SECTION 1
Project Description

1.1 Introduction

The Pacific Gas and Electric Company (PG&E), in its California Public Utilities Commission (CPUC) application (A.04-11-011), filed on November 17, 2004[1], seeks a Permit to Construct (PTC) approximately 7.23 miles of 115 kilovolt (kV) single-circuit transmission line between the Lakeville and Sonoma Substations pursuant to CPUC General Order (GO) 131-D. The application includes the Proponents Environmental Assessment (PG&E PEA, 2004) prepared by EDAW pursuant to Rules 17.1 and 17.3 of CPUC's Rules of Practice and Procedure. PG&E, who currently owns a single-circuit 115 kV electric transmission system in the Petaluma–Napa–Sonoma area of the San Francisco Bay Area Region, requests to construct a second 115 kV transmission circuit within its existing single-circuit 115 kV transmission line route between Lakeville Substation (at the eastern edge of the City of Petaluma) and Sonoma Substation (at the southern edge of the City of Sonoma). This second 115 kV transmission line would be installed on a rebuilt version of PG&E's existing single-circuit 115 kV transmission line, thus co-locating the two circuits on a single set of poles. The proposed project would also include modifications to both the Lakeville and Sonoma Substations. Under the GO 131-D, approval of this project must comply with the California Environmental Quality Act (CEQA).

Under CEQA, the CPUC must prepare an "Initial Study" for discretionary projects such as the proposed project to determine whether the project may have a significant adverse effect on the environment. If an Initial Study prepared for a project indicates that such an impact could occur, the CPUC would be required to prepare and Environmental Impact Report (EIR). If an Initial Study does not reveal substantial evidence of such an effect, or if the potential effect can be reduced to a level of insignificance through project revisions, a Negative Declaration can be adopted (Public Resources Code, Division 13, Section 21080(c)(1)).

A Mitigated Negative Declaration (MND) may be adopted when "the initial study has identified potentially significant effects on the environment, but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as

[1] Note that PG&E also filed an amendment to the November 17, 2004 Application to reflect a revision to the project plan.

revised, may have a significant effect on the environment" (Public Resources Code, Division 13, Section 21064.5).

Based on the assessment of the Initial Study prepared for the Lakeville-Sonoma 115 kV Transmission Line Project, this Mitigated Negative Declaration has been prepared.

1.2 Project Objectives

PG&E's objectives of the Lakeville-Sonoma 115 kV Transmission Line Project as stated in the Proponent's Environmental Assessment (PG&E PEA, 2-7), are as follows:

- Transmission system reliability – ensure that the Napa and Sonoma County area transmission system continues to meet planning standards and criteria established by the California Independent System Operator (CAISO) and North American Electric Reliability Council (NERC) to ensure the safety and reliability of the transmission system.

- Electric demand – ensure that the electric system includes adequate capacity to safely and reliably serve the Sonoma and Napa County area.

- CAISO Board of Governors' June 24, 2004 Resolution – implement the June 24, 2004 CAISO Board of Governors' resolution approving the Lakeville-Sonoma 115 kV Transmission Line Project for addition to the CAISO-controlled grid, consistent with the CAISO Tariff as adopted by the Federal Energy Regulatory Commission (FERC) pursuant to the Federal Power Act.

As part of the CAISO's annual stakeholder process, reliability problems within the Sonoma and Napa areas were identified beginning in 2006. The Ten-Year Expansion Plan for PG&E identified that a long-term need existed to reinforce the transmission system in the area to reliably serve the future load that is expected to occur over the next ten years. As a result, PG&E's 2003 Ten-Year Transmission Expansion Plan identified alternatives to adequately address the long-term load serving needs for this area and identified the Lakeville-Sonoma 115 kV Transmission Line Project as the preferred alternative to address this reliability need.

The need for the project is primarily related to inadequate transmission line capacity between the Fulton, Pueblo, and Sonoma 115 kV substation during times when the existing Lakeville-Sonoma 115 kV line is out of service. Because the Pueblo 115 kV station is closer to Lakeville, most of the power, approximately 90%, needed to serve the Napa and Sonoma areas flows from the Lakeville substation with the balance being served from the Fulton substation. When the Lakeville-Sonoma 115 kV line is out of service, the balance of the load must be served from the Fulton substation. Planning studies have shown that by 2006, the transmission system between Fulton, Pueblo, and Sonoma will no longer be adequate to reliably serve the load in this area; therefore, additional transmission is needed to assure continued satisfaction of the CAISO's established Planning Standards.

Installing a second 115 kV line from the Lakeville Substation to Sonoma Substation would allow PG&E to meet its objectives and ensure the safe and reliable delivery of electricity to customers during most system disturbance (PG&E PEA, 2-10). A second circuit between Lakeville and Sonoma Substations would increase the reliability of the system and mitigate the low voltage and overloading problem by providing another source of electrical power to the Sonoma and Napa area. Therefore, even if the existing line fails, the new line would ensure that there is an adequate continuous path for power flow from a strong source such as Lakeville Substation. Maintaining this continuous path of electricity would prevent sudden voltage drops during contingency events.

Additionally a second Lakeville-Sonoma line would facilitate maintenance on the other line and associated equipment at either substation. When one line or its associated substation equipment requires maintenance and must be taken out of service, the other line would remain in service and available to serve load (PG&E PEA, 2-11).

Alternatives

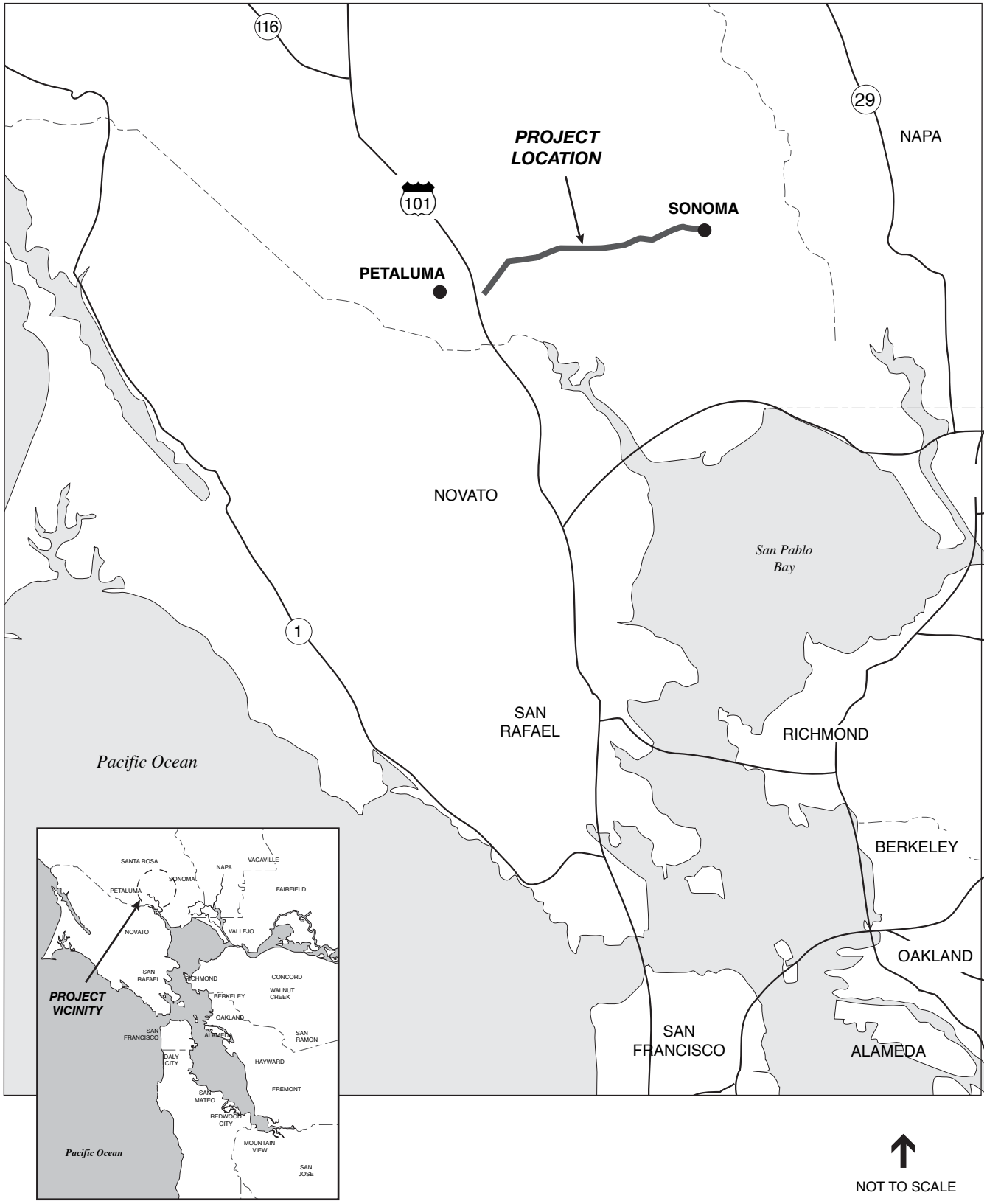
CEQA does not require that a MND include an alternatives analysis because the Initial Study concludes that, with mitigation, there are no significant impacts resulting from the proposed project. The CPUC believes that the Proposed Project with adoption of a mitigation measure to underground the portion of the transmission line between Leveroni Road from about Fifth Street West to the Sonoma Substation would pose fewer overall environmental impacts. Pursuant to Section IX.B.1.c of CPUC's General Order 131-D, PG&E's Application did consider four routes in addition to the Proposed Project and presented an explanation of the advantages and disadvantages of each routes in their PEA. Refer to **Appendix A** for more detailed descriptions and comparisons of the routes described above; as well as an additional two routes not analyzed by PG&E.

1.3 Project Location

The Proposed Project is located in southern Sonoma County between the City of Petaluma and the City of Sonoma, California. The proposed project route traverses an existing PG&E transmission line corridor paralleling county roads, travels through open space, over the Sonoma Mountains, into the vineyards, ranches and agricultural lands of the Sonoma Valley, paralleling city roads into the City of Sonoma (**Figure 1-1**).

1.4 Existing System

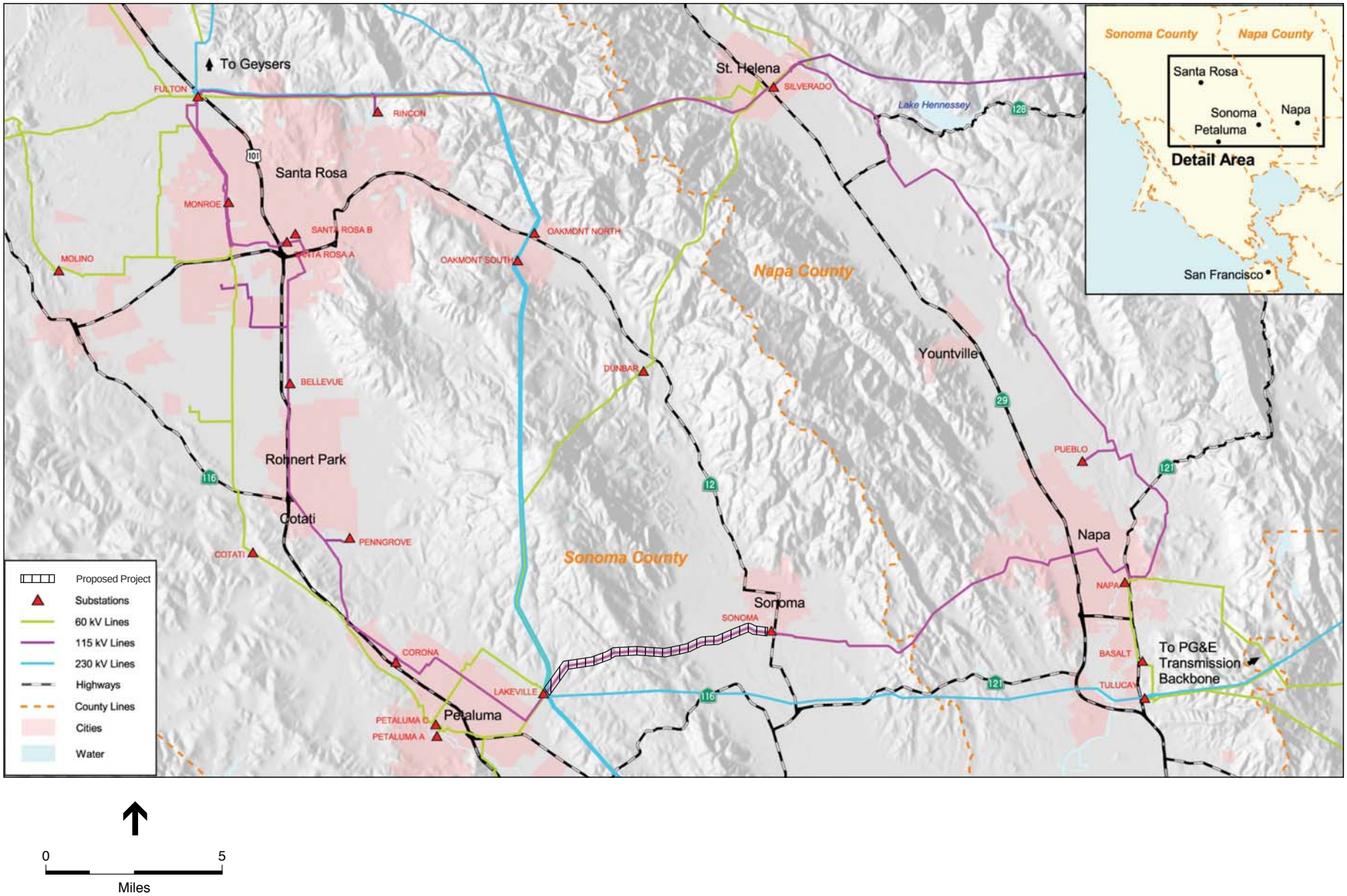
PG&E currently serves the Napa and Sonoma County areas by a system of substations and electrical power transmission lines (**Figure 1-2**); as well as an extensive network of local distribution lines throughout the region. These distribution lines, not shown in **Figure 1-2**, generally follow city streets and back property lines carrying lower voltage electricity from the substations to PG&E residential and commercial customers.



