SECTION 2
Project Description

2.1 Introduction

Pacific Gas and Electric (PG&E), in its California Public Utilities Commission (CPUC) application (A.13-08-014), filed on August 13, 2013, requests to reinforce the electric transmission and distribution system in El Dorado County by replacing existing conductor (reconductoring), replacing existing poles, and modifying existing lattice steel towers on the Missouri Flat-Gold Hill 115 kilovolt (kV) Power Line (Missouri Flat-Gold Hill Line), pursuant to CPUC General Order (GO) 131-D. The application includes the Proponent's Environmental Assessment (PEA) prepared pursuant to Rule 2.4 of the CPUC's Rules of Practice and Procedure.

PG&E owns and operates the Missouri Flat-Gold Hill Line, as well as the El Dorado-Missouri Flat 115 kV Power Line (El Dorado-Missouri Flat Line) and the Gold Hill-Clarksville 115 kV Power Line (Gold Hill-Clarksville Line). The Missouri Flat-Gold Hill Line is an approximately 12.5-mile, double-circuit power line between the City of Folsom in Sacramento County and the community of Shingle Springs in El Dorado County. The Missouri Flat-Gold Hill 115 kV Power Line Reconductoring Project (Project) would also modify and upgrade existing substations and temporarily convert the Gold Hill No. 1 60 kV Power Line (Gold Hill No. 1 Line), an existing 60 kV power line, to 115 kV to provide power to customers during construction of the Project.

With one exception, the proposed alignment would be located in existing PG&E easements. Additional rights-of way (ROW) would be required to accommodate the relocation of 150 feet of an existing distribution feeder line associated with Limestone Substation near the intersection of Strolling Hills Road and Ridge Pass Drive. No additional ROW or easement expansions are anticipated to be needed to accommodate construction or operation and maintenance of the line.

This IS/MND identifies the potential environmental effects of the Project, evaluates their level of significance, and identifies the revisions in the Project agreed to by PG&E that would avoid the effects or mitigate them below the level of significance. The information presented here is based on PG&E's Application for a Permit to Construct (PTC) (PG&E, 2013a), the Proponent's Environmental Assessment (PEA) (PG&E, 2013b), and PG&E's responses to data requests by the CEQA Team (PG&E, 2013c). This information is intended to provide a detailed description of Project construction, operation and maintenance, serving to provide a common understanding of the Project parameters.

2.2 Project Location

The Project is largely located in El Dorado County, extending from the community of Shingle Springs in El Dorado County to the City of Folsom, in Sacramento County (see **Figure 2-1**). The Missouri Flat-Gold Hill Line and Gold Hill No. 1 Line would mostly traverse lands within the existing PG&E ROW along Highway 50 and through the City of Folsom, the communities of El Dorado Hills, Cameron Park, and Shingle Springs, and also a U.S. Bureau of Land Management (BLM) parcel, the Pine Hill Preserve, which is located northwest of Shingle Springs Substation. The developed portions of the Project area are predominantly residential with some light-industrial and commercial development. Rolling grasslands and oak woodlands dominate the areas outside the existing communities.

2.3 Existing System

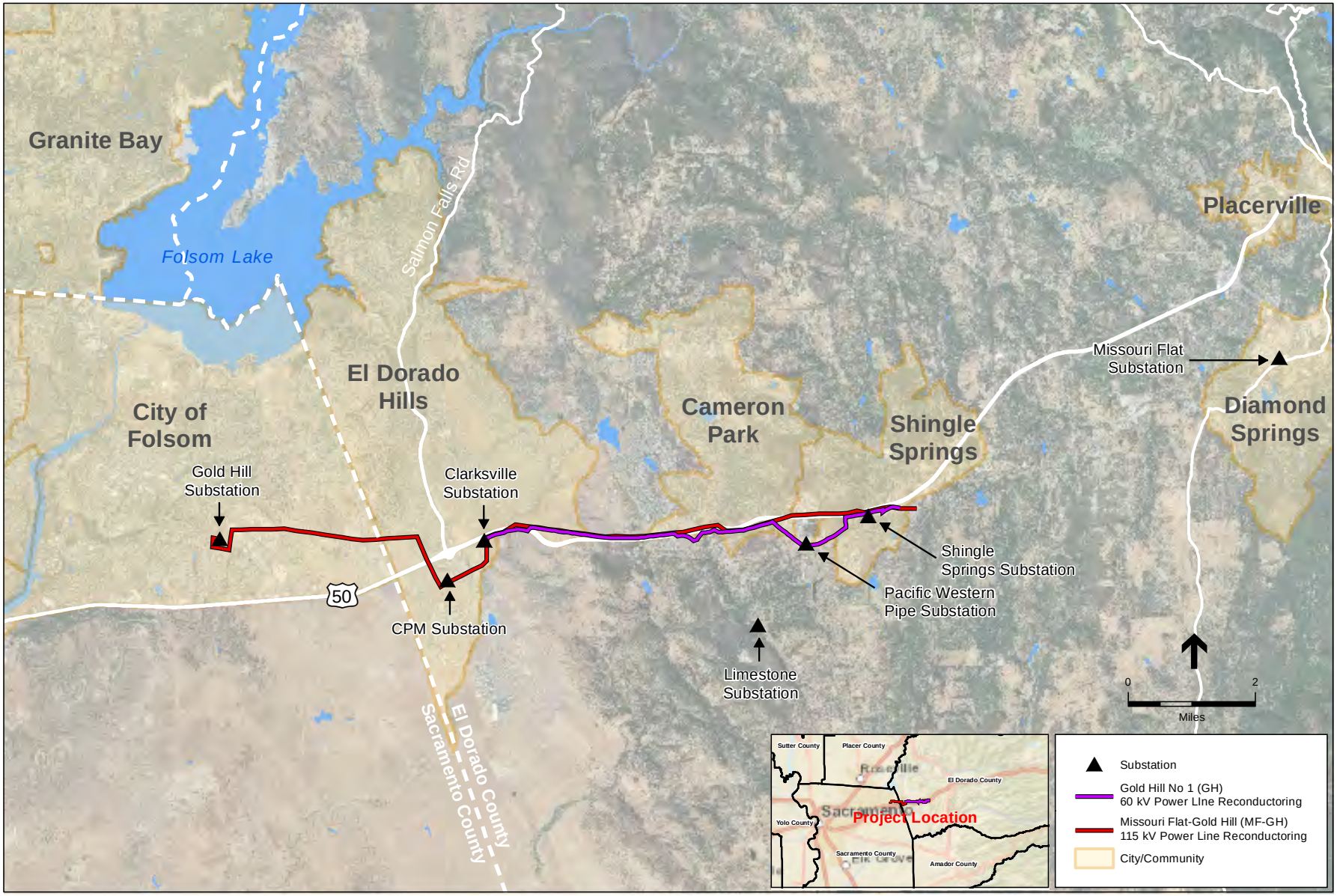
El Dorado County is currently served by a number of substations and transmission lines, as well as an extensive network of distribution lines carrying lower voltage electricity from the substations to PG&E residential, commercial, and private customers. Six distribution substations—Apple Hill, Placerville, Diamond Springs, El Dorado, Shingle Springs, and Clarksville substations—are connected to the 115 kV transmission network to serve customers. Electric power is delivered to these substations through three area power lines: the El Dorado-Missouri Flat Line (No. 1 and No. 2), the Missouri Flat-Gold Hill Line (No. 1 and No. 2), and the Gold Hill-Clarksville Line.[1]

The Missouri Flat-Gold Hill Line is a double-circuit line that travels generally in an east-west direction, interconnecting Diamond Springs, Shingle Springs, Clarksville, and Gold Hill substations and Missouri Flat Switching Station. The nearest electric power generation facility is a 30 megawatt (MW) hydroelectric generation facility located approximately 30 miles east of the City of Folsom and is connected to Placerville and El Dorado substations.

There is also an underlying 60 kV system interconnecting El Dorado County to Amador County, which includes the Gold Hill No. 1 Line, (an approximately 28-mile-long, single-circuit power line, interconnecting Gold Hill and Martell substations). Customers in this region are served by two PG&E-owned distribution substations—Limestone and Oleta distribution substations—and one privately owned distribution substation—Pacific Western Pipe Substation.

El Dorado County's population is expected to increase approximately 2 percent per year for the next 10 years, which will create increasing demand for electric power (PG&E 2013b). The majority of El Dorado County's current load is served by the Missouri Flat-Gold Hill and Gold Hill-Clarksville lines through Clarksville and Shingle Springs substations, and much of the future growth is expected to occur in the areas served by these substations. The increased demand for electricity has put PG&E's local 115 kV power line system at risk of overloading in the event of an outage on either circuit of the Missouri Flat-Gold Hill Line. When the demand on the equipment exceeds its rated capacity, the equipment becomes overheated and may be irreversibly

[1] The Gold Hill-Clarksville and Gold Hill No. 1 lines generally run adjacent to the Missouri Flat-Gold Hill Line on separate, double-circuit structures.



SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-1
Project Location

damaged. The electric system is designed with protective equipment to prevent this type of damage by automatically disconnecting equipment from service during equipment failures or when pre-set design limits are reached, which causes power outages in the areas served by the affected equipment. For example, in 2009, approximately 18,600 customers served from Clarksville Substation were without power when a single electric outage led to a local area blackout due to cascading equipment shut-downs and ensuing outages (PG&E 2013b).

2.4 PG&E's Project

The Project consists of the following activities; a more detailed description of the individual components is included in Section 2.5:

- **Missouri Flat-Gold Hill Line Reconductoring:** Approximately 12.5 miles of the existing 115 kV double-circuit (No. 1 and No. 2) power line between Shingle Springs and Gold Hill substations would be reconductored. In addition, 0.3 mile of the existing 115 kV power line east of Shingle Springs Substation would be reconductored to facilitate construction activities. The Missouri Flat-Gold Hill Line travels in a generally east-west direction from Shingle Springs Substation, located near the intersection of Haven Lane and Durock Road in the community of Shingle Springs, to Clarksville Substation, located near the intersection of Highway 50 and Silva Valley Parkway in the community of El Dorado Hills, to Gold Hill Substation, located just west of the intersection of Clarksville Road and East Bidwell Street in the City of Folsom. It generally parallels Highway 50 for approximately 6.4 miles and crosses the highway at five locations. A 0.4 mile section of the eastern portion of the alignment crosses a BLM parcel—Pine Hill Preserve—located northwest of Shingle Springs Substation. In addition, approximately 1,000 feet of existing 21 kV overhead distribution line would be placed underground along Platt Circle (between Arches Avenue and Finders Way) in the community of El Dorado Hills to meet conductor clearance requirements.

- **Gold Hill No. 1 Line Reconductoring:** Approximately 7 miles of the existing Gold Hill No. 1 60 kV Line would be upgraded in order to provide backup electric service while the Missouri Flat-Gold Hill Line is being reconductored. Upon completion of this reconductoring, the voltage would be returned to 60 kV; however, the upgraded structures and facilities would remain in place. This portion of the line begins 0.6 mile east of Shingle Springs Substation in the community of Shingle Springs and continues west to Shingle Springs Substation. From the substation, the alignment continues westerly, closely paralleling the Missouri Flat-Gold Hill Line; however, the two alignments slightly diverge in three primary locations, including:

    - At 0.3 mile east of Clarksville Substation, where the Missouri Flat-Gold Hill Line crosses from the south side of Highway 50 to the north side and the Gold Hill No. 1 Line continues south of U.S. 50 for 0.4 mile;

    - In the community of Cameron Park near the Highway 50 and Cambridge Road crossing, where the Missouri Flat-Gold Hill Line continues to parallel the north side of Highway 50 and the Gold Hill No. 1 Line crosses to the south side of the highway and parallels Crazy Horse Road for 0.9 mile; and

    - Between the communities of Cameron Park and Shingle Springs at the eastern terminus of Coach Lane, where the Missouri Flat-Gold Hill Line crosses to the north side of Highway 50 (traversing the BLM's Pine Hill Preserve) and the Gold Hill No. 1 Line continues south of Highway 50 (paralleling Durock Road) for 2.2 miles.

In addition, to maintain distribution feeder line service to the Limestone Substation during construction, approximately 150 feet of the distribution feeder line north of the intersection of Strolling Hills Road and Ridge Pass Drive would be relocated within 80 feet of the existing distribution line. The preliminary design includes replacement of three existing structures with two new wood poles. The relocated distribution line would remain in place after construction.

- **Substation and Switching Station Modifications:** Minor modifications would be made to substation equipment and facilities at Shingle Springs, Pacific Western Pipe, Limestone, Clarksville, and Gold Hill substations, and Missouri Flat Switching Station to tie the new conductor into the substations and modify existing equipment to accommodate the line upgrades. All substation equipment would be sized adequately to match or exceed new line requirements. All substation and switching station modifications would be completed within existing substation or switching station fence lines and no substation expansions are proposed.

Figures 2-2 through **2-8** show detailed alignment maps of the proposed Project.

2.5 Project Components

A summary of the key components of the Project is provided **Table 2-1**, followed by a more detailed discussion by component.

2.5.1 Missouri Flat-Gold Hill Pole Segment

The Missouri Flat-Gold Hill Pole Segment would consist of a 9.6-mile section of the existing 115 kV power line, beginning 0.3-mile east of the Shingle Springs Substation and continuing west to the intersection of Empire Ranch Road and Broadstone Parkway in the City of Folsom, in Sacramento County. The existing circuit is supported by approximately 60 double-circuit tubular steel poles (TSPs) and one single-circuit TSP. The existing TSPs would be removed and replaced at an approximately one-to-one ratio with new TSPs within the existing ROW. New TSPs would be placed within 20 feet of existing pole locations; with the exception of four TSPs that would be placed within 40-85 feet of existing pole locations.

The Missouri Flat-Gold Hill Pole Segment would include replacement of approximately 60 existing TSPs with new TSPs. The new TSPs would be constructed to the following heights compared to the existing TSPs:

- 42 would be 3 - 20 feet taller than the existing TSPs,
- 2 would be 25-30 feet taller than existing TSPs.
- 16 would be within three feet in height as the existing poles.

As a result, most new TSPs would range in height from approximately 55 to 135 feet above ground surface (ags) with the exception of two poles that would be up to 145 ags.

The span distances between structures would vary from 50 to 1,400 feet, with an average span length of approximately 850 feet. To optimize operations and maintenance activities, insulators would be replaced during construction with ceramic insulators. As part of the TSP replacement, other equipment on the existing poles would be transferred to the new TSPs.

TABLE 2-1
SUMMARY OF PROJECT COMPONENTS

Missouri Flat-Gold Hill Line Reconductoring - Pole Segment

- *Line length*: 9.6 miles.
- *Conductor*: Replace existing 715 all aluminum (AA), 0.974-inch-diameter conductor with 1.092-inch-diameter, non-specular (dulled finish) type 795 aluminum conductor steel supported (ACSS).
- *Poles:* Replace approximately 60 double-circuit TSPs and one single-circuit TSP with new TSPs.
- *Structure heights*: 55 to 145 feet ags. Preliminary engineering indicates 44 of the 60 poles would be raised 3 to 20 feet. Two poles would be raised 25-30 feet higher than existing poles.
- *Span lengths*: Between 50 and 1,400 feet, with an average span length of 850 feet.
- *Insulators*: Replace existing with ceramic insulators
- *Footings*: Majority of TSPs would have below ground concrete-pier foundations. Several TSPs along this alignment may require the use of micropile foundations to minimize the amount of ground disturbance or because of site-specific substrate constraints.
- *Distribution Line Undergrounding*: 1,000 feet of existing 21 kV overhead distribution line would be placed underground along Platt Circle, between Arches Avenue and Finders Way in the community of El Dorado Hills, to meet conductor clearance requirements.

Missouri Flat-Gold Hill Line Reconductoring - Tower Segment

- *Line length*: 2.9 miles.
- *Conductor*: Replace existing 715 AA, 0.974-inch-diameter conductor with 1.092-inch-diameter, non-specular (dulled finish) type 795 ACSS.
- *Towers:* Modify 13 of 17 existing double-circuit lattice steel towers. Majority of tower modifications would include structural reinforcements and/or cross-arm replacement. One tower would require new bracings and leg reinforcements; one tower would be raised from approximately 93 feet up to 100 feet with the installation of a leg extension.
- *Insulators*: Replace existing with new ceramic insulators made of glass or porcelain.

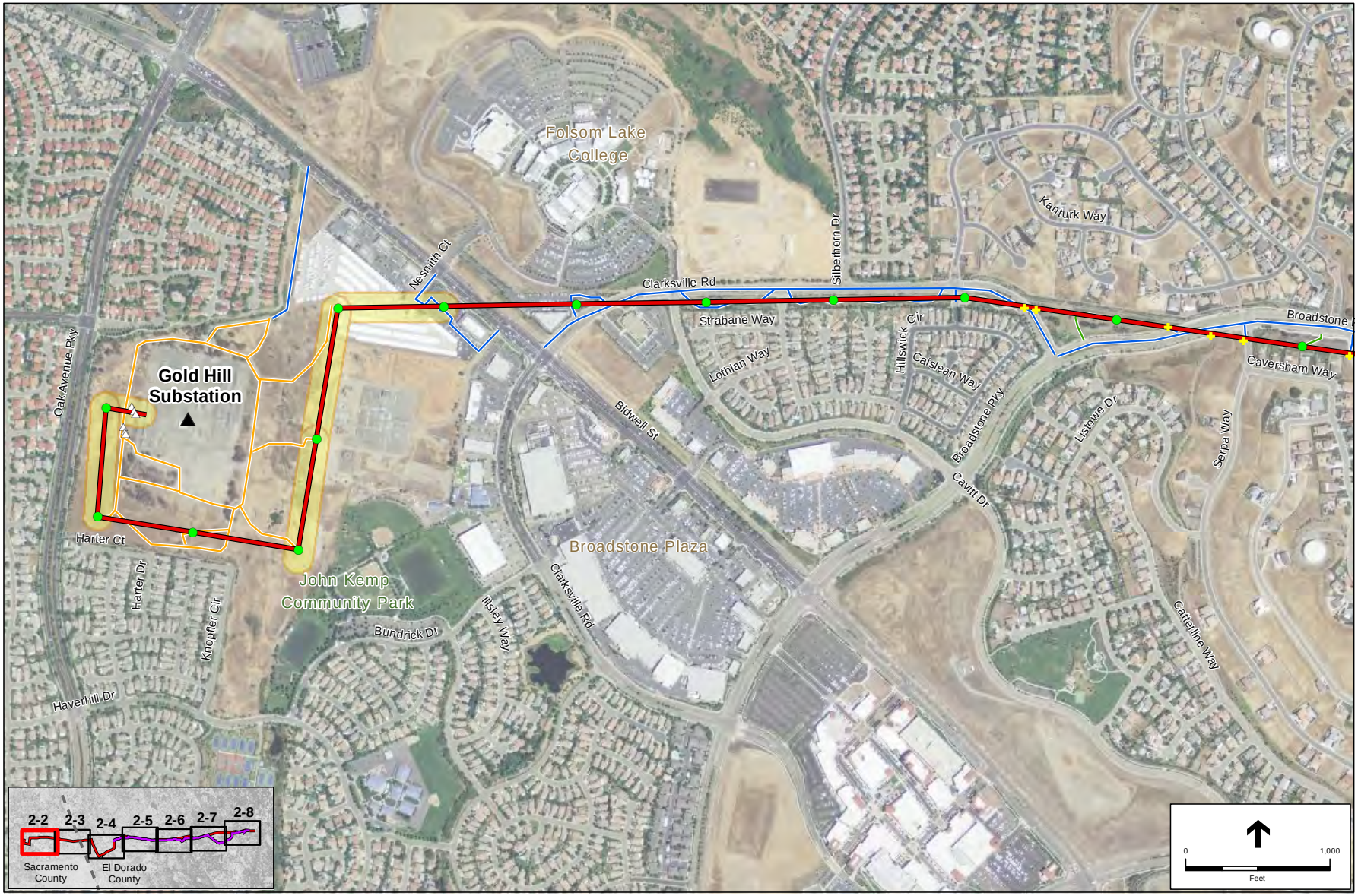
Gold Hill No. 1 Line Reconductoring

- *Line length*: 7 miles.
- *Conductor*: Replace existing 397 AA, 0.724-inch-diameter conductor with 715 AA, 0.974-inch-diameter conductor.
- *Poles:* Replace 80 of existing 120 poles with new wood or light-duty steel (LDS) poles and one new TSP. Up to seven interset wood or LDS poles would also be installed. Between 1-3 existing wood switch poles would be replaced with TSPs to accommodate a new transmission switch. The new TSPs would be up to 90 feet tall and stabilized by concrete-pier foundations.
- *Distribution Feeder Line Relocation:* Up to150 feet of existing distribution feeder line would be relocated by replacing three existing distribution wood pole structures with two new wood poles within 80 feet of the existing structures.
- *Structure heights*: Between 55 and 90 feet ags, and up to 25 feet taller than existing wood poles.
- *Span lengths*: Between 40 to 550 feet, with an average span length of 250 feet.
- *Insulators*: Replace along the entire line length.
- *Footings*: The wood and LDS poles would be direct-bury, with no foundations required. The TSP poles would have a below ground concrete-pier foundation, measuring 5 to 8 feet in diameter.

