1	558	2	4.5	5,022	186	
	Area		1	498	32				15,936
	Vaults								
	Volume	(2) 7'x18'x8'	2	21	10	12	5,040	187	
	Area		2	51	40				4,080
	Pole Installation								
	Volume		2		2	5	20	0.74	
	Area		2	25	30				1,500
	Pole Removal								
	Area		6	25	30				4,500

Location		Detail	Qty	L (ft)	W (ft)	D (ft)	cu. ft.	Volume cu. yds.	Area sq. ft.
6	Pole Installation								
	Volume		5		2	5	50	1.85	
	Area		5	25	30				3,750
	Pole Removal								
	Area		5	25	30				3,750
7	Pole Installation								
	Volume		3		2	5	30	1.11	
	Area		3	25	30				2,250
	Pole Removal								
	Area		2	25	30				1,500
8	Trench	500’							
	Volume		1	485	2	4.5	4,365	162	
	Area		1	455	32				14,560
	Vaults	(1) 6'x12'x8'							
	Volume		1	15	9	12	1,620	60	
	Area		1	45	39				1,755
	Pole Installation								
	Volume		4		2	5	40	1.48	
	Area		4	25	30				3,000
	Pole Removal								
	Area		5	25	30				3,750
9	Trench	1,680’							
	Volume		1	1,680	2	4	13,440	498	
	Area		1	1,680	32				53,760
	Vaults	(2) 7'x14'x8', (1) 6'x12'x8'							
	Volume		2	17	10	12	4,080	151	
	Volume		1	15	9	12	1,620	60	
	Area		2	47	40				3,760
	Area		1	45	39				1,755
	Pole Removal								
	Area		7	25	30				5,250
10	Trench	240’							
	Volume		1	240	2	4	1,920	71	
	Area		1	240	32				768
	Vaults	(2) 7'x14'x8'							
	Volume		2	17	10	12	4,080	151	
	Area		2	47	40				3,760
	Area								
	Pole Removal								
	Area		1	25	30				750
							Total Volume	2,642	yds^3
							Total Area	228,066	ft^2
								5.2	acres

TABLE 2.3-2. CONSTRUCTION EQUIPMENT FOR RELOCATION OF DISTRIBUTION LINES.

Activity	# of Work Days	Equipment	Duration of Use (hours)	Fuel Type
Civil	31	Backhoe	8	Diesel
		Dump Truck	8	Diesel
		Roller	8	Diesel
		Delivery Truck	8	Diesel
		Water Truck	8	Diesel
		Cement Truck	8	Diesel
		Foreman Truck	8	Gasoline
Electrical	66	Rodder Truck	8	Diesel
		Cable Dolly	8	Diesel
		Reel Truck	8	Diesel
		Line Truck	8	Diesel
		Boom Truck	8	Diesel
		Troubleman Truck	8	Diesel
		Foreman Truck	8	Gasoline

FIGURE 2.3-8. RELOCATION OF DISTRIBUTION LINES



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2.3.6 NEW TELECOMMUNICATION FACILITIES

New fiber optic telecommunication lines would be required for system control of Wildlife and Wilderness Substations and associated 230 kV transmission and 69 kV subtransmission lines. Communication facilities supporting RTRP 69 kV subtransmission components would be incorporated into the existing RPU fiber optic telecommunication network. The proposed communications facilities that would support the 230 kV transmission line would meet SCE's reliability standards and connect to the existing SCE network at multiple locations. The 230 kV communication facilities would require construction of diverse communication paths for operation and monitoring of the substation and transmission line equipment. The diverse paths would connect Wildlife Substation to Mira Loma and Vista Substations. New telecommunication infrastructure would be installed to provide protective relay circuit, Supervisory Control and Data Acquisition (SCADA) circuit, data, and telephone services to Wildlife Substation. For the 69 kV portion of the Proposed Project, telecommunications lines would be installed on new or existing 69 kV subtransmission poles.

SCE Fiber Optic Telecommunication Lines

The Proposed Project would include connecting three diverse fiber optic telecommunication lines to the existing SCE fiber optic network. These three lines would be required for the protective relay circuit between the proposed Wildlife Substation and Mira Loma Substation, for the protective relay circuit between the proposed Wildlife Substation and Vista Substation, and the fiber optic telecommunication line that would provide the SCADA circuit, data, and telephone services to the proposed Wildlife Substation. Figure 2.3-9 presents SCE fiber optic telecommunication routes that are proposed for construction or upgrade as part of the Proposed Project. Approximately seven miles of new fiber optic cable would be constructed as part of the Proposed Project, of which approximately six miles would be placed on existing overhead distribution poles and approximately 3,900 feet would be installed in underground conduit.

Path 1: The first fiber optic telecommunication line is OPGW (optical ground wire) that is proposed for installation on the new 230 kV transmission line structures for the Proposed Project and described above in Section 2.3.1. This OPGW line would intercept and connect to the existing fiber wrap cable on OHGW (over head ground wire) on the Mira Loma – Vista #1 transmission line tower.

Path 2: A new ADSS (all dielectric self supporting) fiber optic telecommunication line is proposed for installation on the existing SCE distribution structures between the existing Pedley Substation and the new Wildlife Substation, with a path length of approximately six miles. This new line would tie into the existing Mira Loma to Corona fiber optic telecommunication line as shown in Figure 2.3-9. A preliminary engineering survey conducted in 2010 of the approximate 100 distribution poles in the existing ADSS fiber optic telecommunication route between Pedley substation and the Wildlife Substation site determined that no new poles would need to be added, and that no existing poles would need to be replaced. However, a final determination of the need for pole replacement will not be made until final engineering is completed. The fiber optic telecommunication line would enter into Pedley and Wildlife Substations in an underground conduit that would be installed to the fence line of the substations for fiber optic telecommunication line entry. This construction method allows ADSS cables on the distribution line poles to be brought into the substations. The approximate length of the underground conduit outside the substations' property lines would be 200 feet at Pedley Substation and 500 feet at

Wildlife Substation. In addition, because of the proximity of the proposed new 230 kV transmission line to the existing SCE distribution line, five fiber optic telecommunication line intersection locations would need to be placed underground for cable path reliability. The required underground paths for the proposed fiber optic telecommunication line are as follows:

- The first proposed fiber optic telecommunication line crossing location would be located approximately 0.25 miles west of the Harrell Street and Etiwanda Avenue intersection under the existing Mira Loma – Vista 230 kV transmission line. The two cables at the crossing location would be: 1) the existing ADSS cable on the distribution line poles, and 2) the existing fiber wrap cable on Mira Loma – Vista 230 kV transmission line OHGW. An approximately 900-foot section of the existing ADSS fiber cable would need to be placed underground. For this diverse path, both (crossed) fiber cables would carry protection circuits to protect against the event that the circuit would fail as a result of the crossed fiber cables failing concurrently.

- The second proposed fiber optic telecommunication line crossing location would be located in an area south of the Santa Ana Regional Park, adjacent to residential areas along the proposed 230 kV transmission line route. The two intersecting fiber cables would be: 1) the proposed new Path 2 ADSS fiber optic telecommunication route between Pedley Substation and new Wildlife substation, and 2) the Path 1 OPGW on the proposed 230 kV transmission line. An approximately 1,000-foot section of the proposed ADSS fiber optic telecommunication line would need to be placed underground in order to prevent single-point failure for the circuit as a result of the crossing fiber optic telecommunication lines.

- The third proposed fiber optic telecommunication line crossing location would be located in an area approximately 1,000 feet west of the proposed Wildlife Substation between Wilderness Avenue and Payton Avenue, along the existing distribution line north of Jurupa Avenue around the northwest perimeter of the existing building and parking area. The two intersecting fiber optic telecommunication lines would be: 1) the proposed new Path 2 ADSS route between Pedley Substation and the new Wildlife substation, and 2) the Path 1 OPGW on the proposed 230 kV transmission line. An approximately 600-foot section of the proposed ADSS fiber optic telecommunication line would need to be placed underground in order to prevent single point failure for the circuit as a result of the crossing fiber optic telecommunications lines.

- The fourth proposed fiber optic telecommunications line crossing location would be located approximately 500 feet southwest of Pedley Substation, close to Pedley Substation Rd. The two cables at the crossing location would be: 1) the existing ADSS cable on the 12 kV pole line, and 2) the Path 1 OPGW on the proposed 230 kV transmission line. An approximately 400-foot section of the proposed ADSS fiber optic telecommunication line would need to be placed underground in order to prevent single point failure.

- The fifth proposed fiber optic telecommunications line crossing location would be located approximately 1,000 feet west of Pedley Substation on the Lab 12 kV distribution pole line. The two cables at the crossing location would be: 1) the existing ADSS cable on the 12 kV pole line, and 2) the Path 1 OPGW on the proposed 230 kV transmission line. An approximately 300-foot section of the proposed ADSS fiber optic telecommunication line would need to be placed underground in order to prevent single point failure.

Path 3: The third proposed SCE fiber optic telecommunications line associated with the 230 kV portion of the Proposed Project would connect the new Wildlife Substation and a fiber optic demarcation point to the Vista Substation to meet the telecommunication diverse path requirements. SCE would lease fiber optic strands within the RPU fiber optic network to create this third telecommunication path. Existing and available fiber optic cable is in place for most of this pathway between Wildlife and Vista Substations. The new portion of this path would utilize planned RPU telecommunication fiber optic cable to be installed along the proposed 69 kV subtransmission lines as described below.

RPU Fiber Optic Telecommunication Lines

As part of the Proposed Project, the existing RPU fiber optic network would be extended approximately 2,000 feet from the intersection of Jurupa Avenue and Wilderness Avenue to the proposed Wilderness Substation. The new fiber optic telecommunication line would be installed on the new 69 kV subtransmission line poles described above in Section 2.3.2 that would be constructed along both sides of Wilderness Avenue (Wilderness – Jurupa Ave., Segments A and B). This new fiber optic telecommunication line would connect the proposed Wilderness Substation to RPU's existing communication system. Additionally, a new fiber optic telecommunication line would be included as part of the new Wilderness – Mountain View subtransmission line construction.

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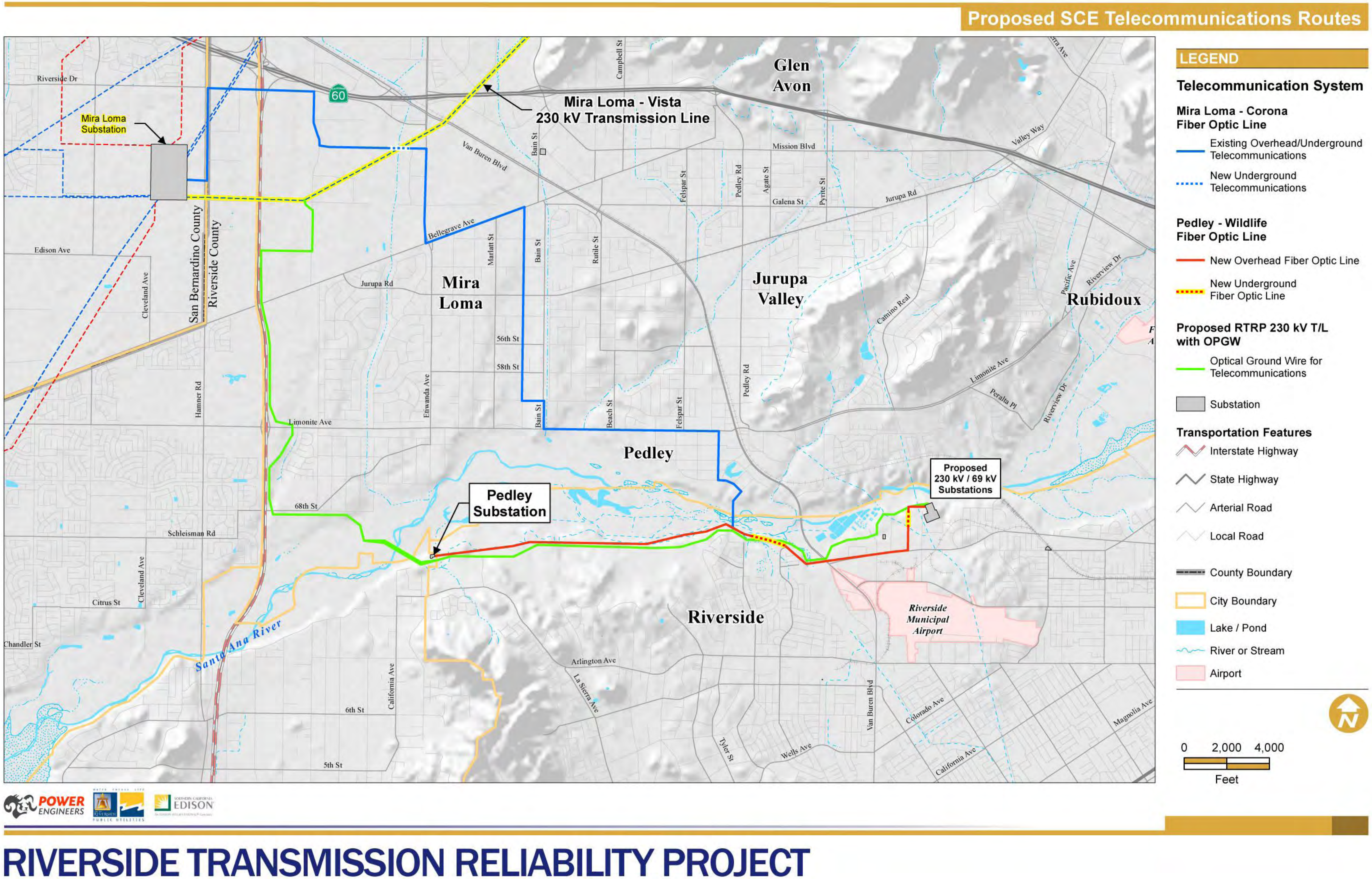
FIGURE 2.3-9 PROPOSED SCE TELECOMMUNICATIONS ROUTES



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2.4 ELECTRICAL AND PHYSICAL CHARACTERISTICS

This section presents a detailed description of the electrical and physical design characteristics of the Proposed Project components introduced in Section 2.3. A summary of the electrical design characteristics of the proposed 230 kV transmission line and 69 kV subtransmission lines is shown in Table 2.4-1. More detailed descriptions follow in Sections 2.4.1 and 2.4.2.