SOURCE: ESA (2005)

Lakeville-Sonoma 115 kV Transmission Line Project / 204202 ■

Figure 1-1
Project Location



SOURCE: EDAW (2004)

Figure 1-2
Existing Regional Electric System

Electric power is currently delivered to substations in the project area at 60 kV, 115 kV and 230 kV. Power is then converted to lower voltages for distribution to customers through overhead or underground distribution lines. The local distribution system, typically at 12 and 21 kV, is further stepped down to 120 V by individual neighborhood transformers for customer use.

1.4.1 Existing Substations

PG&E relies on five distribution substations to serve its electric customers in the cities of Sonoma and Napa, and surrounding areas: Sonoma, Pueblo, Basalt, Napa, and Tulucay Substations (**Figure 1-2**). The Sonoma and Pueblo Substations are connected to PG&E's 115 kV transmission network and serve about 60 percent of the customers in this area. While the Basalt, Napa, and Tulucay Substations are connected to PG&E's 60 kV transmission network and serve the remaining customers. These two transmission systems are operated independent of each other.

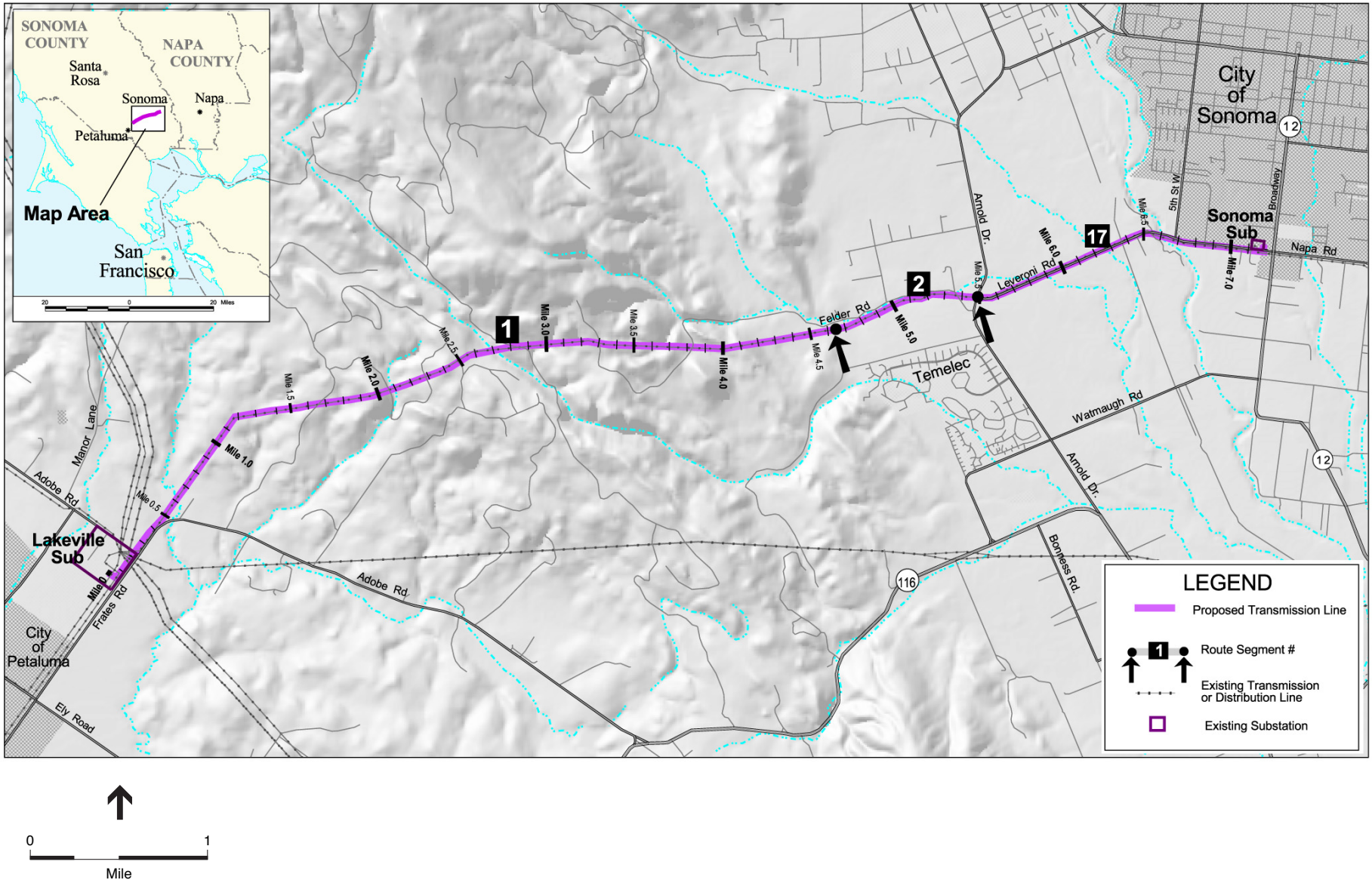
1.4.2 Existing 115 kV Transmission Facilities

In the existing 115 kV system, the Sonoma and Pueblo Substations are tied in a loop configuration to the Lakeville and Fulton Substations by the Fulton–Pueblo, Sonoma–Pueblo, and Lakeville–Sonoma 115 kV lines.

As shown in **Figure 1-2**, the Fulton–Pueblo 115 kV line runs from northern Santa Rosa eastward to St. Helena and then turns south toward the City of Napa. This line serves the Sonoma and Pueblo Substation and in the event of an outage on the Fulton–Fulton Junction 115 kV line, the line serves as a back up for the Rincon and Silverado Substation. The Fulton–Pueblo and the Fulton–Fulton Junction 115 kV lines share the same transmission towers from the Fulton Substation to St. Helena. The Sonoma–Pueblo 115 kV line runs from the Pueblo Substation southward to downtown Napa and then westward to downtown Sonoma. The Lakeville–Sonoma 115 kV line runs from the Lakeville Substation eastward to Sonoma Substation.

1.5 PG&E's Proposed Project Description

Figure 1-3 shows the location and alignment of Proposed Project. Retaining the segmentation of the alignment as delineated in the PEA, the Proposed Project consists of: Segment 1, Segment 2, and Segment 17. As shown in **Figure 1-3**, the transmission line begins at the Lakeville Substation, parallels Adobe Road for approximately 1.2 miles, and then passes northeast through vineyards and ranch lands for approximately 3.6 miles. The line roughly parallels Felder Road for approximately .08 miles from the junction of Felder Road and Felder Creek east to the junction of Felder Road and Leveroni Road where it continues, approximately 1.7 miles, following Leveroni Road to the Sonoma Substation. Note that this double-circuit transmission line generally would follow the same alignment as the existing single-circuit line.



SOURCE: EDAW (2004)

Figure 1-3
Proposed Project

1.6 Project Components

A summary of the key components of the proposed Lakeville–Sonoma 115 kV Transmission Line Project is provided **Table 1-1** with a more detailed discussion by component to follow.

TABLE 1-1
SUMMARY OF PROJECT COMPONENTS

115 kV Transmission Line
• Replace the existing single-circuit 115 kV transmission line with a double-circuit 115 kV line from the Lakeville Substation to the Sonoma Substation • Existing transmission, distribution and telecommunication lines would be transferred to the new poles. • Voltage of new circuit: 115 kV alternating current • Pole Type: tubular steel poles (TSP) that are self weathering (these poles typically oxidize to a "natural" reddish-brown color) and wood poles • Pole Height: generally 50 to 100 feet • Span between Poles: approximately 200 to 1,370 feet • During construction, existing land access and helicopters would be used to minimize environmental impacts.
Lakeville Substation
• Modification of existing Lakeville substation yard on PG&E property. Existing landscape along Frates Road would provide screening. • Installation of facilities to support a 115 kV line position. One new TSP to be located inside the substation.
Sonoma Substation
• Installation of facilities to support a 115 kV line position. One TSP would replace an existing wood pole inside the substation. Installation of additional landscaping along Leveroni Road.

1.6.1 Transmission Line

PG&E proposes to replace the existing single-circuit wood pole line with a rebuilt double-circuit line on a combination of tubular steel poles (TSPs) and wood poles for approximately 7.23 miles (**Table 1-2**). For safety purposes, wood poles would be used along Leveroni Road as steel poles could cause induction problems next to an existing transmission gas line in that area. Additionally, TSPs would be located a bit farther to the west of the existing wood poles along Adobe Road to avoid potential conflicts with an existing transmission gas line. Overall, the new transmission line would require approximately 27 fewer poles than the existing line because the taller tubular steel poles allow for greater spans (distance) between poles, which reduces the total number of poles needed to support the existing and new circuits.

The route alignment, approximate pole locations, and likely pole types with tentative locations of staging areas, helicopter landing zones, pull sites, and access roads are shown in **Figure 1-4(a)** through **Figure 1-4(d)**.

1.6.2 Poles

The transmission line would be supported by TSPs and wood poles, which would be approximately 2 to 3 feet in diameter and generally range from approximately 50 to 100 feet in height (**Figure 1-5**). **Table 1-3** provides a more detailed description of existing, proposed, and difference of pole heights plus their land use designations for the entire transmission line project. Span lengths between the poles would range from 200 to 1,370 feet, with average spans of 500 to

TABLE 1-2
115 KV TRANSMISSION LINE CONSTRUCTION

Segment	Existing Lines	Proposed Construction	Miles	Segment Miles
1	Wood Pole Single-circuit w/ Distribution Under	TSP Double-circuit w/ Distribution Under	0.70	4.64
	Wood Pole Single-circuit	TSP Double-circuit	0.92	
	Wood Pole Single-circuit w/ Distribution Under	TSP Double-circuit w/ Distribution Under	0.22	
	Wood Pole Single-circuit	TSP Double-circuit	2.44	
	Wood Pole Single-circuit w/ Distribution Under	TSP Double-circuit w/ Distribution Under	0.36	
2	Wood Pole Single-circuit	TSP Double-circuit	0.45	0.85
	Wood Pole Single-circuit w/ Distribution Under	TSP Double-circuit w/ Distribution Under	0.40	
17	Wood Pole Single-circuit w/ Distribution Under	TSP and Wood Poles Double-circuit w/ Distribution Under	1.74	1.74
			Total Miles	7.23

900 feet. The TSPs, which require less maintenance than wood poles, would be made of self-weathering steel, which oxidize to a natural-looking rust color within about one year.

For safety purposes, wood poles would be used along Leveroni Road as steel poles could cause induction problems next to an existing transmission gas line in that area.

Angle poles would be installed in concrete foundations to eliminate the need for wire down guys that would otherwise be needed to support an angle pole.

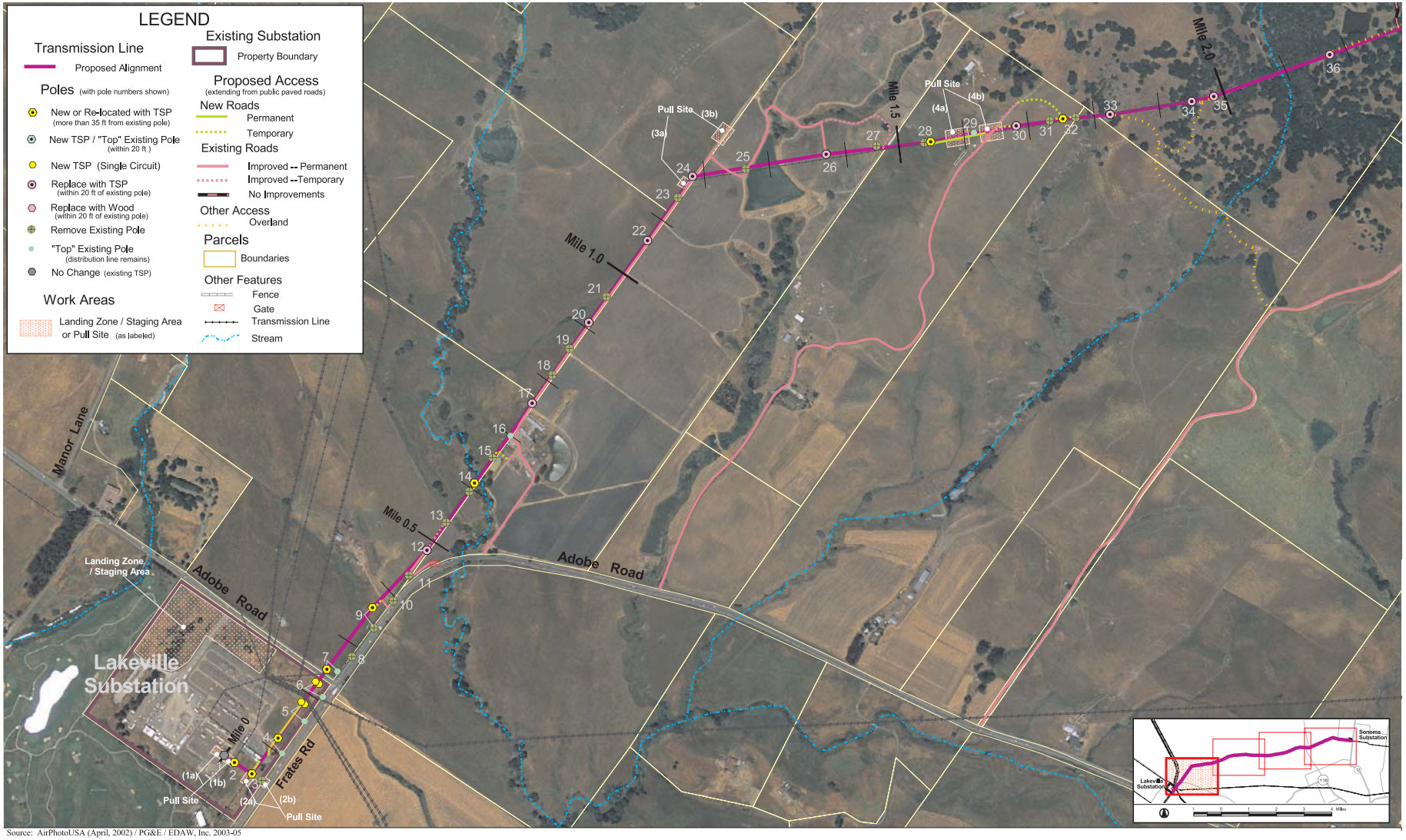
The existing single-circuit transmission line, which consists of 119 poles (118 wood and one TSP), would be replaced with a new double-circuit transmission line consisting of 90 poles (23 wood and 67 TSPs). In order to support the additional circuit, the new poles would generally need to be larger and taller than the existing wood poles. Most of the new poles would be located within 20 feet of an existing pole location. Approximately eleven existing wood poles would be “topped” (i.e., shortened by removing the existing transmission lines and cut down to the level of the lower distribution lines) allowing the existing distribution lines to remain. One (1) existing TSP inside the Lakeville Substation would remain and two additionally TSP will be installed along the fence line.

