

INITIAL STUDY

ENVIRONMENTAL CHECKLIST FORM

1. Project Title:

Pacific Gas & Electric Company – San Mateo-Martin #4 Conversion Project
Application # A.02-11-051

2. Lead Agency Name and Address:

California Public Utilities Commission (CPUC)
Energy Division
505 Van Ness Avenue
San Francisco, CA 94102

3. Contact Person and Phone Number:

Nicolas Procos, Project Manager
Energy Division
(415) 703-5289

4. Project Location and Regional Context:

The existing San Mateo–Martin #4 60 kilovolt (kV) power line is approximately 12 miles long, beginning at the San Mateo Substation (in the City of San Mateo) and running north to the Martin Substation (in Brisbane), within San Mateo County, California (see Figure B-1). The project corridor generally follows U.S. Highway 101 (US 101). Along its route, the power line traverses unincorporated areas of San Mateo County; the cities of San Mateo, Burlingame, Millbrae, San Bruno, South San Francisco, Brisbane, and Daly City; and property owned by the City and County of San Francisco (see Figure B-2).

The corridor travels through primarily urban, built-out commercial and industrial areas, county parklands, and open space areas. However, there are four stretches where the San Mateo–Martin #4 60 kV power line crosses environmentally sensitive areas:

- the Burlingame Lagoon/San Francisco Bay, located adjacent to Burlingame, an open water area known to be habitat for endangered wildlife species;
- the San Francisco International Airport (SFO) West of Bayshore parcel, which lies immediately west of US 101 between Millbrae Avenue in Millbrae and San Bruno Avenue in San Bruno, a large area containing wetlands and known occurrences of endangered wildlife species;
- Navigable Slough in South San Francisco, containing habitat suitable for endangered bird species; and
- San Bruno Mountain, located at the northern terminus of the power line route, a known habitat for listed plant and wildlife species and under the jurisdiction of an approved Habitat Conservation Plan.

5. Project Sponsor's Name and Address:
Pacific Gas & Electric Company (PG&E)
245 Market Street
San Francisco, CA 94104
Attn: Jo Lynn Lambert
(415) 973-5248


6. General Plan Designation:
Table B-1 lists land use designations along the project corridor, as identified in the general plans for the cities of San Mateo, Burlingame, Millbrae, and San Francisco, and for the County of San Mateo.

**Table B-1
Project Area Land Use Designations and Existing Land Uses**

Substations and Tower Number(s) ¹	General and Specific Plan Land Use Designations	Jurisdiction	Existing Land Use
San Mateo	Utilities	City of San Mateo	Substation/general construction yard
0/2-0/4	Parks/Open Space	City of San Mateo	Poplar Creek Golf Course Overhead transmission line
0/4-1/8	Public Recreation Parks/Open Space	County and City of San Mateo	Coyote Point Recreation Area (county park, museum, and marina) Overhead transmission line
1/8-1/10	Industrial and Office Use	Burlingame	Offices, warehouses, and drive-in movie theater Overhead transmission line
1/10-2/18	Public/Private Open Space	Burlingame	Lagoon and open space Overhead transmission line
2/18-2/19	Waterfront Commercial/Industrial and Office Use	Burlingame	Parking lot and industrial area, park, public landfill, open space, and US 101 Overhead transmission line
Burlingame 2/19-3/29	Industrial and Office Use Industrial and Office Use	Burlingame Burlingame	Substation Industrial buildings and parking lots Overhead transmission line
3/29-4/32	General Commercial	Millbrae	Millbrae BART Station parking area Overhead transmission line
4/32-4/33	Residential	Millbrae	Undeveloped lot and single-family homes Overhead transmission line
4/33-4/37	Park and Open Space	Millbrae	Utilities and urban park Overhead transmission line
Millbrae	Industrial and Utility	Millbrae	Substation



LEGEND

 Proposed Power Line Conversion

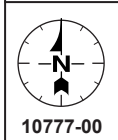
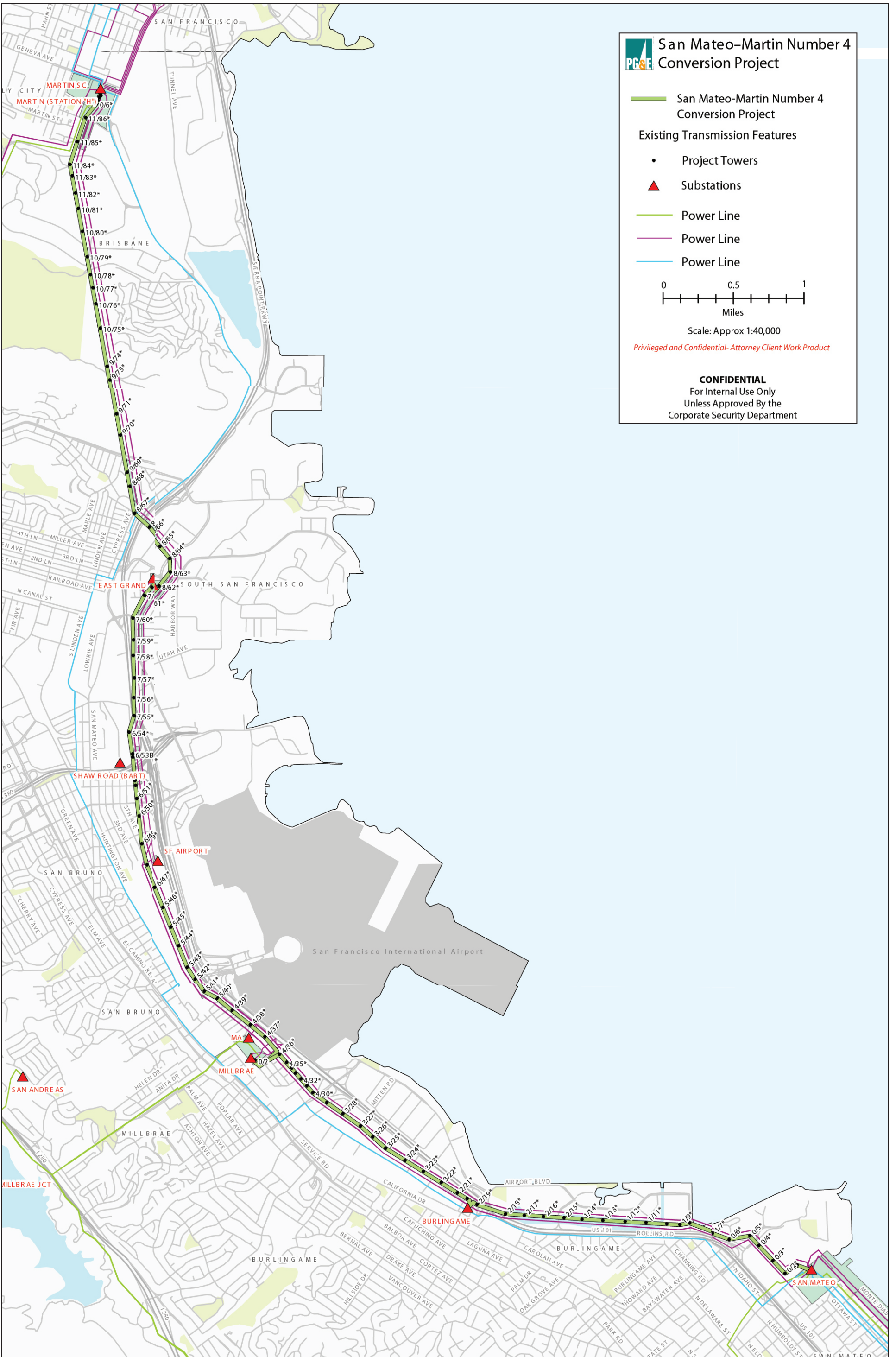


FIGURE B-1
Project Location Map

Sources: ESRI; PG & E 2002

Not to Scale





San Mateo-Martin Number 4 Conversion Project

PG&E

San Mateo-Martin Number 4 Conversion Project

Existing Transmission Features

- Project Towers
- ▲ Substations
- Power Line
- Power Line
- Power Line

0 0.5 1
Miles

Scale: Approx 1:40,000

Privileged and Confidential-Attorney Client Work Product

CONFIDENTIAL
For Internal Use Only
Unless Approved By the
Corporate Security Department