Summary Table 2.4-2 provides an overview of the electrical design characteristics of the secondary components of the proposed 230 kV Wildlife and 230/69 kV Wilderness Substations, followed by a more detailed discussion in Sections 2.4.3 and 2.4.4. The characteristics for the 230 kV transmission line are only estimates, and are subject to change when final engineering is completed.

Electrical characteristics of the proposed upgrades to the four 69 kV substations are described in Section 2.4.5. Details regarding relocation of existing overhead distribution lines are presented in Section 2.4.6. Fiber optic telecommunication line upgrades are discussed in Section 2.4.7.

TABLE 2.4-1. ELECTRICAL DESIGN CHARACTERISTICS OF TRANSMISSION LINES

Feature	230 kV Transmission Line		69 kV Subtransmission Lines
Line Length	**10 miles**		**11 miles**
Type of Structure	57 Tubular Steel Poles (TSPs) 24 Lattice Steel Towers (LSTs)		Single Wood or Steel Pole
Structure Height	90-170 ft (TSPs) 113-180 ft (LSTs)		65-90 ft
Structure Footprint	6-10 ft diameter (TSPs) 34 ft x 34 ft (LSTs)		1.5-6 ft diameter
Span Length	600-800 feet typical Up to 2,200 ft		150-300 ft
Number of Structures per Mile	7-8		20-30
Transmission Line ROW	100 ft		Up to 40 ft
Pulling/Tension Sites	100 x 400 ft		100 x 25 ft
Circuit Configuration	Double-circuit		Double-circuit & Single-circuit
Conductor Size	Double Bundle 1,590 kcmil ACSR[1] 45/7 "Lapwing"		954 kcmil ACSR

1: Aluminum conductor, steel-reinforced
Note: All estimates above are preliminary and are subject to change upon final engineering.

2.4.1 230 KV TRANSMISSION LINE

The proposed 230 kV transmission line would be constructed using structures consisting of single-shaft galvanized steel poles (tubular steel poles or TSPs) or galvanized lattice steel towers (LSTs) bolted to concrete footings. Typical heights range from 90 to 170 feet for the single poles, and approximately 113 to 180 feet for the lattice towers (see Figure 2.4-1); the span length (distance between structures) ranges from 600 to 800 feet typically, and up to 2,200 feet. The longest span would be for the Santa Ana River crossing. In general, longer spans require taller structures. The transmission line would be composed of suspension and dead-end structures. On suspension structures, conductors approach and depart the structures in a straight line. Most structures would fall in this category. Dead-end structures would be used for limited changes in line direction and special crossings. Structure weights would vary with heights and specific load requirements. Approximately 81 transmission structures would be required for the Proposed Project, with approximately 57 of these being TSPs and approximately 24 being LSTs.

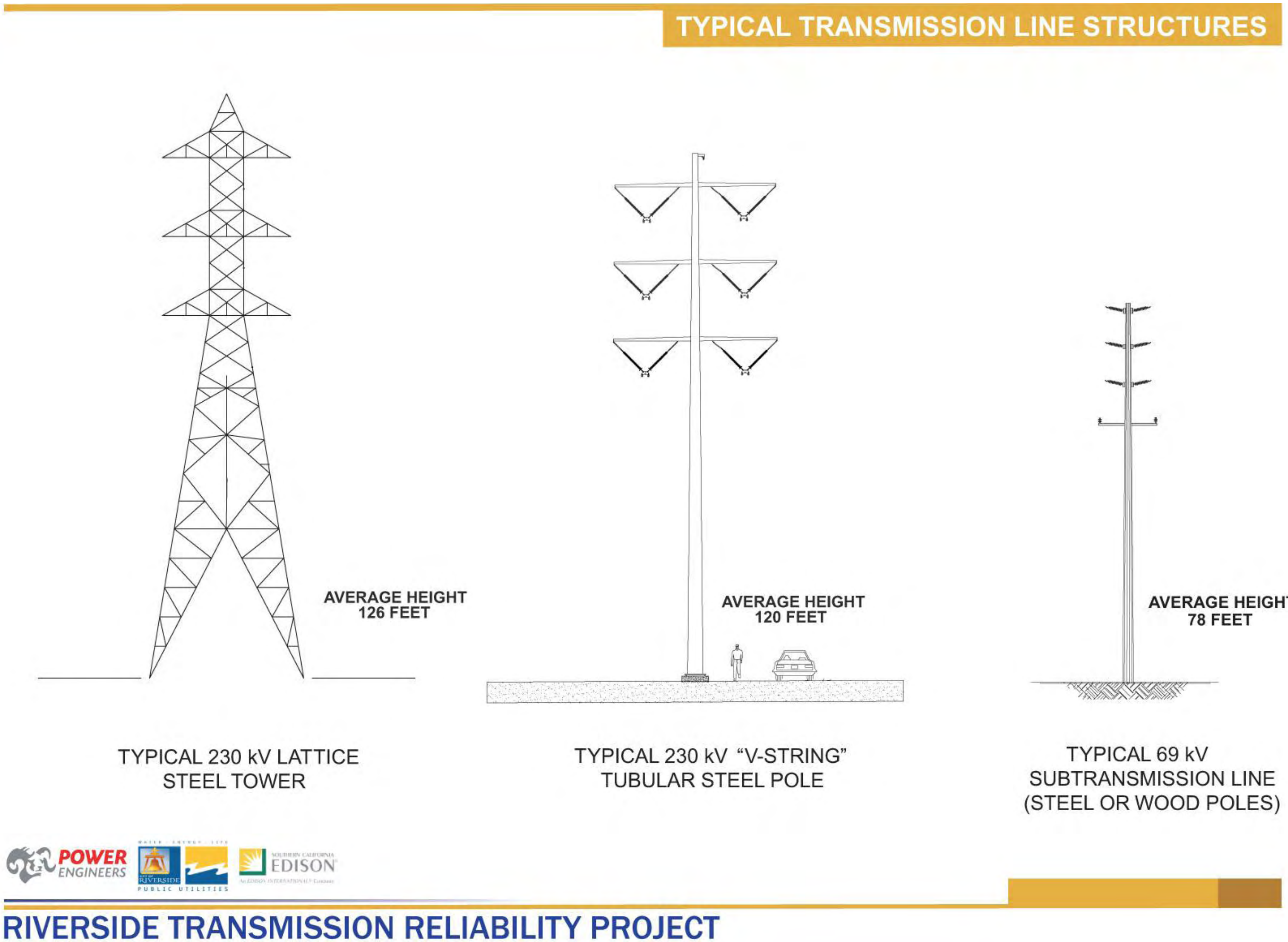
Tubular steel poles are free-standing structures with non-straight shaft foundations. The foundations are particularly well suited to resist large horizontal shear by mobilizing the lateral resistance of the surrounding soil and rock. Foundations vary in diameter from approximately six to ten feet. Lattice steel dead-end towers would require four concrete foundations with an approximate diameter of four feet each. Installation depths would vary according to local soil and geological conditions and structural requirements.

On the dead-end structures, the conductor angle is directly into the tower crossarm and the insulator hardware assembly becomes part of the span. The line continues on the other side of the tower in the same fashion. A conductor jumper is strung between one side of the tower and the other to electrically connect the two spans across the tower.

For suspension structures, the conductor attaches to the bottom of the insulator assembly without making the assembly part of the span. Typical insulator assemblies are I-string and V-string assemblies. I-string assemblies consist of one insulator string hanging vertically from the structure crossarm and offer mostly vertical support to the line. A V-string consists of two insulator strings connected to the structure crossarm in a V configuration. The V-shaped support limits the movement of the conductor during wind and on minor angles, and is more suitable for compact ROWs.

A 100-foot-wide easement would be required for the proposed 230 kV transmission line ROW. The easement width is dictated by requirements for maintenance and safety, and for the swing of the conductors caused by wind (sometimes referred to as “blowout”). For long spans (e.g. river crossings), additional ROW of up to an estimated 280 feet may be required to allow for conductor swing. Areas of additional ROW would not result in additional ground disturbance, vegetation removal, or other direct physical impacts. SCE generally purchases easements from property owners for ROWs. A payment of fair market value would be offered for these easement rights, based upon a value determined by a certified appraiser. Typically, final ROW determination and the property acquisition process are not initiated until after project approval.

FIGURE 2.4-1. TYPICAL TRANSMISSION LINE STRUCTURES



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2.4.2 69 KV SUBTRANSMISSION LINES

The proposed 69 kV subtransmission lines would be constructed using structures consisting of single-shaft galvanized steel or wood poles. Typical heights range from 65 to 90 feet (see Figure 2.4-1), and the typical span length is approximately 150 to 300 feet. As was described for the 230 kV transmission line, the subtransmission lines would be composed of tangent poles, angle structures, and dead-end structures. No LSTs would be used. Structure weights would vary with heights and specific load requirements. Subtransmission structures would be shorter and less massive than the TSPs proposed for the 230 kV transmission portion of the Proposed Project.

All 69 kV pole foundations would be direct-embedded, with the exception of heavy angle and dead-end poles which would be set on drilled pier concrete foundations. The bottom of the poles would vary in diameter from approximately 1.5 to 3.0 feet for tangent and angle poles and between approximately 4.0 and 6.0 feet in diameter for dead-end poles. Installation depths would vary according to local soil and geological conditions and structural requirements.

The 69 kV subtransmission line insulator assemblies would consist of horizontal post insulator assemblies for tangent and light angle structures and suspension dead-end insulator assemblies for dead-end and heavy angle structures.

Up to a 40-foot-wide easement may be required for each of the RTRP 69 kV subtransmission line ROWs. The easement width is dictated by requirements for maintenance and safety and the swing of the conductors caused by wind. To the maximum extent feasible, the new 69 kV subtransmission lines would be constructed in existing public road ROW, such that no additional private ROW would be required. These lines would be constructed overhead on steel and wood poles.

2.4.3 WILDLIFE SUBSTATION

The proposed new Wildlife Substation would be constructed in a four-switchrack-bay arrangement, with two bays in a double-breaker-double-bus configuration and one bay in a breaker-and-a-half configuration. The substation would accommodate the proposed double-circuit 230 kV transmission line from the SCE system and two outgoing lines connected to the RPU Wilderness Substation. The substation would consist of seven 230 kV circuit breakers and associated disconnect switches, rigid and flexible bus connections, and instrument transformers, as well as a MEER. The proposed substation would be enclosed on three sides by a ten-foot-high perimeter wall typically constructed of light-colored decorative blocks, with the fourth side being the shared chain link fence separating the Wildlife Substation from the Wilderness Substation. A band of at least three strands of barbed wire would be affixed near the top of the perimeter wall inside the substation and would not be visible from the outside. Access to the new substation would be at the end of Wilderness Road. Figure 2.4-2 shows the preliminary boundaries and layout of the proposed Wildlife Substation and the adjacent proposed Wilderness Substation. Table 2.4-2 summarizes electrical design characteristics. The Wildlife Substation would be an unattended site.

A 20-foot by 40-foot MEER would be constructed on the site to house protection devices, monitoring equipment, and batteries. The MEER design would be prefabricated sheet metal. Two air conditioning units would be required to prevent overheating of equipment.

Power for substation operation and lighting would be provided from the 12 kV Anderson distribution line from SCE's Glen Avon Substation and station service voltage transformers in Wildlife Substation. Approximately 600 feet of two- to four-inch ducts and one 3-foot by 5-foot pull box would be installed.

In compliance with the Western Riverside County Multi-Species Habitat Conservation Plan (MSHCP), the City would coordinate with the Regional Conservation Authority to ensure compliance with urban interface provisions.