1.6.3 Substation Modification

The Proposed Project includes modifying and adding some equipment at the existing PG&E Lakeville and Sonoma Substations.

1.6.3.1 Lakeville Substation Modifications

The Proposed Project would require modification of the Lakeville Substation, to accommodate installation of some new equipment including: galvanized structures, circuit breaker, air



Source: AirPhotoUSA (April, 2002) / PG&E / EDAW, Inc. 2003-05

Pole locations and construction sites are based on preliminary engineering, which is subject to change as a result of the CPUC permit process, final engineering, and any necessary adjustments during construction.

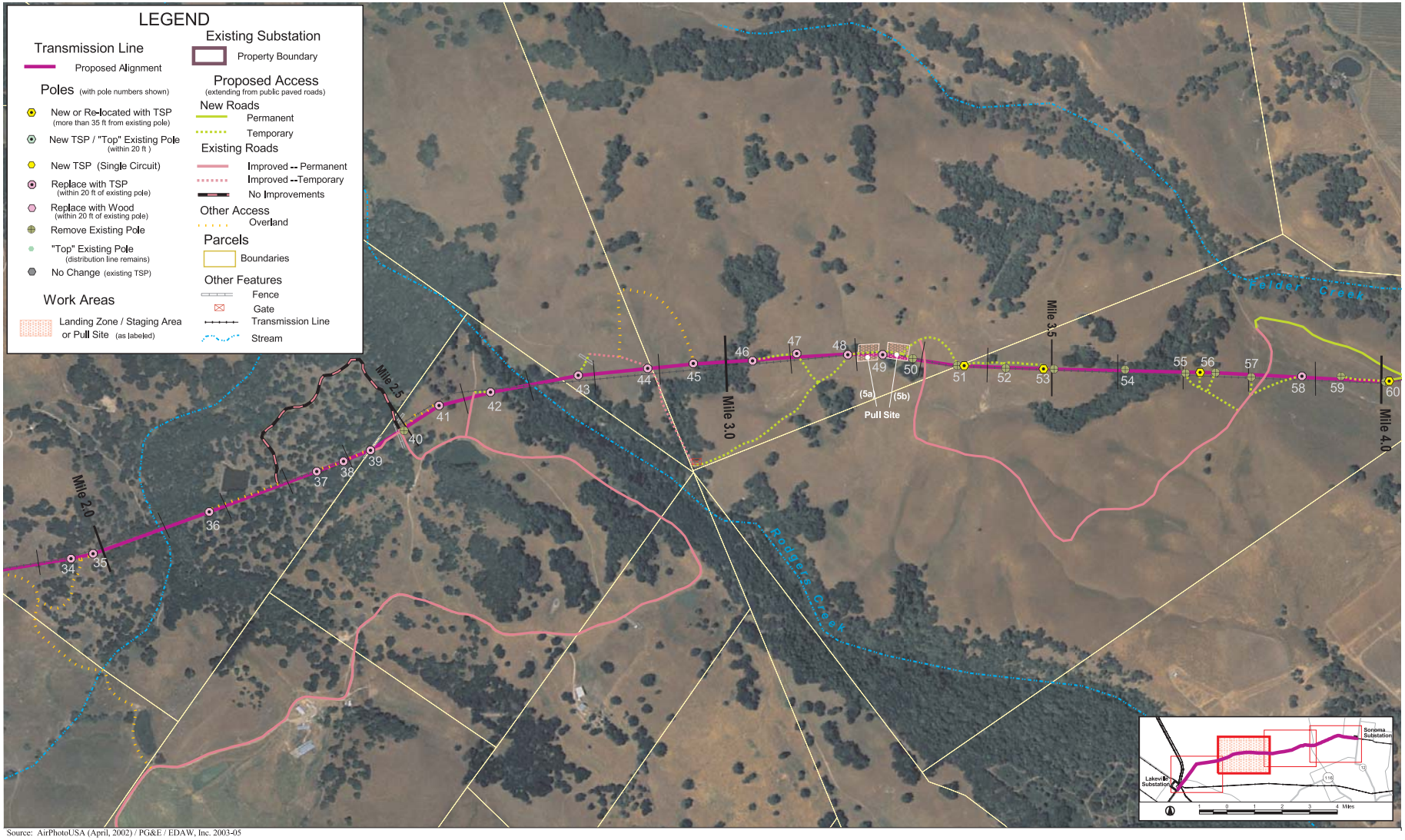
0 1000

Feet

SOURCE: AirPhotoUSA (April, 2002)/PG&E/EDAW, Inc. 2003-05

Figure 1-4(a)

Proposed Route (West)



Source: AirPhotoUSA (April, 2002) / PG&E / EDAW, Inc. 2003-05

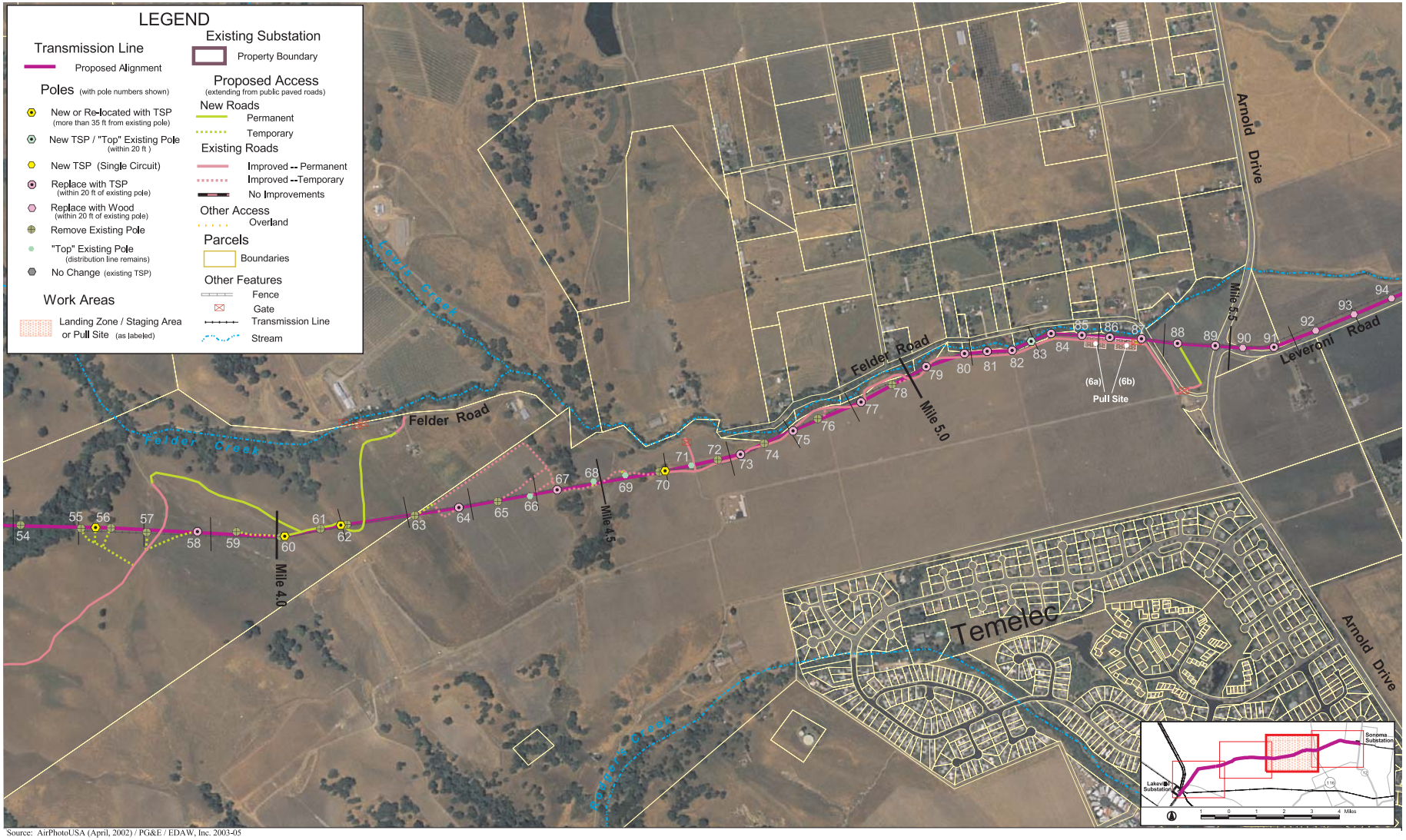
Pole locations and construction sites are based on preliminary engineering, which is subject to change as a result of the CPUC permit process, final engineering, and any necessary adjustments during construction.

0 1000 Feet

SOURCE: AirPhotoUSA (April, 2002)/PG&E/EDAW, Inc. 2003-05

Figure 1-4(b)

Proposed Route (Mid-West)



Source: AirPhotoUSA (April, 2002) / PG&E / EDAW, Inc. 2003-05

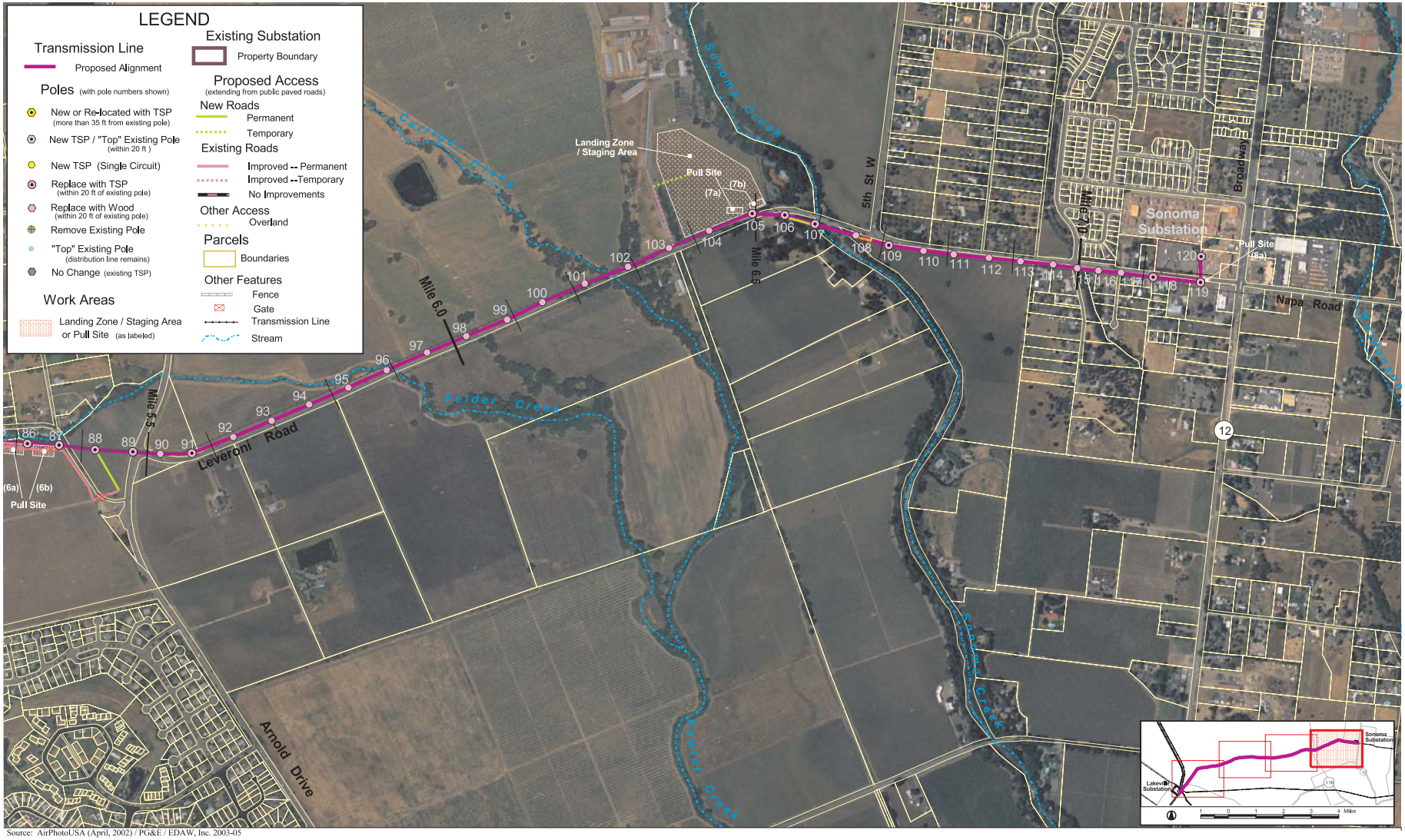
Pole locations and construction sites are based on preliminary engineering, which is subject to change as a result of the CPUC permit process, final engineering, and any necessary adjustments during construction.