FIGURE B-2
Project Route Map

10777-00

Source: PG & E

Scale: 1:40,000



**Table B-1 (Continued)
Project Area Land Use Designations and Existing Land Uses**

Substations and Tower Number(s) ¹	General and Specific Plan Land Use Designations	Jurisdiction	Existing Land Use
4/37-6/53	Airport	San Mateo County ² San Francisco International Airport	Airport, open space, utilities, school and park, single-family homes, San Bruno Avenue, Interstate 380 Overhead transmission line
6/53-7/55	Mixed Industrial	South San Francisco	Industrial buildings and offices Overhead transmission line
7/55-7/56	Business Commercial/Mixed Industrial	South San Francisco	Industrial office buildings and hotels Overhead transmission line
7/56-8/65	Business Commercial	South San Francisco	Warehouses, parking lots, office buildings, hotels, Airport Boulevard, Colma Creek, and US 101 Overhead transmission line
East Grand	Business Commercial	South San Francisco	Substation
8/65-8/67	Business Commercial/Mixed Industrial	South San Francisco	Caltrain and US 101 Overhead transmission line
8/67-9/69	Parks and Recreation	South San Francisco	Open space and power lines Overhead transmission line
9/69-9/70	Parks and Recreation/Residential	South San Francisco	Single-family home and parks Overhead transmission line
9/70-10/75	Public Recreation	San Mateo County	County park Overhead transmission line
10/75-10/78	Open Space	Brisbane	Buckeye Canyon Open Space Overhead transmission line
10/78-10/80	Trade Commercial	Brisbane	Crocker Industrial Park Overhead transmission line
10/80-11/85	Open Space/Residential	Brisbane	Single-family homes and open space Overhead transmission line
11/85-11/86	Subregional Commercial/Retail/Office/Marsh	Brisbane	Marsh, open space, single-family homes, and new office buildings Overhead transmission line
Martin	Subregional Commercial/Retail/Office	Brisbane	Substation

Source: PG&E, 2002.

Notes:

1. General Plan and Specific Plan land use designations dictate the breakdown of the towers herein.
2. Although SFO lies within unincorporated San Mateo County, the County and City of San Francisco owns and operates the entire SFO property.

7. Zoning:

The proposed project traverses open space, commercial, industrial, and residential areas in San Mateo County; the cities of San Mateo, Burlingame, Millbrae, San Bruno, South San Francisco, Brisbane, and Daly City; and property owned by the City and County of San Francisco. Details of zoning in these different areas are provided in the Description of Project in Item 8 below.

8. Description of Project:

Pacific Gas & Electric Company (PG&E) proposes to convert an existing 60 kV transmission line in northern San Mateo County (referred to as San Mateo-Martin #4) to 115 kV operation in order to reduce potential electrical service interruptions in the event of overloading of the existing electrical transmission system serving San Francisco and northern San Mateo County (see Figures B-1 and B-2). The proposed project would be implemented and operated by PG&E.

Relationship of Proposed Project to San Mateo-Martin #3 Reconductoring Project

The San Mateo-Martin #4 60 kV circuit is located on the same structures as the San Mateo-Martin 115 KV #3 circuit, which was reconducted in February 2000. The #3 project required modifications to more than 30 towers and replacement of six towers. The proposed #4 project would require three tower modifications and no tower replacements. Mitigation measures and permit conditions applied on the #3 project have been proposed and incorporated by PG&E as part of the #4 project. Further details on these mitigation measures and permit conditions are discussed below under “Applicant Proposed Measures and Other Plans.”

Project Components

The project would consist of two major components:

- Power line conversion (reconductoring) work, and
- Modifications at the four substations.

Power Line Conversion Work. The conductors and insulators on the #4 circuit would be replaced with higher-capacity conductors on approximately 12 miles of existing overhead power lines. In addition to replacing the conductors and insulators, the proposed power line conversion would involve the work items below.

- New crossarms would be installed on three towers to comply with state and federal regulations regarding strength and safety.¹ The proposed modifications are required to strengthen the towers for reconductoring. Tower 0/2 is located in the San Mateo Substation construction yard, Tower 1/9 is north of the Coyote Point Recreation Area in an industrial/heavy commercial development area, and Tower 5/41 is located in the West of

¹ Crossarm structures are segments of steel, located at the top of transmission towers, and are the structures to which transmission lines are connected.

Bayshore parcel south of the new Bay Area Rapid Transit (BART)–San Francisco Airport Extension tracks. Minor reinforcement work such as steel bracing would also be conducted at the three towers. No tower foundation modifications or tower replacements are anticipated as part of the reconductoring work.

- Temporary guard structures, as shown in Figure B-3 and Figure B-4, would be installed where needed to prevent the circuits from falling onto other lines, the BART tracks, and roadways. The temporary guard structures consist of poles or poles with netting strung between them that would “catch” transmission lines that swag lower than allowed clearances during the reconductoring process. These structures would be installed as necessary to protect existing lines serving Millbrae and MA Substations, the BART tracks, and roadway crossings so that traffic would not be interrupted during implementation of the proposed project. Trucks and personnel required for installing temporary guard structures include a line truck and approximately four workers. The steps below would be followed to install the temporary guard structures and netting:
 1. Attach crossarm and any anchor attachments while the pole is on the ground.
 2. Using a line truck, auger a hole about 6 feet deep. Dirt from the hole would be allowed to pile around the perimeter and would be used to refill the hole when reconductoring is completed.
 3. Using the truck’s boom, set the pole in the hole like any wooden pole.
 4. Tamp dirt around the pole.
 5. Place any needed anchors.
 6. Using the boom, attach any necessary nets to each pole.

Upon removal of the poles, a total of up to 19 cubic yards of fill would be needed to fill the holes. Dirt excavated while setting poles for the guard structures would be placed beside the temporary structures. Some of the dirt would be placed in the hole while setting the pole. The rest would be used to refill the hole when poles are removed. As indicated above, the fill material would be the same dirt excavated to create the holes. Any affected pavement or landscaping would be replaced. A total of 24 holes is anticipated for the project; 10 holes would be augured within 200 feet of wetlands or sensitive species in the West of Bayshore parcel, however they would avoid both wetlands and sensitive species.

As an alternative to temporary guard structures, flaggers could be used to temporarily hold traffic for brief periods while PG&E pulls the conductors across the roads.

- Two wood poles supporting the existing San Mateo–Martin #4 60 kV line just outside of the Millbrae Substation in the West of Bayshore parcel would be removed by cutting them off below ground level and abandoning the base in place once the 115 kV circuit has been built.

Table B-2 identifies the work to be undertaken at each tower.