Substation and Switching Station Modifications

- Minor modifications to substation and switching station equipment and facilities at Shingle Springs, Pacific Western Pipe, Limestone, Clarksville, and Gold Hill substations and Missouri Flat Switching Station
- Replace circuit breakers, switches, conductor, busses, jumpers, and line relays.
- Install junction boxes and pull boxes for new equipment.
- Upgrading existing supervisory control and data acquisition systems.

SOURCE: PG&E, 2013b.



Existing Features
- Substation
- Gold Hill No 1 (GH) 60 kV Power LIne Reconductoring
- Missouri Flat-Gold Hill (MF-GH) 115 kV Power Line Reconductoring

Existing Structures
- Lattice Steel Towers
- Tubular Steel Pole
- GH Wood Pole
- Distribution Wood Pole

Temporary Features*
- Guard Structure
- Staging Area
- Temporary Line Pole
- Helicopter Landing Zone
- Potential Pull Site

Access Routes
- Existing Dirt/Gravel Road
- Existing Paved Road
- Existing Unpaved Access Road Requiring Improvement
- New Unpaved Access Road
- Overland

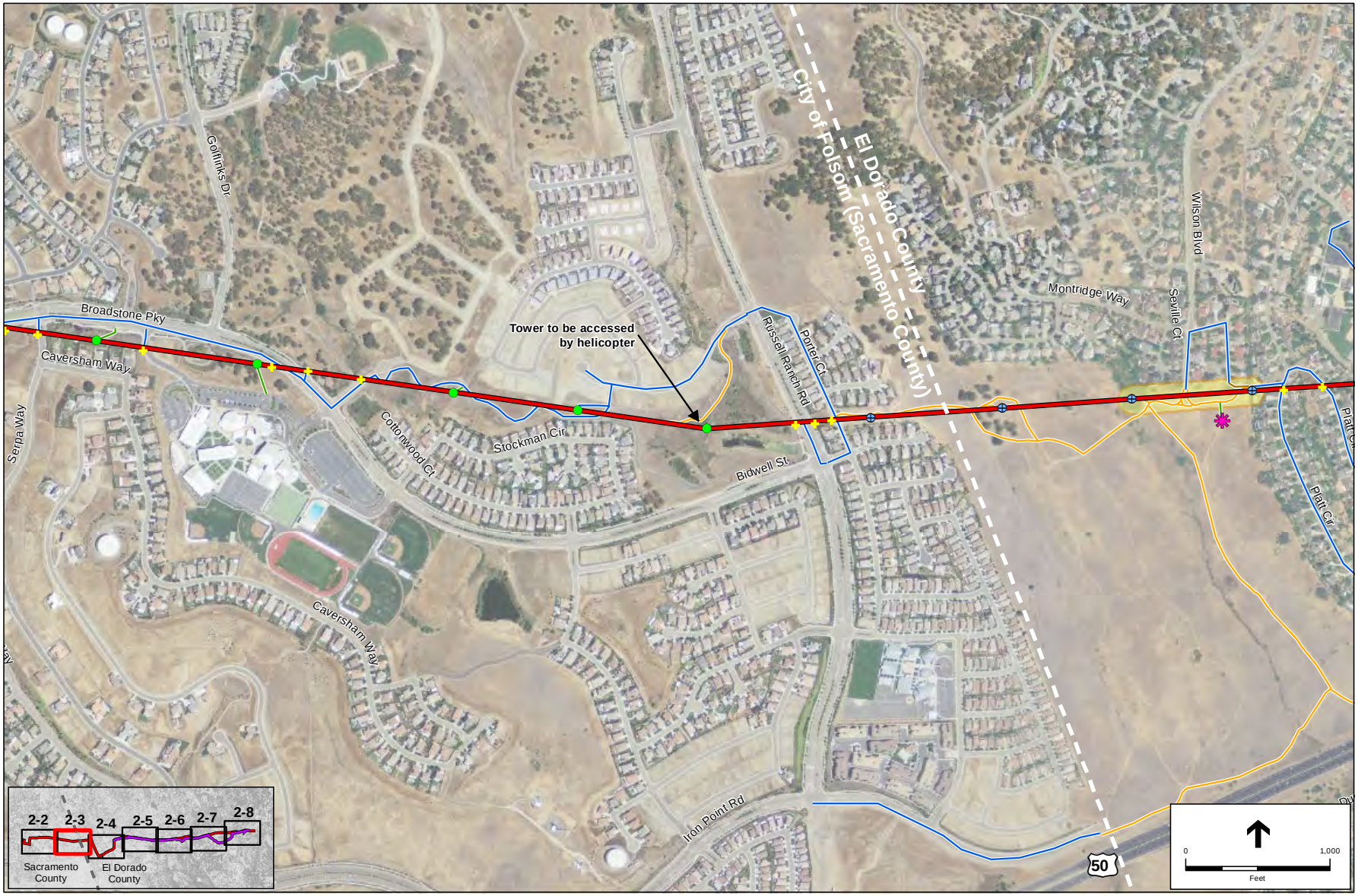
* Based on preliminary design; locations are approximate and may be modified based on final design.

SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-2

Proposed Project: Detailed Alignment (Panel 1 of 7)



Existing Features
- Substation
- Gold Hill No 1 (GH) 60 kV Power LIne Reconductoring
- Missouri Flat-Gold Hill (MF-GH) 115 kV Power Line Reconductoring

Existing Structures
- Lattice Steel Towers
- Tubular Steel Pole
- GH Wood Pole
- Distribution Wood Pole

Temporary Features*
- Guard Structure
- Staging Area
- Temporary Line Pole
- Helicopter Landing Zone
- Potential Pull Site

Access Routes
- Existing Dirt/Gravel Road
- Existing Paved Road
- Existing Unpaved Access Road Requiring Improvement
- New Unpaved Access Road
- Overland

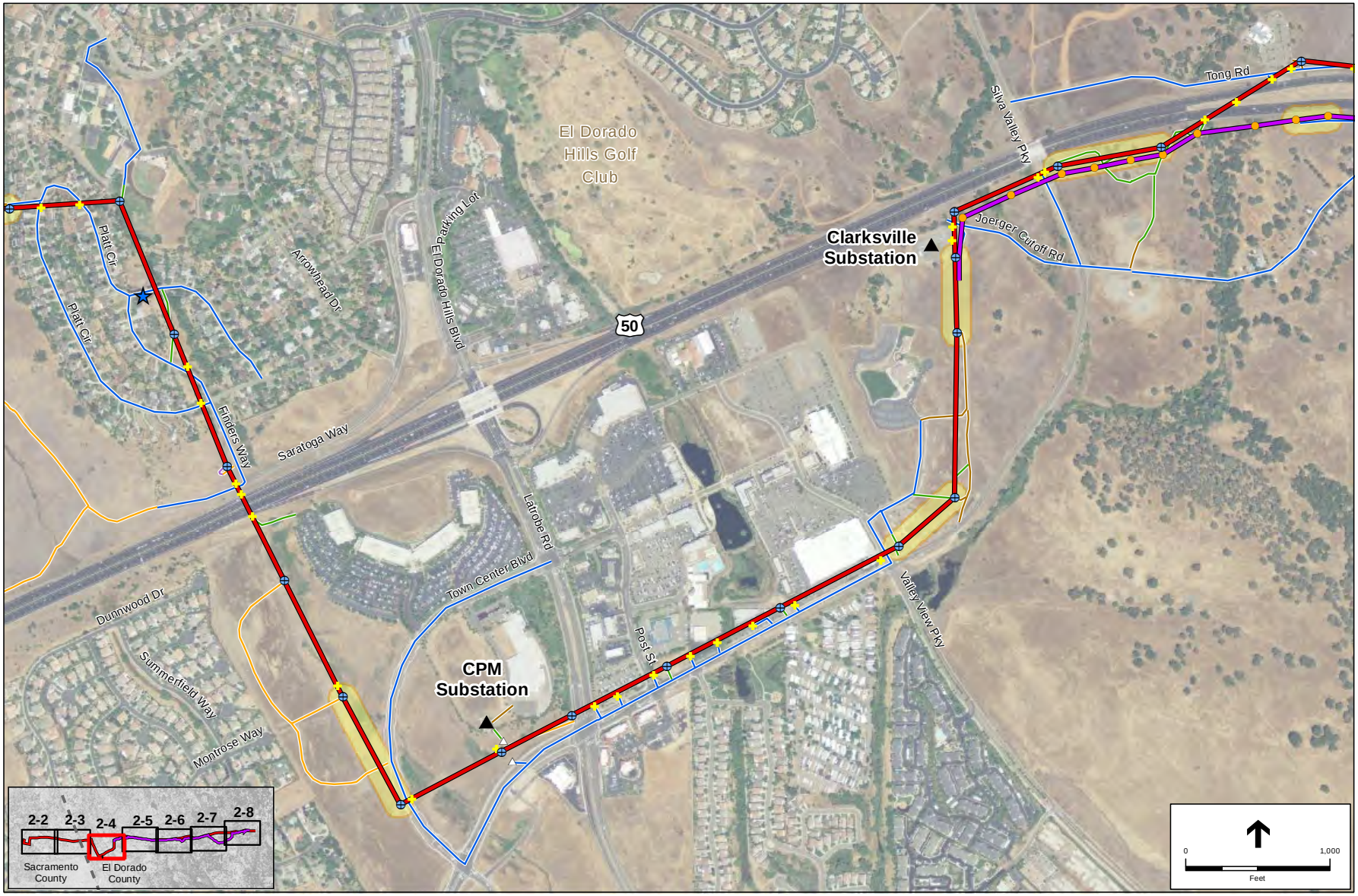
* Based on preliminary design; locations are approximate and may be modified based on final design.

SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-3

Proposed Project: Detailed Alignment (Panel 2 of 7)



Existing Features
- Substation
- Gold Hill No 1 (GH) 60 kV Power LIne Reconductoring
- Missouri Flat-Gold Hill (MF-GH) 115 kV Power Line Reconductoring

Existing Structures
- Lattice Steel Towers
- Tubular Steel Pole
- GH Wood Pole
- Distribution Wood Pole

Temporary Features*
- Guard Structure
- Staging Area
- Temporary Line Pole
- Helicopter Landing Zone
- Potential Pull Site

Access Routes
- Existing Dirt/Gravel Road
- Existing Paved Road
- Existing Unpaved Access Road Requiring Improvement
- New Unpaved Access Road
- Overland

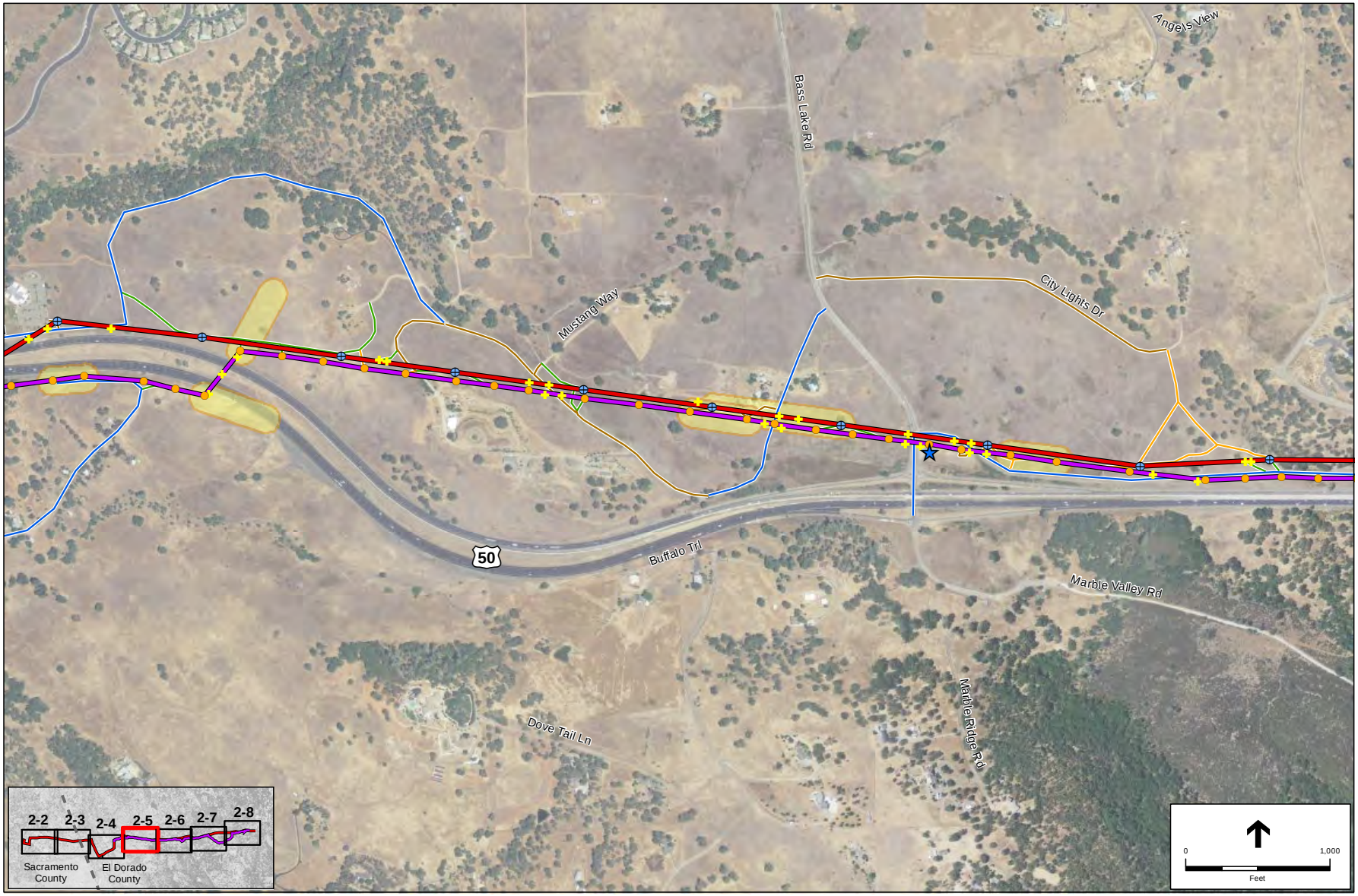
* Based on preliminary design; locations are approximate and may be modified based on final design.

SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-4

Proposed Project: Detailed Alignment (Panel 3 of 7)



Existing Features
- Substation
- Gold Hill No 1 (GH) 60 kV Power LIne Reconductoring
- Missouri Flat-Gold Hill (MF-GH) 115 kV Power Line Reconductoring

Existing Structures
- Lattice Steel Towers
- Tubular Steel Pole
- GH Wood Pole
- Distribution Wood Pole

Temporary Features*
- Guard Structure
- Staging Area
- Temporary Line Pole
- Helicopter Landing Zone
- Potential Pull Site

Access Routes
- Existing Dirt/Gravel Road
- Existing Paved Road
- Existing Unpaved Access Road Requiring Improvement
- New Unpaved Access Road
- Overland

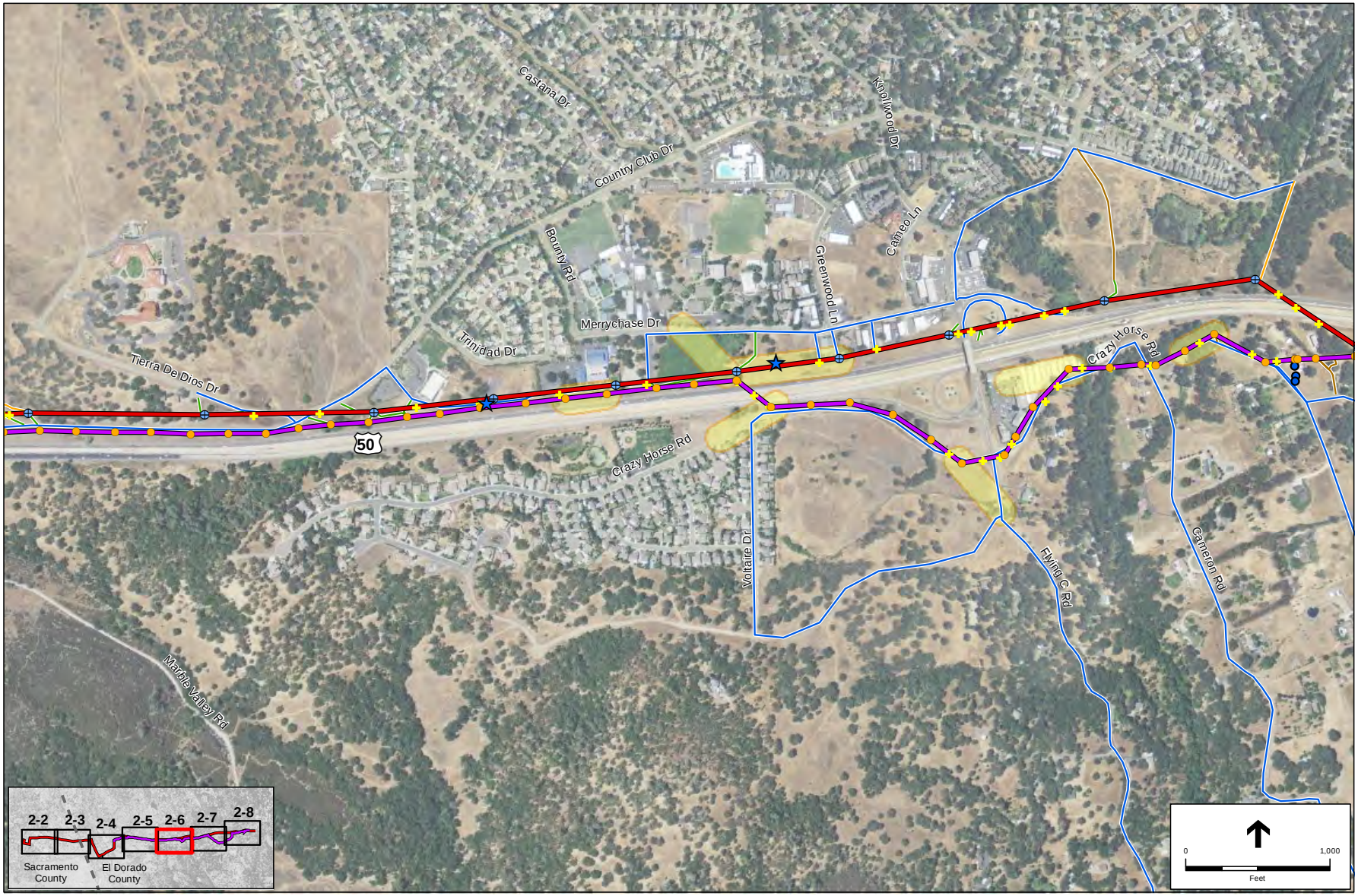
* Based on preliminary design; locations are approximate and may be modified based on final design.

SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-5

Proposed Project: Detailed Alignment (Panel 4 of 7)



Existing Features
- Substation
- Gold Hill No 1 (GH) 60 kV Power LIne Reconductoring
- Missouri Flat-Gold Hill (MF-GH) 115 kV Power Line Reconductoring

Existing Structures
- Lattice Steel Towers
- Tubular Steel Pole
- GH Wood Pole
- Distribution Wood Pole

Temporary Features*
- Guard Structure
- Staging Area
- Temporary Line Pole
- Helicopter Landing Zone
- Potential Pull Site

Access Routes
- Existing Dirt/Gravel Road
- Existing Paved Road
- Existing Unpaved Access Road Requiring Improvement
- New Unpaved Access Road
- Overland

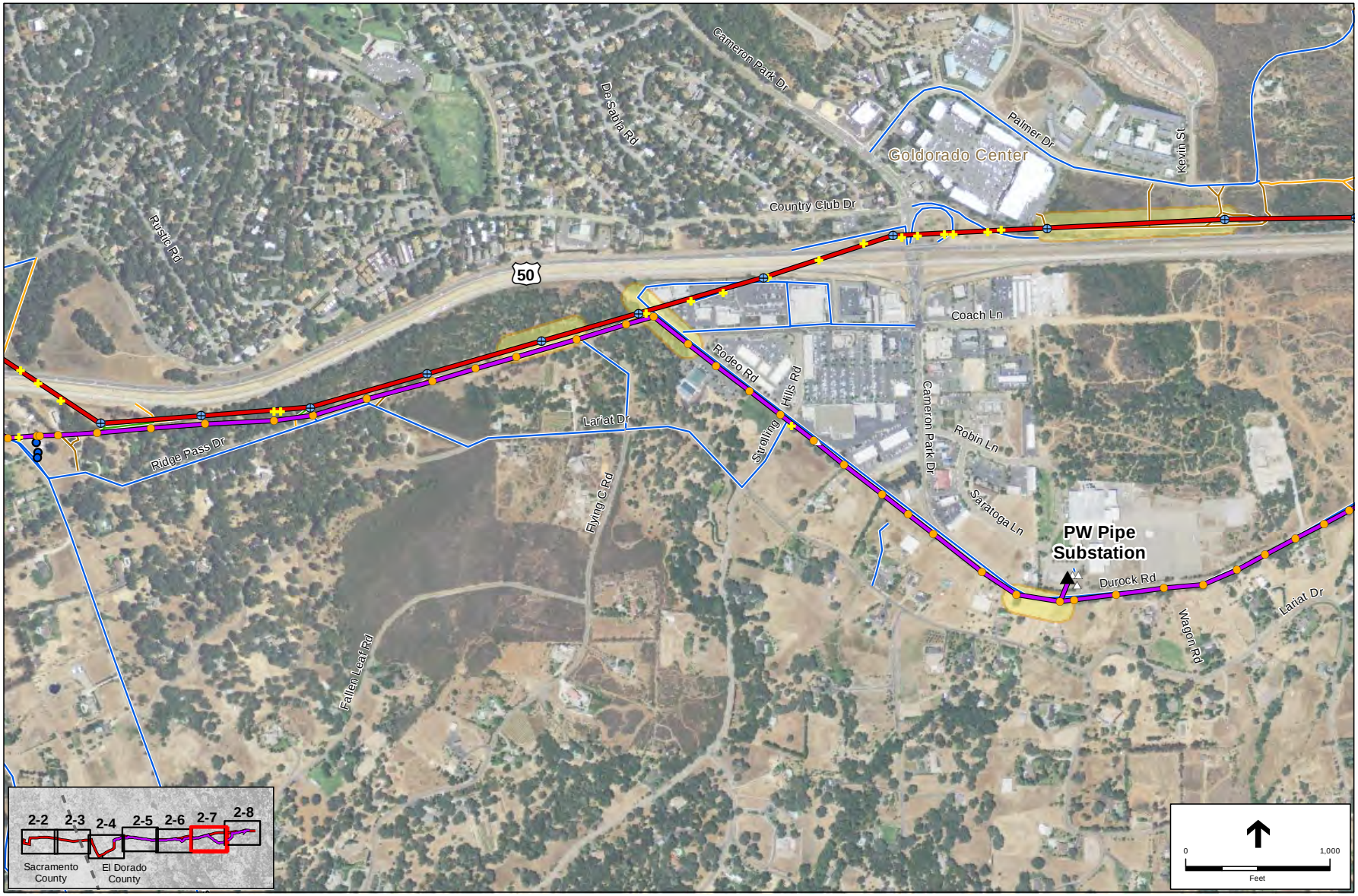
* Based on preliminary design; locations are approximate and may be modified based on final design.

SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-6

Proposed Project: Detailed Alignment (Panel 5 of 7)



Existing Features
- Substation
- Gold Hill No 1 (GH) 60 kV Power LIne Reconductoring
- Missouri Flat-Gold Hill (MF-GH) 115 kV Power Line Reconductoring

Existing Structures
- Lattice Steel Towers
- Tubular Steel Pole
- GH Wood Pole
- Distribution Wood Pole

Temporary Features*
- Guard Structure
- Staging Area
- Temporary Line Pole
- Helicopter Landing Zone
- Potential Pull Site

Access Routes
- Existing Dirt/Gravel Road
- Existing Paved Road
- Existing Unpaved Access Road Requiring Improvement
- New Unpaved Access Road
- Overland

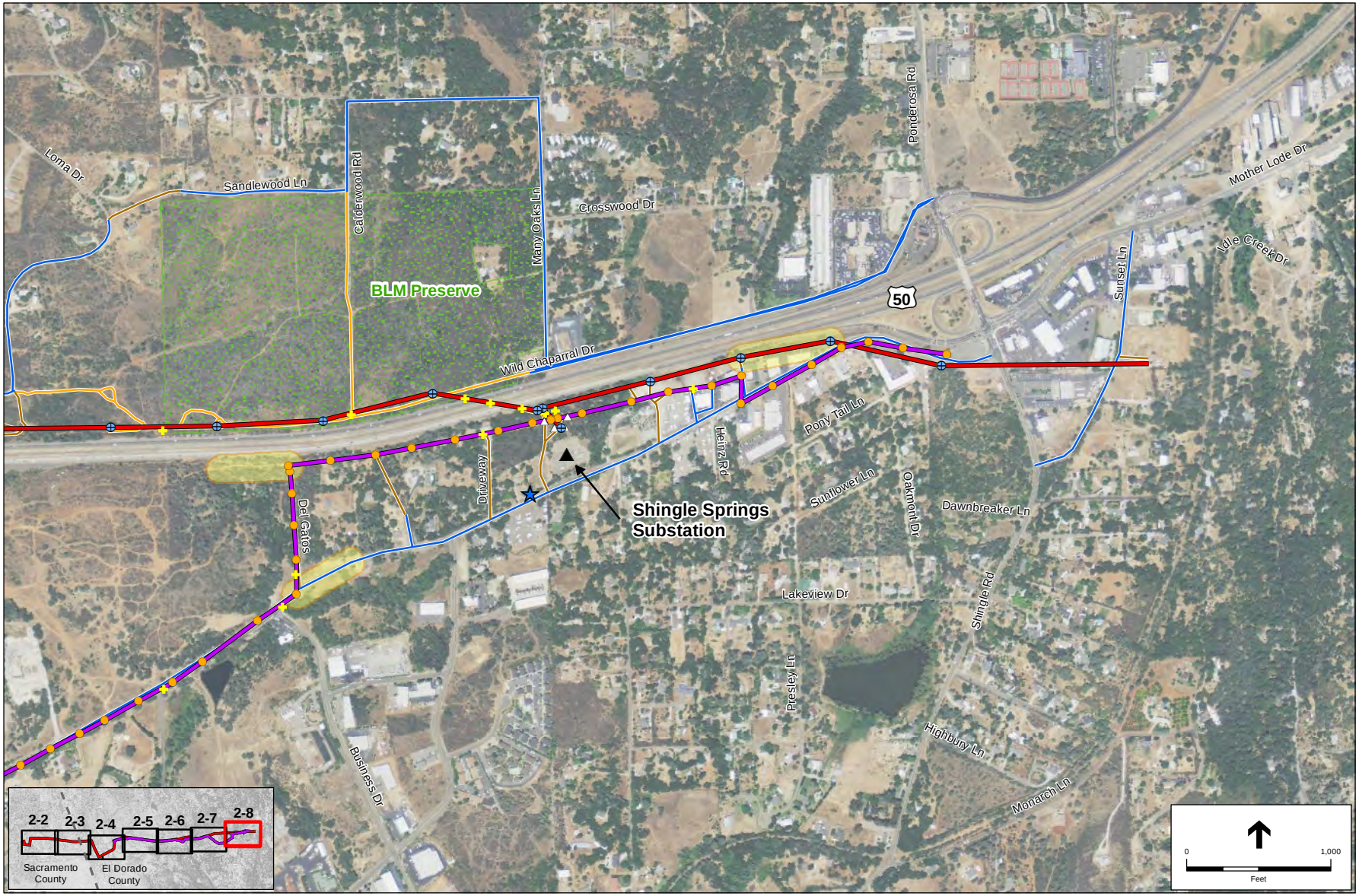
* Based on preliminary design; locations are approximate and may be modified based on final design.

SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-7

Proposed Project: Detailed Alignment (Panel 6 of 7)



Existing Features
- Substation
- Gold Hill No 1 (GH) 60 kV Power LIne Reconductoring
- Missouri Flat-Gold Hill (MF-GH) 115 kV Power Line Reconductoring

Existing Structures
- Lattice Steel Towers
- Tubular Steel Pole
- GH Wood Pole
- Distribution Wood Pole

Temporary Features*
- Guard Structure
- Staging Area
- Temporary Line Pole
- Helicopter Landing Zone
- Potential Pull Site

Access Routes
- Existing Dirt/Gravel Road
- Existing Paved Road
- Existing Unpaved Access Road Requiring Improvement
- New Unpaved Access Road
- Overland

* Based on preliminary design; locations are approximate and may be modified based on final design.

SOURCE: AECOM, 2013

Missouri Flat Project . D207584.16

Figure 2-8

Proposed Project: Detailed Alignment (Panel 7 of 7)

The distance from the ground to the lowest conductor and distance between conductors would vary along the Project route. The minimum ground-to-conductor distance would not be less than 25 feet and the minimum distance between conductors would not be less than 7 feet. For clearances above roads and highways, PG&E uses a minimum clearance from ground to conductor of 32 feet normal clearance[2] and 29 feet emergency clearance[3] in accordance with PG&E design standards. For clearance above railroad tracks, PG&E uses a minimum clearance from ground to conductor of 34 feet normal clearance and 32.3 feet emergency clearance. The Project does not cross over rivers or involve any other special crossings.

The typical clearances between conductors on the steel poles and towers would be 10 feet. Wood poles on the distribution line have a different transmission framing and generally include a mix of pole configurations, including vertical (approximately 8 feet-6 inches vertical conductor spacing) and delta (approximately 4 feet-3 inches vertical conductor spacing). The distribution under-build is typically 10 to 12 feet below the lowest transmission wires on the wood poles.

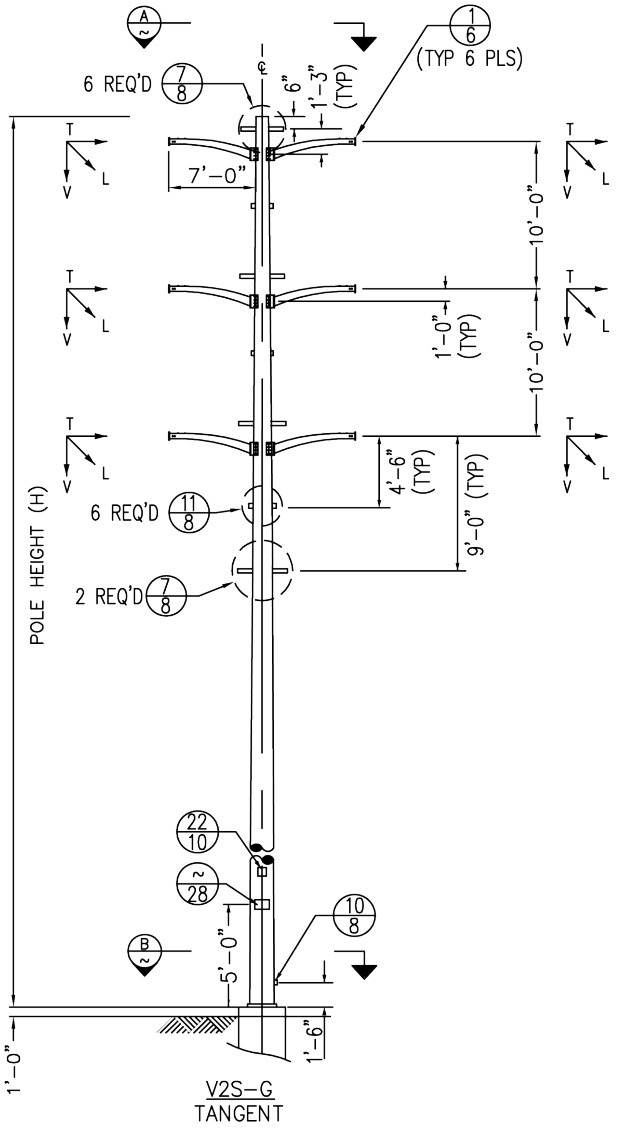
The majority of the new TSPs would have belowground concrete-pier foundations for stabilization. The concrete-pier footings would measure 5 to 8 feet in diameter and 15 to 23 feet in depth, with an average footing diameter of approximately 6 feet and an average depth of approximately 21 feet. A diagram of a typical TSP with a concrete-pier foundation is provided in **Figure 2-9**. Several TSPs may require the use of micropile foundations to minimize the amount of ground disturbance or because of site-specific substrate constraints. Micropile foundation systems would include four to 12 composite piles constructed in a 5- to 6-foot-diameter array at the ground line. Composite piles would be constructed using up to 9-inch high-strength steel casing, high-strength all-thread rebar, and grout. The steel casings would project a minimum of 1 foot aboveground and the piles would connect to TSPs by either a steel cap or cast-in-place concrete cap connection. The maximum depth for each composite micropile would be 30 feet belowground surface. A diagram of a typical TSP with a micropile foundation is provided in **Figure 2-10**. In addition, approximately 1,000 feet of existing 21 kV overhead distribution line would be placed underground along Platt Circle, between Arches Avenue and Finders Way, in the community of El Dorado Hills, to meet ground-to-conductor clearance requirements for the reconductored Missouri Flat-Gold Hill Line. This work would include installing an interset pole adjacent to the east side of Platt Circle approximately 300 feet southeast of the intersection of Platt Circle and Arches Avenue, installing a riser pole at the northeast corner of the intersection of Platt Circle and Finders Way, and removing existing power line poles, which also support the existing distribution line.

[2] Normal clearance is the distance on an average day or during typical weather conditions and average conductor loading.

[3] Emergency clearance is the distance the conductor sags at its maximum point as a result of a temporary weather condition or above-average conductor loading.

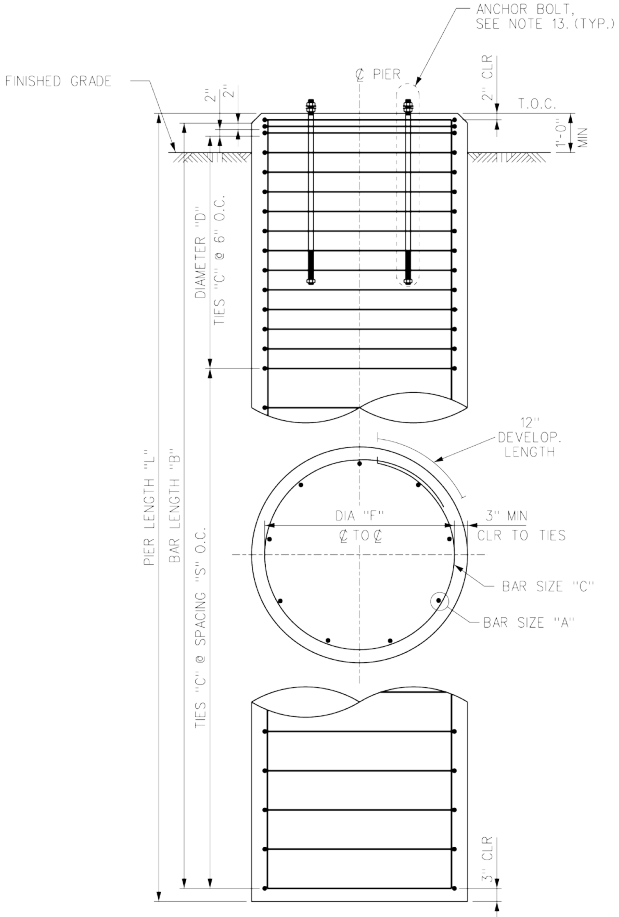
Tubular Steel Pole - Aboveground

*Not to Scale



Concrete-Pier Foundation - Belowground

*Not to Scale



Preliminary and subject to change based on California Public Utilities requirements, final engineering and other factors.

Missouri Flat Project . D207584.16

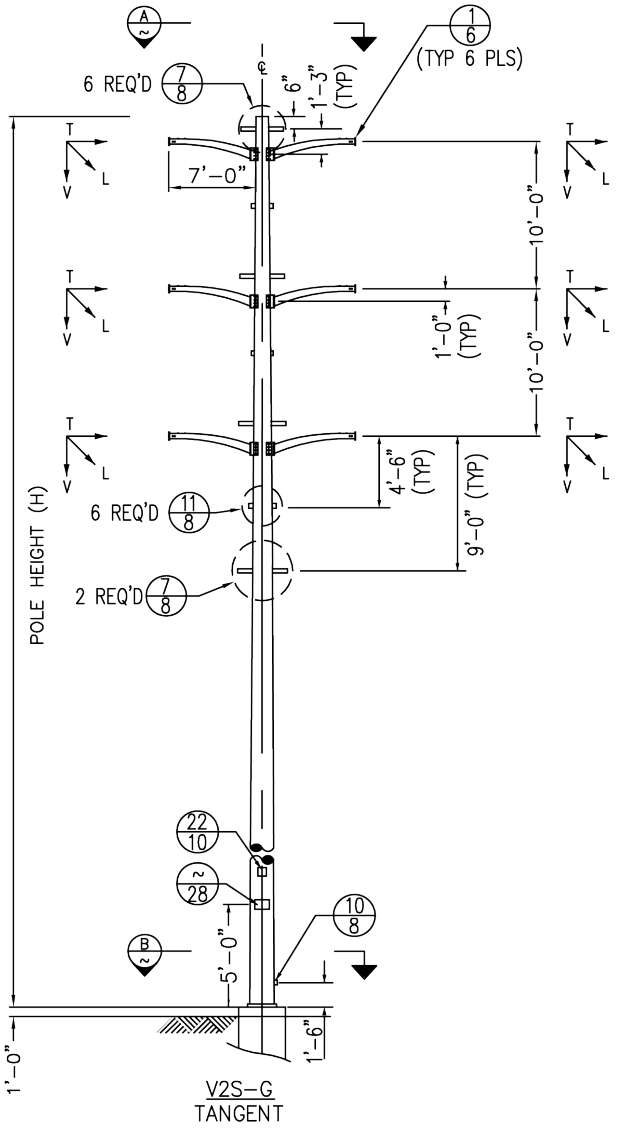
SOURCE: AECOM, 2013

Figure 2-9

Typical Tubular Steel Pole Drawing - Concrete-Pier Foundation

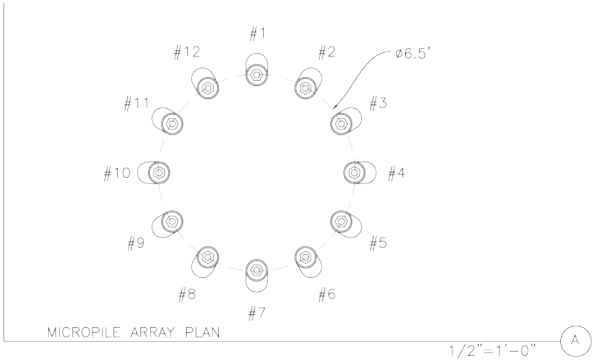
Tubular Steel Pole - Aboveground

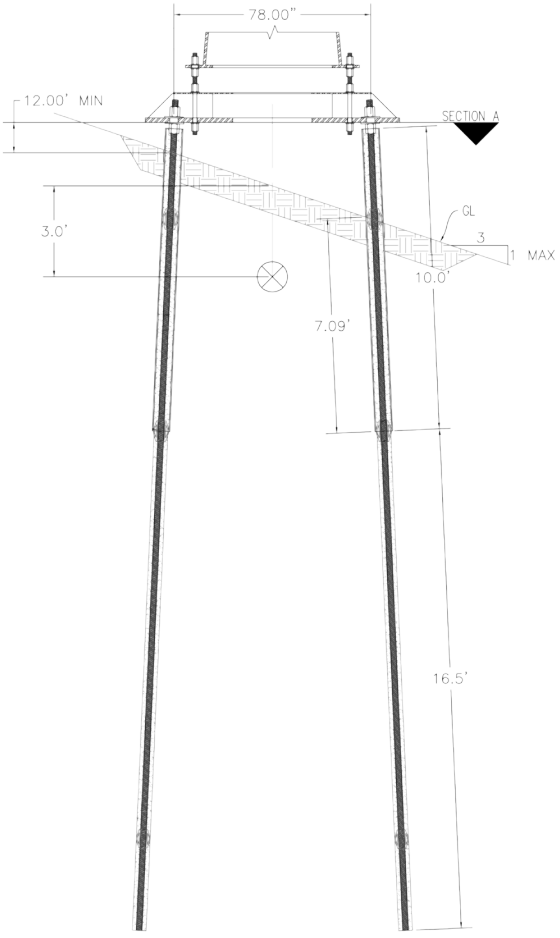
*Not to Scale



Micropile Foundation - Belowground

*Not to Scale





Preliminary and subject to change based on California Public Utilities requirements, final engineering and other factors.