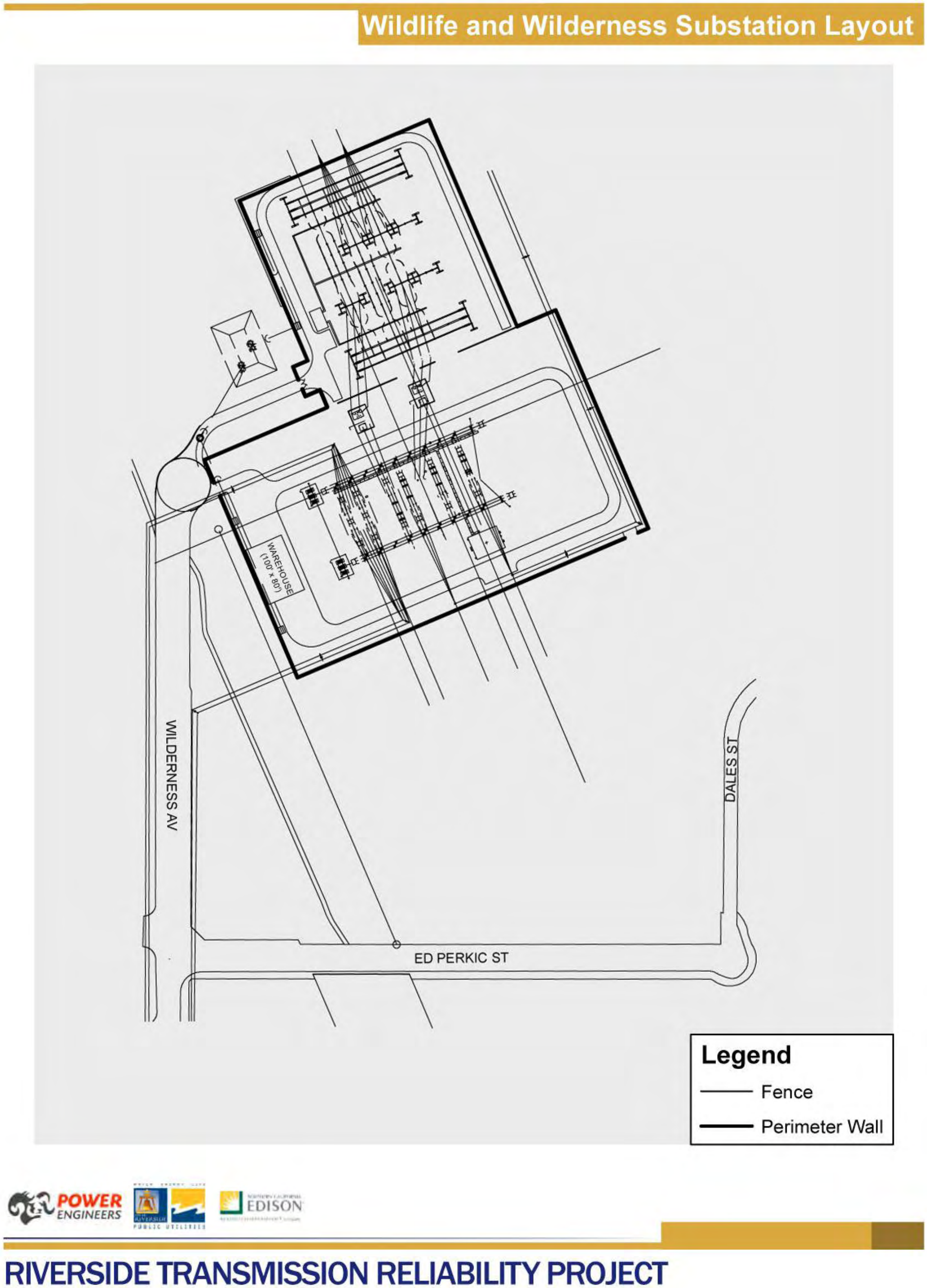
2.4.4 WILDERNESS SUBSTATION

The proposed new Wilderness 230/69 kV Substation would be constructed in a six-bay, breaker-and-a-half configuration. The station would include two 280 megavolt-ampere (MVA) 230/69 kV transformers connected to the incoming 230 kV spans from the adjacent SCE Wildlife Substation. There would be a total of six outgoing 69 kV subtransmission lines, as well as two 69 kV capacitor banks and two grounding transformers. The substation would consist of sixteen 69 kV circuit breakers and associated disconnect switches, rigid and flexible bus connections, and instrument transformers, as well as a control building and storage building for electrical equipment. The substation would be enclosed by a ten-foot block wall on the west, south, and east sides, and chain-link fence with barbed wire on the north side adjacent to the Wildlife Substation (see Figure 2.4-2 and Table 2.4-2). Access to the site would be from Wilderness Avenue, similar to the Wildlife Substation.

Wilderness Substation would be continuous with the graded site supporting the new Wildlife Substation. The overall look of the site MEER facilities and lighting would be similar.

Landscaping would be used to filter the view of the new substation and integrate it into the surroundings. Careful planting would also mitigate potential graffiti problems. In addition, the level area to the south of the perimeter wall would require some sort of ground cover, such as xeriscaping (drought-resistant plants), or possibly a lawn of low-water-use grasses.

FIGURE 2.4-2. PROPOSED WILDLIFE AND WILDERNESS SUBSTATION LAYOUT



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2.4.5 UPGRADES TO EXISTING 69 KV SUBSTATIONS

The following substations would require upgrades, as described, to allow for complete Proposed Project integration, including the incorporation of the new 69 kV subtransmission lines. Preliminary substation drawings illustrating the proposed improvements are included within the Appendices accompanying this DEIR. All proposed upgrades and equipment installations would occur within the existing substation footprint.

- **Harvey Lynn Substation.** The substation would be upgraded to include a new 69 kV circuit breaker and associated equipment to form a new line position for relocation of the existing Freeman line. The existing Freeman line position would be reconfigured to terminate a new line to RERC Substation. New line protection would be installed for both the new and reconfigured lines. A new Substation Automation System (SAS) and digital fault recorder would be integrated into the new and existing equipment.

- **Mountain View Substation**. The substation would be reconfigured to add two new lines to Wilderness Substation. One line would terminate in the existing Riverside line position and the other in the existing Freeman line position. New line protective relaying would be included for the two new Wilderness lines.

- **Freeman Substation.** The substation modifications would include changing the existing Mountain View line into the new Wilderness line and adding a new line to the RERC switchyard. A line bypass switch would be installed to directly connect the Orangecrest and Riverside lines, and bypass the Freeman Substation. The Orangecrest line termination would be disconnected and the new RERC line would be terminated in its place. New line protection would be added for the relocated line and the one new line. A new SAS and digital fault recorder would be integrated into the new and existing equipment.

- **RERC Substation.** Two new lines would be installed and connected to Harvey Lynn Substation and Freeman Substation. The two existing lines connected to Mountain View and Riverside Substations would be reconnected to Wilderness Substation.

2.4.6 RELOCATION OF DISTRIBUTION LINES

To accommodate the new 230 kV transmission line, ten locations would require relocation (and in some cases undergrounding) of existing distribution lines. The proposed locations are described in Section 2.3.5.

Civil

For the locations that require the construction of a trench or vault, excavation activities will generally be done by a backhoe. The anticipated dimensions for trenches are typically 24 inches wide, by approximately 48 inches deep, and by a required and specified length. The depth of the trench would depend on the number of conduits installed. Shields or trench shoring are then temporarily installed for safety to brace the walls of the trench. The conduits would then be installed using spacers to create a ductbank consisting of two columns of three stacked 5-inch conduits apiece. The temporary shoring would be removed.

The specific dimensions for the trenches at each location are provided in the table. Vault excavation is typically three feet greater than the vault's width and length dimensions, as well as four feet deeper than the vault's height. The backhoe would serve the purpose of placing the excavated soil into the dump truck to be hauled away. Calculation of the area of disturbance is approximately 15 feet on either side of trench, as well as on all sides of vaults. The conduits would then be encased in concrete with a minimum encasement of three inches on all sides. After the concrete encasement has hardened, the trench would be backfilled with 1.5 sacks of cement and sand slurry (which is a mix of sand and water with 1.5 bags of cement added with no aggregate) in accordance with the minimum permit requirements as required by the local jurisdiction (e.g. the City) in which the trench is located. Later, the job would be finished as the street would be repaved in accordance with the City's permit requirements. Precast vaults may be installed and backfilled with native soil all around the vaults. During these activities, it is anticipated that water trucks would be used during excavation to control fugitive dust.

Conduit would always be installed in the ductbank. After the civil work of installing the ductbank, vaults, and vent pipes has been completed, SCE's contract or SCE's cable crews would arrive at a later date to pull in three single conductor 1,000 kcmil jacketed aluminum cross-linked polyethylene (CLP) cables per circuit run in one of the 5-inch conduits in the ductbank. To accomplish this, a rodder (cable pulling truck) would be set up at every other vault to pull cable both ways. At opposite ends of every other vault, the cable carousels, would be set up to feed cable both ways. Other distribution crews typically would install the vault grounds; rack the cables; install any switches, any transformers and any other necessary equipment; and make the appropriate cable splices and terminations. Switching would be performed to put the new equipment into service. Lane closures and traffic control permits are often required by local, County and State agencies for cable installations.

Electrical

For the overhead work, poles are typically removed with the use of a boom truck, and then replaced with backfill generally by hand using native soil. Typical pole installation would include the use of a boom truck with an auger to first dig and then set the pole. Once the poles are set, one or more line trucks and a cable (wire) dolly would be used to string the new wire. For underground installations after the civil engineering work is performed, a rodder truck and cable dolly would be used to pull the cable and make it up.

2.4.7 SUBSTATION FIBER OPTIC TELECOMMUNICATIONS

The proposed fiber optic communications system would consist of diverse fiber optic paths, fiber terminating equipment connecting Wildlife Substation to Mira Loma Substation and Vista Substation, and diverse fiber optic links between Wildlife Substation and Wilderness Substation. The fiber paths are discussed in Section 2.3.6.

Fiber Termination Equipment / Fiber Links / Communication Circuit: Multiple fiber terminating equipment would be installed at Wildlife Substation used for the configured fiber ring network. The equipment would include optical interface units and miscellaneous channel units for various substation communication requirements. Separate fiber routes would be built between Wildlife Substation and Wilderness Substation for communication links. Protection circuits would be installed for the new 230 kV transmission line between Wildlife Substation and Wilderness Substation. Other communication circuits would include phone lines, alarms, and required station automation communication.

TABLE 2.4-2. ELECTRICAL DESIGN CHARACTERISTICS OF NEW SUBSTATIONS

Feature	Wildlife Substation	Wilderness Substation
Transformers	0	2
Bays	4	6
230 kV Circuit Breakers	7	0
69 kV Circuit Breakers	0	16
230 kV Line Termination Structures	4	2
Developed Acreage	3.0 acres	6.4 acres

2.5 PROJECT CONSTRUCTION AND OPERATION

All construction work would be performed with conventional construction techniques in accordance with SCE and RPU construction specifications and other industry-specific standards. Construction crews would be required to work within the stipulations of documents governing compliance with regional environmental, storm water pollution prevention, and fire prevention criteria, as well as owner/operator best management practices, standardized environmental protection elements, and those additional mitigation measures outlined within this DEIR.

The workforce necessary for construction of the Proposed Project is anticipated to range from approximately 10 to 100 persons, with an estimated average daily workforce of 50 persons. Tables 2.5-1 and 2.5-2 provide a summary of the labor force requirements for the Proposed Project. A summary of the primary equipment to be used during the various construction activities for the Proposed Project is also provided in Tables 2.5-1 and 2.5-2.

2.5.1 CONSTRUCTION SCHEDULE

Construction of the 230 kV component of the Proposed Project would begin following the necessary approvals, including a Certificate of Public Convenience and Necessity (CPCN), which is required in order for SCE to proceed to construct its components of the Proposed Project. The CPCN is anticipated to be issued in December 2012, at which time SCE would complete final engineering, procurement of equipment, and any required acquisition of land rights. Depending on construction schedule coordination, permitting, variances, agency consultations, and specific mitigation implementation, construction is not anticipated to begin until spring 2014. Construction of the Proposed Project is expected to last between 14 and 18 months.

Construction of the 69 kV component of the Proposed Project would begin following the approvals, and is not anticipated to begin until fall 2012.

Impact analysis for this DEIR was conducted under the assumption that both components would be built with 100% overlap of construction in order to accurately capture potential impacts from a "worst case" scenario. However, it should be noted that this construction scenario with complete overlap is not considered feasible given the project schedules for each segment.

2.5.2 TRANSMISSION/SUBTRANSMISSION LINE CONSTRUCTION

The construction of the proposed 230 kV transmission and 69 kV subtransmission lines would generally follow the sequence of surveying the centerline, constructing access roads (230 kV only), clearing ROW, installing foundations and poles, assembling and erecting towers (230 kV only), stringing, tensioning, clipping conductors, and cleanup and restoration. The entire new 230 kV transmission line would require new ROW and new support structures. In contrast, most sections of the new 69 kV subtransmission lines would be installed on existing ROW, although many of the existing structures would be replaced as part of construction.

Temporary marshalling yards would be needed along or near the proposed transmission lines for construction crews to store materials and vehicles. Access to structure sites for construction and maintenance would be required at several locations along the corridors. Access work, which would take place primarily within the ROW, would consist of making improvements to existing roads, constructing new roads, and constructing spurs to individual structure sites.

Most new permanent access roads are proposed for construction on previously disturbed areas. Any temporary roads constructed would be removed, and the ground would be restored to its original contour when the line is completed. Land rights, usually easements, for access roads would be acquired from property owners as necessary. After the line is built, access roads would also be used for line maintenance. Subtransmission lines are located along or within existing public road ROWs and would not require new access road construction.

The ROW would not be de-vegetated; however, limited cutting of trees and tall brush in the ROW may occur if they interfere with the construction, operation, and maintenance of the transmission line. Trees would be cut outside the ROW only if, due to their height and condition, they may pose a threat to the transmission line. All potential tree cutting within the City of Riverside would require approval by the City's Public Works Department.

TSP and LST structures for the 230 kV transmission lines would be anchored to the ground with concrete footings. Typically, the footing site is excavated, a steel cage and anchor plates or bolts are positioned, and the excavated site is filled with formed concrete. Structures are assembled at the site and lifted into place by a large crane. Drilling mud will be used for wet holes. The structures are bolted to the footings after they are set in place. After transmission structures are in place, conductors are strung from structure to structure through pulleys. Subtransmission line wood poles would be direct-embedded and would not require foundation construction. Subtransmission line steel poles would be a mix of direct-embedded poles and poles requiring foundation construction.

Construction and Workforce Estimates

The estimated elements, number of personnel, and equipment required for construction of the 230 kV portion of the Proposed Project are summarized in Table 2.5-1. Estimates for the 69 kV subtransmission lines are provided in Table 2.5-2.

Construction of the Proposed Project would be performed by either RPU or SCE construction crews or contractors, depending on the availability of utility construction personnel at the time of construction. If RPU or SCE power line and telecommunications construction crews are used, they would likely be based at local facilities or RPU facilities within the City. Contractor construction personnel would be managed by RPU and SCE construction management personnel.

In general, construction efforts would occur in accordance with accepted construction industry and RPU and SCE standards. Construction activities would generally be scheduled during daylight hours, more specifically 6:00 a.m. to 6:00 p.m. (June to September) and 7:00 a.m. to 6:00 p.m. (October to May), Monday through Friday. In the event construction activities need to occur outside the local noise ordinance, SCE would obtain any variance as necessary from appropriate jurisdictions. All materials associated with construction efforts would be delivered by truck to established marshalling yards. Delivery activities requiring major street use would be scheduled to occur during off-peak traffic hours.