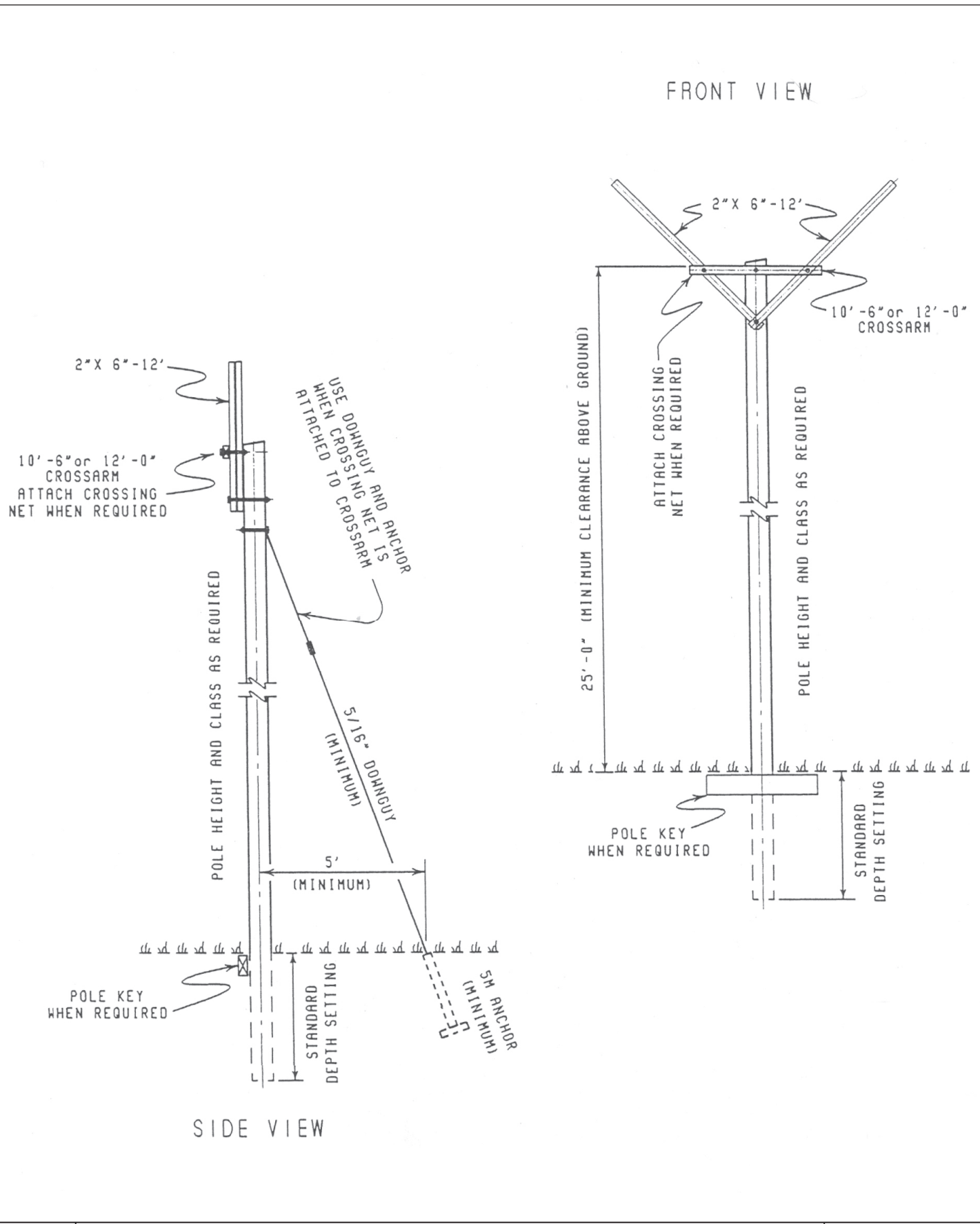
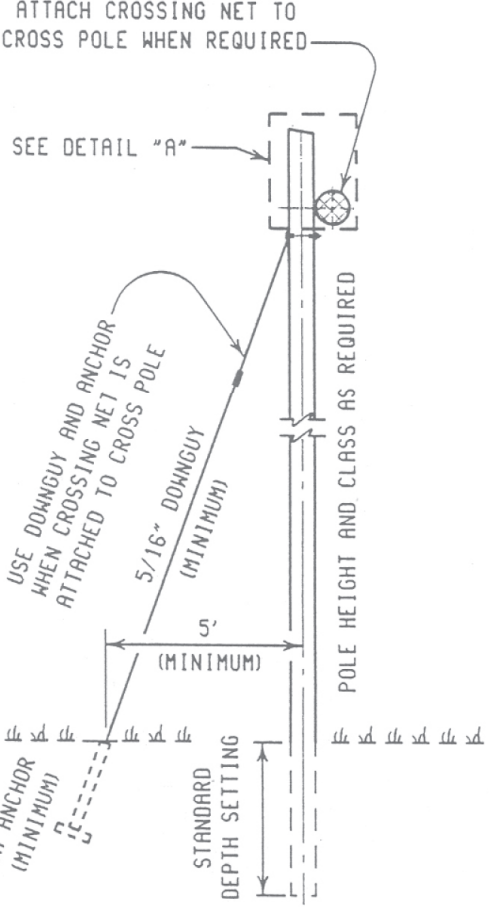
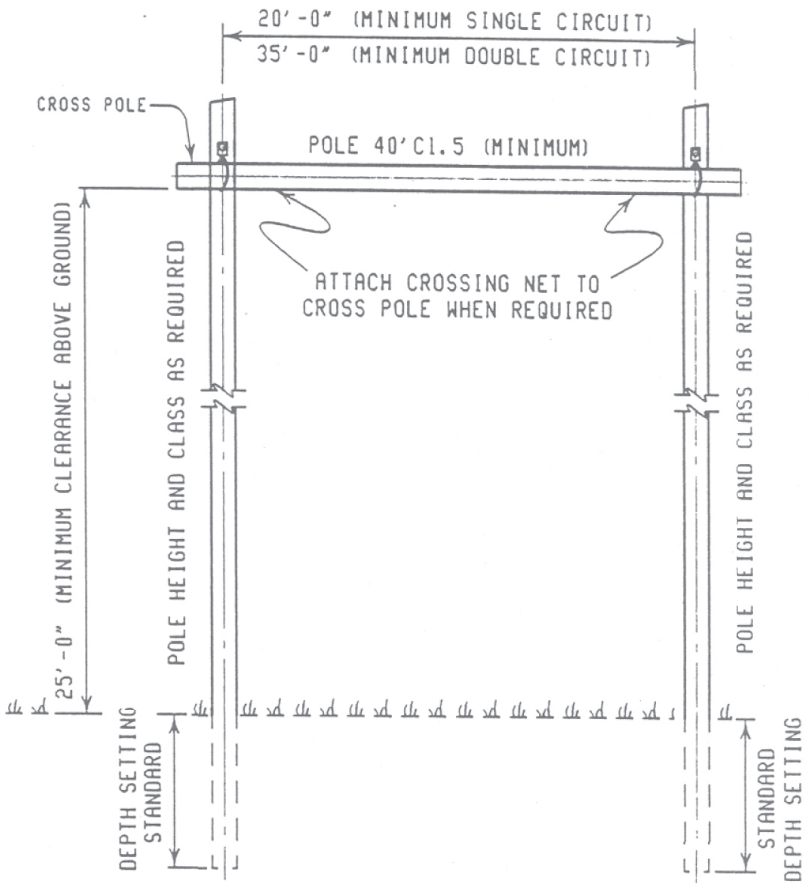


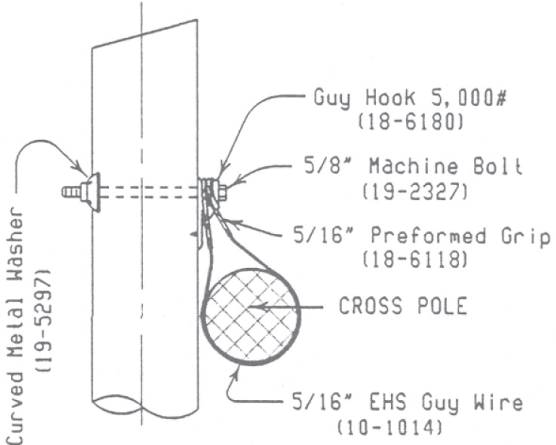
FIGURE B-3
Typical "Y" Type Guard Structure

Not to Scale

FRONT VIEW



SIDE VIEW



DETAIL "A"

FIGURE B-4
Typical "H" Type Guard Structure

Not to Scale

Table B-2
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
Towers 0/1-1/7								
0/1	Yes ²	No	No	Yes	Poplar Creek Golf Course	Foot and existing access roads	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • 3-reel truck and trailer • Pickup trucks • Truck-mounted tensioner • Boom truck 	<ul style="list-style-type: none"> • Set up tension site at end of the access road entering the substation to pull wire • Install rollers and insulators, clip in wire and remove rollers
0/2	Yes; 100 by 120	Yes; modification	No	Yes	Vacant San Mateo Substation general construction yard	Existing access roads	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Replace crossarms with reinforced crossarms • Install rollers and insulators, clip in wire and remove rollers • Attach dead-end eye end to tower
0/3	No	Yes; minor reinforcement	No	No	Poplar Creek Golf Course	Existing access roads (Airport Boulevard) and foot	<ul style="list-style-type: none"> • Pickup truck 	<ul style="list-style-type: none"> • Replace cross bracing within tower structure • Install rollers and insulators, clip in wire and remove rollers