Missouri Flat Project . D207584.16

SOURCE: AECOM, 2013

Figure 2-10

Typical Tubular Steel Pole Drawing – Micro-Pile Foundation

2.5.2 Missouri Flat-Gold Hill Tower Segment

The Missouri Flat-Gold Hill Tower Segment would consist of approximately 2.9-mile section of the existing 115 kV power line, beginning near the intersection of Empire Ranch Road and Broadstone Parkway in the City of Folsom and continuing west to Gold Hill Substation. The existing circuit is supported by approximately 17 double-circuit lattice steel towers (LSTs), 13 of which would be modified as part of the Project. The heights of existing LSTs range from 75 feet to 135 feet, with an average height of 105 feet. The typical width of the top of the existing LSTs is approximately 18 feet (from cross-arm tip-to-tip). The width of LST bases range from 17 feet to 25 feet, with an average base width of 21 feet.

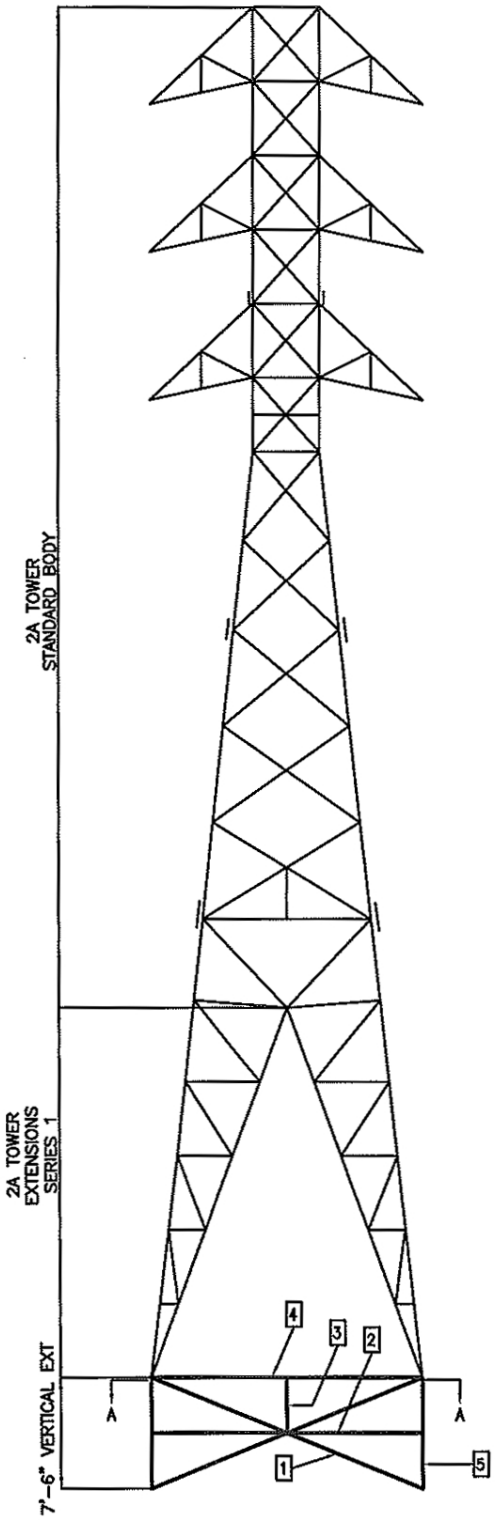
The majority of the tower modifications would be minor, including structural reinforcements and/or cross-arm replacement. Six suspension LSTs would have cross-arms replaced for greater electrical clearances (conductor to structure) that will maintain the same width and will appear similar to existing configurations. Six dead-end LSTs will require cross-arm extensions that would increase the tower width at the top from 18 feet to 23 feet. The conductor attachment locations on the cross-arms for the larger dead-end structures would not change from existing conditions. The Project does not include any increase or expansion of LST bases.

One tower, located south of the intersection of Nesmith Court and East Bidwell Street, would require new bracings and leg reinforcements. Another tower, located approximately 650 feet east of Gold Hill Substation, would be raised from 93 feet up to a maximum of 100 feet with the installation of a leg extension. The towers would be equipped with new ceramic insulators made of glass or porcelain. Other equipment that is collocated on the existing towers would be replaced or maintained, as needed. A typical lattice steel tower diagram is provided in **Figure 2-11**.

2.5.3 Gold Hill No.1 Line Reconductoring

Approximately 7 miles of the existing 60 kV Gold Hill No.1 Line would be upgraded and temporarily converted to 115 kV voltage to provide electric service during reconductoring of the 115 kV Missouri Flat-Gold Hill Line. Upon completion of this reconductoring, the voltage would be returned to 60 kV; however, the upgraded structures and facilities would remain in place. The Gold Hill No. 1 Line reconductoring would extend from just beyond Shingle Springs Substation west to Clarksville Substation. This 7-mile segment is supported by approximately 120 wood poles that range in height from 45 to 95 feet. The span distances between structures vary from 40 to 550 feet, with an average span length of 250 feet.

The Project would include replacement of 80 existing wood poles with new wood or LDS poles and one new TSP. The remaining 40 existing poles would require only minor modifications (e.g., reframing, installing new clamps) to existing poles. In addition, seven new interset poles would be added to the existing alignment. To optimize operations and maintenance activities, insulators along the entire 7-mile-long portion would be replaced during construction. Other existing lines, equipment, and utilities that are collocated on the existing poles would be transferred to the new poles.



Preliminary and subject to change based on California Public Utilities requirements, final engineering and other factors.

*Not to Scale

Missouri Flat Project . D207584.16

SOURCE: AECOM, 2013

Figure 2-11

Typical Lattice Steel Tower Drawing

The typical clearances between conductors on wood poles range between 4 feet-3 inches to 8 feet-6 inches vertical conductor spacing. The distribution under-build is typically 10 to 12 feet below the lowest transmission wires on the wood poles.

Replacement wood or LDS poles, which would be located within 20 feet of existing pole locations, would range in height from 55 to 90 feet, and would be up to 25 feet taller than existing wood poles. Replacement poles would be direct-bury poles (not requiring a foundation) and placed generally in line with the existing alignment. A drawing of a typical wood or LDS pole structure is provided in **Figure 2-12**.

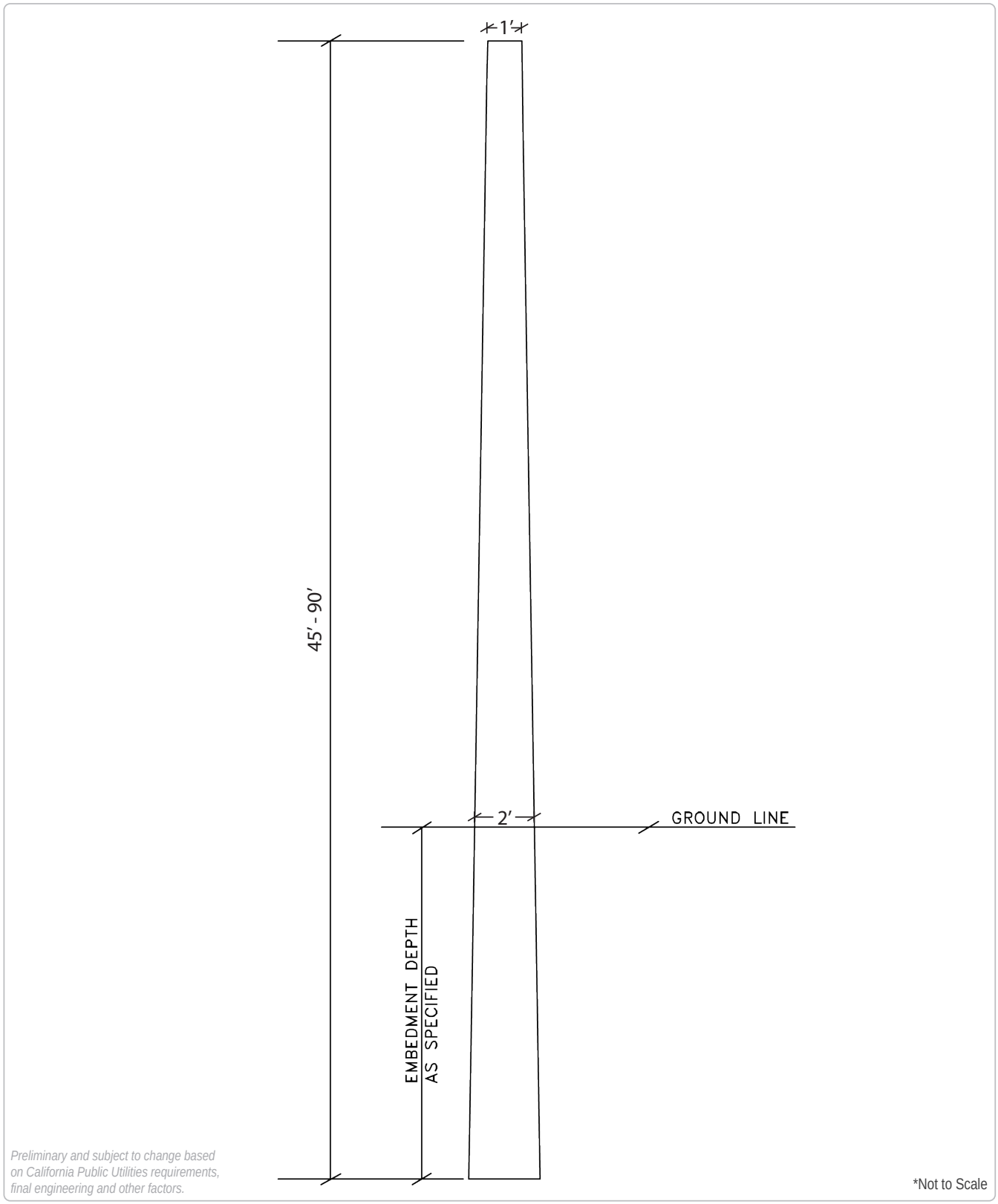
To ensure adequate ground-to-conductor clearance, seven new interset wood or LDS poles would be installed generally in line with the existing Gold Hill No. 1 Line alignment, where the line crosses Strolling Hills Road and parallels Ridge Pass Drive south of the community of Cameron Park. The new poles would be up to 75 feet tall.

Between one and three existing wood switch poles may need to be replaced with up to 90-foot-tall TSPs to accommodate a new transmission switch. The new TSPs would be stabilized by a concrete-pier foundation and would be up to 90 feet tall. The first TSP replacement would be located approximately 700 feet east of the intersection of Strolling Hills Road and Lariat Road in the community of Cameron Park and would be up to 27 feet taller than the existing wood pole. A second wood switch pole to TSP replacement may be required north of the intersection of Strolling Hills Road and Ridge Pass Drive and would be up to 13 feet taller than the existing pole. A third wood switch pole to TSP replacement would be located along the south side of Durock Road and would be up to 17 feet taller than the existing pole.

Approximately 150 feet of existing distribution feeder line connecting the Gold Hill No. 1 Line to the Limestone Substation would be relocated within 80 feet of the existing feeder line in order to maintain service to the Limestone Substation during construction. The distribution feeder line is located in the community of Cameron Park, north of the intersection of Strolling Hills Road and Ridge Pass Drive. The distribution line would be relocated by replacing three existing distribution wood pole structures (one wood H-frame structure and two wood poles) with two new wood poles. The relocated distribution line would remain in place after construction.

2.5.4 Substation and Switching Station Modifications

Modifications would be made to substation and switching station equipment and facilities at Shingle Springs, Pacific Western Pipe, Limestone, Clarksville, and Gold Hill substations and Missouri Flat Switching Station to tie the upgraded lines into the existing system and accommodate construction activities. Because modifications are being made at existing facilities, no changes to existing operation and maintenance activities are anticipated with Project implementation. All substation equipment would correspond to match or exceed the new line requirements. Modifications would include, replacing circuit breakers, switches, conductor, busses, jumpers, and line relays; installing junction boxes and pull boxes for new equipment; and upgrading existing supervisory control and data acquisition systems. All work at the substations and the switching station would be completed within existing fence lines, and no facility expansions are proposed.



Missouri Flat Project . D207584.16

SOURCE: AECOM, 2013

Figure 2-12
Typical Wood Pole Drawing

2.6 Right-of-Way Requirements

The Missouri Flat-Gold Hill Line is located within an existing 80-foot-wide PG&E easement, which would be used throughout the Project. No additional ROW or easement expansions would be needed to accommodate construction or operation and maintenance of the line.

The Gold Hill No. 1 Line easement varies in width up to 120 feet wide, with the majority of the easement being 40 feet wide. The existing easement would be used throughout the Project, and no additional ROW or easement expansions would be needed to accommodate construction or operation and maintenance of the line.

Near the intersection of Strolling Hills Road and Ridge Pass Drive, an approximately 150 foot length of an existing distribution feeder line associated with Limestone Substation would be relocated within 80 feet of the existing line. Additional ROW would be required to accommodate the relocation.

2.7 Construction

This section describes the construction methods that would be used to complete the various components of the Project, including replacing existing conductor (reconductoring), replacing existing poles, and modifying existing lattice steel towers on the Missouri Flat-Gold Hill Line.

2.7.1 Power Line Reconductoring

Power line reconductoring would require:

- staging areas/helicopter landing zones/pull sites;
- access roads;
- removal of existing poles and topping of existing wood poles;
- tower modifications;
- new structure installation;
- substation modifications;
- vegetation clearance and removal;
- erosion and sediment control and pollution prevention;
- best management practices; and
- site cleanup and waste disposal.

2.7.1.1 Staging Areas/Work Areas/Helicopter Landing Zone/Pull Sites

Staging Areas

Construction of the Project would require temporary staging and storage areas to store materials and equipment during the construction process. Materials and equipment typically staged at these areas would include, but would not be limited to:

- Construction materials (tower steel bundles, tubular poles, anchor bolts, rebar, conductor, insulators and hardware);

- Construction vehicles and facilities (heavy equipment, light trucks, construction trailers with electrical and communications connections, and portable sanitation facilities);
- Crew vehicles;
- Material that would be removed from the existing subtransmission lines (conductor, steel, concrete, and other debris). These materials would be temporarily stored in staging areas as the material awaits salvage, recycling, or disposal; and
- Portable stations for concrete clean-up. The establishment of such stations at staging areas throughout the Project area would minimize time between the concrete pour and truck cleanout. The locations of all such stations would be approved by an environmental monitor. Each cleaning station would include dike walls and tarping to allow washed materials to be contained properly for disposal.

It is anticipated that five staging areas, each 5 acres or less in size, would be required during construction. The footprints would vary depending on the area available for use at the time of construction and Project needs. No substantial site preparation would be necessary.

Various existing PG&E industrial facilities or private parcels in the general Project area may be used as temporary staging areas to facilitate Project activities throughout the duration of construction, including, but not limited to:

- An existing industrial site located west of Shingle Springs Substation off Durock Road;
- An undeveloped lot approximately 600 feet southwest of the intersection of Greenwood Lane and Merrychase Drive in the community of Cameron Park;
- A paved parking lot approximately 700 feet southeast of the intersection of Country Club Drive and El Norte Road in the community of Cameron Park;
- An undeveloped lot at the intersection of Bass Lake Road and Country Club Drive in the community of El Dorado Hills; and
- PG&E facilities, such as Missouri Flat Switching Station and Shingle Springs, Limestone, Clarksville, and Gold Hill substations.

Conversion of the existing overhead 21 kV distribution line to underground would require an up to 1.4-acre staging area, which is planned to be located within the paved area of Platt Circle in the community of El Dorado Hills. Proposed staging areas are illustrated in Figures 2-2 through 2-8.

Towers and Poles Work Areas

Modifications to towers, removal of existing poles, and assembly and installation of new poles would require an up to 0.30-acre work area at each tower and pole location along the Missouri Flat-Gold Hill Line and a 0.05- to 0.10-acre work area at each pole location along the Gold Hill No. 1 Line. Site preparation is not expected to be necessary for the majority of the tower and pole staging areas; however, some limited surface blading, grading, and filling to create a stable and level work pad may occur on an as-needed basis. Vegetation removal, tree trimming, and matting or plating of drainage crossings may be required for vehicle access.

Construction materials would be delivered using line trucks and staged near existing structures. Construction vehicles would access staging areas using existing paved, dirt, and gravel roads and overland travel routes, with the exception of one tower and one pole, one of which may be accessed by helicopter and one would require a new gravel road. The tower located near the intersection of Broadstone Parkway and Empire Ranch Road is located within a seasonal pond and may require helicopter access; however, depending on site-specific conditions at the time of construction, other construction methods may be employed, including accessing the tower on foot and using pulley equipment staged outside of the pond or completing tower work only during the dry season and staging construction equipment on temporary matting. The construction of a new gravel road would be required for work at one pole located approximately 170 feet northwest of the intersection of Finders Way and Saratoga Way in El Dorado Hills.

Helicopter Landing Zone

Modifications to one tower, located approximately 800 feet northwest of the intersection of Broadstone Parkway and Empire Ranch Road, may require use of a helicopter to facilitate access to the tower staging area. To accommodate use of a helicopter, a helicopter landing zone has been identified approximately 560 feet southeast of the intersection of Montridge Way and Wilson Boulevard in an undeveloped area of El Dorado County (shown on Figure 2-3). This landing zone (approximately 0.7 mile east of the proposed tower modification) would have a temporary footprint of not more than 1 acre; however, the exact location and footprint would depend on conditions on the ground and would not be determined until just prior to construction. The helicopter landing zone would be used to support helicopter operations (e.g., transport materials to and from the tower), as well as facilitate other activities, including, but not limited to, staging and storing construction materials and equipment, refueling, and assembling construction materials. Ground access to the helicopter landing zone would be by overland access routes. Some limited surface blading, grading, and filling to create a stable and level area may occur as-needed. Vegetation removal, tree trimming, and matting or plating of drainage crossings may be required for vehicle access.

Pull Sites

Up to 14 pull sites would be located generally in line with the existing Missouri Flat-Gold Hill Line and up to 15 pull sites would be located generally in line with the existing Gold Hill No. 1 Line (shown on Figures 2-2 through 2-8). The average distance between pull sites along the Missouri Flat-Gold Hill Line would be approximately 1.2 miles; the average distance between pull sites along the Gold Hill No. 1 Line would be approximately 0.4 mile. These pull sites would be used during construction to stage conductor-pulling trucks and conductor reel trucks to install the new conductors onto the lattice steel towers, TSPs, and wood or LDS poles. Pull sites for the Missouri Flat-Gold Hill Line would average 400 feet in length by 100 feet in width. Pull sites for the Gold Hill No. 1 Line would average 250 feet in length by 50 feet in width. Each site would have a footprint of up to 2.4 acres along the Missouri Flat-Gold Hill Line and up to 0.8 acre along the Gold Hill No. 1 Line.

The locations of the pull sites would be sited within the larger potential pull site siting areas; identified on Figures 2-2 through 2-8. Actual pull sites would not require use of the entire area

identified on these figures. The exact locations and footprints of the sites would depend on conditions on the ground and would not be determined until just prior to construction. Site preparation is not expected to be necessary for the majority of the pull sites; however, some limited surface blading, grading, and filling to create a stable and level staging area would occur as-needed. Vegetation removal, tree trimming, and matting or plating of drainage crossings may be required for vehicle access to pull sites. Construction vehicles and equipment needed at the pull sites would be parked or staged within the Project ROW or alongside access roads. Transport vehicles (e.g., crew-cab trucks and half-ton pickups) would be used to transport personnel to pull sites. To haul the conductor to the site, reel trailers with reel stands would be mounted on a line truck. On the line truck, pullers would be mounted to install the conductor. The old conductor would be removed from the sites on a line truck.

2.7.1.2 Access/Spur Roads

The Project would be accessed via existing roads, new permanent access roads to be constructed, and overland access routes. **Table 2-2** presents estimated miles of each type of access road required for the Project. Planned access routes may change depending on construction needs and site conditions at the time of construction. As shown, 22.8 miles of existing paved roads that would be used for the Project would not require any substantial upgrades prior to Project construction. 4.2 miles of existing dirt/gravel roads would be used that would typically require minor repair and maintenance. 6.6 miles of existing unpaved roads would be upgraded to access the Project. Upgrades would occur within the existing access road corridor and would include vegetation removal, grading, filling, or other repair and maintenance. Portions of some unpaved access roads may need to be reestablished and maintained through tree trimming, vegetation clearing, the addition of substrate, and some minor grading/blading.