TABLE 2.5-1. CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY FOR CONSTRUCTION OF THE PROPOSED 230 KV TRANSMISSION LINE

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Survey (1)				**4**	**11**		**11 Miles**
3/4-Ton Pick-Up Truck, 4x4	275	Gas	2		11	8	1 Mile/Day
Marshalling Yard (2)				**4**			
1-Ton Crew Cab, 4x4	300	Diesel	1		Duration of Project	2	
30-Ton Crane Truck	350	Diesel	1			2	
10,000 lb Rough Terrain Fork Lift	120	Diesel	1			5	
Truck, Semi, Tractor	400	Diesel	1			1	
Roads & Landing Work (3)				**5**	**29**		**7.5 Miles & 81 Pads**
1-Ton Crew Cab, 4x4	300	Diesel	1		29	2	0.5 Mile/Day & 6 Structure Pads/Day
Road Grader	250	Diesel	1		29	4	
Water Truck	300	Diesel	1		29	8	
Backhoe/Front Loader	125	Diesel	1		29	6	
Drum Type Compactor	100	Diesel	1		29	4	
Track Type Dozer	150	Diesel	1		29	6	
Lowboy Truck/Trailer	450	Diesel	1		18	2	
Guard Structure Installation (4)				**6**	**4**		**16 Structures**
3/4-Ton Pick-up Truck, 4x4	275	Gas	1		4	6	4 Structures/Day
1-Ton Crew Cab Flat Bed, 4x4	300	Diesel	1		4	6	
Compressor Trailer	60	Diesel	1		4	6	
Auger Truck	210	Diesel	1		4	6	
Extendable Flat Bed Pole Truck	400	Diesel	1		4	6	
30-Ton Crane Truck	350	Diesel	1		4	8	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Bucket Truck	250	Diesel	1		4	4	
Install Tubular Steel Pole Foundations (5)				**6**	**114**		**57 TSPs**
1-Ton Crew Cab, 4x4	300	Diesel	2		114	2	0.5 TSP/Day
30-Ton Crane Truck	350	Diesel	1		114	5	
Backhoe/Front Loader	125	Diesel	1		114	8	
Auger Truck	210	Diesel	1		114	8	
Water Truck	300	Diesel	1		114	8	
Dump Truck	350	Diesel	1		114	8	
10-cu. yd. Concrete Mixer Truck	350	Diesel	3		114	5	
Steel Pole Haul (6)				**4**	**15**		**57 TSPs**
3/4-Ton Pick-up Truck, 4x4	275	Gas	1		15	5	4 Steel Poles/Day
Crane/Boom Truck	350	Diesel	1		15	6	
40-ft Flat Bed Truck/ Trailer	400	Diesel	1		15	8	
Steel Pole Assembly (7)				**8**	**29**		**57 TSPs**
3/4-Ton Pick-up Truck, 4x4	275	Gas	2		29	5	2 Steel Poles/Day
1-Ton Crew Cab, 4x4	300	Diesel	2		29	5	
Compressor Trailer	60	Diesel	1		29	5	
Crane/Boom Truck	350	Diesel	1		29	6	
Steel Pole Erection (8)				**8**	**29**		**57 TSPs**
3/4-Ton Pick-up Truck, 4x4	275	Gas	2		29	5	2 Steel Poles/Day
1-Ton Crew Cab, 4x4	300	Diesel	2		29	5	
Compressor Trailer	60	Diesel	1		29	5	
80-Ton Rough Terrain Crane	275	Diesel	1		29	6	
Install LST Foundations (9)				**7**	**48**		**24 LSTs**
1-Ton Crew Cab Flat Bed, 4x4	300	Diesel	2		48	2	0.5 LST/Day
Crane/Boom Truck	350	Diesel	1		48	5	
Backhoe/Front Loader	125	Diesel	1		48	8	
Auger Truck	210	Diesel	1		48	8	
Water Truck	300	Diesel	1		48	8	
Dump Truck	350	Diesel	1		48	8	
10-cu. yd. Concrete Mixer Truck	350	Diesel	3		48	5	
LST Steel Haul (10)				**4**	**24**		**24 LSTs**
1-Ton Crew Cab, 4x4	300	Diesel	1		24	2	1 LST/Day
Rough terrain (RT) Crane/Fork Lift	125	Diesel	1		24	6	
40-ft Flat Bed Truck/ Trailer	400	Diesel	1		24	8	

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Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
LST Steel Assembly (11)				**10**	**48**		**24 LSTs**
3/4-Ton Pick-up Truck, 4x4	275	Gas	2		48	4	0.5 LST/Day
1-Ton Crew Cab, 4x4	300	Diesel	2		48	4	
RT Crane/Fork Lift	125	Diesel	1		48	6	
30-Ton RT Crane	215	Diesel	1		48	8	
Compressor Trailer	60	Diesel	1		48	6	
LST Erection (12)				**12**	**24**		**24 LSTs**
3/4-Ton Pick-up Truck, 4x4	275	Gas	2		24	5	1 LST/Day
1-Ton Crew Cab, 4x4	300	Diesel	3		24	5	
Compressor Trailer	60	Diesel	1		24	6	
80-Ton RT Crane	275	Diesel	1		24	6	
Modify Existing LST (13)				**10**	**10**		**1 LST**
3/4-Ton Pick-up Truck, 4X4	275	Gas	2		10	4	0.1 LST/Day
1-Ton Crew Cab, 4x4	300	Diesel	2		10	4	
Crane/Boom Truck	350	Diesel	1		10	8	
Bucket Truck	250	Diesel	2		10	8	
Sag Cat w/ 2 winches	350	Diesel	2		10	2	
Compressor Trailer	60	Diesel	1		10	6	
Install Conductor & OPGW (14)				**55**	**32**		**11 Circuit Miles**
3/4-Ton Pick-up Truck, 4x4	275	Gas	4		32	4	0.35 Mile/Day
1-Ton Crew Cab, 4x4	300	Diesel	6		32	4	
Wire Truck/Trailer	350	Diesel	4		21	4	
Bucket Truck	250	Diesel	4		32	8	
Crane/Boom Truck	350	Diesel	4		32	8	
Rough Terrain Crane	215	Diesel	2		32	4	
Dump Truck	350	Diesel	1		32	4	
3 Drum Sock Line Puller	300	Diesel	1		11	6	
Bull Wheel Puller	525	Diesel	1		21	6	
Static Truck/ Tensioner	350	Diesel	1		32	6	
Splicing Rig	350	Diesel	1		9	8	
Backhoe/Front Loader	120	Diesel	1		32	3	
Sag Cat w/ 2 winches	350	Diesel	2		16	2	
Lowboy Truck/Trailer	450	Diesel	3		16	4	
Hughes 500 E Helicopter		Jet A	1		18	6	
Fuel, Helicopter Support Truck	300	Diesel	1		18	4	
Guard Structure Removal (15)				**6**	**3**		**16 Structures**
3/4-Ton Pick-up Truck, 4x4	275	Gas	1		3	6	6 Structures/Day
1-Ton Crew Cab, 4x4	300	Diesel	1		3	6	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Compressor Trailer	60	Diesel	1		3	6	
Extendable Flat Bed Pole Truck	400	Diesel	1		3	6	
Crane/Boom Truck	350	Diesel	1		3	8	
Bucket Truck	250	Diesel	1		3	4	
Restoration (16)				**7**	**11**		**11 Miles**
1-Ton Crew Cab, 4x4	300	Diesel	2		11	2	1 Mile/Day
Road Grader	250	Diesel	1		11	6	
Water Truck	300	Diesel	1		11	8	
Backhoe/Front Loader	125	Diesel	1		11	6	
Drum Type Compactor	100	Diesel	1		11	6	
Track Type Dozer	150	Diesel	1		11	6	
Lowboy Truck/Trailer	450	Diesel	1		11	3	

Crew Size Assumptions:

#1 Survey = one 4-man crew	#9 Install Foundations for Lattice Steel Towers = one 7-man crew
#2 Marshalling Yards = one 4-man crew	#10 Lattice Steel Tower Steel Haul = one 4-man crew
#3 Roads & Landing Work = one 5-man crew	#11 Lattice Steel Tower Assembly = one 10-man crew
#4 Guard Structure Installation = one 6-man crew	#12 Lattice Steel Tower Erection = one 12-man crew
#5 Install Foundations for Tubular Steel Poles = one 7-man crew	#13 Modify Existing Lattice Steel Tower = one 10-man crew
#6 Steel Pole Haul = one 4-man crew	#14 Conductor & OHGW/OPGW Installation = one 55-man crew
#7 Steel Pole Assembly = one 8-man crew	#15 Guard Structure Removal = one 6-man crew
#8 Steel Pole Erection = one 8-man crew	#16 Restoration = one 7-man crew

TABLE 2.5-2. CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY FOR CONSTRUCTION OF THE PROPOSED 69 KV SUBTRANSMISSION LINES

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
69 kV Subtransmission Line Construction (Wilderness – Mountain View, Wilderness-Jurupa Segments A&B)							
Construction Inspection				**1**	**75**	**6**	
Truck, Pick-up	180	Gas	1				Duration of project
Marshalling Yards				**3**	**75**		
Forklift, 5 tons (T)	75	Diesel	1			2	Duration of project
Forklift, 10T	85	Diesel	1			4	
Hydraulic Crane RT, 25-35T	125	Diesel	1			2	
Truck, Crew Cab, Flatbed, 1-Ton	180	Gas	1			3	
Truck, Flatbed, 2T	210	Diesel	1			3	
Truck, Semi, Tractor	310	Diesel	1			3	
Trailer, Flatbed, 40-ft	n/a	n/a	1			n/a	
Office Trailer	n/a	n/a	1			n/a	
Survey				**2**	**10**	**4**	
Truck, Pick-up	180	Gas	1				5-6 sites per day
Dig Holes / Foundation Installation				**15**	**50**		
Truck, Pick-up	210	Diesel	2			4	1-2 sites per day
Truck, Crew Cab, Flatbed, 1T	210	Diesel	3			3	
Loader, Front End, w/bucket	165	Diesel	1			4	
Digger, Transmission Type, Truck Mount	190	Diesel	1			6	
Back Hoe, w/bucket	85	Diesel	1			3	
Truck, Flatbed, 2T	210	Diesel	1			3	
Truck, Flatbed w/Boom, 5T	235	Diesel	1			4	
Crane, Hydraulic, RT, 25-35T	125	Diesel	1			2	
Truck, Concrete, 10 Yd	310	Diesel	2			5	
Truck, Dump, 10T	235	Diesel	1			3	
Truck, Semi, Tractor	310	Diesel	1			3	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Motor, Auxiliary Power	5	Gas	2			1	
Trailer, Flatbed, 40-ft	n/a	n/a	1			n/a	
Trailer, Lowboy, 30-ft	n/a	n/a	2			n/a	
Trailer, Storage, 40-ft	n/a	n/a	2			n/a	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Install Steel Structure (Hauling, Assembly, Erection)				**8**	**25**		
Crane, Hydraulic, RT, 25-35T	125	Diesel	3			4	1-2 sites per day
Truck, Flatbed w/Boom, 5T	235	Diesel	1			4	
Truck, Pick-up	180	Gas	4			4	
Truck, Crew Cab, Flatbed, 1T	180	Gas	2			3	
Truck, Semi, Tractor	310	Diesel	2			5	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Trailer, Flatbed, 40-ft	n/a	n/a	2			n/a	
Trailer, Storage, 40-ft	n/a	n/a	1			n/a	
Remove Existing Conductors and Structures				**8**	**5**		
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	2			4	2-4 sites per day
Truck, Flatbed w/ Boom, 5T	235	Diesel	2			4	
Tension Machine	135	Diesel	1			3	
Truck, Wire Take Up, Respooler	310	Diesel	1			3	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1			3	
Truck, Semi, Tractor	310	Diesel	2			5	
Trailer, Lowboy, 30-ft	n/a	n/a	2			n/a	
Trailer, Flatbed, 40-ft	n/a	n/a	2			n/a	
Truck, Crew Cab, Flatbed, 1T	180	Gas	2			3	
Truck, Pick-Up	180	Gas	2			3	
Loader, Front End, w/Bucket	165	Diesel	1			5	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Truck, Dump, 10T	235	Diesel	1			5	
Crane, Hydraulic, Rough Terrain, 25-35T	125	Diesel	1			4	
Motor, Auxiliary Power	5	Gas	1			2	
Guard Poles				**6**	**10**		
Truck, Flatbed w/ Boom, 5T	235	Diesel	1			4	As required for duration of work
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	1			4	
Back Hoe, w/ Bucket	85	Diesel	1			3	
Truck, Dump, 10T	235	Diesel	1			2	
Truck, Semi, Tractor	310	Diesel	1			4	
Trailer, Flatbed, Pole, Expandable	n/a	n/a	1			n/a	
Digger, Distribution Type, Truck Mount	190	Diesel	1			3	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Truck, Crew Cab, Flatbed, 1T	210	Diesel	1			4	
Air Compressor	75	Gas	1			2	
Install Conductors				**15**	**25**		
Truck, Flatbed, w/Bucket, 5T	235	Diesel	2			6	0.15 mile per day
Tension Machine, Conductor	135	Diesel	1			2	
Truck, Wire Puller, 3 Drum	310	Diesel	1			2	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1			2	
Truck, Semi, Tractor	310	Diesel	2			4	
Trailer, Lowboy, 30’	n/a	n/a	3			n/a	
Trailer, Lowboy & Reel Stand	n/a	n/a	1			n/a	
Trailer, Flatbed, 40-ft	n/a	n/a	2			n/a	
Crawler, Track Type, Sagging (D8 type)	305	Diesel	1			2	
Truck, Crew Cab, Flatbed, 1T	180	Gas	3			4	
Truck, Pick-Up	180	Gas	2			5	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Trailer, Storage, 40-ft	n/a	n/a	2			n/a	
Crane, Hydraulic, RT, 25-35T	125	Diesel	2			3	
Motor, Auxiliary Power	5	Gas	2			2	
Transfer Existing Facilities				**6**	**5**		
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	2			5	2-3 sites per day
Truck, Pick-Up	180	Gas	1			3	
Truck, Crew Cab, Flatbed, 1T	180	Gas	1			3	
Truck, Line, w/Dist. Materials, 1-2T	260	Diesel	1			3	
Cleanup				**3**	**10**		
Truck, Dump, 10T	235	Diesel	2			4	8-10 locations per day
Loader, Front End, w/Bucket	165	Diesel	1			4	
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	1			4	
Truck, Crew Cab, Flatbed, 1T	180	Gas	1			4	
69 kV Subtransmission Line Construction (RERC – Harvey Lynn - Freeman)							
Construction Inspection				**1**	**250**	**6**	
Truck, Pick-up	180	Gas	1				Duration of project