0 1000 Feet

SOURCE: AirPhotoUSA (April, 2002)/PG&E/EDAW, Inc. 2003-05

Figure 1-4(c)

Proposed Route (Mid-East)



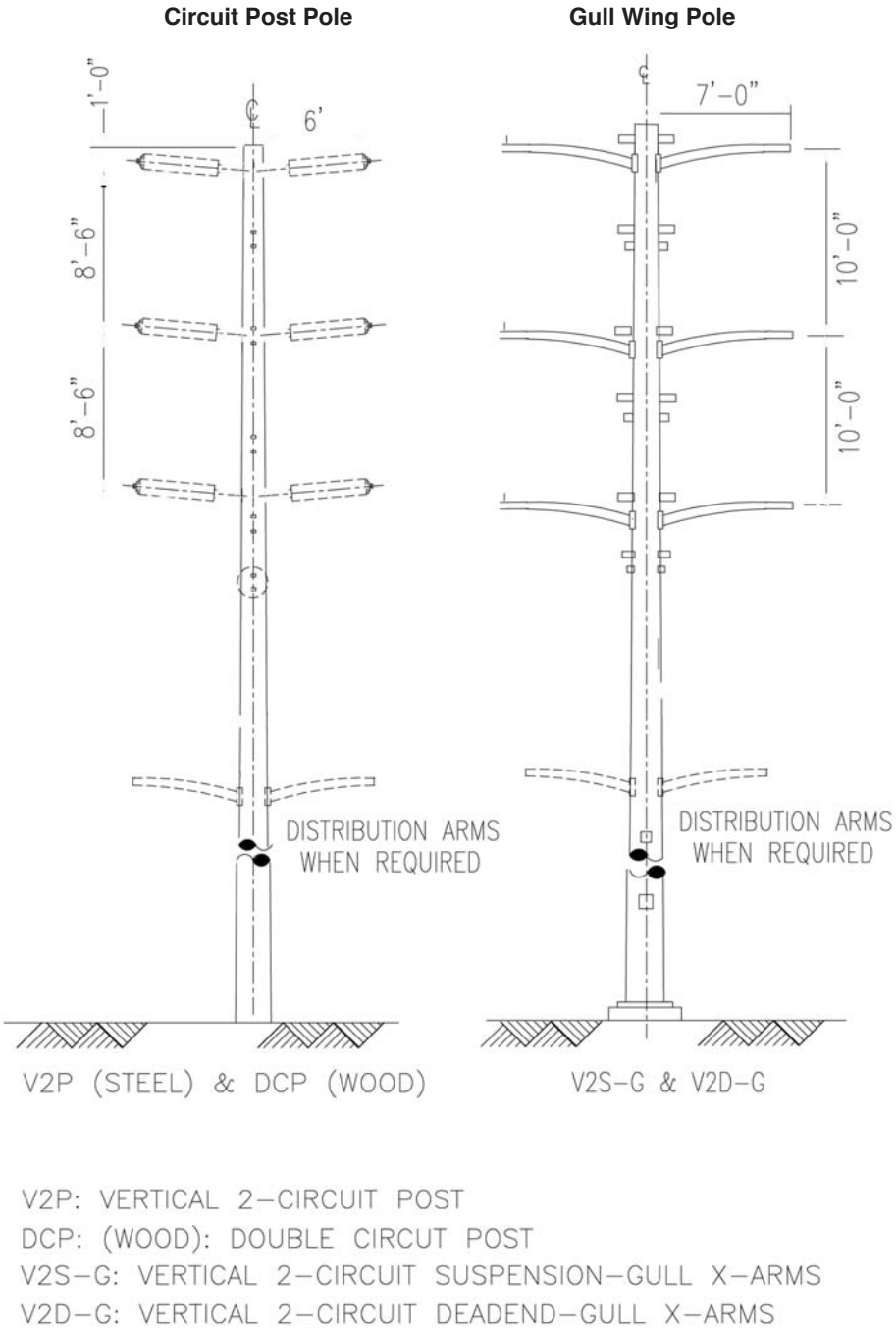
Source: AirPhotoUSA (April, 2002) / PG&E / EDAW, Inc. 2003-05

Pole locations and construction sites are based on preliminary engineering, which is subject to change as a result of the CPUC permit process, final engineering, and any necessary adjustments during construction.

0 1000 Feet

SOURCE: AirPhotoUSA (April, 2002)/PG&E/EDAW, Inc. 2003-05

Figure 1-4(d)
Proposed Route (East)



This diagram is based on preliminary engineering, which is subject to change as a result of the CPUC permit process, final engineering, and any necessary adjustments during construction.

SOURCE: EDAW (2004)

Figure 1-5
Typical Pole Designs

TABLE 1-3
EXISTING AND PROPOSED POLES AND EXISTING LAND USES

Existing Pole Number	Existing Pole Type	Proposed Pole Type	Existing Height (ft)	Proposed Height (ft)	Change in Height (ft)	Existing Land Use
1	TSP	No Change	60	60	0	Lakeville Substation
2	N/A	TSP	60	60	0	Lakeville Substation
3	Wood	TSP	65	65	0	Lakeville Substation
4	Wood	TSP	50	65	15	Lakeville Substation
5	Wood	TSP	42	45	3	Lakeville Substation
6	Wood	TSP	42	40	2	Lakeville Substation
7	Wood	TSP	42	80	38	Irrigated vineyard
8	Wood	Eliminate	47	N/A	Eliminate	Irrigated vineyard
9	Wood	TSP	55	85	30	Irrigated vineyard
10	Wood	Eliminate	46	N/A	Eliminate	Irrigated vineyard
11	Wood	Eliminate	51	N/A	Eliminate	Irrigated vineyard
12	Wood	TSP	44	80	36	Irrigated vineyard
13	Wood	Eliminate	52	N/A	Eliminate	Irrigated vineyard
14	Wood	TSP	50	85	35	Irrigated vineyard
15	Wood	Eliminate	46	N/A	Eliminate	Irrigated vineyard
16	Wood	Eliminate	44	N/A	Eliminate	Irrigated vineyard
17	Wood	TPS	44	90	46	Irrigated vineyard
18	Wood	Eliminate	48	N/A	Eliminate	Irrigated vineyard
19	Wood	Eliminate	42	N/A	Eliminate	Irrigated vineyard
20	Wood	TSP	43	80	37	Irrigated vineyard
21	Wood	Eliminate	51	N/A	Eliminate	Irrigated vineyard
22	Wood	TSP	44	60	16	Irrigated vineyard
23	Wood	Eliminate	44	N/A	Eliminate	Irrigated vineyard
24	Wood	TSP	62	80	18	Irrigated vineyard
25	Wood	Eliminate	54	N/A	Eliminate	Irrigated vineyard with residence
26	Wood	TSP	50	85	35	Irrigated vineyard with residence
27	Wood	Eliminate	47	N/A	Eliminate	Irrigated vineyard with residence
28	Wood	TSP	53	90	37	Pasture with residence
29	Wood	Eliminate	43	N/A	Eliminate	Pasture with residence
30	Wood	TSP	50	85	35	Pasture with residence
31	Wood	Eliminate	45	N/A	Eliminate	Pasture with residence
32	Wood	TSP	52	55	3	Pasture with residence
33	Wood	TPS	45	60	15	Open space with residence
34	Wood	TSP	50	50	0	Open space with residence
35	Wood	TSP	50	60	10	Open space with residence
36	Wood	TSP	53	60	7	Open space with residence
37	Wood	TPS	48	60	12	Open space with residence
38	Wood	TSP	50	60	10	Open space with residence
39	Wood	TSP	60	65	5	Open space with residence
40	Wood	Eliminate	50	N/A	Eliminate	Open space
41	Wood	TSP	54	60	6	Open space

TABLE 1-3 (continued)
EXISTING AND PROPOSED POLES AND EXISTING LAND USES

Existing Pole Number	Existing Pole Type	Proposed Pole Type	Existing Height (ft)	Proposed Height (ft)	Change in Height (ft)	Existing Land Use
42	Wood	TPS	47	60	13	Open space
43	Wood	TSP	51	60	9	Pasture
44	Wood	TSP	51	55	4	Pasture
45	Wood	TSP	56	50	-6	Pasture
46	Wood	TSP	46	50	4	Pasture
47	Wood	TPS	56	55	-1	Pasture
48	Wood	TSP	60	55	-5	Pasture
49	Wood	TSP	56	65	9	Pasture
50	Wood	Eliminate	51	N/A	Eliminate	Pasture
51	Wood	TSP	52	70	18	Pasture
52	Wood	Eliminate	56	N/A	Eliminate	Pasture with residence
53	Wood	TSP	54	90	36	Pasture with residence
54	Wood	Eliminate	52	N/A	Eliminate	Pasture with residence
55	Wood	Eliminate	53	N/A	Eliminate	Pasture with residence
56	Wood	TSP	55	75	20	Pasture with residence
57	Wood	Eliminate	53	N/A	Eliminate	Pasture with residence
58	Wood	TSP	54	75	21	Pasture with residence
59	Wood	Eliminate	57	N/A	Eliminate	Pasture with residence
60	Wood	TSP	55	65	10	Pasture with residence
61	Wood	Eliminate	48	N/A	Eliminate	Pasture with residence
62	Wood	TSP	57	60	3	Pasture with residence
63	Wood	Eliminate	58	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
64	Wood	TSP	60	80	20	Irrigated vineyard/primarily premium varietals with residence
65	Wood	Eliminate	52	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
66	Wood	Eliminate	54	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
67	Wood	TSP	52	80	28	Irrigated vineyard/primarily premium varietals with residence
68	Wood	Eliminate	62	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
69	Wood	Eliminate	47	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
70	Wood	TSP	52	75	23	Irrigated vineyard/primarily premium varietals with residence
71	Wood	Eliminate	47	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
72	Wood	Eliminate	54	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
73	Wood	TSP	55	70	15	Irrigated vineyard/primarily premium varietals with residence
74	Wood	Eliminate	47	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence

TABLE 1-3 (continued)
EXISTING AND PROPOSED POLES AND EXISTING LAND USES

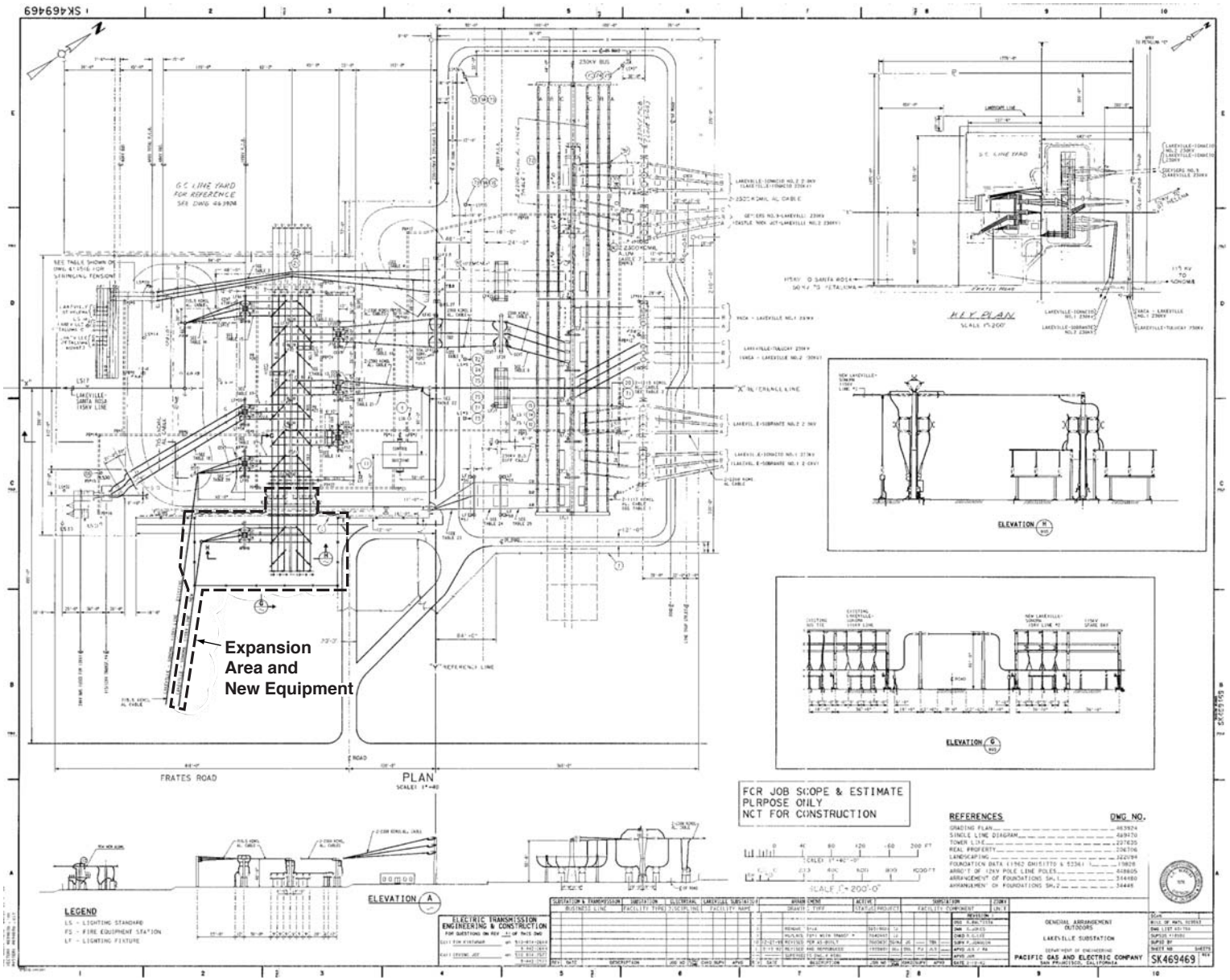
Existing Pole Number	Existing Pole Type	Proposed Pole Type	Existing Height (ft)	Proposed Height (ft)	Change in Height (ft)	Existing Land Use
75	Wood	TSP	51	60	9	Irrigated vineyard/primarily premium varietals with residence
76	Wood	Eliminate	51	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
77	Wood	TSP	57	75	18	Irrigated vineyard/primarily premium varietals with residence
78	Wood	Eliminate	54	N/A	Eliminate	Irrigated vineyard/primarily premium varietals with residence
79	Wood	TSP	61	65	4	Irrigated vineyard/primarily premium varietals with residence
80	Wood	TSP	56	65	9	Irrigated vineyard/primarily premium varietals with residence
81	Wood	TSP	50	65	15	Irrigated vineyard/primarily premium varietals with residence
82	Wood	TSP	56	65	9	Irrigated vineyard/primarily premium varietals with residence
83	Wood	TSP	51	65	14	Irrigated vineyard/primarily premium varietals with residence
84	Wood	TSP	60	65	5	Irrigated vineyard/primarily premium varietals with residence
85	Wood	TSP	51	70	19	Irrigated vineyard/primarily premium varietals with residence
86	Wood	TSP	54	70	16	Irrigated vineyard/primarily premium varietals with residence
87	Wood	TSP	57	70	13	Irrigated vineyard/primarily premium varietals with residence
88	Wood	TSP	56	60	4	Irrigated vineyard
89	Wood	TSP	58	65	7	Irrigated vineyard
90	Wood	Wood	60	65	5	Irrigated vineyard
91	Wood	TSP	65	70	5	Irrigated vineyard
92	Wood	Wood	57	75	18	Irrigated vineyard/primarily premium varietals with residence
93	Wood	Wood	60	75	15	Irrigated vineyard/primarily premium varietals with residence
94	Wood	Wood	60	75	15	Irrigated vineyard/primarily premium varietals with residence
95	Wood	Wood	62	75	13	Irrigated vineyard/primarily premium varietals with residence
96	Wood	Wood	62	75	13	Irrigated vineyard/primarily premium varietals with residence
97	Wood	Wood	60	75	15	Irrigated vineyard/primarily premium varietals with residence
98	Wood	Wood	50	75	25	Irrigated vineyard/primarily premium varietals with residence
99	Wood	Wood	60	75	15	Irrigated vineyard/primarily premium varietals with residence
100	Wood	Wood	59	75	16	Irrigated vineyard/primarily premium varietals with residence

TABLE 1-3 (continued)
EXISTING AND PROPOSED POLES AND EXISTING LAND USES

Existing Pole Number	Existing Pole Type	Proposed Pole Type	Existing Height (ft)	Proposed Height (ft)	Change in Height (ft)	Existing Land Use
101	Wood	Wood	59	75	16	Irrigated vineyard/primarily premium varietals with residence
102	Wood	Wood	61	75	14	Irrigated vineyard/primarily premium varietals with residence
103	Wood	Wood	60	75	15	Irrigated vineyard/primarily premium varietals with residence
104	Wood	Wood	58	75	17	Irrigated vineyard/primarily premium varietals with residence
105	Wood	TSP	58	75	17	Irrigated vineyard/primarily premium varietals with residence
106	Wood	TSP	62	75	13	Irrigated vineyard/primarily premium varietals with residence
107	Wood	TSP	66	75	9	Irrigated vineyard/primarily premium varietals with residence
108	Wood	Wood	63	75	12	Irrigated vineyard/primarily premium varietals with residence
109	Wood	TSP	58	85	27	Irrigated vineyard/primarily premium varietals with residence
110	Wood	Wood	59	85	26	Irrigated vineyard/primarily premium varietals with residence
111	Wood	Wood	58	85	27	Irrigated vineyard/primarily premium varietals with residence
112	Wood	Wood	59	85	26	Irrigated vineyard/primarily premium varietals with residence
113	Wood	Wood	57	85	28	Irrigated vineyard/primarily premium varietals with residence
114	Wood	Wood	62	85	23	Residence
115	Wood	Wood	52	85	33	Residence
116	Wood	Wood	52	85	33	Residence
117	Wood	Wood	53	85	32	Residence
118	Wood	TSP	61	85	24	Residence
119	Wood	TSP	65	85	20	Residence
120	Wood	TSP	65	75	10	Sonoma Substation

a Proposed construction of 2 poles at this location
b Prpopsed construction of 2 poles at this location
c Poles include a 10' height increase based on Field Management Plan

switches, aluminum bus, control room, control/protection equipment, insulators, and some limited additional lighting near Frates Road. The dead end structures for the bus extension would be no more than 40 feet high while the other bus support structures would be 9 feet high. One new 60-foot-high tubular steel pole would be located inside the substation. All of the new installation would be contained within the land owned by PG&E. Additionally, as shown in **Figure 1-6**, an existing chain link fence would be moved approximately 80 feet closer to Frates Road from it's existing location on the southeast side of the substation.



This diagram is based on preliminary engineering, which is subject to change as a result of the CPUC permit process, final engineering, and any necessary adjustments during construction.

SOURCE: EDAW (2004)

Figure 1-6
Lakeville Substation Modifications

1.6.3.2 Sonoma Substation Modifications

At the Sonoma Substation, additional equipment would be installed within the existing fenceline, as shown in **Figure 1-7**. This would include installation of a 115 kV line position and bus modification to include galvanized steel, 115 kV circuit breakers, 115 kV air switches, surge arrestors, aluminum bus, and a relay protection. The existing control room would be extended to provide for the additional batteries required for the new equipment. And, some additional lighting would be required for periodic use when personnel are on-site for activities such as inspections and maintenance.

The dead end structure would be no more than 45 feet high while the other bus support structures would be 9 feet high. An existing 70-foot single-circuit wood pole would be replaced by an approximately 75-foot high tubular steel pole; while a second existing wood pole would be moved a few feet. Low maintenance landscaping and irrigation would be added along Leveroni Road.

1.7 Right-of-Way Requirements

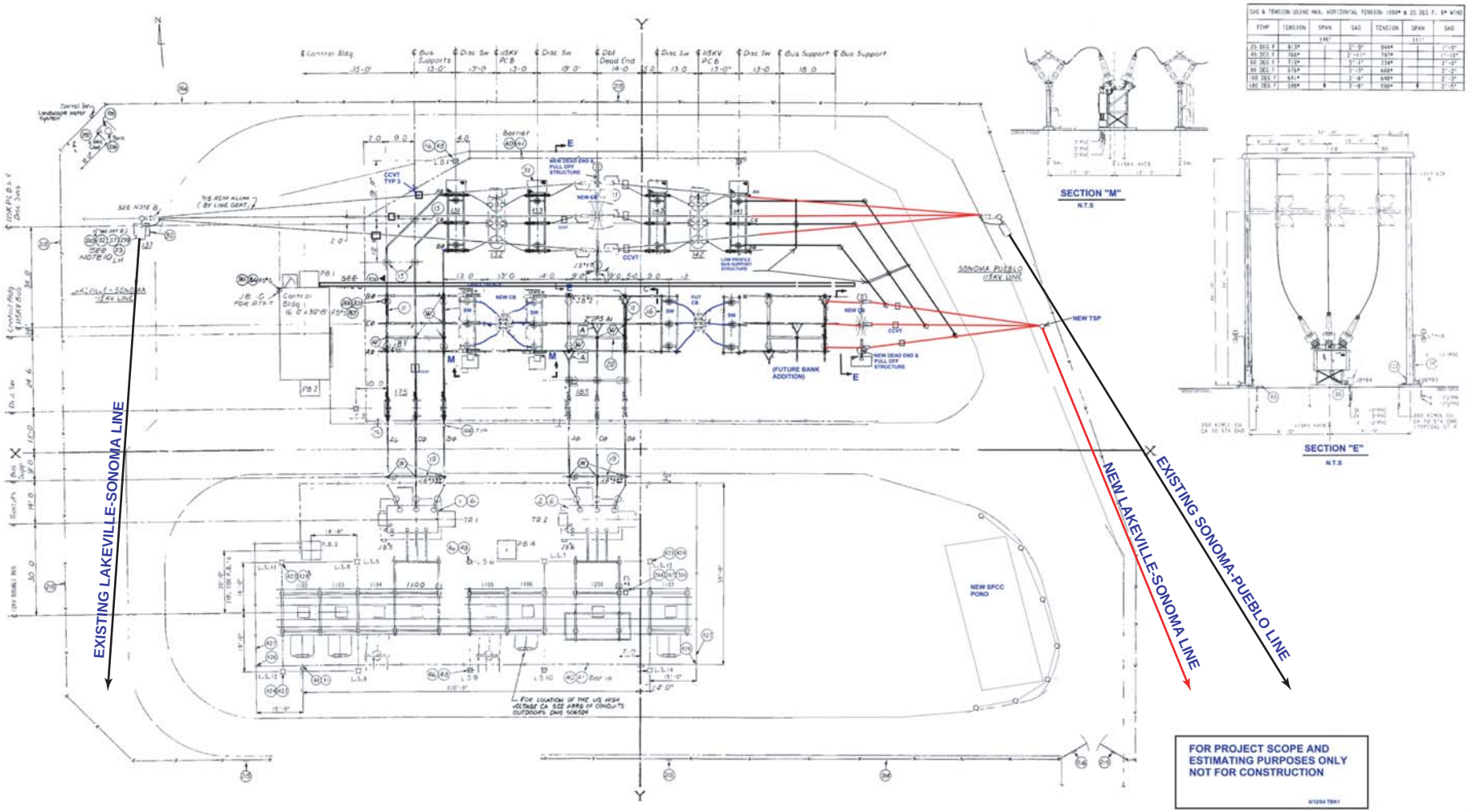
PG&E currently owns right-of-way easements along segments 1, 2, and 17, as there is an existing single-circuit line along these segments (**Figure 1-3**). However, the addition of a second 115 kV circuit may require PG&E to adjust easements to account for slight deviations from the existing alignment, or acquire expanded easements as needed to accommodate taller poles depending on the length of spans between poles and CPUC safety requirements or to secure other adjustments to the easements depending on the terms of the affected easements. Along Felder Creek (see **Figure 1-4(c)**), it may necessary from approximately Pole 73 to Pole 87 for individual poles to be set back further from the creek due to engineering issues regarding construction of a double circuit transmission line as well as to avoid impact to riparian habitat and aesthetics. If additional ROW or changes to existing easements is necessary, PG&E will acquire additional ROW from the appropriate owner either through negotiation or condemnation.

1.8 Construction

This section describes construction methods to be used along the 115 kV transmission line route and at Lakeville and Sonoma Substations.

1.8.1 Transmission Line Construction

Construction of the transmission line would include installation of new tubular steel poles, installation of wood poles, removal of existing wood poles and conductor (transmission line wires), topping of some existing wood poles, installation / removal of safety structures at road crossings, and stringing of new conductor for the 115 kV circuits. The existing 115 kV conductor would be removed and replaced with the same 477 ACSS conductor type (aluminum with a steel core). In addition, construction would require the acquisition and preparation of ROW as required



This diagram is based on preliminary engineering, which is subject to change as a result of the CPUC permit process, final engineering, and any necessary adjustments during construction.

SOURCE: EDAW (2004)

Figure 1-7
Sonoma Substation Modifications

for the 115 kV transmission line; establishment of work areas, staging areas, pull and tension sites; and access to pole sites and pull sites along the transmission line route.

1.8.1.1 Line Staging Areas

Prior to transmission line construction, two staging areas of no more than 10 acres each would be prepared to provide space for materials delivery, storage, and preparation, equipment storage, crew parking, and offices prior to installation. These staging areas, which would also be used as helicopter landing areas, would be located at the Lakeville Substation (**Figure 1-4(a)**) and off of Leveroni Road near the Sonoma Substation (**Figure 1-4(d)**).

Once the two large staging areas are leased by PG&E, the appropriate grading[2], electrical, traffic control, and other permits would be obtained for potential leveling, ingress/egress, drainage, fencing, temporary construction postings, electrical service, and any other pertinent activities; however, PG&E does not expect to require grading of either staging area. If construction activities take place during the winter, PG&E would install a rock surface in the yards where heavy traffic is expected. PG&E would secure the areas with fences and locked gates, and contract security would be provided. The site layouts would be approved by the project's environmental monitor, and work crew activities would follow all PG&E environmental guidelines include applicant proposed mitigation measures delineated below in Section 1.9.4. Additionally, the eastern staging area would be set back at least 50 feet from Sonoma Creek to avoid impacts to riparian habitat.