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
0/4	No	Yes; minor reinforcement	No	No	Poplar Creek Golf Course	Existing access roads (Airport Boulevard) and foot	<ul style="list-style-type: none"> • Pickup trucks 	<ul style="list-style-type: none"> • Replace cross bracing within tower structure • Install rollers and insulators, clip in wire and remove rollers
0/5	No	No	No	Yes	Coyote Point Recreation Area Open Space	Existing access roads (Airport Boulevard) and foot	<ul style="list-style-type: none"> • Pickup truck • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire and remove rollers • Attach dead-end eye to tower
0/6	Yes; 100 by 200	No	No	Yes	Coyote Point Recreation Area Open Space	Existing access roads (Airport Boulevard and Coyote Point Road), foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Boom truck • Helicopter 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire and remove rollers • Attach dead-end eye to tower
1/7	No	No	No	No	Coyote Point Recreation Area Open Space	Existing access roads (Airport Boulevard), foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire and remove rollers

**Table B-2 (Continued)
Tower by Tower Construction Work**

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
Towers 1/8–2/18 (Burlingame Lagoon and San Francisco Bay)								
1/8	No	No	No	Yes	San Francisco Bay	Existing access roads (Airport Boulevard), foot, and helicopter	<ul style="list-style-type: none"> • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire and remove rollers • Attach dead-end eye to tower
1/9	Yes; 100 by 200	Yes; modification	No	No	Industrial parking lot	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Helicopter • Pickup trucks 	<ul style="list-style-type: none"> • Replace cross arm with new cross arm and convert to dead-end • Install rollers and insulators, clip in wire, and remove rollers
1/10	No	No	No	No	Industrial parking lot	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Helicopter • Pickup trucks 	<ul style="list-style-type: none"> • Install rollers, clip in wire, and remove rollers
1/11 to 2/17	No	No	No	No	Burlingame Lagoon	Existing access roads, boat, and helicopter	<ul style="list-style-type: none"> • Boat • Helicopter • Pickup trucks 	<ul style="list-style-type: none"> • Install rollers, clip in wire, and remove rollers
2/18	No	No	No	Yes	Burlingame Lagoon	Existing access roads, boat, and helicopter	<ul style="list-style-type: none"> • Boat • Helicopter • Pickup trucks • Condor truck 	<ul style="list-style-type: none"> • Install rollers, clip in wire, and remove rollers • Attach dead-end eye to tower

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
North of 2/18	Yes; 100 by 200	No	No	No	Parking lot (rear) of Park Plaza Hotel, restaurants, commercial, recreation, hotels/motels	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Helicopter • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers, clip in wire, and remove rollers
Towers 2/19-4/32								
2/19	No	No	No	Yes	Caltrans right-of-way for Broadway off-ramp west of US 101	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup truck • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
North of 2/19	Yes; 40 by 100	No	No	No	Industrial area behind Burlingame Substation, Nerli Lane/parking lot	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Helicopter • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers
2/20 to 3/28	No	No	No	No	Urbanized areas (residential, commercial, industrial)	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup truck • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
3/29	No	No	No	Yes	Urbanized areas (residential, commercial, industrial)	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup truck • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
3/30	No	No	No	No	Urbanized areas (residential, commercial, industrial)	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup truck • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
4/31	No	No	No	Yes	Bay Area Rapid Transit (BART) parking lot	Existing access road, foot, and helicopter	<ul style="list-style-type: none"> • Pick-up trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers, clip in wire, and remove rollers • Attach dead-end eye to tower
4/32	Yes; 100 by 200	No	No	Yes	Urbanized areas (residential, commercial, industrial)	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller or tensioner • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers. • Attach dead-end eye to tower
West of Bayshore Parcel								
4/33 to 4/35	No	No	No	No	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Clear vegetation

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
4/36	No	No	No	No	Delineated wetlands; San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers. • Clear vegetation
West of 4/36	No	No	No	No	Delineated wetlands; San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Remove the two 60 kV wood poles once conversion is completed by cutting them below ground level • Fill minor holes with spoil from auguring and abandon bases of poles in place
Between 4/36 and 4/37	No	No	Yes	No	Delineated wetlands; San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Mobile crane 	<ul style="list-style-type: none"> • Use digger to dig pole hole 6 feet deep • Install temporary guard structure consisting of six wood poles (50 feet Class 4) with one anchor (7/32 on p. B-38 down guy) for each pole 15 inches from pole using utility truck • Install netting across poles • Remove temporary

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
							•	• crossing structure once construction is complete over 115 kV line and fill holes (approximately 3 cubic yards of fill)
4/37	No	No	No	Yes	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	• Pickup trucks • Helicopter • Boom truck	• Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
4/38	No	No	Yes	Yes	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	• Pickup trucks • Helicopter • Boom truck	• Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower • Use digger to dig pole hole 6 feet deep • Install temporary crossing structure consisting of 4 wood poles (50 feet Class 4) with one anchor (one 7/32 down guy) for each pole 15 inches from pole using utility truck • Install netting across

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
							•	<ul style="list-style-type: none"> • poles • Remove temporary crossing structure once construction is complete over 115kV line and fill holes (approximately 2 cubic yards of fill)
4/39	No	No	No	Yes	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers. • Attach dead-end eye to tower
4/40	No	No	No	No	Delineated wetland; San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
5/41	No	Yes; modification	No	No	Delineated wetlands; San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Replace existing crossarm with new crossarm and convert to dead-end • Replace one cross member • Install rollers and insulators, clip in wire, and remove rollers

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
5/42	No	No	No	No	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
5/43	No	No	Yes	Yes	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Condor truck • Pickup trucks • Helicopter • 25-ton crane 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower • Use digger to dig pole hole 10 to 14 feet deep • Install temporary crossing structure consisting of four wood poles (90 to 100 feet above ground) with up to two anchors (7/32 down guys) for each pole 15 inches from pole using crane • Install netting across poles • Remove temporary crossing structure once construction is complete over BART tracks and fill holes (approximately 7 cubic yards of fill)

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
5/44	No	No	Yes	Yes	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Condor truck • Pickup trucks • Helicopter • 25-ton crane 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower • Use digger to dig pole hole 10 to 14 feet deep • Install temporary crossing structure consisting of four wood poles (90 to 100 feet above ground) with up to two anchors (7/32 down guys) for each pole 15 inches from pole using crane • Install netting across poles • Remove temporary crossing structure once construction is complete over BART tracks and fill holes (approximately 7 cubic yards of fill)

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
5/45	No	No	No	No	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
5/46	No	No	No	No	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
5/47	No	No	No	No	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
6/48	Yes; two 100 by 200 sites south and west of tower	No	No	Yes	San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Pull or tension sites • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
6/49	No	No	No	Yes	Delineated wetlands in access; San Francisco garter snake and California red-legged frog habitat	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers

**Table B-2 (Continued)
Tower by Tower Construction Work**

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
Towers 6/50–8/67								
6/50 to 6/51	No	No	No	No	Urbanized	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
6/52	Yes; 180 by 120	No	No	Yes	Under Interstate 380 interchange	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
6/53	Yes; 180 by 120	No	No	Yes	Adjacent to Interstate 380 interchange and behind private lot	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
6/54 to 7/55	No	No	No	No	Urbanized	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
7/55	Yes; 100 by 200	No	No	Yes	Urbanized, parking lot for Sieger Engineering	Existing access roads, and foot	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
7/56	No	No	No	Yes	Urbanized, industrial	Existing access roads, and foot	<ul style="list-style-type: none"> • Pickup trucks • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
7/57	No	No	No	Yes	Colma Creek, delineated wetlands, urbanized, industrial	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Boom truck • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
7/58	No	No	No	Yes	Urbanized, industrial	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
7/59	No	No	No	No	Urbanized, industrial	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
7/60	Yes; 130 by 200	No	No	Yes	Urbanized	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
7/61	No	No	No	Yes	Urbanized	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
8/62	No	No	No	Yes	Urbanized	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
8/63	No	No	No	Yes	Urbanized	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower

**Table B-2 (Continued)
Tower by Tower Construction Work**

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
Between 8/63 and 8/64	Yes; 100 by 120	No	No	No	Commercial; parking lots of Embassy Suites and Hampton Inn	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers
8/64	No	No	No	Yes	Commercial and industrial office complexes	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
8/65	No	No	No	No	Commercial and industrial office complexes	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
8/66	Yes; 100 by 120	No	No	Yes	East of US 101 in industrial complex	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower

**Table B-2 (Continued)
Tower by Tower Construction Work**

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
8/67	Yes; 200 by 200	No	No	Yes	Irish Town Greens Park, Linden and Airport Boulevards	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Condor truck 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
Towers 8/68 and 9/69 and San Bruno Mountain								
8/68	No	No	No	No	Open space	Foot and helicopter	<ul style="list-style-type: none"> • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
9/69	No	No	No	No	Open space	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
9/70 to 9/72	No	No	No	No	San Bruno Mountain Habitat Conservation Plan (HCP) area	Foot and helicopter	<ul style="list-style-type: none"> • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
9/73	No	No	No	Yes	San Bruno Mountain HCP area	Foot, helicopter, and existing access roads	<ul style="list-style-type: none"> • Helicopter • Pickup trucks 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
9/74	No	No	No	No	San Bruno Mountain HCP area	Foot and helicopter	<ul style="list-style-type: none"> • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
10/75 to 10/77	No	No	No	No	San Bruno Mountain HCP area	Foot, helicopter, and existing access roads	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
10/78	No	No	No	Yes	San Bruno Mountain HCP area	Foot, helicopter, and existing access roads	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
10/79	No	No	No	Yes	Urbanized, industrial	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
10/80	Yes; 200 by 200	No	No	Yes	San Bruno Mountain HCP area	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower

Table B-2 (Continued)
Tower by Tower Construction Work

Tower Number	Pull or Tension Site (Yes/No) and Dimensions in Feet	Tower Modification or Minor Reinforcement (Yes/No)	Guard Structure (Yes/No)	Dead-end Structure (Yes/No)	Land Use and Site Conditions ¹ (in addition to existing overhead transmission line corridor)	Access	Equipment	Work to Be Performed
10/81	No	No	No	Yes	San Bruno Mountain HCP area	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower
11/82	No	No	No	No	San Bruno Mountain HCP area	Foot and helicopter	<ul style="list-style-type: none"> • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
11/83 to 11/85	No	No	No	No	San Bruno Mountain HCP area	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • Pickup trucks • Helicopter 	<ul style="list-style-type: none"> • Install rollers and insulators, clip in wire, and remove rollers
11/86	Yes; 200 by 200	Yes; minor reinforcement	Yes	Yes	Martin Substation, delineated wetlands	Existing access roads, foot, and helicopter	<ul style="list-style-type: none"> • 5-ton line truck • Aerial truck • Rope truck • Truck-mounted puller and/or tensioner • 3-reel truck and trailer • Pickup trucks • Helicopter • Boom truck 	<ul style="list-style-type: none"> • Pull or tension site • Add tower leg bracing to all four legs in tow locations in the middle of the tower structure • Install rollers and insulators, clip in wire, and remove rollers • Attach dead-end eye to tower

Source: PG&E, 2002.

Notes:

¹ The project would not result in significant impacts to either San Francisco garter snake or California red-legged frog habitats, as described in Section B.7—Biological Resources, or to wetlands, as described in Section B-11—Hydrology and Water Quality.

• ² Dimensions not provided because pull site is located along an existing access road covered under PG&E's easement rights.

PG&E has developed a work sequence in three segments, which would allow completion of the West of Bayshore work and the project as a whole in a non-critical environmental time period:

- **Segment 1, Millbrae Substation to Martin Substation.** Reconductoring would be done from Tower 4/37 outside the Millbrae Substation to Tower 11/87 at the Martin Substation. The estimated duration for work along Segment 1 would be six weeks.
- **Segment 2, Burlingame Substation to San Mateo Substation.** Reconductoring would be done from Tower 0/2 outside the San Mateo Substation to Tower 2/19A outside the Burlingame Substation. The estimated duration for work along Segment 2 is six weeks.
- **Segment 3, Millbrae Substation to Burlingame Substation.** Reconductoring would be done from Tower 2/19B outside the Burlingame Substation to Tower 4/37 outside the Millbrae Substation. The estimated duration for work along Segment 3 is six weeks.

Substation Modifications. To accommodate the new 115 kV circuit, modifications would be required at the San Mateo, Burlingame, Millbrae, and Martin Substations. Modifications include installing new 115 kV breakers at the Martin and San Mateo Substations, and installing new 115 kV transformer banks at the Millbrae and Burlingame Substations. In addition, four new tubular steel poles would be installed, two each at the San Mateo and Millbrae Substations. These poles would be used for mounting terminal connections to bring the new 115 kV circuit into the substation switchyards. The new tubular steel poles would achieve a natural dulling surface in 6 to 18 months. Except for the removal of two wood poles just outside of the Millbrae Substation, work would occur within the existing fence line of each substation.

Construction Staging

Segment-specific staging information can only be determined just prior to construction at each segment/site, because environmental conditions and staging requirements may vary at different periods.

Helicopter Staging. Two or three helicopter staging areas of approximately 200 feet by 200 feet would be used to bring crews, materials, and equipment to and from the towers and to accommodate the materials, equipment, helicopter refueling truck, and helicopter takeoff and landing. These areas would be determined prior to project construction. The landing zone for this project would be located either at a local airport or on a paved area, such as a parking lot. At no time would helicopters land in areas with special status biological species. Criteria for selection of a landing zone include centralized location, large paved unobstructed area, minimal dust suppression, and separated from the public so as to not impede normal commerce or create a safety hazard.

Other Equipment Staging. Construction staging, material delivery/laydown, and equipment parking would occur within the substations. Pull or tension sites, where equipment that strings the conductor and shield wire for the new circuit would be temporarily placed, would also be within PG&E's existing 140-foot-wide right-of-way, except where noted in the following subsections and in Table B-2.

Project Access

Helicopter Access. Project access would be by helicopter where feasible to transport workers and equipment to and from tower locations. The reason for using helicopters is to avoid ground disturbance impacts and maximize the speed of installation. The helicopter would take off and land to avoid sensitive species. It would hover at or above the tops of towers, at heights of approximately 80 to 120 feet. Work proposed for the San Bruno Mountain would be done outside of the adult flight season for the Mission blue and Callipe silverspot butterflies, eliminating the potential that flight of those species would be disrupted. There is little bare ground exposed in the vicinity of most towers and, due to thin and rocky soil, there is little dust around the towers even when bare soils is exposed.

At the West of Bayshore parcel, the helicopter would hover at or above the tops of towers, with little or no downdraft. Helicopter access for tower work would be similar to that during the replacement of insulators on the San Mateo-Martin #3 Project in January 2001.

Road Access. The main transportation corridors providing access to the project area would be US Highway 101 and Interstate 380. The arterial roadways crossed by the project include El Camino Real, Peninsula Avenue, Broadway, Millbrae Avenue, San Bruno Avenue, South Airport Boulevard, East Grand Avenue, Gateway Boulevard, Sister Cities Boulevard, Bayshore Boulevard, Guadalupe Canyon Parkway, and Geneva Avenue (see Figure B-2).

Road and off-road access by vehicles and foot would be used to enter the existing right-of-way. No new rights-of-way or other access routes would be required. None of the existing access roads would require widening or grading; however, some access roads may require mowing to improve access and to enhance fire prevention. Areas may need to be mowed in the West of Bayshore parcel. The precise extent of the areas to be mowed would depend on conditions in the West of Bayshore parcel close to the time of construction. In general, PG&E would mow the following:

- Access roads where vegetation has grown more than 4 to 6 inches in height;
- Work areas where vehicles would be driven off road (e.g., at guard structures, pull and tension, and towers where equipment/vehicle access is necessary); and
- Spur roads from the access road to work areas.

Some portions of the access roads fall within the 140-foot-wide right-of-way, and other portions do not. Most of the spur roads fall within the right-of-way. All work areas within the West of Bayshore parcel are on property owned by the San Francisco International Airport, which has historically cooperated fully with PG&E maintenance needs.

The machinery needed for vegetation clearance consists of hand-held weed-whackers, leaf rakes, plastic garbage bags, and a pick-up truck for hauling vegetation off-site. No specific agency approvals would be required to start vegetation clearance, other than the Memorandum of Understanding (MOU) with the California Department of Fish and Game (CDFG) and the

Biological Opinion from the United States Fish and Wildlife Service (USFWS). The CDFG MOU will be completed by the summer of 2003 and would be largely similar to the MOU completed for PG&E's San Mateo-Martin #3 Reconductoring Project implemented in February 2000 (Johnston, CDFG, 2003). The USFWS Biological Opinion has not been issued for the proposed project but consultation with the USFWS by CPUC consultants indicate that many of the conditions applied to the #3 project would also apply to the proposed San Mateo-Martin #4 Conversion project.