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Marshalling Yards				**3**	**250**		
Crane, Hydraulic, Rough Terrain, 25-35T	125	Diesel	1			2	Duration of project
Truck, Semi, Tractor	310	Diesel	1			3	
Trailer, Flatbed, 40-ft	n/a	n/a	1			n/a	
Forklift, 5T	75	Diesel	1			2	
Forklift, 10 T	85	Diesel	1			4	
Truck, Crew cab, Flatbed, 1T	180	Gas	1			3	
Truck, Flatbed, 2T	210	Diesel	1			3	
Trailer, Office, 40 - 60-ft	n/a	n/a	1			n/a	
Survey				**2**	**40**	**4**	
Truck, Pick-up	180	Gas	1				5-6 sites per day
Dig Holes / Foundation Installation				**15**	**160**		
Digger, Transmission Type, Truck Mount	190	Diesel	1			6	1-2 sites per day
Truck, Flatbed, 2T	210	Diesel	1			3	
Truck, Concrete, 10 Yd	310	Diesel	2			5	
Truck, Flatbed w/Boom, 5T	235	Diesel	1			3	
Loader, Front End, w/Bucket	165	Diesel	1			4	
Crane, Hydraulic, Rough Terrain, 25-35T	125	Diesel	1			2	
Truck, Semi, Tractor	310	Diesel	1			3	
Trailer, Flatbed, 40-ft	n/a	n/a	1			n/a	
Trailer, Lowboy, 30-ft	n/a	n/a	2			n/a	
Back Hoe, w/ Bucket	85	Diesel	1			3	
Truck, Dump, 10T	235	Diesel	1			3	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Truck, Pick-Up	210	Diesel	2			4	
Truck, Crew cab, Flatbed, 1T	210	Diesel	3			4	
Motor, Auxiliary Power	5	Gas	2			1	
Trailer, Storage, 40-ft	n/a	n/a	2			n/a	
Install Steel Structure (Hauling, Assembly, Erection)				**8**	**95**		
Crane, Hydraulic, Rough Terrain, 25-35T	125	Diesel	3			4	1-2 sites per day
Truck, Flatbed w/Boom, 5T	235	Diesel	1			4	
Truck, Pick-Up	180	Gas	4			4	
Truck, Crew Cab, Flatbed, 1 T	180	Gas	2			3	
Truck, Semi, Tractor	310	Diesel	2			5	
Trailer, Flatbed, 40-ft	n/a	n/a	2			n/a	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Trailer, Storage, 40-ft	n/a	n/a	1			n/a	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Remove Existing Conductors and Structures				**8**	**40**		
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	2			4	2-4 sites per day
Truck, Flatbed w/ Boom, 5T	235	Diesel	2			4	
Tension Machine	135	Diesel	1			3	
Truck, Wire Take Up, Respooler	310	Diesel	1			3	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1			3	
Truck, Semi, Tractor	310	Diesel	2			5	
Trailer, Lowboy, 30-ft	n/a	n/a	2			n/a	
Trailer, Flatbed, 40-ft	n/a	n/a	2			n/a	
Truck, Crew Cab, Flatbed, 1T	180	Gas	2			3	
Truck, Pick-Up	180	Gas	2			3	
Loader, Front End, w/Bucket	165	Diesel	1			5	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Truck, Dump, 10T	235	Diesel	1			5	
Crane, Hydraulic, Rough Terrain, 25-35T	125	Diesel	1			4	
Motor, Auxiliary Power	5	Gas	1			2	
Guard Poles				**6**	**20**		
Truck, Flatbed w/ Boom, 5T	235	Diesel	1			4	As required for duration of work
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	1			4	
Back Hoe, w/ Bucket	85	Diesel	1			3	
Truck, Dump, 10T	235	Diesel	1			2	
Truck, Semi, Tractor	310	Diesel	1			4	
Trailer, Flatbed, Pole, Expandable	n/a	n/a	1			n/a	
Digger, Distribution Type, Truck Mount	190	Diesel	1			3	
Truck, Crew Cab, Flatbed, 1T	210	Diesel	1			4	
Air Compressor	75	Gas	1			2	
Install Conductors				**15**	**80**		
Truck, Flatbed, w/Bucket, 5T	235	Diesel	2			6	0.15 mile per day
Tension Machine, Conductor	135	Diesel	1			2	
Truck, Wire Puller, 3 Drum	310	Diesel	1			2	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1			2	
Truck, Semi, Tractor	310	Diesel	2			4	
Trailer, Lowboy, 30-ft	n/a	n/a	3			n/a	

Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Trailer, Lowboy & Reel Stand	n/a	n/a	1			n/a	
Trailer, Flatbed, 40’	n/a	n/a	2			n/a	
Crawler, Track Type, Sagging (D8 type)	305	Diesel	1			2	
Truck, Crew Cab, Flatbed, 1T	180	Gas	3			4	
Truck, Pick-Up	180	Gas	2			5	
Truck, Mechanics, 1-2T	260	Diesel	1			6	
Trailer, Storage, 40’	n/a	n/a	2			n/a	
Crane, Hydraulic, RT, 25-35T	125	Diesel	2			3	
Motor, Auxiliary Power	5	Gas	2			2	
Transfer Existing Facilities				**6**	**40**		
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	2			5	2-3 sites per day
Truck, Pick-Up	180	Gas	1			3	
Truck, Crew Cab, Flatbed, 1T	180	Gas	1			3	
Truck, Line, w/Dist. Materials, 1-2T	260	Diesel	1			3	
Install Underground				**6**	**60**		
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	1			3	As required for duration of work
Truck, Cable Puller, 1 Drum	310	Diesel	1			3	
Truck, Semi, Tractor	310	Diesel	1			3	
Truck, Concrete, 10 Yd	310	Diesel	2			5	
Trailer, Lowboy, w/Reel Stand, 30’	n/a	n/a	2			n/a	
Trailer, Splicing, 5th Wheel, 24’	n/a	n/a	1			n/a	
Truck, Crew Cab, Flatbed, 1T	180	Gas	1			3	
Truck, Pick-Up	180	Gas	3			3	
Loader, Front End, w/Bucket	165	Diesel	1			6	
Truck, Mechanics, 1-2T	260	Diesel	1			4	
Truck, Dump, 10T	235	Diesel	2			6	
Crane, Hydraulic, Rough Terrain, 45T	235	Diesel	1			2	
Trailer, Storage, 40’	n/a	n/a	3			n/a	
Motor, Auxiliary Power	5	Gas	2			2	
Cleanup				**3**	**30**		
Truck, Dump, 10T	235	Diesel	2			4	8-10 locations per day
Loader, Front End, w/Bucket	165	Diesel	1			4	
Truck, Flatbed, w/ Bucket, 5T	235	Diesel	1			4	

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Work Activity				Activity Production			
Primary Equipment Description	Estimated Horse-Power	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Schedule (Days)	Duration of Use (Hrs/Day)	Estimated Production Per Day
Truck, Crew Cab, Flatbed, 1T	180	Gas	1			4	

Construction Plan

Construction of the Proposed Project would include activities associated with land survey, substation site construction, installation of new transmission structures, and telecommunications installations. In addition, construction support activities, such as the establishment of marshalling yards and the development of access roads and spur roads to reach construction sites, would be required.

Specific structure height, material, mass, and spacing would be determined upon final engineering and would be constructed in compliance with CPUC General Order (GO) 95 and other factors including, but not limited to:

- length of span between poles (230 kV average span of 676 feet; 203-foot minimum span and 2,200-foot maximum span)
- length of span between poles (69 kV average span of 150 to 300 feet)
- ground clearances pursuant to GO 95, SCE and RPU construction standards
- overhead clearances pursuant to GO 95, SCE and RPU power-line construction standards
- wind loading
- distance between angle points
- conductor type
- number and voltage of electrical lines installed on structures

Because construction of the Proposed Project would disturb a surface area greater than one acre, a National Pollutant Discharge Elimination System (NPDES) permit would be required, specifically the Construction General Permit (Order No. 2009-0009-DWQ). In order to acquire coverage under this permit, a Storm Water Pollution Prevention Plan (SWPPP) that includes specific project information, monitoring and reporting procedures, and Best Management Practices (BMPs), such as dewatering procedures, storm water runoff quality control measures, and concrete waste management, as necessary, would be prepared. The SWPPP would be based on final engineering design by both SCE and RPU and would include all Proposed Project components.

Construction Schedule

230 kV Components (SCE)

SCE anticipates that construction of the proposed 230 kV portion of the Proposed Project (which includes the transmission line, Wildlife Substation, and associated telecommunications work) would take approximately 370 working days. Construction would commence following CPUC and regulatory agency approval, final engineering, and procurement activities.

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69 kV Components (RPU)

RPU anticipates that construction of components of the proposed 69 kV portion of the Proposed Project (which includes the subtransmission lines, Wilderness Substation, substation upgrades, and associated telecommunications work) could begin following publication of the Notice of Determination on the Final EIR by the RPU Board and Riverside City Council, including any conditions of approval and statements of overriding considerations (anticipated early 2012). Completion would be timed to synchronize completion date with the 230 kV portion of the Proposed Project, anticipated to be May 2015.

Surveying

Prior to construction, a survey would be conducted to determine centerline location, specific structure locations, tower leg elevations, ROW boundaries, work area boundaries, and access roads to work areas. Specific areas identified during the surveys would be marked with painted laths or flags. Marks would be maintained and would remain in place until final cleanup and restoration is completed.

Marshalling Yards

Construction of the Proposed Project transmission lines would begin with the establishment of approximately two temporary marshalling yards located at strategic points along the route. RPU, SCE, or their contractors may utilize additional construction yards as needed to optimize construction efficiency. See Figure 2.5-1 for proposed locations.

Each yard would be used as a reporting location for workers, and for vehicle and equipment parking and material storage. The yards would have offices for supervisory and clerical personnel. Normal maintenance of construction equipment would be conducted at these yards. The maximum number of workers reporting to any one yard is not expected to exceed approximately 60 workers at any one time. Each yard would be approximately 2 to 20 acres in size, depending on land availability and intended use. Preparation of the marshalling yards would include the application of road base, depending on existing ground conditions at the yard site, and the installation of perimeter fencing.

At peak construction, most of the vehicles could occupy the yards listed. Approximately 60 private commuting vehicles would also be parked at the yard. Crews would load materials onto work trucks and drive to the line position being worked. At the end of the day, they would return to the yard in their work vehicles and depart in their private vehicles.

Materials stored at the marshalling yards would include:

- Construction trailers
- Construction equipment and hand-held power equipment
- Steel
- Wood Poles
- Conductors / Wire Reels
- OPGW cable
- Hardware
- Insulators

- Signage
- BMP materials, such as straw wattles, gravel, and silt fences
- Portable sanitation facilities
- Waste materials for salvaging, recycling, or disposal
- Personal Protective Equipment (PPE) and safety-related equipment (e.g., extinguishers, ear/eye protection)
- Hazardous materials such as fuels, lubricants, joint compound, and cleaning solvents

In addition to the primary marshalling yards, temporary secondary material staging yards would be established for short-term utilization near construction sites. Where possible, the secondary staging yards would be sited in areas of previous disturbance along the construction corridors. Final siting of these yards would depend upon availability of appropriately zoned property that is suitable for this purpose. The number and size of the secondary yards would be dependent upon a detailed ROW inspection and would take into account, where practical, suggestions by the successful bidder for the work. Typically, an area approximately one to three acres would be required. Once sites for secondary yards are proposed, clearance surveys for sensitive biological resources, cultural resources, geotechnical evaluation, and previously unidentified hazards would be conducted before final site selection. Preparation of the secondary staging yards would include installation of perimeter fencing; the application of road base may also occur, depending on existing ground conditions at the yard site. Land disturbed at the temporary material staging areas, if any, would be restored to preconstruction conditions following the completion of construction for the Proposed Project.