1.8.1.2 Pull and Tension Sites

In order to replace or install a length of conductor, a temporary pull site is needed at one end and a temporary tension site is needed at the other. The distance between the pull and tension sites would vary, ranging from approximately 0.5 miles to 2.1 miles. Depending on the existing terrain for the activity and whether the site would be a pull or a tension site, these sites generally vary in size though typically a 200- by 200-foot area is sufficient. A gravel pad would be installed over fabric (likely geotextiles comprised of UV stabilized polypropylene slit film) at each site, and sites would be cleaned up and restored to preconstruction condition after construction. Pull sites would require a puller, crew truck, and aerial lift truck, while tension sites would require a tensioner, a crew truck, a reel dolly, an aerial lift, and a truck to move the reel dolly. Removal of the old conductor and replacement of the conductor reel is carried out within the staging area.

1.8.1.3 Access Roads

Construction crews would use existing roads along most of the transmission line corridor to access pole sites; these include paved roads, ranch and vineyard roads, and fire access roads. In areas where existing roads are not available, new access roads would be needed. The different

[2] Grading is defined as "to level or smooth to a desired or horizontal gradient". Grading for the Proposed Project would be done in accordance with applicable city and/or county regulations.

types of access roads and improvements needed are shown on **Figure 1-4(a)** through **Figure 1-4(d)**. They fall into six categories:

1. new permanent road;
2. new temporary road;
3. existing road that would have permanent improvements;
4. existing road that would have temporary improvements, and
5. existing paved road (no improvements needed) (not shown in color on map); and
6. overland access.

New permanent access roads would be approximately 15 feet wide, may be groomed or graded with approximately 4 to 5 inches of rock road base installed and permanently left in place. The rock road base would be compacted with a heavy roller to provide all-weather access. About 0.94 miles of new permanent access roads [see green lines on **Figure 1-4(a)** through **Figure 1-4(d)**] would be constructed (approximately 1.72 acres) within the Lakeville Substation (i.e., between Poles 3, 4, and 5); between Poles 28 and 29, Poles 106 and 107, Poles 108 and 109; off of Felder Road to access Poles 60, 61, and 62, between Pole 60 and 61 traversing cross country to an existing road that accesses Pole 57, near the intersection of Leveroni Road and Arnold Drive to access Pole 88. All new access roads would be gated and locked at fence lines and would have a "No Trespassing" sign posted at their entrance from a public roadway. Note: no new permanent or new temporary (discussed below) access roads would be constructed on the Moon Ranch or Pristkert properties.

Temporary access roads would be approximately 15 feet wide, may be groomed or graded with approximately 4 to 5 inches of rock road base installed over a fabric base. The rock and fabric would be removed after the project and the area would be restored. Approximately 1.47 miles of new temporary access roads [see green dashed lines on **Figure 1-4(a)** through **Figure 1-4(d)**] would be cleared (approximately 2.67 acres) and then restored to their previous condition after construction. These temporary access roads would be located off of Pole 15, 43, 47, 48, 50, 51, 55, 56, 57, 58, 63; between Pole 31 and 32, Pole 48 and 50, Pole 51 and 53, Pole 59 and 60; and within the eastern landing zone/staging area.

Some existing unpaved roads would have permanent improvements. These roads would be approximately 15 feet wide, may be groomed or graded with up to 4 to 5 inches of rock road base installed on over the existing road base, depending on conditions and permanently left in place. The rock road base would be compacted with a heavy roller to provide all-weather access. Water bars would be installed at 50-foot intervals (or greater, depending on slope and conditions) where there is an incline of 10 degrees or more. In addition, these roads would be sloped to allow natural run-off. Approximately 6.6 miles of existing road would have permanent improvements [see pink lines on **Figure 1-4(a)** through **Figure 1-4(d)**] (approximately 12.10 acres). These roads are located off of Pole 11; between Pole 11 and Pole 12, off of Adobe Road traversing to Pole 16 then over the project alignment to Pole 26; off of Adobe Road over a number of farms to Poles 29, 40 and 42; in open space providing access between Poles 50 and 57; and along the project alignment between Poles 70 and 87.

Some existing unpaved roads would have temporary improvements. These roads would be approximately 15 feet wide, may be groomed or graded with approximately 4 to 5 inches of rock road base installed over a fabric base. The rock and fabric would be removed after the project and the area would be restored. Approximately 1.33 miles of existing road would have temporary improvements [see pink dashed lines on **Figure 1-4(a)** through **Figure 1-4(d)**] (approximately 2.42 acres). These existing roads that would have temporary improvements would be located by Pull Site 3b, off Poles 27, 29, 44, 64, 65, 66, 67, 78, 103; and between Poles 12 and 13 and 67 and 70.

Some existing dirt road would not receive any improvements and would be used in there current conditions. These areas will be restored to pre-construction conditions if impacts occur. Approximately .41 miles of existing road would be used for access (approximately .75 acres) [see pink and black dashed lines on **Figure 1-4(c)**]. The existing road that would not receive any improvement would be located off of the transmission line route between Pole 36 and 37 and ending near Pole 40.

Some areas would be accessed overland (i.e., where access route would not receive preparation or grooming). Overland travel would occur on approximately 1.14 miles (approximately 1.66 acres) of gently sloping grassy areas and rangeland without the preparation of a road [see yellow dashed lines on **Figure 1-4(a)** through **Figure 1-4(d)**]. These routes would be approximately 12 feet wide. Overland access would be used to access Poles 33, 34, 36, 37, 38, 39, 40 and 41 which are all located on Moon Ranch; as well as Pole 45.

Additionally, gates would be installed to provide access through existing fences; gate installation and/or replacement would be discussed with property owners in advance.

1.8.1.4 Helicopter Access

Helicopter access would be used to install 30 poles (Poles 14, 26, 33-49, 51-56, 58, 59 and 63-66) in locations where overland access is not possible or difficult due to topography, vegetation, or to otherwise facilitate the project construction. Smaller helicopters would be used to remove and deliver poles, materials, equipment, concrete, soil, and workers to these pole locations and to other locations where access is difficult or the project schedule requires it. These smaller helicopters would briefly touch down and quickly take off from the landing zones requiring an approximate area of 100 by 100 feet for clearance. The larger helicopters, which would be used to set heavy poles, are not expected to hover or land near any of the pole locations requiring helicopter installation. **Figures 1-4(a)** through **1-4(d)** show temporary helicopter landing zones that would be used by the smaller helicopters to drop off construction equipment and workers and the staging areas at the Lakeville Substation and near Leveroni Road which would be used for helicopter landing zones to pick up and drop off crew and materials, as well as to stage. Note, refueling would be performed at the Petaluma Airport, not a part of this project site. As with other construction sites, landing zones would incorporate standard dust control measures.

1.8.1.5 Vegetation Clearance

Following construction, tree trimming and removal, and clearing of vegetation around transmission poles would be performed by outside contractors and, per contract specifications, would follow proper guidelines [e.g., CPUC's General Order 95, Public Resources Code Sec. 4293 (pertaining to removal of hazardous trees that could fall on the line), PG&E's Transmission Right-of-Way Vegetation Management Program and Transmission Routine Patrol Standard (PG&E 2003), and the International Society of Arboriculture's pruning guidelines and the ANSI A300 Pruning Standards].

Vegetation clearing also would be performed in a manner to meet the following goals:

- prevent spread of the Sudden Oak Death (SOD) pathogen
- retain the low-growing brush as much as possible, but to remove trees that could grow and physically contact the conductor
- maintain a minimum of 15 feet of clearance between vegetation and conductors (i.e., transmission line wire) as required for safety and to minimize tree-related outages
- achieve at least 3-4 years of clearance before the next trim by removing fast growing trees or trim vegetation back farther than the minimum required
- clear flammable fuels (e.g., vegetation) during fire season at least 10 feet in each direction around wood poles as required under Public Resources Code Sec. 4292

1.8.1.6 Pole Removal, Top Removal, and Installation

Project construction would involve removal of 118 existing wood poles, topping of 11 wood poles, and installation of 67 new TSPs and 23 new wood poles for a total of 90 poles.

Wood Pole Removal

The wood poles that need to be replaced or eliminated would be removed by a line crew, which would access each pole site with a line truck and trailer or a boom truck. Existing wood poles would be loosened from the ground with a hydraulic jack, then removed from their holes using the line truck, helicopter, or boom truck, and transported from the site on the trailer or boom truck. If the hole would not be reused, a backhoe and dump truck would backfill the hole with imported gravel. The top roughly12 inches would be backfilled with soil removed from project construction activities (e.g., pole excavations) and stockpiled at the staging areas. The stockpile would be covered to prevent silt from flowing into nearby drainages or creeks. The surface would be seeded with appropriate revegetation seed mix. Approximately 30 poles would require removal by helicopter.

Top Removal

Top removal or “topping” involves the removal of the transmission portion of an existing pole while retaining the height necessary to carry existing distribution lines. The tops of some wood poles need to be removed so they do not interfere with transmission lines that would be suspended by higher poles on either side. These wood poles cannot be removed entirely because they are needed to hold up the lower distribution lines in some areas where the span between transmission poles is too great (and the distribution line would hang too low to the ground without the existing wood pole).

Poles to be topped would be accessed by a pole crew with a line truck and trailer or a boom truck. The line truck or boom truck would be used to hold the top of the pole in place, while a chainsaw would be used to cut the pole. Once cut, the top section would be placed on the trailer or boom truck for removal and disposal. The remaining pole would continue to serve as a distribution pole.

Some poles are difficult to access and would require special techniques. The hardware and insulators would be removed from the top and lowered to the ground with a hoist. Then small sections of the pole would be cut and lowered in the same fashion to the ground. The cut pieces would be carried out by the crew, flown out by helicopter or hauled out on a quad runner if access is available.

Pole Installation

Installation of TSP generally involves these steps: staking the pole location, flagging the work area, installing silt fencing (if required), preparing crane pad (if required), excavating the hole, installing forms, rebar, and anchor bolts, pouring concrete, removing forms, placing gravel around and grooming the base area, installing the new pole, removing old conductor from the wood pole and stringing the new conductor to the TSP, removing the old wood pole, and transporting excess soil and materials off-site for disposal. Installation of a wood pole involves these steps: staking the pole location, flagging the work area, excavating, installing the pole, backfilling, transferring wire and equipment, removing the old pole and backfilling. The distinction regarding the construction method for pole installation is that TSP poles require a foundation while wood poles are directly buried in the ground.

On average, an approximate 50-foot radius work area around each pole would be required. Some work areas may require the removal of vegetation and installation of silt fencing (e.g., during the wet season). Work areas around transmission poles generally would not require grading or surfacing.

Poles supporting straight spans are directly embedded into the soil (wood only). Wood poles may be embedded to a depth of approximately 7 to 12 feet below grade. All tubular steel poles would have concrete pier foundations approximately 5 to 7 feet in diameter and 15 to 30 feet deep. All angle poles would also have concrete pier foundations, which eliminate the need for wire down guys. This decreases the damage potential to the pole by eliminating the opportunity for contacts with the guys during agriculture and farming operations, and can decrease bird strikes.

Equipment used to drill and excavate holes for both wood and tubular steel poles would include a hole auger, backhoe, dump truck, and crew truck. This equipment would be transported to all the pole locations via existing paved and dirt roads and over land where roads do not exist. A hole auger consists of an auger mounted on a heavy truck chassis or piece of track equipment and would be used to drill holes.

A boom truck consisting of a small crane mounted on a flatbed truck would be used to haul foundation forms, anchor bolts, rebar, and pole structures to the TSP locations. The boom truck would also be used to place foundation forms, anchor bolts, and rebar in place prior to pouring of concrete for the foundation, and also to remove the forms following completion of the foundation.

A concrete truck consisting of a four-wheel drive mixer capable of delivering 10 yards of concrete would be used to deliver and pour concrete for the tubular steel pole foundations. Concrete trucks would not be washed out at pole locations; cleaning pits would be established at various locations throughout the project to minimize time between the concrete pour and truck clean out. These pits would include dike walls and tarping which would allow washed materials to be properly contained and disposed of. The backhoe would be used to load excavated soils and materials into a dump truck for off-site disposal, to place gravel around the TSP foundation after formwork has been removed, and to groom the area immediately surrounding all pole installations.

A crane would be used to place steel poles on the foundations. The line truck is used to place the wood poles in the excavated hole and to remove the old wood pole. Aerial lift trucks are used to install/transfer/remove conductors. Lastly, a crew truck would be used to transport the crew, their hand tools, and other minor materials to and from pole locations; as well as to minimize the number of vehicles accessing each site. **Table 1-4** shows a summary of pole installation and associated disturbance area estimates.

TABLE 1-4
SUMMARY OF TYPICAL POLE INSTALLATION METRICS

	Double-circuit 115 kV TSP (approximate metrics)
Foundation Diameter	5 to 7 feet
Foundation Depth	15 to 30 feet
Average Work Area around Pole (e.g., for removal, topping, new pole installation)	50-foot radius
Permanent Footprint per Pole	20 sq. feet
Number of Poles in Double-circuit 115 kV Transmission Line	90
Total Permanent Footprint for 90 Poles in Double-circuit 115 kV Transmission Line	Approximately 0.041 acres
Number of Existing Wood Poles that would be Topped (and carry distribution line)	11
Total Permanent Footprint for 11 Topped Poles	Approximately 0.0050 acres

1.8.1.7 Helicopter Pole Installation

Installation of approximately 30 TSPs would require the use of a helicopter and special construction techniques. Typically, an auger would be walked into the site by the pole crew, accompanied by the environmental monitor. Excavated soils, foundation forms, concrete, TSPs, and miscellaneous tools and materials would all be transported in or out by helicopter. The crew would drive on existing roads to a nearby location, park, and walk the remainder of the way to some sites. There may also be helicopter transportation of some construction workers to remote pole sites.