TABLE 2-2
ACCESS ROADS

Type of Access	Description	Potential Improvements Required	Approximate Distance (miles)
Existing paved roads	Typically a highway (U.S. 50) or two-lane county road	None	22.8
Existing dirt/gravel roads	Typically a previously graded road with a dirt or gravel base	Minor road repair and maintenance, as needed	4.2
Existing unpaved road requiring improvement	Typically an unmaintained previously graded road with a dirt or gravel base	Vegetation removal, grading, filling, or other repair and maintenance, as needed	6.6
New unpaved road	Typically located in areas with problematic access to establish a road to facilitate operation and maintenance	Vegetation removal, grading, and/or fill, as needed to establish road	0.02 (100 feet)
Overland route	Typically relatively flat grassy areas	Mowing as needed	2.9

SOURCE: PG&E, 2013b.

Access to one pole located north of the intersection of Finders Way and Saratoga Way in El Dorado Hills would require construction of a new graded and graveled road. The 100-foot-long spur road is anticipated to be 12 to 18 feet wide.

Typical construction equipment required for the construction of unpaved roads includes a grader, bulldozer, compactor, and haul trucks. Along access routes within the Pine Hill Preserve and parcels immediately adjacent to the preserve, existing gates may be repaired or replaced and new gates may be installed on an as-needed basis in coordination with the BLM and relevant landowners. Overland travel would occur on 2.9 miles of relatively flat, grassy areas to reach various work sites. These overland routes are not expected to require grading, or filling; however, mowing of vegetation may be required.

Construction crews would access the Project area primarily by using Highway 50 and traveling along East Bidwell Street, Broadstone Parkway, Silva Valley Parkway, Latrobe Road, Old Bass Lake Road, White Rock Road, Country Club Drive, Crazy Horse Road, Flying C Road, Strolling Hills Road, Ridge Pass Drive, Rodeo Road, Durock Road, and Merrychase Drive, which are all existing paved roads.

2.7.1.3 Pole Removal

Project construction would include removal of 61 existing TSPs and 80 wood poles.

Tubular Steel Poles

To remove the existing TSPs, a crane would be rigged to the top of the pole, and the pole would be cut off below the bottom arms with a torch and lowered to the ground. The bottom section of the pole would be supported by the same crane and cut with the torch at ground level and lowered to the ground.

Existing foundations would be removed to 2 to 4 feet below grade, including concrete and steel. The excavation would be filled in with the spoils from the new foundations. Existing TSP foundations within environmentally sensitive areas, such as the Pine Hill Preserve, may be abandoned in place to minimize ground-disturbing impacts. Should TSP foundations be abandoned, the steel pole portion would be removed using the same methods described above. The abandoned foundation would contain a void and, to avoid potential safety concerns, a cement truck would be mobilized to fill the void with slurry. The foundation would then be left in place. The crane, cement truck, and other construction equipment would be staged outside of environmentally sensitive areas, matted, or otherwise protected.

Wood Poles

A hydraulic jack mounted on a line truck would be used to loosen wood poles and replacement or temporary wood poles would be installed to accommodate construction. Wood poles that would be removed and replaced as part of the Project consist of treated wood. Removed poles would be placed in bins and transported to an appropriate disposal facility in accordance with applicable regulations. If the poles need to be cut prior to transport, plastic sheeting would be placed under

the saw equipment area to gather all shavings. Shavings would also be placed in bins for transport to the appropriate disposal facility. Poles would be cut into two sections and then removed using a line truck with a trailer. Once the poles are removed, the soil removed while auguring the new pole hole would be used to backfill the remaining void. Any unused soil would be feathered in around the new pole site.

2.7.1.4 Tower Modifications

Tower Reinforcement and Antennae Installation

The reinforcement of eight towers would be accomplished with crew trucks, pickups, and boom trucks. Some towers may be accessed on foot where only light modifications are needed. One tower with cellular equipment mounted at the top of the tower would require substantial reinforcement of the tower body. The cellular equipment that may interfere with work would be removed prior to modification of the tower. The reinforcement would be accomplished using pickups trucks and boom trucks. Once tower modifications are completed, any cellular equipment removed would be reinstalled on the tower.

Tower Raise

The vertical tower raise within Gold Hill Substation would utilize a tower lifter, which would be mobilized to the tower from Gold Hill Substation, to install the leg extension. The equipment would be positioned beneath the tower and lift the structure to facilitate installation of the new extension steel.

Helicopter Staging and Use

The Project would require only limited use of a helicopter for the modification of one tower, located approximately 800 feet northwest of the intersection of Broadstone Parkway and Empire Ranch Road. A helicopter may be used to facilitate access to the tower staging area as a result of its location in a seasonal pond (shown on Figure 2-3). The helicopter likely would be stationed at Sacramento Mather Airport, a public-use airport located approximately 12 miles southwest of the proposed tower modification or at Auburn Airport, a public-use airport located approximately 20 miles north of the proposed tower modification. The helicopter flight path would generally follow the existing alignment and avoid flying over residences. The helicopter type would depend on availability at the time of construction; however, the actual helicopter to be used would not be larger than a Bell L3 (long ranger) with a load capacity of approximately 1,200 pounds. The total hours of operation for the helicopter would be an estimated 20 hours (5 days of operation, 4 hours of operation per day, and 2 landings/take-offs per day), with a maximum of up to 30 hours (5 days of operation, 6 hours of operation per day, and 4 landings/take-offs per day). It is not anticipated that residents would be required to temporarily vacate their homes; however, in the unlikely event that final construction plans require otherwise, all Federal Aviation Administration (FAA) requirements would be met and PG&E would coordinate with potentially affected residents (providing a minimum of 30 days advance notice) to minimize the necessary work duration and any resultant inconvenience. Applicant Proposed Measures (APMs) to avoid and minimize potential impacts from helicopter use are listed in Section 2.9, Applicant Proposed Measures.

2.7.1.5 New Structure Installation

Temporary Structures

To facilitate safe conductor installation, temporary guard structures, snub poles, and line poles would be installed prior to reconductoring.

Guard Structures

Guard structures would be installed alongside roadways or at utility crossings to prevent conductor from sagging or falling into traveled lanes or into contact with other utility lines if the conductor loses tension during reconductoring activities. Guard structures would be installed at crossing locations before conductor pulling activities begin. The structures typically consist of paired, single-Y configured pole structures or paired wood poles with cross bracing designed to catch falling conductor; a network of cables and netting may also be tied onto these poles. An up to 40- by 40-foot staging area would be used to install the guard structures. The structures would be temporary direct-bury wood poles that typically extend up to 50 feet aboveground and 7 feet belowground. These poles would have a minimum of 25 feet of ags clearance. Final design would determine guard structure staging area locations. Guard structures would be installed from paved roads whenever possible, and would be located along roadsides in disturbed areas, causing relatively limited disturbance. Where this is not feasible, guard structure sites would be accessed by existing dirt roads and structures would be installed in a way that minimizes soil disturbance. As an alternative to the installation of guard structures, line or bucket trucks may be staged at crossings to minimize ground disturbance or to accommodate other construction-related needs. PG&E would obtain any necessary city, county, or state encroachment permits. The installation of guard structures may require temporary lane closures at the seven crossings along Highway 50, as required by the California Department of Transportation (Caltrans) for safety. Following reconductoring activities, guard structures would be removed, the holes would be backfilled, and the disturbed areas would be recontoured and reseeded as needed.

Snub Poles

Snub poles are single wood poles that would be used to facilitate pulling operations. Up to two poles would be installed at pull sites where the conductor cannot be directly attached to the structure because of structure design. Snub poles typically extend 70 feet aboveground and 10 feet belowground.

Snub poles are directly buried and may be guyed for stability. A line truck would be used to auger and set the wood poles. Following reconductoring activities, snub poles would be removed, the holes would be backfilled, and the disturbed areas would be recontoured and reseeded as needed.

Temporary Line Poles

Five temporary lines are planned as part of the Project to accommodate required line outages during construction. Specifically, temporary lines would be installed within or immediately adjacent to the boundaries of the Shingle Springs Substation, Pacific Western Pipe Substation, the private CPM tap, Clarksville Substation, and Gold Hill Substation, as all of these facilities must remain energized throughout construction. The temporary lines would be supported by wood

poles and three-pole wood structures that would be guyed for stability and range in height from approximately 40 to 65 feet, with the exception of the temporary line at Clarksville Substation, which may be up to approximately 90 feet height. Drawings of a typical three-pole structure are provided in **Figure 2-13**.

New Pole Installation

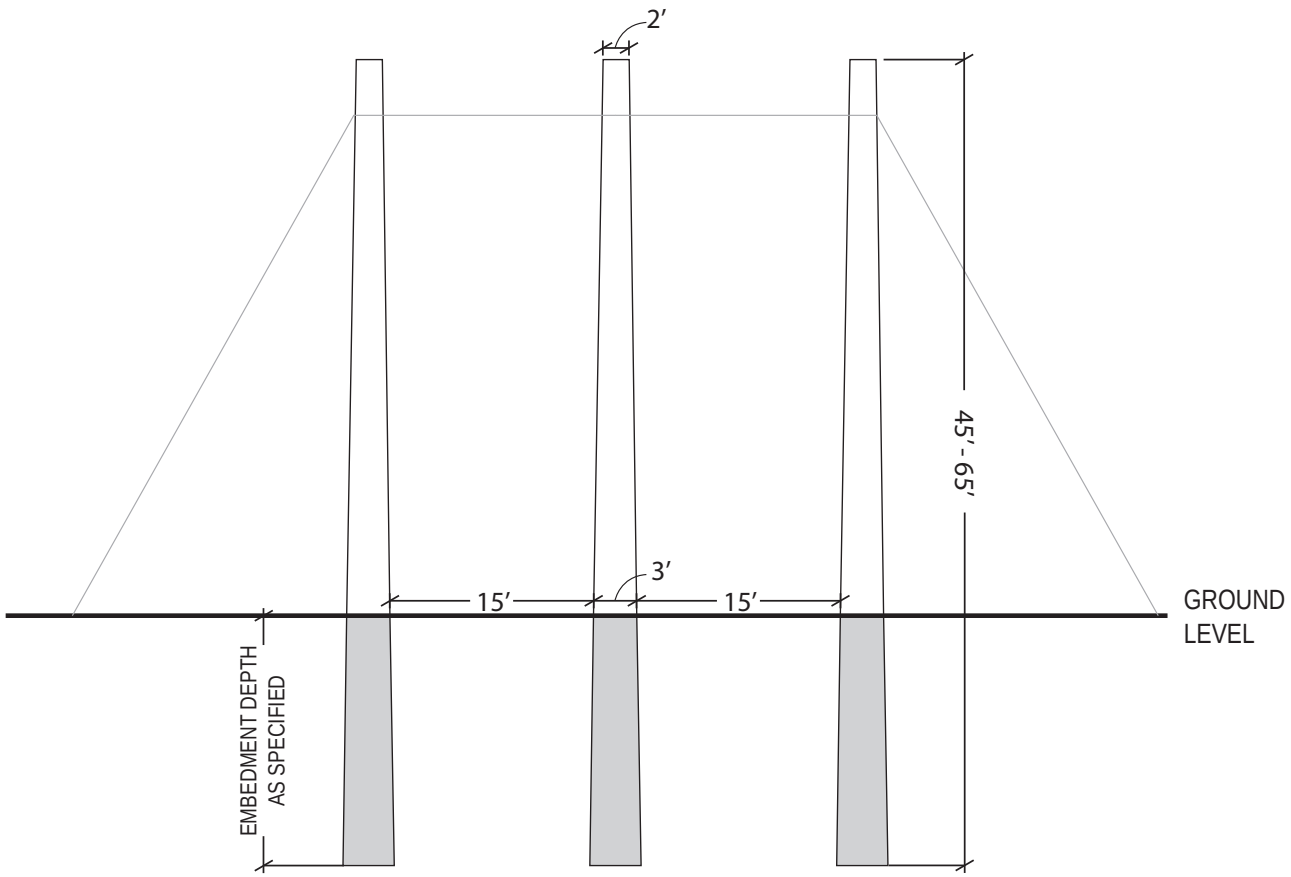
Typical dimensions for TSPs and wood and LDS poles are provided in **Table 2-3**. Pole installation would occur during daylight hours and would typically require four to five truck trips to each pole location to install new poles and remove existing poles. The typical construction sequence for pole installation is shown in **Figure 2-14**.

TABLE 2-3
SUMMARY OF TYPICAL STRUCTURE DIMENSIONS

Structure Feature	Structure Type	Approximate Metrics
Pole Diameter	TSP	30 inches to 50 inches
	Wood and LDS Pole	1 to 2 feet
	Temporary Wood Pole	16 to 24 inches
	Lattice Steel Tower	Not Applicable (NA)
Auger Hole Depth	TSP	19 to 24 feet
	Wood and LDS Pole	7 to 10 feet
	Temporary Wood Pole	6.5 to 16 feet
	Lattice Steel Tower	NA
Footprint	TSP	5 to 8 square feet (permanent)
	Wood and LDS Pole	1 to 3 square feet (permanent)
	Temporary Wood Pole	1 to 3 square feet (temporary)
	Lattice Steel Tower	600 to 800 square feet (permanent)
Number of Poles/Towers	TSP	60
	Wood and LDS Pole	122
	Temporary Wood Pole	321
	Lattice Steel Tower	13
Average Pole/Tower Work Area	TSP	0.3 acre
	Wood and LDS Pole	0.05 acre
	Temporary Wood Pole	0.06 acre
	Lattice Steel Tower	0.3 acre
Approximate Total New Permanent Pole/Tower Footprint Acreage[a]		**0.002 acre**

NOTES:

[a] Because the Project involves replacement of existing structures at an approximately one-to-one ratio, the total permanent pole/tower footprint acreage includes the permanent footprints for new additional structures only.



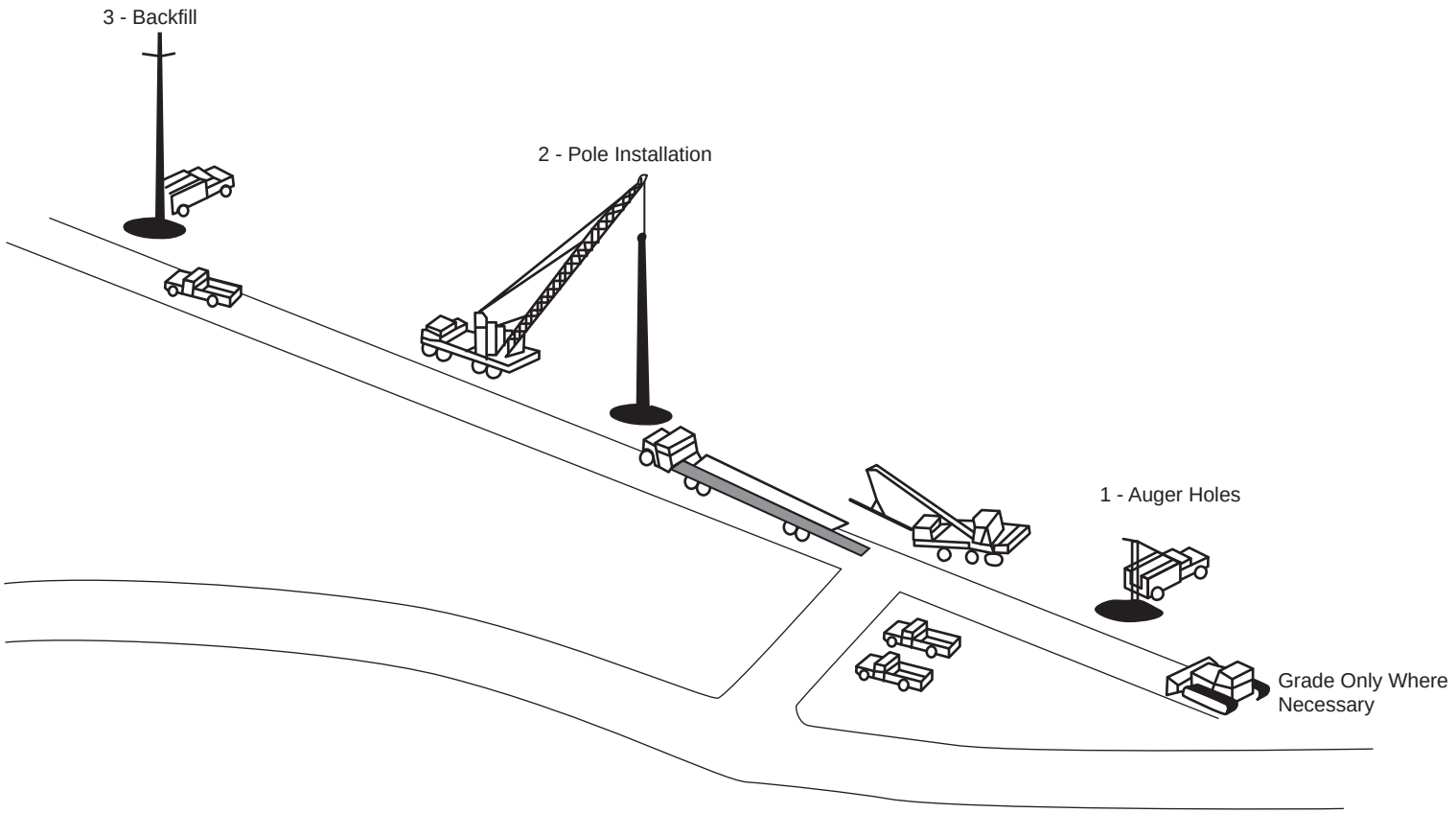
Preliminary and subject to change based on California Public Utilities requirements, final engineering and other factors.

*Not to Scale

Missouri Flat Project . D207584.16

SOURCE: AECOM, 2013

Figure 2-13
Typical Three-Pole Structure Drawing



NOT TO SCALE

SOURCE: ESA

Missouri Flat Project . D207584.16

Figure 2-14
Typical Construction Sequence

Tubular Steel Poles

Each new TSP would be delivered and staged next to the TSP that it would be replacing, and a crane would be used to assemble the TSP. Installation of TSPs typically would include the following steps for site preparation, foundation installation, and TSP installation. To prepare the site, required best management practice (BMP) measures would be implemented. A work area would be prepared by surface blading or minor grading to create a level surface at TSP locations on an as-needed basis. Once TSP work areas are prepared, a line truck or boom truck with a small crane mounted on a flatbed would be used to haul foundation forms, anchor bolts, rebar, and pole structures to the TSP locations. The truck would also be used to place foundation forms, anchor bolts, and rebar prior to pouring the concrete for the foundations. A concrete truck (i.e., a four-wheel-drive mixer capable of delivering 10 yards of concrete) would then deliver and pour concrete for the TSP foundations. Depending on site-specific conditions, one of two construction methods—concrete-pier or micropile foundation—would be employed to construct the TSP foundation.

Concrete-Pier Foundations. Concrete-piers foundations would be 5 to 8 feet in diameter and 18 to 23 feet in depth. They are generally constructed using the following steps:

1) Auger new hole using drill rig (track or wheel mounted)
2) Install foundation forms, rebar, and anchor bolts
3) Pour concrete foundation
4) Remove forms and place gravel around and groom the base area

Micropile Foundations. Micropile foundations consist of up to 12 composite piles constructed in a 5-to-6-foot-diameter array. Individual composite piles consist of up to a 9-inch high-strength steel casing, high-strength all-thread rebar, and grout. Composite piles would be imbedded up to 30 feet below ground. Micropile foundations are generally constructed using the following steps:

1) Drill multiple batter shafts 6 to 8 inches in diameter with platform mounted drill rig
2) Install anchor bolts in batter shafts, grout/slurry backfill on shafts
3) Install steel/concrete cap on micropiles

Following the installation of concrete-pier and micropile foundations, a line or boom truck would be used to remove the form. The new TSP would then be installed using a crane to place the TSP on the foundation. The existing conductor would then be transferred to the new TSP using a line truck or by hand using ropes and the new conductor would be pulled while existing conductor is removed. Once the conductor has been replaced, the existing poles would then be removed by crane and the remaining void would be backfilled. Excess soil on site would be feathered around the work area or placed consistent with applicable requirements and in consultation with the landowner. A backhoe would be used to place gravel around the TSP foundation after the formwork has been removed and to groom the area surrounding the TSP installations.

Portable washing stations would be established at various locations throughout the Project alignment to minimize time between the concrete pour and truck clean out. These stations would

include dike walls and tarping, allowing washed materials to be contained and disposed of in accordance with applicable laws. Alternatively, self-washing concrete trucks with mobile containment may be used or equipment would be washed and contained in accordance with local encroachment permits. Excess construction materials would be transported to an area service center or other appropriate facility for disposal in accordance with applicable laws. Washed materials are typically allowed to dry before transport and disposal.