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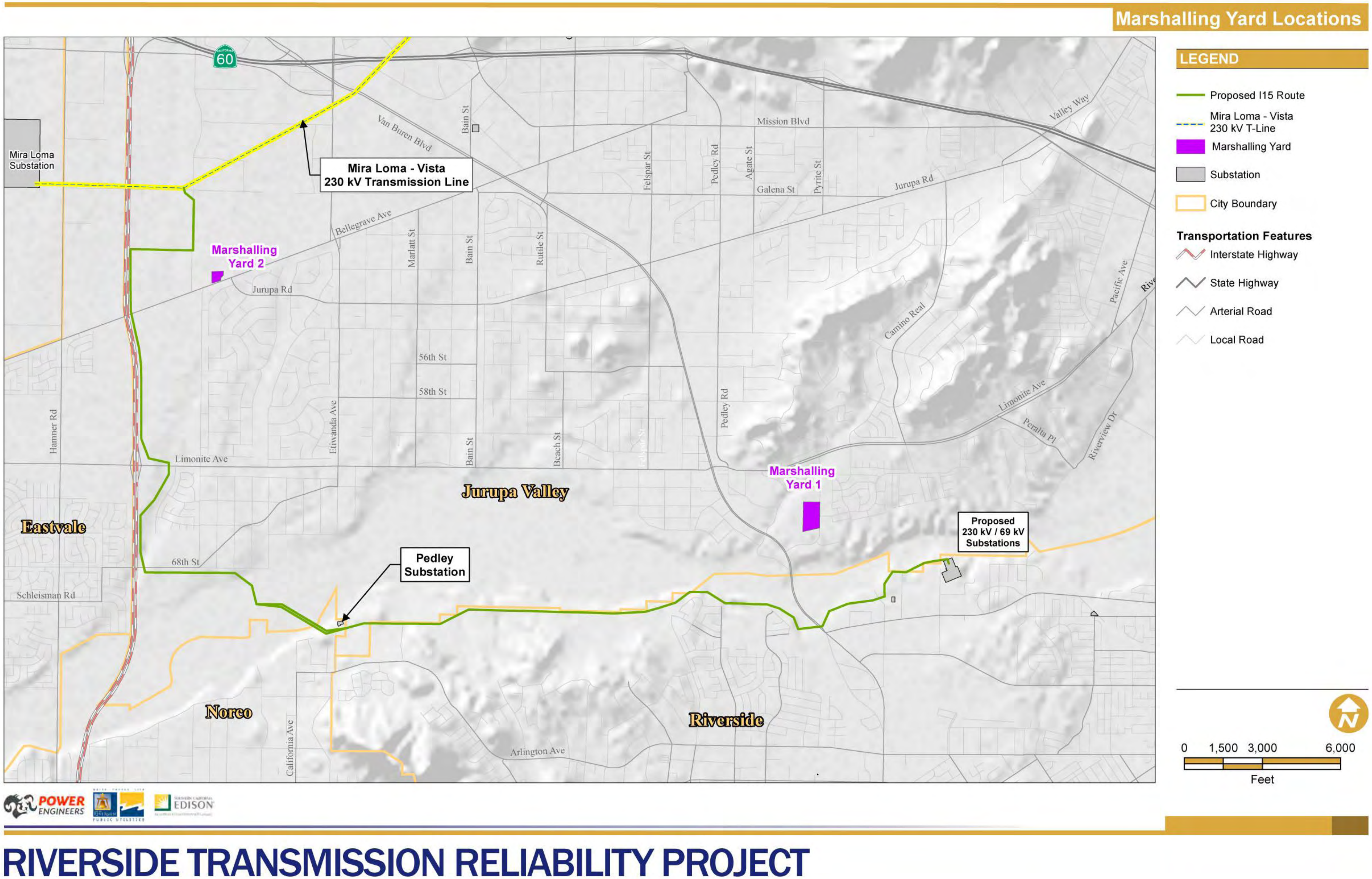
FIGURE 2.5-1. MARSHALLING YARD LOCATIONS



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Guard Structures

Guard structures may be installed at transportation, flood control, and utility crossings. Guard structures are temporary facilities designed to stop the movement of a conductor should it momentarily drop below a conventional stringing height. Temporary netting could be installed to protect some types of under-built infrastructure. Typical guard structures are standard wood poles, 60 to 80 feet tall; depending on the width of the conductor being installed, the number of guard poles installed on either side of a crossing would be between two and four. The guard structures are removed after the conductor is clipped into place. In some cases, the wood poles could be substituted with the use of specifically equipped boom-type trucks with heavy outriggers staged to prevent the conductor from dropping.

Public agencies differ on their policies for preferred methods to protect public safety during conductor stringing operations. For highway and open channel aqueduct crossings, RPU and SCE would work closely with the applicable jurisdiction to secure the necessary permits to string conductor across the applicable infrastructure. For major roadway crossings, typically one of the following four methods is employed to protect the public:

- Erection of a highway net guard structure system, if required;
- Detour of all traffic off a highway at the crossing position;
- Implementation of a controlled continuous traffic break while stringing operations are performed; or
- Strategic placement of special line trucks with extension booms.

Based on a review of the number of road crossings that would be needed along the proposed 230 kV transmission line route, SCE has estimated that approximately 16 guard structures would be installed to facilitate construction. Please note that these estimates are preliminary, as the types of guard structures that would be required for crossings and the number of crossings necessary would be field-verified upon completion of final design. RPU estimates that 14 guard structures would be installed to facilitate construction of the 69 kV subtransmission lines.

Traffic Control

Construction activities completed within public street ROWs would require the use of a traffic control service and all lane closures would be conducted in accordance with local ordinances and city permit conditions. These traffic control measures are typically consistent with those published in the California Joint Utility Traffic Control Manual, 2010 (CJUTCM).

Access Roads and Spur Roads

Transmission line construction and maintenance access roads are classified into 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 line ROWs. Spur roads are roads that lead from line access roads and terminate at one or more TSP/LST sites. As stated above, subtransmission lines are located along or within existing public road ROWs and would not require new access road construction.

The Proposed Project includes construction of 230 kV transmission lines on both existing ROW and new ROW. Where construction would take place on existing ROW, it is assumed that most of the existing access roads as well as spur roads would be used. However, it is also assumed that rehabilitation work would be necessary in some locations for existing roads to accommodate construction activities. This work may include:

- Re-grading and repair of existing access and spur roads. These roads would be cleared of vegetation, blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable width of 14 feet with two feet of shoulder on each side as required.
- Drainage structures, such as wet crossings, water bars, overside drains and pipe culverts, would be installed to allow for construction traffic usage, as well as prevent road damage due to uncontrolled water flow.
- Slides, washouts, and other slope failures would be repaired and stabilized by installing retaining walls or other means necessary to prevent future failures. The type of structure to be used would be based on specific site conditions.

Where construction would take place in new ROW, new access and spur roads would be necessary to access the transmission line structure locations. Similar to rehabilitation of existing roads, all new road alignments would first be cleared and grubbed of vegetation. Roads would be blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment.

Graded roads would have a minimum drivable width of 14 feet, with two feet of shoulder on each side, resulting in a total width of 18 feet as required. Some roads may be wider depending on final engineering requirements and field conditions. Eighteen feet was used for ground disturbance estimates.

Access and spur road gradients would be leveled so that any sustained grade does not exceed 12 percent. Grades of approximately 14 percent would be permitted when such grades do not exceed 40 feet in length and are located more than 50 feet from any other excessive grade or any curve.

All curves would have a radius of curvature of not less than 50 feet, measured at the center line of the usable road surface. For these roads, the road surface may be widened based on final engineering. Spur roads would usually have turnaround areas near the structure locations. Longer or slightly wider spur roads may be needed in some locations. All dead-end spur roads over 500 feet long would include a Y-type or circle-type turnaround.

In addition, drainage structures (e.g., wet crossings, water bars, overside drains, pipe culverts, energy dissipaters) would be installed along spur and access roads to allow for construction equipment usage as well as to prevent erosion from uncontrolled water flow. Slides, washouts, and other slope failures would be repaired and stabilized along the roads by installing retaining walls or other means necessary to prevent future failures. The type of mechanically stabilized earth-retaining structure to be used would be based on site-specific conditions.

It is anticipated that most of the roads constructed to accommodate new construction would be left in place to facilitate future access for operations and maintenance purposes. Gates would be installed where required at fenced property lines to restrict general and recreational vehicular access to road ROWs.

Construction roads across areas that are not required for future maintenance access would be removed and restored after construction is completed. An example of this type of road would be a road constructed to provide access to a splice location during wire-stringing operations. Splice locations are used to remove temporary pulling splices and install permanent splices once the conductor is strung through the stringing travelers located on transmission structures. Access roads to splice locations are sometimes required when a splice location is not accessible from an access or spur road.

Access roads constructed within the Federal Emergency Management Agency designated 100-year flood zone would be designed as aggregate base roads. Access roads designed as aggregate base roads would be excavated to a depth of approximately 18 inches. Ten to twelve inches of soil would be restored and compacted to 95% density, establishing the subgrade. Then, a six- to eight-inch aggregate road base would be placed and compacted to at least 95% relative density over the subgrade.

Access roads constructed within the Federal Emergency Management Agency designated 10-year flood zone would be designed on a case-by-case basis to determine which may require aggregate base roads. Access road construction in these areas would only occur where there is no practical alternative.

Approximately 7.5 miles of new access road is estimated for construction and maintenance activities resulting in 16.4 acres of land disturbance. This land disturbance is assumed permanent and will not be restored after construction is complete.

Site Preparation (230 kV Transmission Line)

The new transmission structure locations would first be graded and/or cleared to provide a reasonably level and vegetation-free surface for footing construction. Sites would be graded such that water would drain naturally away from the site. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the tower footings. The graded area would be compacted to at least 90 percent relative density, and would be capable of supporting heavy vehicular traffic.

Erection of the transmission structures may also require establishment of a temporary crane pad. This crane pad would be located within the laydown area used for structure assembly and occupy an area of approximately 50 feet by 50 feet (0.06 acre). The crane pad would be located adjacent to, and set up approximately 60 feet from, the centerline of each structure. The pad may also be cleared of vegetation and graded as necessary to provide a level surface for crane operation. The decision to use a separate crane pad will be determined during final engineering for the Proposed Project.

In steep areas, benching may be required to provide access for footing construction, assembly, erection, and wire-stringing activities during line construction. Benching is a technique in which a tracked earth-moving vehicle excavates a terraced access to structure excavations in extremely steep and rugged terrain. It would be used minimally and for two purposes:

- To help ensure the safety of personnel during construction activities; and
- To control costs in situations where potentially hazardous manual excavations would be required.

230 kV Tubular Steel Pole (TSP) Installation

Approximately 57 new TSPs would be installed in the 230 kV portion of the Proposed Project. Each structure would require a single-drilled, poured-in-place, concrete footing that would form the structure foundation. Actual footing diameters and depths for each of the structure foundations would depend on the soil conditions and topography at each site and would be determined during final engineering.

The foundation process starts with the drilling of the holes for each structure. The holes would be drilled using truck or track-mounted excavators with various diameter augers to match the foundation diameter and depth as specified in the final engineering design drawings. TSP footings would project approximately zero to four feet above ground level depending on the structure location and the geological hazards in the vicinity. The excavated material may be distributed at each structure site and/or used in the rehabilitation or building of access roads. Alternatively, the excavated soil may be disposed of at an off-site disposal facility in accordance with all applicable laws.

Following excavation of the foundation footings, steel-reinforced cages would be set, survey positioning would be verified, and concrete would then be placed. Steel-reinforced cages would be assembled at laydown yards, if not previously fabricated, and delivered to each structure location by flatbed truck. Typically, TSP foundations would require approximately 20 to 80 cubic yards of concrete delivered to each structure location.

Slight to severe ground caving is anticipated along the preferred route during the drilling of the TSP foundations due to the presence of loose soils. The use of water, fluid stabilizers, drilling mud and/or casings will be made available to control ground caving and to stabilize the sidewalls from sloughing. If fluid stabilizers are utilized, the mud slurry will be added in conjunction with the drilling. The concrete for the foundation is then pumped to the bottom of the hole, displacing the mud slurry. The mud slurry brought to the surface is typically collected in a pit adjacent to the foundation and/or collected by vacuum truck to be reused or discarded at an off-site disposal facility in accordance with all applicable laws (refer to Table 2.5-1).

During construction, existing concrete supply facilities would be used where feasible. Concrete samples would be drawn at the time of the pour and tested to ensure engineered strengths were achieved. A normally specified SCE concrete mix typically takes approximately 20 working days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence erection of the structure.

A minimum of forty eight hours prior to drilling for foundations, SCE or the Contractor would contact Underground Service Alert to identify any underground utilities in the construction zone.

Structure Assembly

TSPs consist of separate base and top sections for ease of construction. Steel pole installation would begin by transporting the individual pole sections on flatbed trucks from the staging area to each structure location. The individual pole sections would be unloaded by a crane and placed on the ground in the temporary laydown area at each new pole location. The laydown area for TSPs is typically 200 feet by 100 feet (0.46 acre). While on the ground, where possible, the top section of the pole would be pre-configured with the necessary insulators and wire-stringing hardware. A crane would then be used to position each pole base section on top of previously prepared foundations. After the base section is secured, the top section would be set onto the base section. The two sections may be spot welded together for additional stability as per the manufacturer's recommendations.

230 kV Lattice Steel Towers

To construct the 230 kV portion of the Proposed Project, installation of approximately 24 new LSTs would be required. Assembly and erection of LSTs typically require a temporary laydown area of approximately 200 feet by 200 feet (0.92 acre). In areas where the terrain in the laydown area is reasonably level, vegetation removal may occur to prepare the site for construction. In areas where the terrain is uneven, both vegetation clearing and grading may be necessary to prepare the LST site for construction.

Foundations

Each LST structure would require multiple-drilled, poured-in-place, concrete footings that form the structure foundation. Structure foundations for each LST would consist of four concrete footings. The foundation process would start with the drilling of the holes for each type of structure. The holes would be drilled using truck or track-mounted excavators with various diameter augers to match the diameter requirements of the structure type. On average, each footing for an LST structure would project approximately one to four feet above ground level. The maximum depth below ground level for the various types of structures is expected to be approximately 60 feet. Actual footing depths for the structure foundation would depend on the soil conditions and topography at each site and would be determined during final engineering.

Drilling of the foundations in soft or loose soil, as well as foundations that extend below the groundwater level, may be stabilized with the use of water, fluid stabilizers, drilling mud and/or casings to keep the sidewalls from sloughing. If fluid stabilizers are utilized, the mud slurry will be added in conjunction with the drilling. The concrete for the foundation is then pumped to the bottom of the hole, displacing the mud slurry. The mud slurry brought to the surface is typically collected in a pit adjacent to the foundation and/or collected by vacuum truck to be reused or discarded at an off-site disposal facility in accordance with all applicable laws.