Vegetation clearing would start at least one week before construction in the West of Bayshore. It may start sooner if the growing season has ended and conditions are dry. A contracted vegetation management crew, accompanied by a PG&E biologist, would do the mowing. The biologist would point out the area to be cleared and would survey the vegetation immediately ahead of the crew to ensure that no animals are present. Mowing would be accomplished with hand-held weed whackers. Mowed vegetation would be raked up, loaded in a pick-up truck, and disposed off-site at a local composting facility or landfill. Occasionally, the biologist may mow additional small areas during construction. In this case, the small amount of clippings would be scattered about the site.

Boat Access. In the Burlingame Lagoon area, boats would be used to enter the existing right-of-way.

Pull and Tension Sites

Pull and tension sites² are the sites from which the old lines would be pulled out and the new lines would be installed. Pull and tension sites are identified in Table B-2, which presents the conditions and required work, access, and equipment at each pull and tension site as well as all other project sites. There would be no pull or tension sites within the Burlingame Lagoon/San Francisco Bay section of the project. There would be 16 pull and tension sites within the rest of the project area. Nine of the pull and tension sites would be the same as those used for the San Mateo-Martin 115 kV #3 Reconductoring Project. The sites would vary in size from 40 by 120 feet to 200 by 200 feet, as identified in Table B-2. The actual size of the pull and tension sites and the type and number of equipment needed may vary at each site, depending on actual site conditions, terrain, conductor weight/loads and spans, Federal Aviation Administration (FAA) and environmental constraints, weather, safety, etc. If needed, adjustments would be made in the field at the time of construction to accommodate these circumstances.

PG&E would be constructing the project in three segments. Generally, no material or equipment would be left or parked overnight along the project right-of-way or on private property; however, when tension trucks or equipment need to remain on-site more than one day, PG&E would first notify the landowner and/or their appropriate representative.

² A pull site is the location along the line where equipment is set up to pull out the old conductor. A tension site is the location along the line where equipment is set up to pull in and tension the new conductor. The pulling out of the old conductor is done with controlled tension.

Additionally, where splices exist along the alignment, a boom truck would be used to install new splices.³ Equipment at the pull and tension sites would remain at those sites for about 4 to 5 days. Typical equipment anticipated at the pull and tension sites include:

- One 5-ton line truck
- One aerial truck
- One 3-reel truck and trailer
- Three pick-up trucks
- Two truck-mounted tensioners
- One boom truck
- One mobile crane (possible for some sites)

One of the proposed pull and tension sites, the site at Tower 6/48, is located in the environmentally sensitive West of Bayshore parcel. Access to Tower 6/48 would be by existing roads, foot, and helicopter (see Table B-2). Tower 10/80 is within the San Bruno Mountain Habitat Conservation Plan boundary, but on disturbed or paved ground outside the butterfly habitat. The footing for Tower 11/86 spans a wetland area; however, the wetland area can be avoided because it does not extend beyond the base of the tower and the area around the tower has been graded and contains no natural soil profile. PG&E has proposed as part of the project to avoid wetlands in the vicinity of Tower 11/86. No temporary or permanent disturbances to sensitive plant or wildlife species are anticipated at any of these pull and tension locations as a result of the proposed work.

Conversion (Reconductoring) Methods and Equipment

Conductors and Travelers Installation. Travelers (rollers), insulators, and hardware would be installed as the first step in completing the actual line reconductoring. Travelers and insulators would be brought to the tower sites by foot, boat, helicopter, or pickup truck, and the crews would access each tower by either climbing, using an aerial lift or helicopter, depending on the tower location (refer to Table B-2). The existing conductors would be unclipped from the tower and placed in the travelers to be pulled out and removed from the towers within a pull section. As the existing conductor is being pulled out, the new sock line would be pulled in.⁴ The sock line then would be attached to the new conductor, which would be pulled into the travelers. After the new conductor is pulled and sagged, the newly strung conductor would be moved from the travelers and clipped permanently to the insulator clip by hand. The travelers would then be removed from the towers by hand. Figure B-5 depicts insulator, traveler, and conductors.

³ Also called conductor splice, sleeve, or compression joint, a splice is a tubular compression fitting designed and fabricated from aluminum and/or steel, to join conductors. It is usually installed using hydraulic or mechanical presses.

⁴ A sock line is a high-strength line, normally synthetic fiber rope or wire rope, used to pull the conductor.

Installing the temporary conductor travelers would involve two four- to six-person crews and would take approximately one day per tower to complete. The crew would spend approximately one to two workdays bringing equipment and materials to the staging areas within the substations. It would take from 60 to 90 days to install, pull, and tension the new conductor the entire length of the line. All work would be performed from the existing access roads.

Helicopters would be used to the extent feasible and where SFO air security restrictions permit, to assist with the installation and removal of the conductors and insulators.

At dead-end towers/line end points, either a boom truck (for towers less than 100 feet high) or a Condor boom truck (for towers greater than 100 feet high) would be needed to access the towers so crews could attach the dead-end eye to the tower. Additionally, where splices exist along the alignment, a boom truck would be used to reach the conductor for the installation of new splices in areas where it would be feasible.

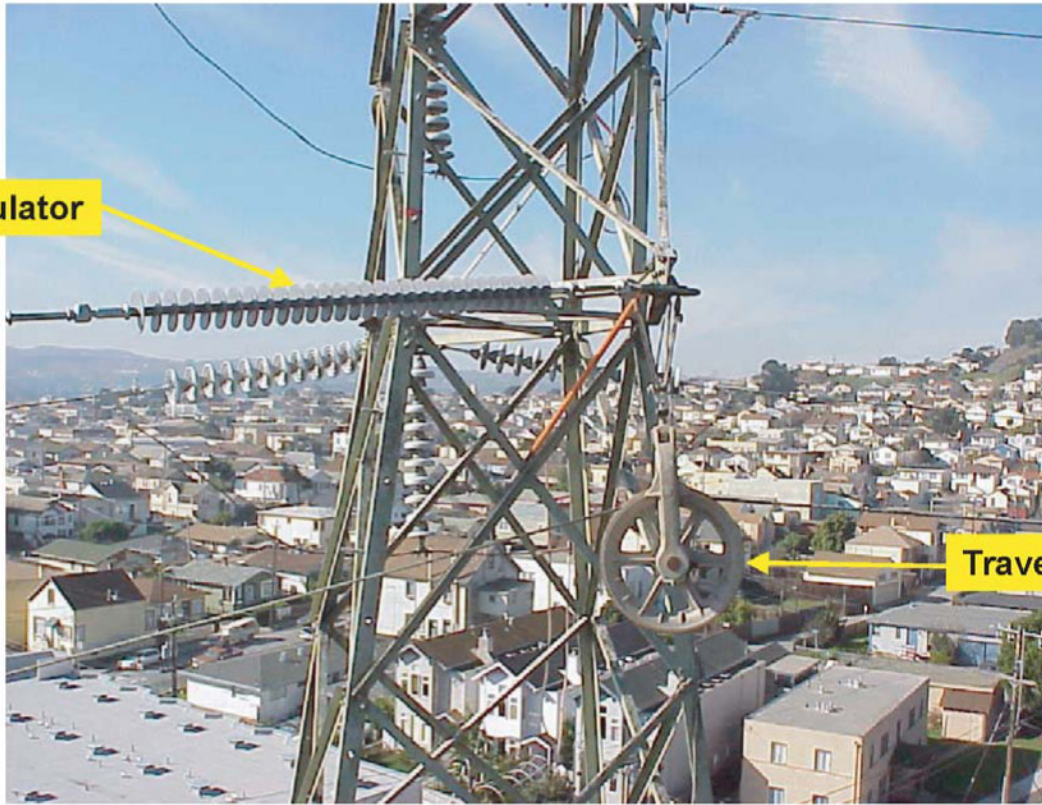
Grounding. Personal protection ground rods would be installed approximately 5 to 15 feet from the footing of each tower. These ground rods would be driven deep enough to reach firm ground, with approximately one foot of ground rod projecting above ground level during construction. Grounding equipment would be connected to these ground rods during construction hours and disconnected when service is restored on the line. These ground rods would remain in the ground during the entire construction period and would be removed when construction is completed. Ground rods would also be used for reel and bullwheel puller trucks, or any equipment near an energized conductor.