Wood and Light-Duty Steel Poles

The first step to install wood and LDS poles, including temporary and permanent wood poles, would be to excavate a pole hole using an auger. Depending on the pole size, the hole dimensions would range between 3 to 4 feet in diameter and 7 to 10 feet in depth. Following excavation, the poles, insulators, and hardware would be delivered to the pole work area and assembled. The poles would then be placed in the hole using line trucks or cranes, the remaining void would be backfilled, and the surrounding area would be compacted. Poles would be direct buried (no foundation or footing) and may be guyed for stability. Once the pole is embedded and the surrounding area is compacted, additional hardware would be installed using a bucket truck. LDS poles would be manufactured in two pieces that are engineered specific to a pole location. The pole pieces are closed at each end. The bottom piece of the pole would be placed in the hole; the top piece would have the hardware assembled to it on the ground. The poles would be assembled by having a truck-mounted crane lift the top piece and lower it onto the lower pole section. Soil would be backfilled around the newly installed pole to fill any remaining void.

Distribution Line – Undergrounding

Approximately 1,000 feet of existing 21 kV overhead distribution line would be placed underground along Platt Circle in the community of El Dorado Hills to meet ground-to-conductor clearance requirements for the reconductored Missouri Flat-Gold Hill Line. This work would include installing an interset pole adjacent to the east side of Platt Circle approximately 300 feet southeast of the intersection of Platt Circle and Arches Avenue, installing a riser pole at the northeast corner of the intersection of Platt Circle and Finders Way, and removing existing power line poles, which also support the existing distribution line. Using a backhoe, an up to 20-inch-wide trench with a minimum depth of 42 inches would be excavated. After the trench is excavated, cable and conduit would be installed using 2- to 6-inch-diameter casing or duct and the trench would be backfilled and the soil compacted. In-ground splice boxes, which are approximately 5.5 feet in width, 9.5 feet in length, and 7 feet in depth, would be installed as needed. The paved roadway then would be repaved to required specifications.

Distribution Line – Relocation

Approximately 150 feet of existing distribution feeder line connecting the Gold Hill No. 1 line to the Limestone Substation would be relocated within 80 feet of the existing feeder line in order to maintain service to the Limestone Substation during construction. The distribution feeder line is located in the community of Cameron Park, north of the intersection of Strolling Hills Road and Ridge Pass Drive. The distribution line would be relocated by replacing three existing distribution wood pole structures (one wood H-frame structure and two wood poles) with two new wood poles. The relocated distribution line would remain in place after construction.

Reconductoring

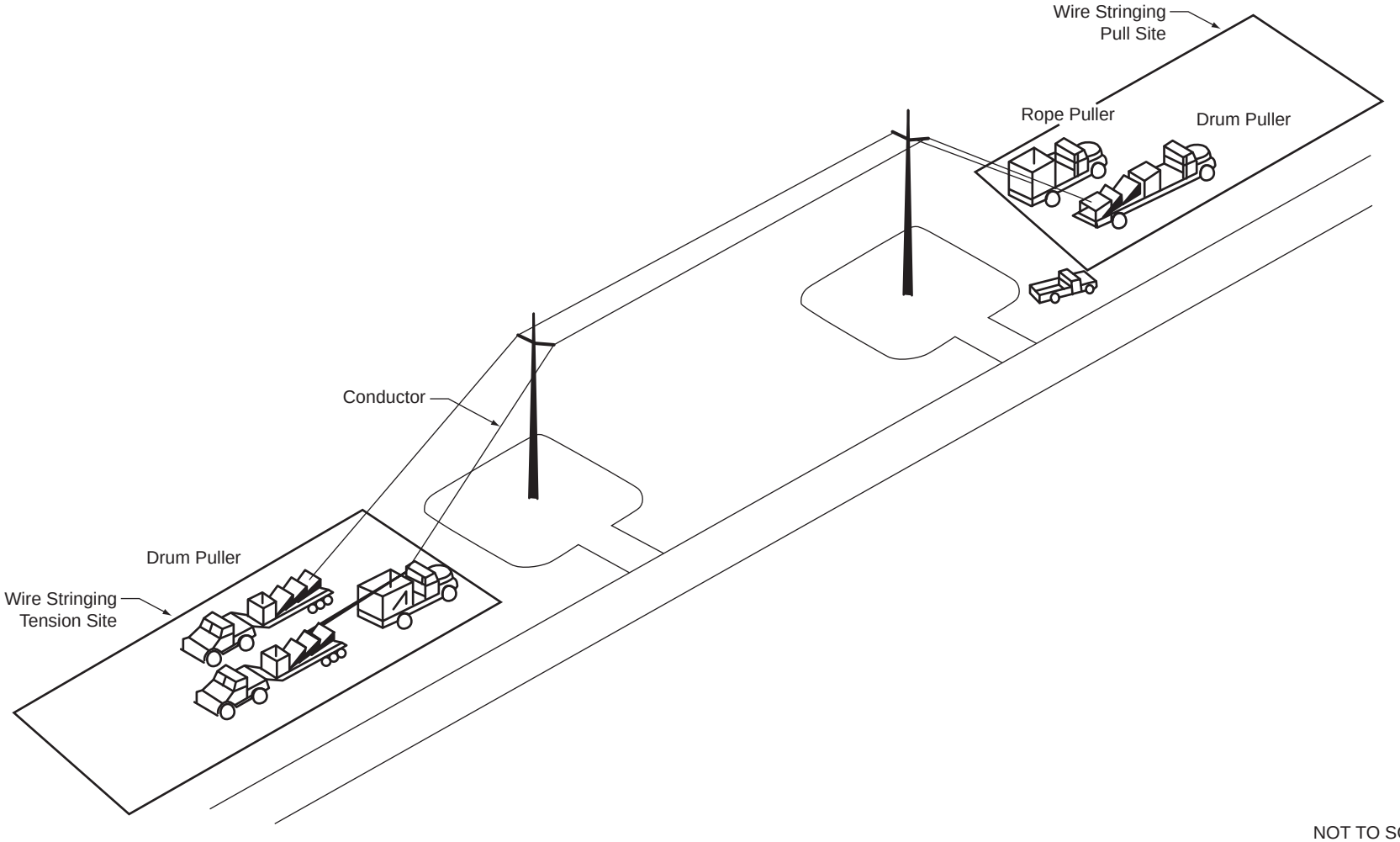
Reconductoring Activities

During reconductoring activities, when existing conductor is replaced with new conductor, the existing power line and any distribution lines that cross or are collocated on the line would be taken out of service (known as "taking a clearance"). To avoid potential safety concerns, a road closure or a rolling stop would be arranged for any locations where lines cross over roads before conductor installation begins. Any road closures that must occur on private and county roads typically would not exceed a few minutes in duration and would be coordinated with the county or landowner. Alternatively, guard structures may be installed at road crossings in lieu of road closures.

To replace a conductor with a new conductor, the existing conductor first would be detached from its support structure and temporarily lifted. Rollers then would be installed at the conductor's attachment point, and the conductor would be placed onto the rollers. The rollers would allow the conductor to be pulled through each structure until the conductor is ready to be pulled up to the final tension position. Installing rollers and detaching the existing conductor typically would require one bucket truck. Crews would access each tower or pole staging area by pick-up truck or bucket truck using existing access roads. Crews may also need to access mid-span locations to structurally reinforce splices (joints where conductor is connected) along the existing conductor to avoid conductor breakage during pulling operations. These locations may be accessed by truck, helicopter, or foot, depending on site conditions at the time of construction. The Missouri Flat-Gold Hill Line crosses Highway 50 at five locations and the Gold Hill No. 1 Line crosses the highway at two locations. The reconductoring work would not require closure of Highway 50 or use of a helicopter at any of the proposed seven crossing locations. As indicated above in Section 2.7.1.5, temporary lane closures may be required during the installation of guard structures.

Once the rollers are in place for an entire section of conductor, the existing conductor would be pulled out of place. A cable would be attached between the old conductor and new conductor, which would be on a reel attached to a line truck at a pull site. A line truck with a drum puller and empty conductor reel would pull the old conductor onto the reel, where it would be collected for salvage. Reel stands mounted on a line truck at the pull site would feed new conductor along the rollers that were previously installed at each structure, while also maintaining tension in the line so that it does not sag to the ground. After the conductor is pulled into place, conductor sags would be adjusted to required tensions. The conductor would then be clamped to the end of each insulator as the rollers are removed. The final step in the conductor installation would be to install vibration dampers and other accessories as necessary. Old conductor would be removed from sites on a line truck. Typical construction stringing activity is shown in **Figure 2-15**.

Packing crates, spare bolts, and construction debris would be picked up and hauled away for recycling or disposal during construction. PG&E would conduct a final inspection to confirm that cleanup activities have been successfully completed.



NOT TO SCALE

SOURCE: ESA

Missouri Flat Project . D207584.16

Figure 2-15

Typical Construction Stringing Activity

Distribution Switching Operations

To reconductor both the Missouri Flat-Gold Hill and Gold Hill No. 1 lines, PG&E would temporarily take out of service specific sections of distribution lines that cross the power line or are co-located on the power line (also known as taking clearances). As part of ongoing operation and maintenance of the distribution system, PG&E's Distribution System Operations group would manage distribution clearances and balance the system by routing power to different lines. This normally involves turning existing distribution switches on and off, and installing additional switches if needed. Distribution switches may be located along the distribution lines that are being taken out of service or along other distribution lines that may be affected by taking a line out of service. Some switches are operated at a central location, such as a substation, or are controlled remotely. Other switches are operated manually in the field by operations personnel, using a bucket truck or similar equipment. The location where switching activities would be required would vary depending on daily and seasonal power demand scenarios and generally is not possible to determine in advance. PG&E crews would perform this work as needed to comply with safety procedures, limit customer outages, and manage the operational needs of the system.

2.7.1.6 Substation Modifications and Construction

All modifications to existing substations would be completed within substation or switching station fence lines and no substation expansions are proposed. All substation equipment would be sized adequately to match or exceed new line requirements. As only minor modifications would be made, no changes to existing operation and maintenance activities would result from Project implementation. Substation modification activities would include replacing circuit breakers, switches, conductor, busses, jumpers, and line relays; installing junction boxes and pull boxes for new equipment; and upgrading existing supervisory control and data acquisition systems.

2.7.1.7 Vegetation Clearance and Tree Removal

The Project includes vegetation trimming and tree or shrub removal of up to 8 acres of land, including the removal of approximately 225 trees along proposed access roads and temporary work areas in order to accommodate construction vehicles and equipment. The majority of vegetation removal, including tree removal, would be required at two primarily undeveloped sections of the Project alignment that are each approximately 1 mile long. The first is between Strolling Hills Road and Rodeo Road, where the Project traverses oak woodland vegetation and the second is between Palmer Drive and Shingle Springs Substation, where the Project traverses multiple parcels comprised of mixed chaparral vegetation, including the Pine Hill Preserve, one parcel west of the preserve, and another parcel south of Highway 50. Approximately 60 percent of trees that may be removed are native species, and a majority of these are oak trees. Native trees that may be removed have an average height of approximately 30 feet (range = 12 to 50 feet) and an average diameter at breast height (dbh) of 9 inches (range = 4 to 20 inches). Approximately 40 percent of the trees that may be removed are non-native, ornamental species, such as eucalyptus and various fruit trees. The non-native trees have an average height of approximately 30 feet (range = 10 to 50 feet) and an average dbh of 11 inches (range = <4 to 20 inches) (PG&E 2013b).

Shrubs would be mowed and shredded or removed from access roads using an all-season vehicle mower or similar equipment on rubber tracks to clear access roads for subsequent grading. Up to four vegetation management crews would be used, typically consisting of two to three workers per truck. Crews would access work areas with lift trucks equipped with hydraulic buckets to reach areas requiring high pruning work, where accessible. Chippers, which would be used to process wood of up to 4 inches in diameter, would be towed to work sites by lift trucks, climb trucks (with no hydraulic buckets), or four-wheel drive pick-up trucks. On sensitive or remote sites, remote-controlled track chippers that can process wood of up to 12 inches in diameter may be utilized. In some areas, limbs and pruning debris would be lopped and scattered outside the power line ROW, to less than 18 inches in depth. Wood chips would be spread on site, where appropriate, and/or hauled away from work sites, depending on landowner preferences.

Vegetation management equipment typically would include manual clippers, hand saws, pole saws, chainsaws, and shredders. For brush and tree species that are prone to resprouting and where trees have been removed along roads, an approved herbicide would be applied to control resprouting and maintain a clear ROW for continued emergency and service access and to encourage the growth of ROW-compatible grasses and low-growing brush species. Generally, removed vegetation would be shredded in place and spread nearby. During clearing activities, vegetation would be mowed or grubbed, leaving root systems intact wherever possible to encourage resprouting and to minimize erosion.

2.7.1.8 Land Disturbance

The Project is anticipated to require a total of up to 29 acres of soil disturbance distributed throughout the entire Project alignment. Activities requiring soil disturbance include recontouring (e.g., minor grading, blading, etc.) of some access roads, pull sites, and pole and tower work areas to accommodate construction vehicles and equipment.

The total approximate amount of soil that would be excavated for installation of TSP and LDS or wood poles is 3,050 cubic yards, assuming that each concrete-pier TSP would require an average excavation diameter of 8 feet and depth of 24 feet; each micro-pile TSP would require up to 12 pilings with an average excavation diameter 0.75 feet and depth of 30 feet; and each LDS or wood pole would have an average excavation diameter of 4 feet and depth of 10 feet.

The total approximate amount of concrete or backfill required for TSP and LDS or wood pole installation is approximately 2,700 cubic yards, assuming that 22 to 24 cubic yards would be needed for each TSP and 15.5 cubic yards for each LDS or wood pole.

2.7.1.9 Erosion and Sediment Control and Pollution Prevention during Construction

Construction activities include ground-disturbing activities such as grading and vegetation removal. Small, temporary stockpiles of excavated dirt may be located near the excavations for the new TSP foundations and wood or LDS poles. These materials will be used to backfill the holes left by removal of the existing TSPs and wood poles. Stockpiles would be located away

from or downgradient from waterways, and other sediment control best management practices (BMP) would be implemented to manage temporary stockpiles. Construction debris, including removed TSPs and wood poles, would be taken on a line truck with a trailer to an area service center for recycling or disposal.

Because these activities would result in excess of 1 acre of disturbance, PG&E would obtain coverage under the California State Water Resources Control Board (SWRCB) General Permit for Storm Water Discharges Associated with Construction Activity Order Number 2009-0009-DWQ (General Permit). To obtain coverage under the permit, PG&E would develop and submit Permit Registration Documents—including a Notice of Intent, a stormwater pollution prevention plan (SWPPP), a risk assessment, a site map, certification, and an annual fee—to the SWRCB prior to initiating construction activities.

In conjunction with the SWPPP, appropriate BMPs would be developed for each activity that has the potential to degrade surrounding water quality through erosion, sediment run-off, and other pollutants. These BMPs would then be implemented and monitored throughout construction by a qualified SWPPP practitioner. APMs to reduce and avoid erosion and control sediment and pollution during construction are provided in Section 2.9, Applicant Proposed Measures.

2.7.1.10 Best Management Practices

Construction crews working on PG&E projects routinely use relevant BMPs to ensure crew and public safety and to avoid and minimize impacts on resources. At a minimum, the following BMPs would be implemented during construction of the Project:

- **Litter and Trash Management.** All food scraps, wrappers, food containers, cans, bottles, and other trash from the project area will be deposited in closed trash containers.

- **Parking Requirements.** Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed or developed areas or work areas, as identified in this document. Off-road parking will only be permitted in previously identified and designated work areas.

- **Route and Speed Limitations.** Vehicles will be confined to established roadways and pre-approved access roads, overland routes, and access areas. Access routes and temporary work areas will be limited to the minimum necessary to achieve the project goals. Routes and boundaries of work areas, including access roads, will be clearly mapped prior to initiating project construction. Vehicular speeds will be kept to 15 mph on unpaved roads with no posted speed limit.

- **Maintenance and Refueling Requirements**. All equipment will be properly maintained for the duration of construction. All refueling and maintenance of vehicles and other construction equipment will be restricted to designated work areas and located at least 100 feet from any downgradient aquatic habitat, unless otherwise isolated from habitat. Proper spill prevention and cleanup equipment will be maintained in all refueling areas.

- **Prohibited Activities**. Trash dumping, firearms, open fires (such as barbecues), hunting, and pets will be prohibited at work sites.

- **Erosion Control Materials.** Only tightly woven netting or similar material will be used for erosion control materials, such as coir rolls and geo-textiles, within or adjacent to suitable habitat for sensitive species. No plastic monofilament matting will be used.

2.7.1.11 Cleanup and Post-Construction Restoration

During construction, construction debris would be picked up from work areas and stored in approved containers on site, and would be hauled to an area service center or other appropriate facility for recycling or disposal periodically during construction. PG&E would conduct a final inspection to ensure that cleanup activities have been successfully completed. Restoration activities would be conducted as needed and in coordination with landowners.

2.7.2 Construction Workforce and Equipment

On a typical work day, 15 to 20 construction workers would be at the Project site; however, because of the variety of work activities that may be completed concurrently, up to 45 workers may be on site at any time. During line work, crews typically would be working at adjacent poles. **Table 2-4** provides the typical number of construction workers and equipment generally required for each construction activity and **Table 2-5** details the equipment that is planned for use. Not all equipment or workers may be used during all stages of the activity. This table represents a preliminary equipment list; additional equipment and/or workers may be identified once Project design is finalized or during construction if unexpected conditions are encountered.

As described below in Table 2-4, 45 workers per day would be required to construct the Project at its peak. Construction would be performed by either PG&E construction crews or contractors, depending on the availability of PG&E construction personnel at the time of construction. Contractor construction personnel would likely be from within El Dorado or

Sacramento Counties or adjacent areas and would be managed by PG&E construction management personnel. Construction efforts would occur in accordance with accepted construction industry standards. Construction activities generally would be scheduled during daylight hours (7:00 a.m. to 6:00 p.m.); nighttime construction would occur only if necessary for safety reasons or if electrical outages (clearances) are scheduled at night to facilitate construction. These activities would be infrequent, temporary and short term. Advance notice of known night work would be provided to affected residents.

Construction vehicles and equipment would be staged or parked within the Project area rights-of-way, approved temporary construction easements, or alongside access roads. Although vehicles and equipment are anticipated to park primarily outside of travel lanes on public roadways, if road closures become necessary, they would be temporary and short-term and coordinated with the California Department of Transportation and/or local jurisdictions.

TABLE 2-4
TYPICAL CONSTRUCTION WORKERS AND EQUIPMENT

Activity	Number of Construction Workers	Equipment Quantity and Type
Site Preparation	5	1 backhoe 1 small bulldozer 1 truck with trailer 1 500-gallon water truck 1 light-duty pickup truck
Auger Holes	3	1 water truck 1 pickup truck 1 line truck with auger attachment
Haul Material	3	1 line truck with trailer
Tubular Steel Pole Installation	6 per crew	1 line truck with boom and crane 2 crew-cab pickup trucks 1 light-duty pickup truck 1 hole digger 3 cement trucks 1 backhoe
Tubular Steel Pole Delivery	2	1 pole delivery truck 1 pickup truck
Wood and LDS Pole Installation	20	3 pickups 1 35-ton crane 3 line trucks 3 bucket trucks 3 light-duty pickup trucks 2 tractors 3 backhoes 8 small line/bucket trucks 1 dump truck 3 water trucks
Wood Pole Removal	6 per crew	2 crew-cab trucks 1 line truck with bucket and trailer
Tower Modification	6	1 200-ton crane
Conductor Installation	6 per crew	1 line truck or semi-truck with conductor reel 2 pickup trucks 2 line trucks with bucket/crane 1 line truck with conductor puller 1 line truck with conductor tensioner
Distribution Placement Underground	5	1 wet vacuum trailer 1 saw cutter 1 dump truck 1 trailer with backhoe 1 crew truck 1 water truck
Substation Modification	5	1 pickup truck 1 line truck 1 bucket truck

TABLE 2-5
ANTICIPATED CONSTRUCTION EQUIPMENT

Equipment	Use
Aerial Lift	Lift crew members to make line connections
Auger	Drill holes for pole installation
Crane	Lift heavy equipment and materials
Crew-cab truck or pickup truck	Transport workers
Dump truck	Remove trash
Excavator	Install mats, trenching
Fork lifts	Install mats
Gas crew truck (26,000 lbs) with trailer	Transport equipment and materials
Generator set	Generate power for operation of tools
Hand-digging equipment	Use for air or hydrologic-operated tooling
Helicopter	Transport personnel workers and equipment
Line truck (with auger, puller, worker-lift bucket, and crane/boom)	Install and remove holes, poles, and conductor
Mechanics service trucks	Service and repair vehicles
Motor grader	Grade work areas and access roads
Pickup truck (1 ton)	Transport equipment and materials
Plate compactor	Grade
Puller/Tensioner/Reel (line truck or trailer-mounted)	Install conductor
Pump	Dewater if groundwater is encountered; water for dirt suppression, if necessary
Reel trailers with reel stands (semi-trailer or truck-mounted type)	Haul conductor
Saw-cutting equipment	Cut pavement for distribution placement underground
Semi-truck (with trailer)	Haul motor grader, conductor reel, or tubular steel pole
Sweeper/Scrubber	Clean roads, if necessary
Tensioner (line truck-mounted)	Install conductor
Tractor/loader/backhoe	Grade and remove foundation; backfill holes
Trencher	Excavate for placing distribution line underground
Vacuum trailer	Clean up potential concrete washout during foundation installation
V-groove puller	Install conductor
Water truck	Suppress dust
Worker-lift (truck-mounted)	Lift workers to perform work on structures

2.7.3 Construction Schedule

Construction is scheduled to begin in summer 2015 and is estimated to be completed by summer 2017. The proposed construction timetable for reconductoring and substation work is provided below in **Table 2-6**. The schedule is preliminary and subject to change.