Following excavation of the foundation footings, steel-reinforced cages and stub angles would be set, survey positioning would be verified, and concrete would then be placed. Steel-reinforced cages and stub angles would be assembled at laydown yards, if not previously fabricated, and delivered to each structure location by flatbed truck. Typically, LSTs would require 25 to 100 cubic yards of concrete delivered to each structure location, depending upon the type of structure being installed.

As with the TSP footings, concrete samples for LSTs would be drawn at time of pour and tested to ensure engineered strengths were achieved. A normally specified SCE concrete mix typically takes approximately 20 working days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence erection of steel.

During construction, existing concrete supply facilities and local suppliers would be used where feasible.

Conventional construction techniques would generally be used as described above for new footing installation. Prior to drilling for foundations, SCE, or its Contractor, would contact Underground Service Alert to identify any underground utilities in the construction zone.

An area of approximately 0.04 acre would be required to accommodate the four footings necessary for each LST foundation. The area occupied by each LST would be approximately 34 feet by 34 feet (1,156 square feet or 0.03 acre).

Structure Assembly and Erection

The LSTs included as part of the Proposed Project would be assembled within the laydown areas at each site, and then erected and bolted to the foundations. Structure assembly would begin with hauling and stacking the bundles of steel at structure location per engineering drawing requirements. This activity requires use of several tractors with 40-foot trailers and a rough terrain forklift. After steel is delivered and stacked, crews would proceed with assembly of leg extensions, body panels, boxed sections, and the bridges. Assembled sections would be lifted into place with a large crane and secured by a combined erection and torquing crew. The construction crew may opt to install insulators and wire rollers (travelers) at this time.

Conductor Installation

A "conductor" is a wire or combination of wires not insulated from one another, suitable for carrying an electric current (ANSI/IEE Std 100-1977). Wire-stringing includes all activities associated with the installation of conductors. This activity includes the installation of primary conductor and OPGW or ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Insulators and stringing sheaves (rollers or travelers) are attached as part of the wire-stringing activity if the work is a part of a reconductoring effort; otherwise they are typically attached during the steel erection process. Wire-stringing activities would be conducted in accordance with SCE specifications, which is similar to process methods detailed in IEEE Standard 524-2003, Guide to the Installation of Overhead Transmission Line Conductors. A standard wire-stringing plan includes a sequenced program of events starting with determination of wire pulls and wire pull equipment set-up positions. Advanced planning by supervision determines circuit outages, pulling times, and safety protocols needed for ensuring that safe and quick installation of wire is accomplished.

Typically, wire pulls occur every 9,000-17,000 feet on flat terrain or less in rugged terrain. Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected, where possible, based on availability of dead-end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setups. In some cases, it may be preferable to select an equipment setup position between two suspension structures. Anchor rods would then be installed to provide dead-ending capability for wire sagging purposes, and also to provide a convenient splicing area.

To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire-stringing activities.

The following four steps describe the wire installation activities proposed by SCE:

- Step 1: Sock Line, Threading: A helicopter would fly a lightweight sock line from structure to structure, which would be threaded through the wire rollers in order to engage a cam-lock device that would secure the pulling sock in the roller. This threading process would continue between all structures through the rollers of a particular set of spans selected for a conductor pull.

- Step 2: Pulling: The sock line would be used to pull in the conductor pulling cable. The conductor pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel. A piece of hardware known as a running board would be installed to properly feed the conductor into the roller; this device keeps the bundle conductor from wrapping during installation.

- Step 3: Splicing, Sagging, and Dead-ending: After the conductor is pulled in, all midspan splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to structures.

- Step 4: Clipping-In: After the conductor is dead-ended, the conductors would be attached to all tangent structures; a process called clipping in.

As noted above, the threading step of wire installation would require the use of one helicopter. On average, the helicopter would operate approximately six hours per day during stringing operations. The operations area of the helicopter would be limited to staging areas and are considered safe locations for landing. Final siting of staging areas for the Proposed Project would be conducted with the input of the helicopter contractor, affected private landowners, and land management agencies. The size of each staging area would be dependent upon the size and number of structures to be removed and installed. Staging areas would likely change as the work progresses along the transmission lines.

Helicopter fueling would occur at a local airport and would be supervised by the helicopter fuel service provider.

The dimensions of the area needed for the stringing setups associated with wire installation are variable and depend upon terrain. The preferred minimum size needed for tensioning equipment set-up sites requires an area of 400 feet by 100 feet. The preferred minimum size needed for pulling equipment set-up sites requires an area of 300 feet by 100 feet. The preferred minimum size needed for splicing equipment set-up sites requires an area of 150 feet by 100 feet. However, crews can work from within slightly smaller areas when space is limited. Each stringing operation would include one puller positioned at one end, and one tensioner and wire reel stand truck positioned at the other end. Splicing sites would be strategically located to support the stringing operations; splicing sites include specialized support equipment such as skidders and wire crimping equipment.

The puller, tensioner, and splicing set-up locations are used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each structure, and are necessary as the permanent splices that join the conductor together cannot travel through the rollers. For stringing equipment that cannot be positioned at either side of a dead-end transmission structure, field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension.

The puller, tensioner, and splicing set-up locations require level areas to allow for maneuvering of the equipment. When possible, these locations would be located on existing level areas and existing roads to minimize the need for grading and cleanup.

The puller, tensioner, and splicing set-up locations associated with the Proposed Project would be temporary and the land would be restored to its previous condition following completion of pulling and splicing activities. Estimates of the land disturbance associated with this activity for the proposed and alternate routes are provided in Table 2.5-3. The final number and locations of the puller, tensioner, and splicing sites will be determined during final engineering for the Proposed Project and the construction methods chosen by SCE or its Contractor would be in accordance with industry standards.

An overhead OPGW would be installed on the transmission line for shielding and communication purposes. The OPGW would be installed in the same manner as the conductor; it is typically installed in continuous segments of up to 19,000 feet or less if installed in conjunction with the conductor, depending upon various factors, including line direction, inclination, and accessibility. Following installation of the OPGW, the strands in each segment are spliced together to form a continuous length from one end of a transmission line to the other. At a splice location, the fiber cables are routed down a structure leg where the splicing occurs. The splices are housed in a splice box (typically a 3-foot x 3-foot x 1-foot metal enclosure) that is mounted to one of the structure legs some distance above the ground. On the last structure at each end of a transmission line, the overhead fiber cable is spliced to another section of fiber cable that runs in underground conduit from the splice box into the communication room inside the adjacent substation.

Construction and Post-Construction Cleanup

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be kept covered and regularly removed from the sites and disposed of according to applicable regulations. Petroleum-based products used during construction would be handled and disposed of according to applicable regulations. Major vehicle maintenance would not be conducted on the ROW. Other than periodic servicing, refueling, and minor adjusting, all vehicle maintenance would be completed at the staging yard or other repair facility.

Construction of the Proposed Project would result in the generation of various waste materials that can be recycled and salvaged. These items would be gathered by construction crews and separated into roll-off boxes. Salvageable items (i.e., conductor, steel, and hardware) would be transported to the material staging yards, sorted, and baled, and then sold through available markets. Items that may be recycled include: nuts, bolts, washers, and other small hardware; the conductor wire; and the hardware (i.e., shackles, clevises, yoke plates, links, or other connectors used to support the conductor).

Construction of the Proposed Project would also generate waste materials that cannot be reused or recycled (i.e., wood, soil, vegetation, and sanitation waste); local waste management facilities would be used for the disposal of these types of construction waste. The disposal of any hazardous waste would be done at an appropriate facility.

All construction materials and debris would be removed from the area and recycled or properly disposed of off-site. SCE and RPU would conduct a final inspection to ensure that cleanup activities are successfully completed.

Any damage to existing roads as a result of construction would be repaired once construction is complete.

Hazardous Materials

Construction and operation 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. For all hazardous materials in use at the construction site, Material Safety Data Sheets would be made available to all site workers.

The SWPPP prepared for the Proposed Project would provide detail of locations that hazardous materials may be stored during construction, and the protective measures, notifications, and cleanup requirements for any accidental spills or other releases of hazardous materials that could occur.

A Spill Prevention, Control, and Countermeasure (SPCC) plan would be designed for the Proposed Project if the hazardous materials on-site exceed 1,320 gallons. Additionally, a Hazardous Materials Business Plan would be written if the flammable materials stored on the Proposed Project site exceed 55 gallons.

Site Restoration

Disturbed areas within the ROW would be graded and reseeded or stabilized to control water and wind erosion. Where native habitats are impacted, native cover will be restored to equal or exceed adjacent habitats. Efforts would be made to restore the land to its original contour and to restore natural drainage along the ROW as required. BMPs and environmental protections would control the introduction and spread of invasive weeds into natural habitats, minimizing the need for intensive restoration efforts to control weeds. Marshalling yards would be restored to preconstruction conditions in accordance with approved plans. Land restoration would involve the personnel and equipment as shown in Table 2.5-1. Crews would be instructed to protect plants, wildlife, and other resources of significance. Reseeding and other erosion control may be installed mechanically (e.g. hydroseeding, imprinting, seed drilling) or by hand (e.g. erosion control blankets, jute sandbags). See Environmental Protection Elements in Table 3.2.4-4 in Chapter 3 of this document.

Land Disturbance

Land disturbance would include the surface modifications at the proposed substation site, the installation of access and/or spur roads, and the installation of the 230 kV transmission line structures. 69 kV subtransmission lines would be constructed within public road ROWs or heavily disturbed areas and are not expected to disturb any previously undisturbed areas or unpaved areas.

Land disturbance would be associated with the construction activities as part of the Proposed Project. Some disturbance would be temporary in nature, such as disturbance associated with the laydown areas and crane pads associated with TSP assembly and erection, and the land would be restored following construction. Other disturbance would be permanent in nature, as the land would remain in a designated use following completion of construction. Examples of permanent disturbance would be structure footings and access and/or spur roads.

The 230 kV transmission line portion of the Proposed Project would temporarily disturb a total of approximately 56.1 acres and result in permanent disturbance to a total of approximately eight acres, plus access and spur roads, as noted in Table 2.5-3.

TABLE 2.5-3. LAND DISTURBANCE ESTIMATES FOR NEW 230 KV TRANSMISSION LINE

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Structures	16	75 ft x 50 ft	1.4	1.4	0
Construct New Lattice Steel Tower[1]	24	200 ft x 200 ft	22	17.2	4.8
Construct New Tubular Steel Pole[2]	57	200 ft x 100 ft	26.2	22.8	3.4
Modify Existing Lattice Steel Tower[3]	1	200 ft x 200 ft	0.7	0.7	0.0
230 kV Conductor & OPGW Stringing Setup Area - Puller[4]	17	300 ft x 100 ft	11.7	11.7	0
230 kV Conductor & OPGW Stringing Setup Area - Tensioner[4]	17	400 ft x 100 ft	15.6	15.6	0
230 kV Conductor Field Snub Area[5]	2	50 ft x 50 ft	0.1	0.1	0.0
New Roads (Downline, Access, & Spur)[6]	7.5	linear miles x 18 ft wide	16.4	0	16.4
Yard-1 - Material & Equipment Staging Area[7]	1	15 acres	n/a	n/a	0
Yard-2 - Material & Equipment Staging Area[7]	1	4 acres	n/a	n/a	0
Total Estimated[8]			**94.1**	**69.5**	**24.6**

Notes:

1. Includes foundation installation, structure assembly & erection, conductor & OPGW installation; area to be restored after construction, portion of ROW within 25 ft of the LST to remain cleared of vegetation, approximately 0.2 acre would be permanently disturbed for each LST.
2. Includes foundation installation, structure assembly & erection, conductor & OPGW installation; area to be restored after construction, portion of ROW within 25 ft of the TSP to remain cleared of vegetation, approximately 0.06 acre would be

permanently disturbed for each TSP.

3. Includes structure modification & assembly, and OPGW installation; area to be restored after construction, existing portion of ROW within 25 ft of the LST footings to remain cleared of vegetation; this structure has pre-existing permanently disturbed area for ongoing O&M access by SCE.
4. Based on 9,000 ft conductor reel lengths, number of circuits, and route design.
5. Includes anchoring and dead-end hardware and/or equipment needed to temporarily secure conductor wire to the correct tension.
6. Based on length of road in miles x road width of 14 ft with 2 ft of shoulder on each side of road.
7. Material/Staging yards are located in previously disturbed areas.
8. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described project feature, the width of the existing ROW, or the width of the proposed ROW; they are subject to revision based upon final engineering and review of the project by SCE's Construction Manager and/or contractor awarded project.

Footing Volume and Area Calculations:
LST depth +/- 60 ft deep, 4-ft diameter, qty 4 per LST: earth removed for footing = +/- 28 cu. yds. x 4 = 112 cu. yds.; surface area = 12.57 sq. ft. x 4 = 50.28 sq. ft.
TSP depth +/- 60 ft deep, 10-ft diameter, qty 1 per TSP: earth removed for footing = +/- 175 cu. yds.; surface area = 78.54 sq. ft.

2.5.3 NEW SUBSTATION CONSTRUCTION

Construction of the new Wildlife and Wilderness Substations would consist of site grading and development (per the approved site grading plans under a grading permit issued by the City of Riverside), installing electrical conduits for equipment power and control, and installing structures and equipment. Equipment required for substation construction would include backhoes, drill rigs, concrete trucks, flatbeds, and trucks. Cranes, man-lifts, portable-welding units, line trucks, and mechanic trucks would also be required. For each new substation, construction would require an estimated 5 1/2 months with approximately 20 workers.

Although the proposed substation site is relatively level, to prepare the site for construction, cut and fill of the current site would be required to create a level surface from existing contours. To the maximum extent possible, excavated material would be maintained on site. Earth would be cut from high areas and used to fill low areas. An estimated 44,900 cubic yards would be cut; fill would involve 43,600 cubic yards. Additionally, approximately 12,090 cubic yards of overlying soil would be hauled off site. Proper disposition of excess fill would be the responsibility of the selected contractor. The final surface would be graded to specifications and developed with crushed rock within the walled area. All grading activity would be in compliance with the City's Grading Code.