Reconductoring Equipment. Table B-3 lists the construction equipment that would be used in reconductoring/power line construction. It shows equipment such as helicopter, 5-ton truck, rope truck, boom truck, aerial truck, pickup trucks, reel truck and trailer, and truck mounted puller and/or tensioner.

Conversion (Reconductoring) Methods In Environmentally Sensitive Segments

Because of the environmental sensitivity of four segments of the project corridor, PG&E has identified special precautions in these areas. Described below are the work to be performed, the equipment to be used, and special construction techniques for the Burlingame Lagoon and San Francisco Bay segment, the West of Bayshore parcel, and the San Bruno Mountain area of the project corridor.

Burlingame Lagoon Segment and San Francisco Bay Segment (Towers 1/8 to 2/18). Work in the Burlingame Lagoon and San Francisco Bay would involve:



Insulator and Traveler



Conductors on Reels

FIGURE B-5
PG&E Power Line Construction

Not to Scale

- replacing the crossarm on Tower 1/9,
- replacing existing conductors with new conductors on existing towers,
- replacing the insulators,
- replacing existing cross members and braces on Towers 0/3 and 0/4 as needed, and
- installing temporary personal protection grounds.

**Table B-3
Major Equipment for Reconducting/Power Line Construction**

Equipment	Use
3/4-ton pickup trucks	Transport construction personnel
5-ton line trucks	Transport construction personnel
2-ton flatbed trucks	Haul materials
Flatbed boom truck	Haul and unload materials
Small mobile cranes (less than 12 tons)	Load and unload materials
3-reel puller	Pull conductor
Dual bull wheel tensioner	Pull conductor
Tensioner	Pull conductor
Wire reel trailer	Haul conductor
Condor boom truck	Access towers over 100 feet high
25-ton crane	Set 100- to 110-foot-high wood poles
Air compressors	Operate air tools
Portable generators	Operate power tools
Hydraulic press	Press together the conductor ends at dead-end structures
Aerial lift trucks	String conductor
Helicopter	To transport crews and materials and to string conductor

Source: PG&E, 2002.

No ground disturbance would occur as part of this work. All work would be completed, depending on the conditions and tasks, by:

- foot, in the areas around the towers that are inaccessible by truck;
- pickup truck, in the areas where existing access roads provide right-of-way access;
- boat, in the Burlingame Lagoon area to access the towers;
- helicopters, to string the line wherever feasible to minimize ground impacts;
- rope truck, to supply pulling rope; and
- truck-mounted puller or tensioner, to pull the conductor.

All pull and tension sites near Burlingame Lagoon/San Francisco Bay are in parking lots adjacent to these areas.

West of Bayshore Parcel (Towers 4/33 to 6/49). Work within the West of Bayshore parcel would involve:

- replacing the crossarm on Tower 5/41 with a new crossarm, which converts the #4 side of the tower to a dead-end configuration;
- replacing conductors with new conductors on existing towers;
- replacing the insulators;
- replacing cross members and braces on some towers if needed;
- installing temporary personal protection grounds;
- installing and removing guard structures; and
- removing two wood poles that support the loop into the Millbrae Substation.

There would be two pull or tension sites in this area, approximately 100 by 200 feet, adjacent to Tower 6/48.

Guard structures would be installed to protect existing power lines and the BART tracks during new line stringing. This work would require temporary placement and then removal of wood poles and backfilling of the resulting holes. Work at these sites in the West of Bayshore parcel would involve the following components.

- Millbrae Substation (between Tower 4/36 and Tower 4/37): six wood poles would be installed temporarily to support safety netting (guard structure) during stringing over other energized 115 kV lines (refer to Figures B-3 and B-4). Each pole would have an anchor (one 7/32 down guy) situated 5 to 15 feet from the pole and set 6 to 8 feet deep.⁵ The installation of the six wood poles would require approximately 3 cubic yards of native fill for the holes left by pole removal.
- BART tracks (at Tower 5/43 and Tower 5/44): four 100- to 110-foot wood poles at each structure (for a total of eight) would be installed on each side of the tracks in 10- to 14-foot-deep holes to support protective netting across the BART tracks. The exact height of these poles would be determined once the elevation is defined. The poles would be either H or Y structures with nets and down guys (see Figure B-3 and B-4). If tall poles cannot be used due to FAA height restrictions or for some other reason, the line would be pulled when the tracks are not in service. A crane would be used to set the poles into the holes. The installation would require approximately 14 cubic yards of native fill (7 cubic yards at Tower 5/43 and 7 cubic yards at Tower 5/44) for the holes left by pole removal.

⁵ A down guy (or anchor) is a wire running from the attachment near the top of the pole to a rod and anchor-installed in the ground.

- Four wood poles would be installed temporarily at the MA Substation (Tower 4/38) to support temporary guard structures during stringing over the energized 115 kV lines. The poles would be installed in the same manner as that previously described for the Millbrae Substation guard structure. The installation would require approximately 2 cubic yards of native fill for the holes left by pole removal.

West of Tower 4/36, the two wood poles supporting the San Mateo–Martin #4 60 kV line would be removed by cutting them off below ground level and abandoning the base in place once the 115 kV circuit has been built. The two poles to be removed are located within wetlands. Removal of the two poles would qualify for a Nationwide Permit from the U.S. Army Corps of Engineers.

Access to the West of Bayshore parcel would be by helicopter, trucks using existing dirt roads, or foot, depending on site conditions, to minimize impact to the greatest extent feasible. No existing roads would be graded, and no new roadway access would be required.

Navigable Slough (Towers 7/55 and 7/56). Work at Navigable Slough in South San Francisco would involve:

- replacing existing conductors with new conductors on existing towers;
- replacing the insulators; and
- installing temporary personal protection grounds.

There would be one pull on tension site in the area, approximately 100 by 200 feet, adjacent to Tower 7/55.

Access to the towers would be by existing access roads and foot. Helicopters would not be used to avoid downdraft impact on the habitats in Navigable Slough.

San Bruno Mountain (Tower 8/68 to Martin Substation). Work in the San Bruno Mountain area would involve:

- replacing existing conductors with new conductors on existing towers,
- replacing the insulators,
- replacing cross members and braces on Tower 11/86, and
- installing personal protection grounds.

Tower access would occur primarily by helicopter for installing travelers and insulators, clipping in wire, and removing travelers. For installing the leg bracing at Tower 11/86, access would occur by pickup trucks using existing access roads or on foot where no access roads exist. One pull and tension site would be located in this area, approximately 200 feet by 200 feet, adjacent to Tower 10/80.

Substation Construction Methods and Equipment

San Mateo Substation. A new 115 kV breaker would be installed at the San Mateo Substation to accommodate the new line. To make room for the breaker, existing transmission line terminations would be rearranged within the substation property. To accommodate the 115 kV line, the double bus⁶ structure would be extended to the west by one bay, or approximately 50 feet.⁷ Two 115 kV breaker disconnects, one bypass, and two bus selector switches would also be installed. Pile drivers would be used to install bus support structures⁸ (eight pilings), bus selector switch support structures (four pilings), a line dead end structure (eight pilings) and two tubular steel poles at the San Mateo Substation. The entire scope of the pile driving activities would be contracted to one single contractor, who would perform the work over a two-week period. The terminal connections for the San Mateo-Martin #6 and the San Francisco Airport-San Mateo 115 kV line would be rearranged on two new 55- to 65-foot steel poles within the substation to allow the connection of the new San Mateo-Martin #4 115 kV line. A new SF6 circuit breaker⁹ would be installed and connected to the 115/60 kV bank number 9. Minor grading (less than 10 cubic yards) and foundation work, including pilings, would be needed to accommodate the new SF6 breaker. Spoils from grading would be stockpiled at the site and tested for toxicity. After testing, the spoils would be disposed of in accordance with all applicable federal, state, and local standards and guidelines regarding their safe disposal. Minor modifications to the control panels within the substation control room would also be required to accommodate the newly converted line and breaker. Construction would take approximately five to six months to complete.