TABLE 2-6
PROPOSED CONSTRUCTION TIMETABLE

Project Component	Length	Duration (months)	Approximate Progression Rate (feet per week)	Estimated Schedule (based on Summer 2015 start date)
Missouri Flat-Gold Hill Line Reconductoring	12.5 miles	18	2,500	10/15-6/17
Establish staging areas Road construction	NA	8	NA	
Modifying 13 existing lattice steel towers	2.9 miles	7	561	
Replace 60 existing TSPs	9.6 miles	9	1,310	
Access road construction	100 feet	8	NA	
Distribution line undergrounding	1,000 feet	4	NA	
Gold Hill No. 1 Line Reconductoring	7 miles	6	1,540	10/15-4/16
Establish staging areas Road construction	NA	2	NA	
Replace 80 existing wood poles / modify 40 existing poles	7 miles	6	1,540	
Distribution feeder line relocation	150 feet	2	NA	
Substation Modifications	NA	8	NA	4/16-12/16

2.8 Operation and Maintenance

No changes to existing operation and maintenance activities are anticipated with Project implementation. Reconductoring of the Missouri Flat-Gold Hill Line and Gold Hill No. 1 Line would result in less conductor breakage from corrosion and brittleness, thereby improving reliability. Less breakage is anticipated to result in fewer events or incidents that require emergency responses and inspections.

The existing power lines are inspected yearly, or as needed when driven by an event or incident, such as an emergency. A detailed ground inspection is required every other year, with a subsequent aerial patrol in between those years. The routine annual inspections, detailed ground inspections, and aerial patrols would not change from existing conditions with Project implementation. Any existing access roads that are reestablished during the Project would be used. As maintenance needs arise, repairs and preventative maintenance would continue to be fulfilled by the PG&E transmission line crew (approximately five trained employees).

2.9 Applicant Proposed Measures

PG&E proposes to implement certain Project design features (the APMs listed in **Table 2-7**) to avoid or reduce impacts that otherwise could be caused by the Project. These Project features are discussed in the context of the relevant environmental resource analyses presented in Chapter 3.

TABLE 2-7
APPLICANT PROPOSED MEASURES

Section 3.1 – Aesthetics
APM AE-1: Include Non-Reflective Finish Non-specular conductor and a non-reflective finish for the poles will be used to reduce the potential for new sources of glare.
APM AE-2: Minimize Effects of Temporary Nighttime Construction Lighting on Sensitive Receptors If temporary lighting is required for nighttime construction, it will be focused on work areas and directed on-site to minimize potential effects with respect to nearby sensitive receptors, particularly residences.
Section 3.3- Air Quality
APM AQ-1: Minimize Fugitive Dust PG&E will minimize fugitive dust during construction by implementing the following measures, which comply with EDCAQMD and SMAQMD requirements: • Reduce the amount of the disturbed area where possible. • Use water trucks or sprinkler systems in sufficient quantity to prevent airborne dust from leaving the site. Increase watering frequency whenever wind speeds exceed 15 miles per hour (mph). Use reclaimed non-potable water whenever possible. Do not use non-potable water in or around crops intended for human consumption. • Implement permanent dust control measures as soon as possible following completion of any soil-disturbing activities. • Enforce a policy that vehicle speed for all construction vehicles is not to exceed 15 mph on any unpaved surface. • Water all active construction areas as needed to suppress dust. Base the frequency on the type of operation and the soil and wind exposure. • Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. • Cover inactive storage piles. • Sweep public roads if visible soil material is carried out from a work site. • Post a publicly visible sign with the phone number for the EDCAQMD for compliance in reporting any Rule 205 (Nuisance) violations, as well as the telephone number and person to contact regarding dust complaints. Instruct this person to respond to complaints and take corrective action within 48 hours. • Limit the area of earth-disturbing activities at any one time.
APM AQ-2: Minimize Vehicle and Equipment Emissions PG&E will minimize vehicle emissions during project construction by implementing the following measures: • Maintain construction equipment in proper working conditions in accordance with PG&E standards. • Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time will depend on the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a “common sense” approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes allowed by California law; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction foremen will include briefings to crews on vehicle use as part of pre-construction conferences. Those briefings will include discussion of a “common sense” approach to vehicle use. • Minimize construction equipment exhaust by using low-emission or electric construction equipment where feasible. Portable diesel-fueled construction equipment with engines 50 hp or larger and manufactured in 2000 or later will be registered under the CARB Statewide Portable Equipment Registration Program. • Minimize welding and cutting by using compression of mechanical applications where practical and within standards. • Encourage use of natural gas powered vehicles for passenger cars and light duty trucks where feasible and available.

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.3- Air Quality (cont.)

APM AQ-3: Minimize Potential Naturally Occurring Asbestos Emissions

The project will develop a preemptive Asbestos Dust Mitigation Plan to identify all necessary best management practices that will be implemented if NOA is encountered at any time during construction. The Asbestos Dust Mitigation Plan will be compliant with the requirements of CARB's Asbestos ATCM, EDCAQMD's Rule 223-2 (Fugitive Dust – Asbestos Hazard Mitigation), and SMAQMD's Rule 902 (Asbestos).

Before beginning any earth-disturbing activities in areas identified in Section 3.6, Geology and Soils (i.e., "areas more likely to contain asbestos," "areas where the presence of asbestos is possible but unlikely," "areas moderately likely to contain NOA," or "areas least likely to contain naturally occurring asbestos"), a geological evaluation will be performed by a registered geologist to determine whether NOA is present. In addition, before beginning any earth-disturbing activities that will occur within 50 feet of residences and 500 feet of schools, a geological evaluation also will be performed by a registered geologist, to test for the presence of NOA. If NOA is detected during any geological evaluation or during subsequent construction activities, PG&E will minimize NOA emissions by implementing the Asbestos Dust Mitigation Plan, which will comply with the requirements of CARB's Asbestos ATCM, EDCAQMD's Rule 223-2 (Fugitive Dust – Asbestos Hazard Mitigation), and SMAQMD's Rule 902 (Asbestos).

CARB's Asbestos ATCM includes asbestos management requirements that range from creating and implementing an Asbestos Dust Mitigation Plan, observing pre-notifications of construction activities, maintaining construction best management practices, meeting post-construction stabilization requirements, and performing administrative recordkeeping. Construction best management practices include monitoring all potential NOA emission sources: road dust (e.g., limiting vehicle speeds); earth-disturbing activities (e.g., watering before, during, and after disturbance); track-out from work sites (e.g., washing equipment and vehicle tires); material export (e.g., haul truck material handling requirements); and post-construction stabilization (e.g., covering, chemical stabilizers, or vegetation). In addition, prior to construction, PG&E will consult with the local air district or air pollution control officer, to determine if air monitoring for asbestos will be required. The project will comply with EDCAQMD's Rule 223-2, which provides a list of best management practices to minimize the generation of asbestos dust from construction activities. The Asbestos Dust Mitigation Plan will include, but will not be limited to measures from EDCAQMD's Rule 223-2, as applicable. Implementation of the following asbestos best management practices for the project would be required where applicable, to ensure adequate performance of the Asbestos Dust Mitigation Plan:

Backfilling

- Mix backfill soil with water before moving the soil.
- Have a dedicate water truck or a high-capacity hose connected to backfilling equipment.
- Empty the loader bucket slowly to prevent dust plumes from being generated.
- Minimize the drop height from the loader bucket.

Clearing and Grubbing

- Maintain live perennial vegetation where possible.
- Apply water in sufficient quantity to prevent generation of visible dust.

Cut and Fill

- Pre-water with sprinklers or water trucks and allow time for penetration.
- Use water as necessary to minimize dust.
- Install upwind fencing to prevent material movement on site.
- Suspend operations when winds generate visible dust emissions despite control measures.
- Use tarps or other suitable enclosures on haul trucks.
- Provide water while loading and unloading to reduce visible dust plumes.
- If excavated material is classified as a hazardous waste material, verify that off-site transport complies with state and federal rules and regulations.

Disturbed Soil

- Limit vehicular traffic and disturbances on soils where possible.
- Limit vehicle speeds to 15 miles per hour.
- Apply water or a stabilizing agent in sufficient quantities to prevent generation of visible dust plumes.

General Site Management

- Wash mud and soil from equipment and vehicles after completing earth-disturbing activities to prevent them from crusting and drying.
- Prohibit the use of blower devices, dry rotary brushes, or dry brooms.
- Restrict vehicular access to established, unpaved travel paths and parking lots, to meet stabilization requirements.
- Document all locations and quantities of cut and fill, and off-site soil transport.
- Provide signage at work sites that meet Occupational Safety and Health Administration requirements.

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.4 – Biological Resources
APM BIO-1: General Biological Resources Measures ***APM BIO-1.1: Worker Environmental Awareness Training Program*** A qualified biologist will develop an environmental awareness training program that is specific for the project. All on-site construction personnel will attend the training before they begin work on the project. Training will include a discussion of the avoidance and minimization measures that are being implemented to protect biological resources as well as the terms and conditions of project permits. Training will include information about the FESA and CESA, special-status species as defined in the Regulatory Setting (Section 3.4.2) and the Special-Status Species section, and the consequences of noncompliance with these acts. Under this program, workers will be informed about the presence, life history, and habitat requirements of all special-status species that may be affected in the project area. Training also will include information on State and federal laws protecting nesting birds, wetlands, and other water resources. An educational brochure will be produced for construction crews working on the project. The brochure will include color photos of sensitive species as well as a discussion of relevant APMs. ***APM BIO-1.2: Identification and Marking of Sensitive Resource Areas*** Sensitive resource areas identified during pre-construction surveys in the project area will be clearly marked in the field or on project maps. Sensitive resource areas will include active bird nests within specified buffer zones (see APM BIO-3), special-status plants adjacent to work sites, special-status vegetation types adjacent to work sites, and vernal pool and wetland boundaries in and adjacent to work sites. Such areas will be avoided during construction to the extent practicable. ***APM BIO-1.3: Construction Monitoring*** A qualified biologist will monitor construction activities in sensitive habitats previously identified by a qualified biologist. The monitor will ensure implementation of and compliance with all avoidance and mitigation measures. The monitor will have the authority to stop or redirect work if construction activities are likely to affect sensitive biological resources. If a listed wildlife species is encountered during construction, project activities will cease in the area where the animal is found until the biologist determines the animal has moved out of harm's way, or with prior authorization from the USFWS and/or CDFW if necessary, relocates the animal out of harm's way, and/or takes other appropriate steps to protect the animal. Work may resume once the biologist has determined that construction activities will not harm any listed wildlife species. If recommended by the biologist, a temporary silt-fence barrier will be installed to prevent wildlife species from entering the work area(s) during project activities. The biological monitor will be responsible for any necessary reporting to USFWS and/or CDFW of any capture and relocation, or inadvertent harm, entrapment or death of a listed species. ***APM BIO-1.4: Tree Removal and Mitigation*** Trees being felled in the vicinity of a sensitive resource area exclusion zone will be directionally felled away from the zone, where possible. Trees and other vegetation that are removed from the project area will be removed using equipment and access routes that avoid sensitive resource areas. Oak tree removal will be minimized to what is required to implement the project. Oak trees greater than 6 inches diameter at breast height (dbh), or having multiple trunks with an aggregate over 10 inches dbh, that are removed will be documented and replaced based on a 1:1 ratio or other measure derived through coordination with El Dorado County that provides an equal level of compensation.
APM BIO-2: Special-Status Species Pre-construction Surveys Before project construction begins, a qualified biologist will perform a pre-construction survey for work areas within 100 feet of suitable habitat for special-status species. If any special-status species are found nearby but outside the proposed work area, they will not be disturbed. If recommended by the biologist, a temporary silt-fence barrier will be installed to prevent special-status species from entering the work area(s) during project activities. If a special-status species is found in a work area prior to construction, the biologist will relocate the species out of harm's way (if prior authorization from USFWS and CDFW is not required for the species), or with prior authorization from USFWS and/or CDFW if necessary, and/or take other appropriate steps to protect the animal.
APM BIO-3: Special-Status Bird Measures Before project activities in proximity to nesting birds begins, PG&E will obtain the applicable permit or follow relevant protocol that is authorized by Section 3503 and/or Section 3503.5 of the California Fish and Game Code, or by any regulation adopted pursuant thereto, pertaining to nesting birds. If no such permit or protocol is available under the above authorities before project construction begins, PG&E will comply with the following measure: ***APM BIO-3.1: Pre-construction Survey and Avoidance of Active Nests*** For any tree trimming or other potential nest-disturbing activities to be conducted between February 1 and August 31, a qualified biologist will conduct a pre-construction survey for nesting birds. The survey will be conducted no more than one week prior to the start of work activities and will cover all affected areas where substantial ground disturbance or vegetation clearing is required. If any active nests containing eggs or young are found, an appropriate nest exclusion zone will be established by the biologist. The standard buffers included in PG&E's Avian Conservation Strategy (e.g., 50 to 400 feet from non-special-status bird nests, 75 to 350 feet from non-raptor special-status bird nests, and 300 to 1,320 feet from raptor nests, depending on species) will serve as a guideline for exclusion zones, but may be modified on a site-

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.4 – Biological Resources (cont.)
specific basis as determined by the biologist. To the extent practicable, no project vehicles, chain saws, or heavy equipment will be operated in this exclusion zone until the biologist has determined that the nest is no longer active and or the young have fledged. If it is not practicable to avoid work in an exclusion zone around an active nest (e.g., a bird is sitting on eggs or bird activity is such that the nest could be interpreted as active, per USFWS [2003] *Migratory Bird Permit Memorandum),* work activities will be modified to minimize disturbance of nesting birds but may proceed in these zones at the discretion of the biologist. The biologist will monitor all work activities in these zones daily when construction is occurring and assess their effect on the nesting birds. If the biologist, determines that particular activities pose a high risk of disturbing an active nest, the biologist will recommend additional, feasible measures to minimize the risk of nest disturbance, potentially including temporary cessation of work activities near active nests.
APM BIO-4: Valley Elderberry Longhorn Beetle Habitat Avoidance and Mitigation PG&E's Valley Elderberry Longhorn Beetle Conservation Program allows PG&E to perform routine operations and maintenance activities and new construction, subject to certain terms and conditions as specified in the USFWS Biological Opinion (File 1-1-01-F-0114). The Biological Opinion provides for thirty years of incidental take coverage and was initiated on June 27, 2003. It defines reasonable and prudent measures required to avoid and minimize impacts to habitat for the federally listed valley elderberry longhorn beetle (VELB). PG&E will implement the surveying, avoidance, and any necessary compensation measures required for the Conservation Program as authorized by USFWS. These measures may include, for example: (1) surveying for and flagging all elderberry plants with one or more stems measuring 1 inch or more in diameter at ground level that are within 20 feet of work sites; (2) avoiding all such elderberry plants to the extent feasible; and (3) reporting unavoidable impacts to elderberry shrubs to USFWS for coverage under the Conservation Program's funding of VELB habitat acquisition, development, and protection.
APM BIO-5: Special-Status Plant Avoidance and Impact Minimization Measures In addition to APM BIO-1 and APM BIO-2, the following measures will be implemented in gabbroic chaparral habitat in and immediately east of the BLM Pine Hill Preserve, and south of U.S. 50, where the highway borders the BLM Pine Hill Preserve, to avoid and minimize impacts on special-status plants. ***APM BIO-5.1: Seasonal Timing Restrictions*** If a special-status annual plant species is present, any work that may impact the plant will occur after plant senescence and prior to the first significant rain, to the extent practicable. ***APM BIO-5.2: Noxious Weed Assessment and Control Plan*** Prior to the commencement of construction activities in the BLM Pine Hill Preserve, a Noxious Weed Assessment and Control Plan will be developed and implemented for work in the BLM Pine Hill Preserve. The plan will assess the areas at risk for noxious weed introduction and/or spread and will identify measures for equipment and vehicle inspection. ***APM BIO-5.3: Plant Salvage Requirements*** Prior to the commencement of construction activities in the BLM Pine Hill Preserve or other areas within the Project footprint known to support rare plant populations, PG&E will refine its Rare Plant Strategy that specifies salvage and propagation methods for listed plants, as well as pre- and post-Project monitoring methods. The Rare Plant Strategy will be submitted to USFWS for review and approval as may be required in the biological opinion from USFWS. At a minimum, the Strategy will include information such as: methods of collection of reproductive structures from affected plants, restoration techniques for temporarily disturbed occurrences, assessments of potential transplant and enhancement sites, success and performance criteria (e.g., documented germination of collected seed within an equal or larger area than affected by the project), and monitoring programs (e.g., 3 to 5 years), as well as measures to ensure long-term site sustainability, as required by USFWS during the Section 7 consultation process. Prior to construction, the location of special-status plants that will be affected by grading and excavation will be surveyed and documented, and the seeds and/or rhizomes of special-status plants that may be destroyed during construction will be collected in accordance with the Rare Plant Strategy. Following construction, which plants were permanently or temporarily impacted by the project will be determined. Collected seeds and/or rhizomes will be planted per planting guidelines described in the Rare Plant Strategy in coordination with BLM and USFWS. Post-project monitoring methods will be applied in accordance with the Rare Plant Strategy to determine if propagation activities met the success criteria described in the Rare Plant Strategy.
APM BIO-5: Special-Status Plant Avoidance and Impact Minimization Measures ***APM BIO-5.4: Topsoil Stockpiling Requirements*** Where grading or excavation is required in gabbroic chaparral habitat, and where noxious weeds are absent, the upper 4 inches of topsoil will be stockpiled separately during grading or excavations, following any necessary plant salvage efforts. When this topsoil is replaced, compaction will be minimized to the extent consistent with utility standards. ***APM BIO-5.5: Locking Gate Installation*** Following project completion, and upon agreement of private landowners, locking gates will be installed at the two main roads leading into the BLM Pine Hill Preserve to limit unauthorized vehicle access that may threaten special-status plant populations.