Following site grading and development, reinforced concrete foundations would be installed to support the electrical equipment and control facilities. It is estimated that approximately 1,000 cubic yards of concrete would need to be delivered to the substation site for the foundations. Foundation work would require approximately 320 trips to the site by 40-ton, 10-yard capacity concrete trucks over an approximate 150-day working period. Subsequent to the foundation installation, trenches would be dug to facilitate placement of copper conductors for the station-grounding mat. During equipment installation all laydown areas would be within the proposed substation perimeter.

2.5.4 SUBSTATION UPGRADE CONSTRUCTION AND FIBER OPTIC INSTALLATION

69 kV Substation Upgrades

Construction work to upgrade the existing substations would occur within the existing boundaries so that no grading or site development work would be needed outside the substation footprint. Concrete foundations would be installed in the substations requiring additional outdoor equipment such as circuit breakers, instrument transformers, and steel structures. Following foundation installation, below-ground conductor and conduit would be installed. Steel structures would then be erected, and electrical equipment and buswork would be installed. Additional substation control and protection equipment and wiring would be installed within the existing control buildings.

Fiber Optic Telecommunication Lines

Fiber optic communication lines would be strung on subtransmission and distribution structures using powered pulling equipment at one end and powered braking or tensioning equipment at the other end, along with a bucket truck.

Fiber Optic Telecommunication Line Construction

Fiber optic cable stringing includes all activities associated with the installation of cables onto the overhead wood pole structures. This activity includes the installation of vibration dampeners, and suspension and dead-end hardware assemblies. Stringing sheaves (rollers or travelers) are attached during the framing process. A standard wire stringing plan includes a sequenced program of events starting with determination of cable pulls and cable pulling equipment set-up positions. At this time, exact locations of the pulling locations are not yet engineered.

Typically, fiber optic cable pulls occur every 6,000 feet to 10,000 feet on flat or steep terrain. Fiber optic cable splices are required at the end and beginning of each cable pull. "Fiber optic cable pulls" are the length of any given continuous cable installation process between two selected points along the overhead or underground structure line. Fiber optic cable pulls are selected, where possible, based on availability of pulling equipment and designated dead-end structures at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of fiber optic cable stringing and splicing equipment set ups. The dimensions of the area needed for stringing set ups varies depending upon the terrain; however, a typical stringing setup is 40 feet by 60 feet. Where necessary due to suitable space limitations, crews can work from within a substantially smaller area. Table 2.5.4 shows the expected construction equipment to be used for the fiber optic telecommunication line construction and the estimated equipment usage

Underground telecommunications cabling would be installed in new underground conduits using trenching. A backhoe would excavate an 18-inch wide, 36-inch deep trench in preparation for conduit installation. PVC conduit would be placed in the trench, a layer of slurry would be poured over the conduit for additional protection, and then the trench would be backfilled with excavated soil and compacted. Each underground section would begin and end with an underground manhole or pullbox. For manholes and pullboxes, a hole of approximately five feet by five feet by six feet would be excavated, the manhole or pullbox would be lowered into place and connected to the conduit, and then backfilled with excavated soil and compacted. To install the fiber optic cable in existing and new underground conduits, a high-density polyethylene smooth-wall innerduct would be used to facilitate installation and to protect and help identify the cable. The innerduct would be installed first inside the conduit, and then the fiber optic cable would be installed inside the innerduct. Installation of underground fiber optic cable would require one four-person crew and two trucks. Table 2.5.5 shows the anticipated ground disturbance for the fiber optic telecommunication line.

Mira Loma Substation, Pedley Substation and the new Wildlife Substation would be used as staging/laydown area for fiber optic cable construction. There are existing access roads to the distribution line poles to be used for stringing the ADSS fiber optic cable from Pedley Substation to Wildlife Substation.

TABLE 2.5-4. RTRP FIBER OPTICS

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equip. Quantity	Estimated Activity Schedule (Work Days unless otherwise noted)	Estimated Equipment Usage Time (Hour Per Day)
Fiber (Sheaves, Stringing, Deadending, Clipping, Dampers, Splicing, underground construction)					
Truck, Flatbed, w/ Bucket, 5 Ton	300	Diesel	1	20	8
Truck, Pick-Up	300	Diesel	2	30	4
Truck, Pick-Up (Edison Carrier Solutions)	300	Gas	1	20	4
Back Hoe, w/ Bucket	150	Diesel	1	20	8
Compressor	50	Gas	1	15	6
Tesla cable stringing Truck (Edison Carrier Solutions [ECS])	300	Diesel	2	35	8
Splicing Van (ECS)	300	Diesel	3	7	8
TOTALS				**147**	**46**

TABLE 2.5-5. RTRP FIBER OPTIC GROUND DISTURBANCE TABLE

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acre Disturbed During Construction	Acre to Be Restored	Acre Permanently Disturbed
200 ft of underground cable duct for fiber cable entry to Pedley Substation	1	1.5 ft x 200 ft	0.0069	0.0069	0
500 ft of underground cable duct for fiber cable entry to Wildlife Substation	1	1.5 ft x 500 ft	0.0172	0.0172	
1,000 ft of underground cable duct south of Santa Ana River under the cable crossing area	1	1.5 ft x 1,000 ft	0.0344	0.0344	
900 ft of underground cable duct under the cable crossing area on Harrell St	1	1.5 ft x 900 ft	0.0310	0.0310	
400 ft of underground cable duct under the cable crossing area south of Pedley Substation	1	1.5 ft x 400 ft	0.0138	0.0138	
300 ft of underground cable duct under the cable crossing area west of Pedley Substation	1	1.5 ft x 300 ft	0.0103	0.0103	
600 ft of underground cable duct under the cable crossing area west of substation between Peyton Ave and Wilderness Ave	1	1.5 ft x 600 ft	0.0207	0.0207	
Underground vaults	6	6 ft x 6 ft	0.0050	0	0.0050

Project Feature	Site Quantity	Disturbed Acreage Calculation (L x W)	Acre Disturbed During Construction	Acre to Be Restored	Acre Permanently Disturbed
Work area for underground vaults and fiber pulling area	2	40 ft x 60 ft	0.1102	0.1102	0
Work area for fiber pulling of six miles of ADSS pole line construction	4	40 ft x 60 ft	0.2204	0.2204	0
Total Estimated			**0.4698**	**0.4649**	**0.0050**

2.6 OPERATION AND MAINTENANCE

The Proposed Project would not require any additional personnel during operation of the new transmission facilities. Operation and maintenance of the Proposed Project would involve periodic inspections. Maintenance of the transmission lines would be performed on an as-needed basis, and could include maintenance of access roads and erosion control measures.

SCE would operate and maintain the Proposed Project 230 kV transmission lines and Wildlife Substation, and RPU would operate and maintain all of the Proposed Project 69 kV subtransmission lines and Wilderness Substation. Both SCE and RPU would operate and conduct maintenance in accordance with existing procedures. Wildlife and Wilderness Substations would be unattended sites.

To properly maintain and operate its system, SCE and RPU require all-weather/all-season access to its facilities. This is particularly critical in Proposed Project areas subject to effects of extreme weather events, such as flood zones.

Restoration procedures following completion of repair work would be similar to those prescribed for normal construction. Crews would be instructed to protect plants, wildlife, and other identified resources of significance. Best Available Control Measures (BACMs) would be used to reduce noise, dust, and vehicle traffic during operation and maintenance activities by the utilities.

2.6.1 FIRE PROTECTION

The transmission line segment may pose a fire hazard if vegetation or other obstructions come in contact with energized electrical equipment. These facilities would be constructed and maintained in a manner consistent with CPUC G.O. 95 and CPUC G.O. 165.

SCE participates with the California Department of Forestry and Fire Protection, California Office of Emergency Services, U.S. Forest Service, and various city and county fire agencies in the Red Flag Fire Prevention Program, and complies with California Public Resources Code (CPRC) Sections 4292 and 4293 related to vegetation management in transmission line corridors.

RPU operates its current substation, subtransmission and distribution system in accordance with CPRC Sections 4291, 4292 and 4293. Additional circuits added to existing structures, new 69 kV subtransmission segments and other Proposed Project features would operate consistent with RPU's existing fire management program.

2.6.2 PERMITTED USES

After the transmission lines have been energized, land uses that are compatible with safety regulations could be permitted in and adjacent to the ROW. Incompatible land uses within transmission line ROW include, but are not limited to, construction and maintenance of inhabited dwellings, and any use requiring changes in surface elevation that would affect existing or planned facilities.

2.6.3 SAFETY

Safety is a primary concern in the design and construction of transmission lines and substations. Transmission lines would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection is provided by overhead groundwires along the line. Electrical equipment and fencing at the substations would be grounded. All metal fencing and gates crossing or within the transmission line ROWs would be grounded to prevent shock potential.

2.7 ENVIRONMENTAL PROTECTION

Both RPU and SCE employ a variety of measures as standard practice to avoid and minimize potential impacts associated with their infrastructure projects. Some of these are integral to construction and operations and maintenance methodologies and are described in their appropriate Proposed Project description sections above. Others are best management practices (BMPs) and general environmental protection elements (EPEs) applied as circumstances arise throughout the Proposed Project, as standard practice. Where BMPs and EPEs fail to reduce environmental impacts to below significant levels, specific mitigations have been developed to further protect the environment.

Proposed Project-related impacts are identified and analyzed in detail in Chapter 3. General impact assessment methodology and mitigation development are described in Section 3.1.2.

2.8 AGENCY PERMITS

Federal, state, and local regulations and permit requirements would be applicable to construction and operation of the Proposed Project. Construction contractors would be required to comply with all applicable requirements, as well as obtain and comply with terms contained within required permits. Table 2.9-1 lists the major federal, state, and local permits, approvals, and consultations identified for the construction and operation of the Proposed Project and alternatives. The list of permits in Table 2.9-1 was based on analysis that included reasonably foreseeable parameters and impacts of the Proposed Project, and may be modified following final engineering and agency coordination. It is likely that those agencies listed in Table 2.9-1 would use this DEIR for making a determination on the necessary permits or approvals.

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TABLE 2.9-1. POTENTIAL PERMITS AND APPROVAL FOR THE PROPOSED PROJECT AND ALTERNATIVES

Agency/Department	Permits/Approval	Action Associated With or Required For Approval
FEDERAL AGENCIES		
U.S Fish and Wildlife Service (USFWS)	Biological Assessment, Section 10 Consultation, Biological Opinion (Federal Endangered Species Act [FESA])	Activity where there may be effects on federally- listed endangered / threatened / proposed species or their designated Critical Habitat (applies to projects with federal involvement).
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources.
U.S. Army Corps of Engineers (USACE)	Section 404 Permit (CWA, 33 USC 1341)	Discharge of dredge/fill into Water of the States, including wetlands.
National Park Service (NPS)	Land and Water Conservation Fund conversion application	Ongoing discussion and negotiations with State and County parks and the NPS. Land exchange or other mitigation tbd.
Advisory Council of Historic Preservation	Section 106 Consultation, National Historic Preservation Act (NHPA)	Opportunity to comment if project may affect cultural resources listed or eligible for listing National Register of Historic Places.
Federal Aviation Administration (FAA)	Form 7460-1	File form.
	Notice of Proposed Construction or Alteration filed with FAA	Requires submittal of a notice identifying any structures that, because of construction or alteration, may be a hazard to air transportation.
	Helicopter Lift Plan	Required for helicopter operations in urban locations.
STATE AGENCIES		
California Public Utilities Commission	Certificate of Public Convenience and Necessity	Project approval and construction of the 230 kV transmission line and substation.
State Water Resources Control Board, Regional Water Quality	Construction General Permit (Order No. 2009-0009-DWQ)	Storm water discharges associated with construction activity disturbing more than one acre of land.
	Waste Discharge Requirements (Water Code1300 *et seq.*)	Discharge of water that might affect groundwater or surface water (nonpoint-source) quality.
	401 Certification (CWA, 33 USC 1341, if the project requires USACE 404 permit)	Discharge into water and wetlands (see USACE Section 404 Permit).
California Department of Transportation	Encroachment Permit	Consider issuance of permits to cross state highways.
California Department of Fish and Game (CDFG)	California Endangered Species Act (CESA) Consistency Determination (CDFG Code 2080.1)	Activity that may affect a state listed species under CESA, for which federal incidental take authorization has already been obtained (through Section 7 or 10 of FESA).
	Lake/Streambed Alteration Agreement (CDFG Code Section 1601-1603)	Change in natural state of river, stream, lake (includes road or land construction across a natural streambed).
California State Historic Preservation Office	Section 106 Consultation, NHPA	Consult project applicant, appropriate land management agencies, and others regarding activities potentially affecting cultural resources.
LOCAL AGENCIES		
Riverside County Transportation Department	Encroachment Permit	Consider issuance of encroachment permit.
Riverside City Public Works Department	Grading Permit	Excavation and fill activities.
Riverside Multiple Species Habitat Conservation Plan	Request a Notice of Inclusion from Regional Conservation Authority for Affects in Quasi-public Conserved Lands	Activity where a listed candidate, threatened, or endangered species under Western Riverside Multi-Species Habitat Conservation Plan (WRMSHCP) may be present in the project area.
Riverside County Parks	Encroachment/Crossing Permit	Consider issuance of encroachment/Crossing Permit.
Riverside County Airport Land Use Commission	Advisory – Does not Approve Projects or Issue Permits	Find projects consistent or inconsistent with the adopted Riverside County Airport Land Use Compatibility Plan.

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2.9 MITIGATION MEASURES

Potential environmental impacts of the Proposed Project and alternatives were assessed based on a comparison of the Proposed Project to existing environmental conditions. Where potentially significant impacts to a resource were identified, mitigation measures were developed to reduce or eliminate potentially significant impacts. Detailed assessments of potential environmental impacts by resource and associated mitigation measures are discussed in Chapter 3. Mitigation measures are compiled and listed in the Executive Summary.

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