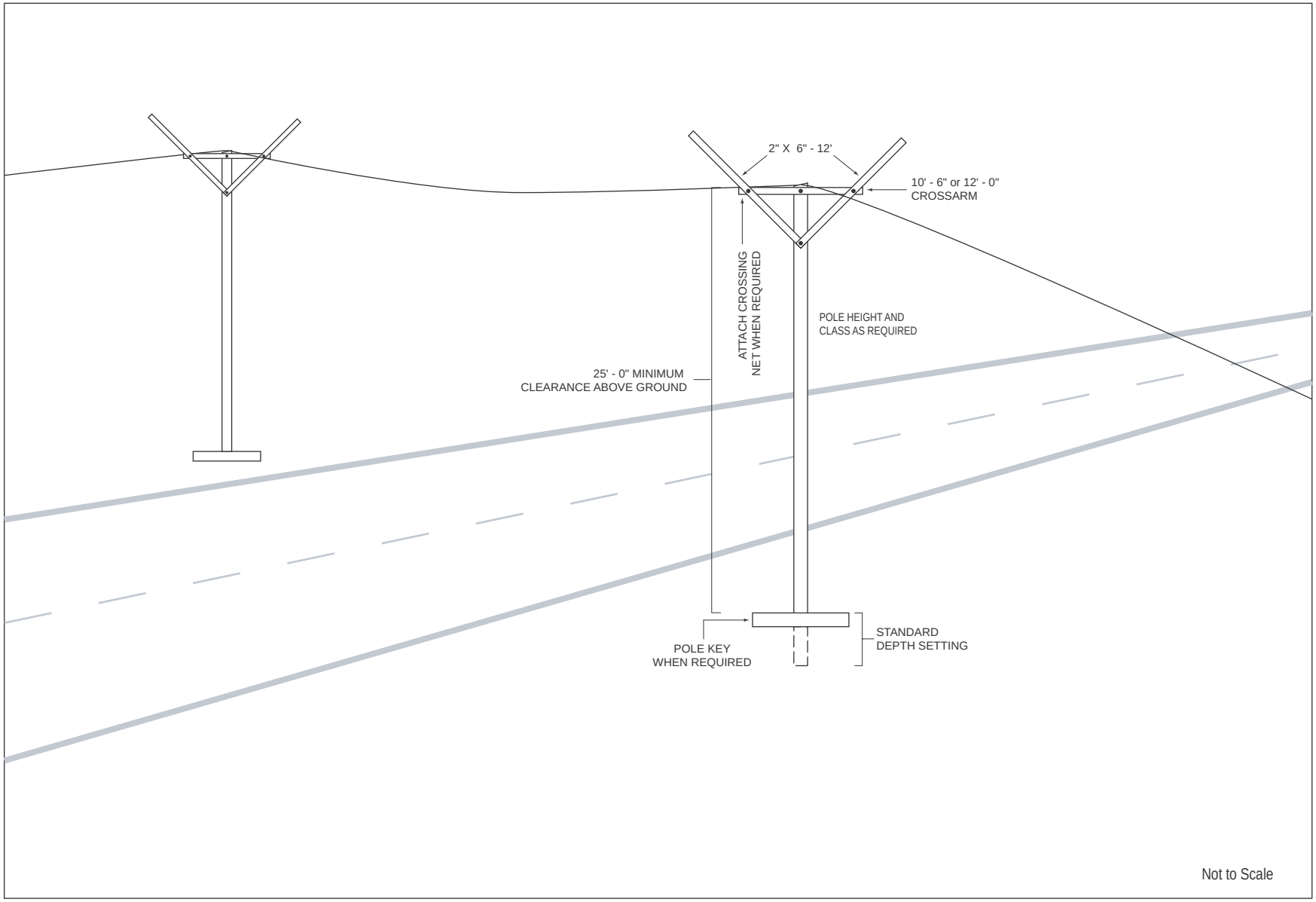
1.8.1.8 Conductor Installation

All of the old conductors would be removed and new conductors installed. Prior to stringing conductors, temporary clearance structures would be installed at 11 road crossings and other locations where the new conductors could otherwise accidentally come into contact with electrical or communication facilities, other power lines, and/or vehicular traffic during installation. The temporary structures would be installed across Adobe Road, the Lakeville Substation access, Felder Road, Arnold Road, Leveroni Road (3), Harris Road, Palmer Avenue, David Street, and Birch Road. PG&E and/or its contractors would provide traffic control where necessary during installation and removal of these temporary clearance structures. These structures consist of a wood pole with a frame at the top that resembles a “Y”, which is placed on each side of the road or power line being crossed (see **Figure 1-8**). Foundations and grading are not required. Installation and removal of clearance structures is similar to that of wood poles, though less excavation is required. These structures prevent the conductor from being lowered or falling into traffic or onto another power line. Where distribution lines are involved, netting is installed between the two Y-frame structures and guy wires are installed at each structure. After the new conductor is installed, the temporary structures will be removed.

Replacement of Existing Conductor

In order to replace an existing conductor with a new conductor, the existing conductor would first be detached from its support structure and temporarily lifted. Rollers would then be installed at the conductor’s attachment point, and the conductor would be placed onto the rollers. Installation of rollers and detachment of the existing conductor would typically require one aerial lift.

Once rollers are in place for the entire section of conductor being replaced, the existing conductor would be pulled out of place. A cable would be attached to the existing conductor, which would then be used to pull the new conductor into place. Removal of the existing conductor and installation of the new conductor would require the establishment of pull and tension sites. Equipment at the pull sites would pull the conductor onto a reel, where it would be collected for salvage; equipment at the tension site would feed new conductor along the rollers previously installed at each structure, while also maintaining tension in the line so that it does not sag to the ground. Once the new conductor is in place, rollers would be removed and the new conductor would be attached to the structures.



SOURCE: EDAW (2004)

Figure 1-8
Y-Frame Crossing Structure

Installation of New Conductor

Prior to the installation of a new conductor, rollers would be installed at vacant positions on new structures using one helicopter lift. The helicopter would then be used to install a pulling (sock) line in the rollers. Once installed, the sock line would be used to pull the new conductor into place. When the conductor has been pulled through the rollers, an aerial lift would typically be used to remove the rollers and attach the conductor to the structures.

1.8.1.9 Cleanup and Post-Construction Restoration

Crews would be required to maintain clean work areas as they proceed along the line and would be instructed that no debris would be left behind at any stage of the project. The cleanup and restoration process would include reseeding disturbed areas to restore the landscape. Where needed, a spring-tooth machine with seed spreader would be used to decompact soil and reseed equipment disturbance areas as approved by property owners. In some cases, and again based on preference of property owners, the land may be left alone for nature to take its course.

Once the cleanup has been completed, the work areas would be inspected on foot with the specific property owners to make sure that their concerns have been addressed. When all construction is completed, there would be a final walk down of the work areas with the crews and the biological monitor to ensure that proper cleanup and landscape restoration has been carried out. The final walk down would include access roads, pull sites, landing zones, staging areas, and pole locations.

1.8.2 Substation Modifications and Construction

Construction at the Lakeville and Sonoma Substations would be performed completely on PG&E property. Materials and equipment would be stored on PG&E property. Each substation work crew would use a mobile office and tool van, both of which would be located within the existing substation yards. Traffic control would be provided if necessary but is not anticipated.

1.8.3 Construction Workforce and Equipment

Project construction would require an excavation crew, a light duty helicopter crew, a heavy duty helicopter crew, a pole crew, line crew, substation crew, and environmental monitor. Including both PG&E and contracted construction personnel, the total number of construction crew members for the proposed project is roughly estimated to require 70 to 80 crew members. It is expected that construction crews would work concurrently; however, which crews depends upon the timing of project approval and other factors. PG&E expects that the underground and substation crews would be working independently at the same time that the pole line and pole crew would be working elsewhere. The following provides a more detailed description of these various construction crews.

Pole Line Crew

Wood pole replacement

The proposed wood pole work along Leveroni requires taking the transmission and distribution lines out of service and therefore would need to be timed accordingly. A crew of approximately six people would typically be required to replace one wood pole. Replacement consists of installation, transfer of wire and removal of old wood poles. The crew would generally work Monday through Thursday framing and preparing for the replacement. On Friday, three additional crews would be brought on board to replace four poles in a given day. Therefore, PG&E and/or its contractors would typically work with approximately six people Monday through Thursday and approximately 24 people on Friday. This is expected to occur for approximately four weeks in a row.

Conductor installation

A line crew of approximately 16 people would install conductor over an approximate six month period. A three member helicopter crew would be used to install the new circuit wire and would require approximately 10 days. There would also be approximately 15 days where the helicopter would be used to transport people and materials for the conductor installation.

Pole Crew

Tubular steel pole foundation work

Pole crews would typically be made up of 6 members. One pole crew will install a typical foundation in about two days. There are several foundations that will require extra work to install due to accessibility issues. These more difficult foundations would typically be worked by a separate 6-person crew. The difficult poles will also require the support of a 2 person helicopter crew. This foundation work would generally take place over a 5-6 month period.

Tubular steel pole installation work

Some structures can be installed without a clearance and will be set with a crane (typically a 6-member tower crew and 3-member contract crane crew working about 1 ½-2 weeks). The two underground riser structures will be installed with a crane to support the summer underground installation (6-member tower crew working with a 6-member line crew and a 3-member contract crane crew working for about two days). For the remaining structures, one pole crew will typically install one structure per day. There would typically be a 6-member line crew on site to transfer the wire from the old wood pole to the new steel structure and then remove the old wood pole. A contract crane or sky crane would typically be used to set these poles. A 3-member crane crew would typically be used to set some of the structures and an 8-member sky crane crew would be used to set others. The typical total crew size for these activities would be 15 to 20 persons.

Excavation Crew

There would typically be an excavation contractor building the needed storage areas, installing storm water prevention measures, and constructing the access roads and pull sites working through approximately five months. The contractor would typically be running approximately 6 people for this activity. This same contractor would perform the cleanup after all work is complete.

Substation Crew

There will be work at both the Lakeville and Sonoma Substations. The grading work at the Lakeville Substation would typically be completed by a contractor with an 8-member crew; no grading work would need to be performed at the Sonoma Substation. Foundation work would typically be done by a contractor with a 6-member crew at both locations. There would typically be a 9-member station crew working at each location.

Table 1-5 describes the roles of each crew and **Table 1-6** shows equipment expected to be used during project construction.

TABLE 1-5
CREWS EXPECTED TO BE USED DURING PROJECT CONSTRUCTION

Crew	Roles	Average Number of Workers
Excavation	The excavation crew would be a contract crew to PG&E responsible for development of the staging areas, access roads, and pull sites. In addition, the excavation crew would perform construction clean up activities.	6
Light-Duty Helicopter	The light-duty helicopter crew would be a contract crew to PG&E responsible for FAA permits, the helicopter (including maintenance and refueling), transporting work crews and materials to pole sites, and removal and installation of the sock line, as needed.	3
Heavy-Duty Helicopter	The heavy-duty helicopter crew would be a contract crew to PG&E responsible for FAA permits, the helicopter (including maintenance and refueling), transporting new poles to pole sites, and installation of poles using sky crane, as needed.	3
Pole	The pole crew (either a PG&E or contract crew) would be responsible for the excavation contractor, the heavy-duty helicopter contractor, the light-duty helicopter contractor, the development of pole-related staging areas, installation of steel pole foundations, and installation of transmission line steel poles.	6-15
Line	The line crew (either a PG&E or contract crew) would be responsible for managing an excavation crew and a light-duty helicopter crew, development of line-related staging areas, establishment of pull and tension sites, installation of rollers and crossbeams, contract removal/installation of the sock line, replacement of wood poles, and installation of new conductor.	16
Substation	The substation crew (either a PG&E or contract crew) would be responsible for all substation site activity, including installation of on-site telecommunications.	9
Environmental and Biological Monitors	The environmental monitor would be a contractor to PG&E and be responsible for inspection of all project construction activity, including inspection of work sites prior to the start of construction activity, monitoring of activities and cleanup, preparing and submitting CPUC compliance reports, and otherwise ensuring compliance with the CPUC Permit to Construct. If warranted, a qualified biological monitor would be utilized in areas with sensitive biological resources.	Varies depending on the number of crews deployed

TABLE 1-6
EQUIPMENT EXPECTED TO BE USED DURING PROJECT CONSTRUCTION

Type of Equipment	Use
• Aerial Lifts	• Remove old conductor and install new
• Backhoe	• Excavate foundations, spoil removal, backfill
• Boom Truck	• Erect structures
• Concrete Mixer Truck	• Haul concrete
• Crane	• Erect structures
• Crew-cab Truck/Pick-ups	• Transport personnel, tools, and materials
• Dump Truck	• Haul material
• Equipment/Tool Vans	• Tool storage
• Grooming/Grading Equipment: – dozer – water truck – grader – rock transport – roller	• Road construction (staging, pull sites): – move/compact soils – compaction and dust control – to properly pitch road for run-off – deliver road base for access roads, staging areas and pull sites – road, surface compaction
• Helicopters (light and heavy duty)	• Erect poles, install sock line, haul materials, equipment, and people
• Hole Auger/Truck Auger	• Excavate holes
• Hydraulic Jack	• Remove wood poles
• Line Truck and Trailer	• Haul conductor, poles, equipment, materials, and people, and to install pole/conductor
• Materials Storage Units	• Store material/tools
• Mobile Offices	• Supervision and clerical office
• Puller	• Install conductor
• Reel Dolly	• Install and move conductor
• Tensioner	• Install conductor

1.8.4 Construction Schedule

Table 1-7 provides a summary of PG&E's proposed construction schedule for the Lakeville-Sonoma 115 kV Transmission Line Project. The construction period for the transmission line would be expected to last approximately 19 months, while construction at each substation would be expected to take approximately 14 months. Weekend work would be required since the electrical capacity of the area is generally lower on weekends; therefore, there would be less risk associated with clearances to perform the transmission line work.