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.4 – Biological Resources (cont.)
APM BIO-6: Special-Status Plant Impact Mitigation To compensate for permanent impacts on special-status plants, PG&E will explore options with USFWS, and will implement the preferred option. The options may include: on-site planting of propagated seeds and cuttings in accordance with the USFWS-approved Rare Plant Strategy; and/or providing funding to the BLM Pine Hill Preserve for the purpose of habitat enhancement, management, and/or monitoring of gabbroic chaparral habitat.
APM BIO-7: Seasonal Wetland Protection Seasonal wetlands that may provide habitat for special-status species will not be entered. Travel across seasonal wetlands that do not provide such habitat will be limited to the greatest extent feasible. Where travel across seasonal wetlands is necessary, it will occur during dry conditions to avoid soil compaction and mixing. If travel is required during wet conditions, matting and other protection measures will be implemented to avoid soil compaction or mixing. Matting and other protection measures will be approved by the biological monitor before work at that location begins. During construction monitoring, the biological monitor may temporarily stop construction work if matting and protection measures are inadequately applied; construction work may resume after matting and other protection measures are installed effectively to protect seasonal wetlands.
Section 3.5 – Cultural and Paleontological Resources
APM CUL-1: Develop and Implement Worker Environmental Awareness Program Prior to Construction PG&E will design and implement a worker environmental awareness program that will be provided to all project personnel involved in earth-moving activities. No construction worker will be involved in field operations without having participated in the worker environmental awareness program. The worker environmental awareness program will include a kick-off tailgate session to present site avoidance requirements and procedures to be followed if unanticipated cultural or paleontological resources are discovered during project implementation, and a discussion of actions that could be taken against persons violating historic preservation laws and PG&E policies. Key project workers involved with ground-disturbing activities will receive a pamphlet listing how to identify a cultural resource or fossil and what to do if an unanticipated discovery is made during construction. The worker environmental awareness training may be conducted in concert with other environmental or safety awareness and education training programs for the project, and may be recorded for use in subsequent training sessions.
APM CUL-2: Manage Unanticipated Cultural Resources Discoveries Properly In the unlikely event that previously unidentified cultural resources are uncovered during project implementation, all work within 100 feet of the discovery will be halted and redirected to another location. The find will be secured, and a CPUC-approved, qualified cultural resources specialist/archaeologist will be contacted immediately. The specialist will inspect the discovery and determine whether further investigation is required. If the discovery can be avoided and no further impacts will occur, the resource shall be documented on California State Department of Parks and Recreation cultural resource record forms and no further effort shall be required. If additional disturbance to the resource cannot be avoided, a CPUC-approved, qualified cultural resources specialist/archaeologist will evaluate the resource's significance and CRHR eligibility and determine whether it is (1) eligible for the CRHR (and thus a historical resource for purposes of CEQA); or (2) a unique archaeological resource as defined by CEQA. If the resource is determined to be neither a unique archaeological nor an historical resource, work may commence in the area. If the resource meets the criteria for either an historical or unique archaeological resource, or both, work shall remain halted, and the cultural resources specialist/archaeologist shall consult with CPUC staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA Guidelines Section 15064.5(b). Preservation in place, i.e. avoidance, is the preferred method of mitigation for impacts to cultural resources. Other methods to be considered shall include evaluation, collection, recordation, and analysis of any significant cultural materials in accordance with a Cultural Resources Management Plan prepared by the CPUC approved qualified cultural resource specialist/archaeologist. The methods and results of evaluation or data recovery work at an archaeological find will be documented in a professional-level technical report to be filed with the NCIC. If previously unidentified cultural resources are uncovered during project implementation on BLM land, procedures will be similar to those described above; however, if additional disturbance to a cultural resource cannot be avoided, PG&E will evaluate the significance and NRHP eligibility per Section 106 of the NHPA in consultation with BLM. Any cultural resource or paleontological work conducted on BLM lands will be conducted under a valid cultural resource and paleontological use permit issued by the BLM California State office, and may require a fieldwork authorization by the local field office. Cultural materials and paleontological resources collected under a BLM-use permit will be curated in an accredited museum repository.

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.5 – Cultural and Paleontological Resources (cont.)
APM CUL-3: Follow Statutory Requirements for Treatment of Human Remains In the unlikely event that human remains or suspected human remains are uncovered during pre-construction testing or during construction, all work within 100 feet of the discovery will be halted and redirected to another location. The find will be secured, and a CPUC-approved, qualified cultural resources specialist will be contacted immediately to inspect the find and determine whether the remains are human. If the remains are not human, the cultural resources specialist will determine whether the find is an archaeological deposit and whether APM CUL-2 applies. If the remains are human, the cultural resources specialist will immediately implement the provisions in PRC Sections 5097.9 through 5097.996, beginning with the immediate notification to the affected county coroner. The coroner has 2 working days to examine human remains after being notified. If the coroner determines that the remains are Native American, California Health and Safety Code 7050.5 and PRC Section 5097.98 require that the cultural resources specialist contact the NAHC within 24 hours. The NAHC, as required by PRC Section 5097.98, determines and notifies the Most Likely Descendant. If potential human remains are discovered during any project activity on lands administered by BLM, the procedures identified in NAGPRA will be closely adhered to and the following steps will be taken: 1. All activities that may further disturb the potential human remains will cease immediately in the vicinity of the discovery. 2. PG&E will take appropriate steps to secure and protect human remains and any funerary objects from further disturbance. 3. PG&E's cultural resources specialist will notify BLM's archaeologist by telephone within 24 hours of discovery, followed within 3 days by written confirmation. Human remains or associated funerary objects will not be excavated or otherwise removed unless a permit is issued under ARPA and after consultation between the appropriate Native American representative(s), BLM, and PG&E. 4. The activity that resulted in the inadvertent discovery will not resume until clearance is provided by BLM.
APM CUL-4: Flag and Avoid Cultural Resources The boundaries of all known cultural resources that lie within 100 feet of a designated work area will be marked with flagging tape, safety fencing, and/or a sign designating it as an "environmentally sensitive area" to ensure that PG&E construction crews and heavy equipment will not intrude on these resources during construction. For those eligible or potentially eligible sites that contain an existing access road within their site boundary, the road will be used as-is (i.e., no grading, widening, or other substantial improvements), and signs or safety fencing will be established on either side of the road within the site's boundary to avoid impacts caused by construction vehicles. If it is infeasible or impractical to use an access road as-is, and grading, widening or other substantial improvement is necessary, PG&E will implement mitigation or treatment measures specific to the resource potentially affected by the work. Examples of such measures would include preservation in place, and evaluation, collection, recordation, and analysis of any significant cultural materials.
APM CUL-5: Avoid Paleontologically Sensitive Locations No direct impacts on fossil-bearing deposits (ground disturbance) will occur within the approximately 0.29-acre project area containing Quaternary alluvium just west of Empire Ranch Road and the El Dorado-Sacramento County boundary. However, should project development result in the disturbance of this geologic unit at a depth of 10 feet or greater, a qualified paleontologist will be retained as needed to ensure that impacts on any potential paleontological resources are avoided. If fossil remains are uncovered during project implementation, all work within 50 feet of the discovery will be halted and the construction crew immediately will notify PG&E. A paleontologist will be retained by PG&E and approved by the CPUC to evaluate the resource. If the discovery can be avoided and no further impacts will occur, no further effort shall be required. If the resource cannot be avoided and may be subject to further impact, the CPUC-approved paleontologist shall evaluate the resource and determine whether it is "unique" under CEQA, Appendix G, part V. If the resource is determined to not be unique, work may commence in the area. If the resource is determined to be a unique paleontological resource, work shall remain halted, and the paleontologist shall consult with CPUC staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA. Preservation in place, i.e. avoidance, is the preferred method of mitigation for impacts to paleontological resources. Other methods include ensuring that the fossils are recovered, prepared, identified, catalogued, and analyzed according to current professional standards under the direction of a qualified paleontologist. All recovered fossils shall be curated at an accredited and permanent scientific institution according to Society of Vertebrate Paleontology standard guidelines (SVP [2010]) standards; typically the Natural History Museum of Los Angeles County and UC Berkeley accept paleontological collections at no cost to the donor. Work may commence upon completion of treatment, as approved by the CPUC. Components of the treatment plan related to "unique" fossil specimens that are encountered during construction may include a field survey, additional construction monitoring, specific sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings.

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.6 – Geology and Soils

APM GEO-1: Minimization of Construction in Soft or Loose Soils

Where soft or loose soils are encountered during project construction, appropriate measures will be implemented to avoid, accommodate, replace, or improve such soils. Depending on site-specific conditions and permit requirements, these measures may include:

- locating construction facilities and operations away from areas of soft and loose soil;
- over-excavating soft or loose soils and replacing them with engineered backfill materials;
- increasing the density and strength of soft or loose soils through mechanical vibration and/or compaction;
- installing material over access roads such as aggregate rock, steel plates, or timber mats; and
- treating soft or loose soils in place with binding or cementing agents.

APM GEO-2: Reduction of Slope Instability during Construction

Existing natural or temporarily constructed slopes affected by construction or operations will be evaluated for stability by qualified construction staff at the beginning of each construction day that employees may be exposed to the areas immediately upslope or downslope from the area of concern can be reasonably anticipated. In developing grading and construction procedures for access roads, the stability of both temporary and permanent cut, fill, and otherwise affected slopes will be analyzed. Construction slopes and grading will be designed to limit the potential for slope instability and minimize the potential for erosion and flooding during construction. During construction, slopes affected by construction activities will be monitored by qualified construction staff and maintained in a stable condition. Construction activities likely to result in slope instability will be suspended, as necessary, during and immediately following periods of heavy precipitation when unstable slopes are more susceptible to failure.

Section 3.7 – Greenhouse Gas Emissions

APM GHG-1: Minimize GHG Emissions

- Maintain construction equipment in proper working conditions in accordance with PG&E standards.
- Minimize unnecessary construction vehicle idling time. The ability to limit construction vehicle idling time will depend on the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel-powered vehicles, have extended warm-up times following start-up that limit their availability for use following start-up. Where such diesel-powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The project will apply a "common sense" approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes allowed by California law; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction foremen will include briefings to crews on vehicle use as part of pre-construction conferences. Those briefings will include discussion of a "common sense" approach to vehicle use.
- Minimize construction equipment exhaust by using low-emission or electric construction equipment where feasible. Portable diesel fueled construction equipment with engines 50 hp or larger and manufactured in 2000 or later will be registered under the CARB Statewide Portable Equipment Registration Program.
- Minimize welding and cutting by using compression of mechanical applications where practical and within standards.
- Encourage use of natural gas powered vehicles for passenger cars and light-duty trucks where feasible and available.

APM GHG-2: Minimize SF_6 Emissions

- Incorporate the new breakers at Gold Hill Substation into PG&E's system-wide SF_6 emission reduction program. CARB has adopted the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear sections 95350 to 95359, title 17, California Code of Regulations, which requires that company-wide SF_6 emission rate not exceed 1 percent by 2020. Since 1998, PG&E has implemented a programmatic plan to inventory, track, and recycle SF_6 inputs, and inventory and monitor system-wide SF_6 leakage rates to facilitate timely replacement of leaking breakers. PG&E has improved its leak detection procedures and increased awareness of SF_6 issues within the company. X-ray technology is now used to inspect internal circuit breaker components to eliminate dismantling of breakers, reducing SF_6 handling and accidental releases. As an active member of EPA's SF_6 Emission Reduction Partnership for Electrical Power Systems, PG&E has focused on reducing SF_6 emissions from its transmission and distribution operations and has reduced the SF_6 leak rate by 89 percent and absolute SF_6 emissions by 83 percent.
- Require that breakers to be replaced at Gold Hill Substation have a manufacturer's guaranteed maximum leakage rate of 0.5 percent per year or less for SF_6.
- Maintain substation breakers in accordance with PG&E's maintenance standards.
- Comply with CARB Early Action Measures as these policies become effective.

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.8 – Hazards and Hazardous Materials
APM HAZ-1: Hazardous-Substance Control and Emergency Response PG&E will implement a Hazardous Substance Control and Emergency Response Plan, which will identify methods and techniques to minimize exposure of the public and construction workers to potentially hazardous materials during all phases of project implementation. The Hazardous Substance Control and Emergency Response Plan shall be submitted to the CPUC prior to the start of construction activities. The procedures require PG&E to provide worker training in hazardous-substance control and emergency response that is appropriate to the workers' roles. The procedures also require implementation of appropriate control methods and approved containment and spill-control practices for construction and materials stored in the project area. If it is necessary to store chemicals, the chemicals will be managed in accordance with all applicable regulations. Material safety data sheets will be maintained and kept available in the project area, as applicable. Project construction may require blading/leveling of the soil surface and excavation or auguring to a depth of approximately 24 feet. However, if soils suspected of contamination (based on visual, olfactory, or other evidence) are removed during grading or excavation/auguring activities, the excavated soil will be tested. If they are contaminated above hazardous-waste levels, those soils will be contained and disposed of at a licensed waste facility. Any known or suspected contaminated soil will undergo testing and investigation procedures, supervised by a qualified person as appropriate, to meet the requirements of State and federal regulations. All hazardous materials and hazardous wastes will be handled, stored, and disposed of in accordance with all applicable regulations, by personnel qualified to handle hazardous materials. The hazardous-substance-control and emergency-response procedures will include but will not be limited to the following measures: • proper disposal of potentially contaminated soils; • establishment of project area–specific buffers for construction vehicles and equipment located near sensitive resources; and • implementation of emergency-response and reporting procedures to address spills of hazardous materials.
APM HAZ-2: Smoking and Fire Rules Smoking will be permitted only in designated smoking areas or within the cabs of vehicles or equipment.
APM HAZ-3: Fire Risk Management Project personnel will be directed to park away from dry vegetation. During fire season in designated SRAs, all motorized equipment driving off paved or maintained gravel/dirt roads will have federally approved or State-approved spark arrestors. All off-road vehicles will be equipped with a backpack pump (filled with water) and a shovel. Fire-resistant mats and/or windscreens will be used when welding. In addition, during fire "red flag" conditions (as determined by CAL FIRE), welding will be curtailed. Every fuel truck will carry a large fire extinguisher with a minimum rating of 40 B:C, and all flammable materials will be removed from equipment parking and storage areas.
Section 3.9 – Hydrology and Water Quality
APM HYDRO-1: Stormwater Pollution Prevention Plan PG&E will file a Notice of Intent with the SWRCB for coverage under the General Construction Storm Water Permit and will prepare and implement an SWPPP in accordance with General Order No. 2009-0009-DWQ, as amended, which typically includes measures such as placement of straw wattles or silt fencing, flagging, mulching, seeding and other means to help stabilize disturbed areas and reduce erosion and sedimentation.
APM HYDRO-2: Water Feature Protection Requirements Where access through hydrologic resources are required, PG&E shall install temporary bridges or plates over drainages (spanning the ordinary high water mark) and install fiberglass or wood matting in wetland features to reduce water quality impacts to these features.
Section 3.12 – Noise
APM NO-1: Minimize Noise-Related Disruption by Notifying Residents Should nighttime project construction be necessary because of planned clearance restrictions, affected residents will be notified at least 7 days in advance by mail, personal visit, or door hanger and informed of the expected work schedule.
APM NO-2: Minimize Noise with Portable Barriers Compressors and other small stationary equipment used during project construction will be shielded with portable barriers if the equipment is located near noise-sensitive receptors.

TABLE 2-7 (Continued)
APPLICANT PROPOSED MEASURES

Section 3.15 – Recreation
APM REC-1: Coordination with Park and Open Space Management and Signage PG&E will coordinate closely with park and open space management for temporary public land closures during project construction activities. If traditional access is temporarily unavailable, signs advising recreational facility users of construction activities, including directions to alternative trails and/or bikeways, will be posted at entrance gates to park and open space areas. Signage will be posted at least 1 week in advance of construction, near parks and open space areas.
Section 3.16 – Transportation and Traffic
APM TRA-1: Air Transit and Neighborhood Coordination PG&E will implement the following protocols that pertain to helicopter use during construction and air traffic: • PG&E will comply with all applicable FAA regulations regarding air traffic within 2 miles of the project alignment. • PG&E's helicopter operator will coordinate all project helicopter operations with the local airport before and during project construction. • PG&E does not anticipate that residents will be required to temporarily vacate their homes or businesses. In the unlikely event that final construction plans require otherwise, PG&E will coordinate with potentially affected residents or businesses to minimize the duration of the necessary work and any resultant inconvenience.
APM TRA-2: Temporary Traffic Controls PG&E will obtain any necessary transportation and/or encroachment permits, including those for the U.S. 50 crossings and transport of oversized loads and certain materials, and will comply with permit requirements designed to prevent excessive congestion or traffic hazards during lane closures. PG&E will develop lane closure/width reduction or traffic diversion plans as required by the encroachment permits. Construction activities that are in, along, or cross local roadways will follow best management practices and/or local jurisdictional encroachment permit requirements, to minimize impacts to traffic and transportation in the project area.

2.10 Electric and Magnetic Fields Summary

2.10.1 Electric and Magnetic Fields

This Initial Study does not consider electric and magnetic fields (EMF) in the context of the CEQA analysis of potential environmental impacts because [1] there is no agreement among scientists that EMF creates a potential health risk, and [2] there are no defined or adopted CEQA standards for defining health risk from EMF. However, recognizing that there is a great deal of public interest and concern regarding potential health effects from human exposure to EMF from transmission lines, this document does provide information regarding EMF associated with electric utility facilities and human health and safety.

Exposure to *electric fields* from transmission lines (i.e., the effect produced by the existence of an electric charge, such as an electron, ion, or proton, in the volume of space or medium that surrounds it) typically does not present a human health risk since electric fields are effectively shielded by materials such as trees, walls, etc. Therefore, the majority of the following information related to EMF focuses primarily on exposure to *magnetic fields* (i.e., the invisible fields created by moving charges) from transmission lines. Additional information on electric and magnetic fields generated by transmission lines is presented in Appendix A.

After several decades of study regarding potential public health risks from exposure to power line EMF, research results remains inconclusive. Several national and international panels have conducted reviews of data from multiple studies and state that there is not sufficient evidence to conclude that EMF causes cancer. Most recently the International Agency for Research on Cancer and the California Department of Health Services both classified EMF as a *possible* carcinogen.

Presently, there are no applicable federal, State or local regulations related to EMF levels from power lines or related facilities, such as substations. However, the CPUC has implemented a decision (D.06-01-042) requiring utilities to incorporate "low-cost" or "no-cost" measures for managing EMF from power lines up to approximately four percent of total Project cost. Using the four percent benchmark, PG&E has incorporated low-cost and no-cost measures to reduce magnetic field levels along the subtransmission corridor.

2.10.2 EMF and the Project

In accordance with the standard EMF Design Guidelines for Electrical Facilities, filed with the CPUC in compliance with CPUC Decision No. D.06-01-042, the Project would implement the following "no-cost and low-cost" magnetic field reduction measures. The field reduction measures would include:

- Increase the height of 13 poles along the Missouri Flat-Gold Hill Line in the school and residential land use areas by 10 feet to reduce magnetic field strength at ground level.
- Increase the height of 29 poles along the Gold Hill No. 1 Line in the high density residential land use areas by 10 feet.
- On the Missouri Flat-Gold Hill Line, install conductors with optimal phasing to reduce the magnetic field at the edge of the ROW. Phases of the new Missouri Flat-Gold Hill 115 kV line #2 would be arranged for minimum magnetic field at the edge of the ROW. Phases would be arranged A-B-C (Top, Middle, Bottom).
- Operating voltage of the Gold Hill No. 1 Line would be temporarily increased to 115 kV, which would reduce magnetic field levels by 47 percent.

2.11 Required Permits and Approvals

The CPUC is the lead state agency for the Project under CEQA because a PTC is required in accordance with Section III.B of CPUC General Order 131-D. General Order 131-D contains the permitting requirements for the construction of transmission and power line facilities. In addition to the PTC, PG&E would obtain all applicable permits for the Project from federal, state, and local agencies. **Table 2-8** provides the potential permits and approvals that may be required for Project construction.

TABLE 2-8
PERMITS AND APPROVALS THAT MAY BE REQUIRED

Permit/Authorization	Agency	Purpose
Federal		
Special Use Permit	BLM	Project activities in the Pine Hill Preserve
Section 7 Consultation (Biological Opinion)	U.S. Fish and Wildlife Service (consulting through the BLM)	Potential impacts to federally listed species
Section 106 Consultation (National Historic Preservation Act) (consultation)	State Historic Preservation Officer	Consultation with the BLM regarding impacts to cultural resources
Notification of Proposed Construction or Alteration	FAA	Height increase of power line structures
State		
PTC	CPUC	Overall project approval and CEQA review
CEQA Review/Approval		Issuance of a PTC
Asbestos National Emission Standards for Hazardous Air Pollutants Notification (notification)	California Air Resources Board	Demolition activities in El Dorado County
National Pollutant Discharge Elimination System – General Construction Storm Water Permit (ministerial)	Central Valley Regional Water Quality Control Board	Stormwater discharges associated with construction activities disturbing more than 1 acre of land
Local		
Encroachment Permit (ministerial)	California Department of Transportation	Activities related to the placement of encroachments within, under, or over State highway rights-of-way
Utility Encroachment Permit (ministerial)	El Dorado County	Work within county roads/road ROW or property
Encroachment Permit (ministerial)	City of Folsom	Work within city roads/road ROW or property
Grading Permit (ministerial)	City of Folsom	Disturbance over 800 cubic yards, or 400 cubic yards in a flood hazard/erosion area or is more than 2 feet deep

References – Project Description

Pacific Gas and Electric Company (PG&E), 2013a. *Application of Pacific Gas and Electric Company for a Permit to Construct the Missouri Flat-Gold Hill 115 kV Power Line Reconductoring Project*, filed August 23, 2013.

PG&E, 2013b. *Proponent's Environmental Assessment for the Application of Pacific Gas and Electric Company for a Permit to Construct the Missouri Flat-Gold Hill 115 kV Power Line Reconductoring Project*, filed August 23, 2013.

PG&E, 2013c. *PG&E Responses to CPUC Data Request 1 for the Missouri Flat-Gold Hill 115 kV Power Line Reconductoring Project*, submitted to the CPUC on December 6, 2013.

PG&E, 2014a. *PG&E Responses to CPUC Data Request 2 for the Missouri Flat-Gold Hill 115 kV Power Line Reconductoring Project*, submitted to the CPUC on February 13, 2014.

PG&E, 2014b. Revisions to the proposed project provided via electronic communication from Jo Lynn Lambert, March 14, 2014 and Jillian Blanchard, April 9, 2014, respectively.

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