TABLE 1-7
PROPOSED PROJECT CONSTRUCTION SCHEDULE

Permit To Construct decision adopted and effective	No later than March 1, 2006
Acquisition of required permits	November 2005 – April 2007
Right-of-way / property acquisition	January 2006 – November 2006
Final engineering completed	November 2005 – April 1, 2006
Construction begins	April 1, 2006
Transmission line construction	April 1, 2006 – May 1, 2007
Substation construction	August 1, 2006 – May 1, 2007
Project operational	May 1, 2007
Clean up	April 1, 2007 – June 30, 2007

1.9 Operation and Maintenance

1.9.1 General System Monitoring and Control

Substation and transmission line monitoring and control devices would be installed as part of the new circuit breakers (three at Sonoma Substation and 1 at the Lakeville Substation) per PG&E Design Standards and connected to the existing telecommunication and protection schemes at the substations. The transmission systems at these two substations are monitored 24 hours a day, 7 days a week by System Operators at the Fulton Substation.

1.9.2 Facility Inspection

Regular inspection of transmission lines, instrumentation, and control and support systems is critical for safe, efficient, and economical operation of electric transmission facilities. Early identification of items needing maintenance, repair, or replacement would ensure continued safe operation of the project and continued reliable service to the Napa–Sonoma area. PG&E proposes to continue to use their "Overhead Line Inspection Guideline", which is currently implemented for the existing Lakeville-Sonoma 115 kV Transmission line, for the inspection process for this project (PG&E 1998).

The process involves three types of inspections: aerial inspection, ground inspection, and climbing. The frequency of inspection would vary depending on factors such as the age of the system, pole type, vegetation conditions, and other factors. For this project, PG&E "troublemen" would inspect all structures from the ground annually for corrosion, misalignment, deterioration, foundation failures and signs of vandalism. Ground inspection would occur on selected lines to check the condition of hardware, insulators, and conductors. Inspection would include checking conductors and fixtures for corrosion, breaks, broken insulators, and failing splices. In instances where a disturbance is detected by the relays, the troublemen would be dispatched to determine the issues. Annually or bi-annually, the troublemen would climb up the poles to check the insulators. The first climbing steps or pegs are located approximately 10 to 12 feet above the ground to deter unauthorized structure access from the ground.

PG&E proposes to conduct inspections by driving to the poles in a pick-up truck where feasible. Troublemen would use an All-Terrain Vehicle (ATV) or go by foot where needed to minimize surface disturbance and in certain areas where access is difficult. Aerial inspection using helicopters may be conducted annually using infrared technology. Any specific access requirements that may result from ROW negotiations with property owners would be documented and provided to the troublemen with instructions to comply with these access requirements during inspection and maintenance.

1.9.3 Maintenance Procedures

Maintenance of the transmission line would occur on an as-needed basis, when the troublemen discover something needing repair or in response to an emergency situation. The tubular steel

poles used for this project generally require less maintenance than wood poles. Specific access requirements that may result from ROW negotiations with property owners would be documented and provided to the transmission line troublemen with instructions to comply with these access requirements during inspection and maintenance.

During inspections, PG&E troublemen would also document vegetation conditions. Where needed, vegetation inspections may be conducted more frequently. To maintain appropriate clearance under the transmission line, vegetation removal would be performed on a regular basis.

Maintenance at the substations is not expected to be much different with the equipment additions. Currently, maintenance on the equipment is performed as needed (generally once every 6-7 years). Addition of the new transmission line and substation modifications is not expected to result in the need for any additional new employees for operation and/or maintenance.

1.9.4 Applicants Proposed Mitigation Measures

The following summarizes mitigation measures proposed by PG&E within their PEA that are incorporated as part of the Proposed Project:

- An ongoing environmental education program for construction crews would be conducted before beginning the site work and during construction activities. Sessions would include information about the Federal and State Endangered Species Acts, the consequences of noncompliance with these acts, identification of special-status species and wetland habitats (including waterways), and review of mitigation requirement.

- Vehicles would be restricted to established roadways and identified access routes.

- A biological monitor would be on site during any construction activity near sensitive habitat to ensure implementation of, and compliance with, mitigation measures. The monitor would have the authority to stop activities and determine alternative work practices in consultation with construction personnel, if construction activities are likely to impact special-status species or other sensitive biological resources.

- If special-status species are located prior to or during work activities, construction personnel would contact the biological monitor. If the monitor determines that project activities may adversely affect the species, the monitor would consult with the United States Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), and/or California Department of Fish and Game (DFG) regarding appropriate avoidance and mitigation measures.

- Photo documentation of preconstruction habitat conditions would occur at all construction locations within sensitive habitat prior to the start of work, as well as immediately after construction activities.

- Trash, dumping, firearms, open fires, hunting, and pets would be prohibited in the project area.

1.10 Electric and Magnetic Fields Summary

1.10.1 Electric and Magnetic Fields

Recognizing that there is a great deal of public interest and concern regarding potential health effects from exposure to electric and magnetic fields (EMF) from transmission lines, this document provides information regarding EMF associated with electric utility facilities and the potential effects of the Proposed Project related to public health and safety. Potential health effects from exposure to ***electric fields*** from transmission lines (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) are typically not of concern since electric fields are effectively shielded by materials such as trees, walls, etc. Therefore, the majority of the following information related to EMF focuses primarily on exposure to ***magnetic fields*** (invisible fields created by moving charges) from transmission lines. However, this Initial Study does not consider magnetic fields in the context of CEQA and determination of environmental impact. This is because [1] there is no agreement among scientists that EMF does create a potential health risk, and [2] there are no defined or adopted CEQA standards for defining health risk from EMF. As a result, EMF information is presented for the benefit of the public and decision makers. Additional information on electric and magnetic fields generated by transmission lines is presented in **Appendix B**.

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 (IARC) and the California Department of Health Services (DHS) both classified EMF as a *possible* carcinogen.

Presently, there are no applicable regulations related to EMF levels from power lines. However, the California Public Utilities Commission has implemented a decision (D.93-11-013) requiring utilities to incorporate “low-cost” or “no-cost” measures for managing EMF from power lines up to approximately 4 percent of total project cost. Using the 4 percent benchmark, PG&E has incorporated low-cost and no-cost measures to reduce magnetic field levels along the transmission corridor.

1.10.2 EMF and the Proposed Project

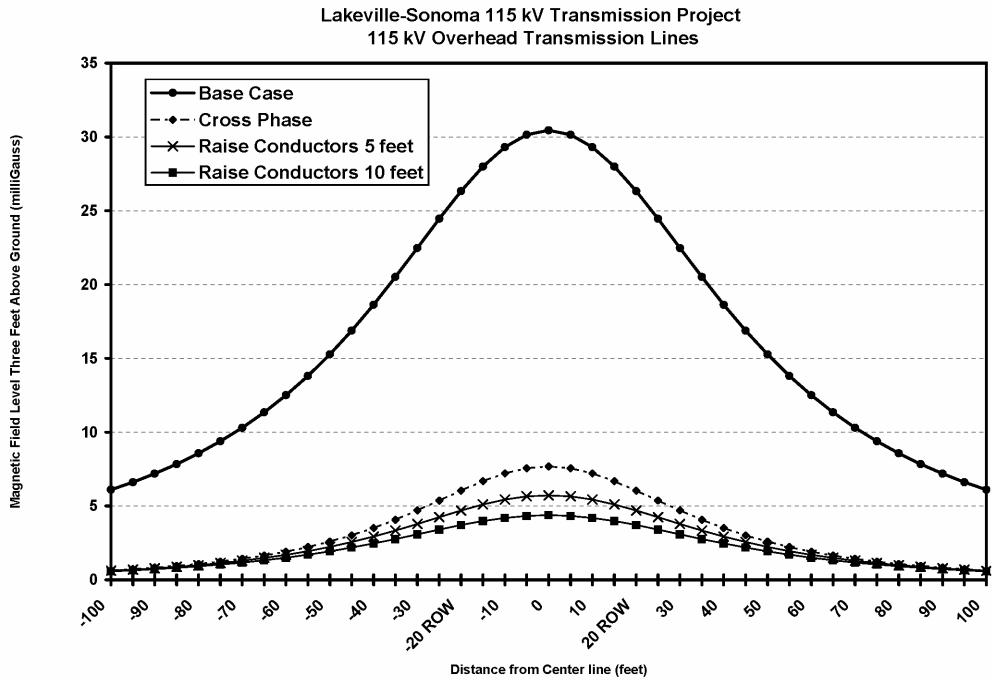
PG&E has prepared a Field Management Plan that provides EMF information regarding the Proposed Project. The Field Management Plan includes a brief introduction to EMF characteristics, scientific research related to possible health effects, and public policy activities. In addition, the Field Management Plan identifies PG&E’s guidelines and general methods for managing EMF for new electrical facilities.

PG&E’s Field Management Plan for the Proposed Project provides modeling of the magnetic field levels for both the existing power lines and the proposed lines and substations associated

with the project. As part of the Proposed Project, PG&E "…will incorporate "no cost" and "low cost" magnetic field reduction steps [for] proposed transmission and substation facilities..." Potential measures to reduce magnetic field exposure "…will be consistent with PG&E's Transmission and Substation EMF Design Guidelines." The design guidelines provide for all of the following potential proactive EMF reduction measures:

- Increase distance from conductors and equipment;
- Reduce conductor spacing;
- Minimize current; and
- Optimize phase configuration.

PG&E proposes to use cross phasing circuits in a double circuit transmission line as a field cancellation technique, where the phases from one circuit in a multi-circuit line are used to reduce the fields from another circuit, thereby reducing the total magnetic field strength. In addition, because EMF levels decrease as the distance from the conductors increases, as part of the project, the height of the conductors would be raised by ten feet adjacent to residential areas along Felder and Leveroni Roads as a "low-cost" field reduction measure. **Figure 1-9** shows EMF levels for the overhead transmission line with and without EMF reduction measures.



PG&E's Lakeville-Sonoma 115 kV Transmission Line Project . 204202

SOURCES: PG&E (2004); PG&E (2005)

Figure 1-9
Estimated EMF Levels with and without EMF Reduction Measures

1.11 Required Permits and Approvals

The California Public Utilities Commission (CPUC) is the lead agency for the Lakeville–Sonoma 115 kV Transmission Line Project under the California Environmental Quality Act (CEQA). PG&E would also obtain permits, approvals, and licenses as needed from, and would participate in reviews and consultations as needed with, federal, state, and local agencies as shown in **Table 1-8**.

TABLE 1-8
SUMMARY OF PERMIT REQUIREMENTS

Agency	Permits	Jurisdiction/Purpose
Federal Agencies		
U.S. Army Corps of Engineers	Nationwide or Individual Permit (Section 404 of the Clean Water Act), if required.	Waters of the United States, including wetlands
U.S. Fish and Wildlife Service (USFWS)	Section 7 Consultation (through U.S. Army Corps of Engineers' review process), if required.	Consultation on federally-listed species; incidental take authorization (if required)
Federal Aviation Administration (FAA)	Lift Plan Permit	Helicopter Construction Plans
State Agencies		
California Public Utilities Commission (CPUC)	Permit to Construct	Overall project approval and CEQA review
California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region	National Pollutant Discharge Elimination System—General Construction Storm Water Permit	Permit applies to all construction projects that disturb more than 5 acres of land
	Section 401 Water Quality Certification (or waiver thereof)	Requests RWQCB's certification that the project is consistent with state water quality standards
	Storm Water Pollution Prevention Plan	
Caltrans / Sonoma County	Road Closures	Any road closure during construction, if required
California Department of Fish and Game (CDFG)	Endangered Species Consultation	Consultation on State-listed species; incidental take authorization (if required)
	Section 1600 Streambed Alteration Agreement	Alteration of any streambed or drainage channel (if required)
State Historic Preservation Officer (SHPO)	Section 106 of the NHPA Review (through U.S. Army Corps of Engineers' review process)	Cultural Resource Management Plan (if required)
Bay Area Air Quality Management District	Authority to Construct/Permit to Operate	All grading and construction activities, air emission reduction and monitoring
Local Agencies		
County of Sonoma and/or City of Sonoma	Road Encroachment Permit	Permit to install 115 kV facilities in Frates and Leveroni Road right-of-way
	Grading Permit	Access road on Felder Property
	Building Permit	Battery room in Sonoma Substation
Sonoma County Permit and Resource Management Department	Cultural resources consultation (through CEQA review process)	Cultural resources management plan (if required)
Sonoma County Transportation and Public Works Department	Traffic Control Plan	Plan to manage construction vehicles and equipment deliveries to and from the Adobe Road staging area.

References – Project Description

California Independent System Operator (CAISO), 2004. *Approval of the Lakeville-Sonoma 115 kV Transmission Line Project*, June 18, 2004.

Pacific Gas and Electric Company (PG&E), 2005. *Amendment to the Application of Pacific Gas and Electric Company, a California corporation, for a Permit to Construct the Lakeville-Sonoma 115 kV Transmission Line Project Pursuant to General Order 31-D, Application No. 04-11-011*, April 12, 2005.

Pacific Gas and Electric Company (PG&E), 2005. *Supplement to the Proponent's Environmental Assessment Addressing Minor Revision to Project Plans: Pole Locations Adjustments Within and Adjacent to Sonoma County Agricultural Preservation and Open Space District*, April 12, 2005.

Pacific Gas and Electric Company (PG&E), 2004. *Application of Pacific Gas and Electric Company, a California Corporation, for a Permit to Construct the Lakeville-Sonoma 115 kV Transmission Line Project Pursuant to General Order 31-D*, November 17, 2004.

Pacific Gas and Electric Company (PG&E), 2004. *Proponent's Environmental Assessment, Lakeville-Sonoma 115 kV Transmission Line Project*, November 2004. *Prepared by EDAW.*