Burlingame Substation. Converting the existing Burlingame Substation to operate at 115/4 kV would require replacing the four existing 60/4 kV transformers with one 115/21 kV transformer and two 21/4 kV three-phase transformers. Transport of new transformers and transformers to be removed would be by truck and railroad car as applicable. Transport of the transformers would be in accordance with local moving permits that are required for moving the transformers through towns and on freeways. Local authorities set conditions, but they typically include weight and dimension limitations, day and time restrictions, and flag cars to precede and follow the load. Old transformers would be disposed of in accordance with all applicable federal, state, and local standards and guidelines regarding their safe disposal. Transformers are tested for PCB content and are disposed as hazardous materials if necessary.

⁶ A bus is a conductor or group of conductors that serves as a common connection for two or more circuits.

⁷ A double bus consists of two assemblies of conductors for collecting electric currents and distributing them to outgoing transmission lines or distribution feeders.

⁸ A bus support structure is an assembly of bus conductors with associated connection joints and insulating supports.

⁹ A circuit breaker is a switching device capable of making, carrying, and interrupting currents under normal circuit conditions and also making, carrying for a specified time, and interrupting currents under abnormal circuit conditions.

In addition, minor alteration, replacement, or rearrangement could occur to several breakers, switches, and breaker disconnects that exist in the substation area. The existing control building would be replaced with a larger, 20-by-20-foot control building with a battery room to the southeast of the existing building. The existing protection telecommunication building would remain in its current location. During construction of the transformer bank and control buildings, PG&E would need full access to the rear portion of its property for storing equipment and materials. This portion of the property is rented out under a license agreement that would terminate prior to the start of construction.

Approximately 50 cubic yards of material would be moved or graded during cut and fill work during site preparation. Spoils from grading would be stockpiled at the site and tested for toxicity. After testing, the spoils would be disposed of in accordance with all applicable federal, state, and local standards and guidelines regarding their safe disposal. Construction would take approximately five to eight months to complete.

Millbrae Substation. The existing San Mateo–Martin #4 line loops through the 60 kV yard of the Millbrae Substation. The conversion would require eliminating the loop and connecting the 60 kV yard to the 115 kV yard. The connection would require building a short line from the 115 kV yard to a new 115/60 kV transformer bank at the 60 kV yard. The new line would be installed within the substation property. In addition, minor alteration, replacement, or rearrangement could occur to several breakers, switches, and breaker disconnects that exist in the substation area.

Within the fenced substation property, the existing dirt perimeter road, which loops the substation, would be leveled in some areas and covered with asphalt. Some grading (approximately 20 cubic yards) would be required to accommodate the transformers, the bus extension, new bank, and the perimeter road. Excavations for foundations (drilled piers) for two new tubular steel poles would be made inside the existing graded Millbrae Substation on the southwest side of the station, in cut area. Spoils from grading and excavation would be stockpiled at the site and tested for toxicity. After testing, the spoils would be disposed of in accordance with all applicable federal, state, and local standards and guidelines regarding their safe disposal. Access would be along an existing paved or graveled access road, and all substation work would take place within the fenced substation area. No wetlands exist inside the substation fence. Construction would take approximately five to six months to complete.

Martin Substation. A new 115 kV SF6 breaker would be installed at the Martin Substation to accommodate the new line. Existing transmission line terminations would be rearranged within the substation property. The San Mateo–Martin #5 115 kV line would be relocated to the other side of the tower and terminated on the new breaker. The new San Mateo–Martin #4 115 kV line would be extended to existing Tower 0/1 and terminate on the existing circuit breaker (Number 162). The existing bay would be modified to terminate and protect the #5 line by adding steel crossarms, two 115 kV breaker disconnects, one 115 kV breaker bypass switch, two 115 kV selector switches, and a 115 kV SF6 breaker within the existing 115 kV yard. Although the station modifications would not require grading, they would require excavation

totaling approximately 18 cubic yards. Spoils from excavation would be stockpiled at the site and tested for toxicity. After testing, the spoils would be disposed of in accordance with all applicable federal, state, and local standards and guidelines regarding their safe disposal. Within the control room, minor modifications to the control panel would also be made to accommodate the newly converted line and breaker. Construction at the Martin Substation would take approximately five to six months to complete.

Substation Construction Equipment. Table B-4 lists the equipment that would be used in substation construction. Principal equipment used in the substation construction areas include small- to medium-sized trucks, air compressors, generators, pile drivers, forklift, small mobile cranes, and motorized scaffolding.

**Table B-4
Major Equipment for Substation Construction**

Equipment	Use
3/4-ton pickup trucks	Transport construction personnel
2-ton flatbed trucks	Haul materials
Flatbed boom truck	Haul and unload materials
Forklift	Move material on site
Two-man backhoe	Dig and move material
Small mobile cranes (less than 12 tons)	Load and unload materials
Air compressors	Operate air tools
Portable generators	Operate power tools
Motorized scaffold	Position personnel
Concrete truck	Haul materials
Pile drivers	Install piles

Source: PG&E, 2002.

Best Management Practices and Construction Monitoring

PG&E has proposed a Best Management Practices (BMP) Plan for the San Mateo-Martin #4 60 kV Conversion Project. The BMP Plan, included in this document as Appendix C, describes measures to be taken by PG&E and its contractors before, during, and after construction of the project to protect the human and natural resources in the project area. BMPs included in the plan address air quality, water quality, hazardous materials, and noise concerns. PG&E would be responsible for ensuring that its contractor meets the standards defined in the BMP Plan.

PG&E would employ biological monitors, including those with biological and other applicable expertise, who would be responsible for ensuring that the contractor's perform field activities

according to BMPs and in compliance with all other applicable permits and agreements. The biological monitors would have the authority to make site-specific field changes within the BMP guidelines in consultation with the CPUC, as needed.

Project Personnel

The reconductoring and tower work would require four- to six-person crews; typically, five to seven crews would work throughout the job. During the peak periods of reconductoring, 35 to 45 workers would be involved. For substation construction, a crew of eight to 12 would be onsite during the five to six months of work required at each substation.

Construction Schedule

The construction schedule would depend on CPUC completion of the CEQA review process and approval of the project. Assuming a construction season starting in the fall of 2003, operation would start in the fall of 2004. As stated above, reconductoring would be completed in three segments. The estimated duration for reconductoring at each segment is up to six weeks. In the West of Bayshore parcel, PG&E has proposed to restrict construction activities to the period from August 1 to about November 1, or the first heavy rainfall, to avoid disturbance to sensitive species. For the same reason, PG&E has proposed to conduct construction activities on San Bruno Mountain from September 1 to approximately February 28, and at Navigable Slough from September 1 to January 15. It would take from 60 to 90 days to install, pull, and tension the new conductor along the entire length of the line. Construction at each substation would generally take between five to eight months to complete.

Construction hours would be generally between 7 a.m. and 7 p.m. seven days a week, except when reconductoring the line across US 101. When crossing US 101, construction would occur between 5 a.m. and 10 a.m. on several weekend mornings or as directed by the California Department of Transportation (Caltrans), in order to conduct work during time of less traffic. All city, county, state, and railroad regulations, ordinances, and restrictions would be identified and complied with prior to and during construction.

For the transmission line work, the only possible night work would occur if required by Caltrans for the US 101 crossings. For the substation work, construction would not usually be scheduled at night. However, if night work is necessary at substations, mobile light towers would be used for lighting. It is possible that work scheduled on a clearance (i.e., transformer bank de-energization) would be scheduled on weekends in the summer months due to the high weekday customer loads of that season. It is not rare that the work inside the substations extends throughout the night to take advantage of the clearance.

Applicant Proposed Measures and Other Plans

The proposed project includes a number of measures proposed by PG&E, which are designed to reduce or avoid potential environmental impacts associated with project construction and operation. PG&E's measures are considered part of the proposed project for purposes of

impact assessment in this Initial Study and are summarized in Table B-5. For the purposes of this analysis, PG&E proposed measures are termed Applicant Proposed Measures (APMs). The APMs are based on mitigation measures and permit requirements for the PG&E Circuit #3 Reconductoring Project. In Table B-5, APM-1 through APM-17 and APM-60 through APM-64 apply to the entire project site, APM-18 through APM-54 apply to the West of Bayshore parcel, and APM-55 through APM-59 apply to San Bruno Mountain. It should be noted that, in addition to the APMs presented in Table B-5, PG&E has agreed to implement all additional Mitigation Measures (MMs) that are recommended within this Initial Study's environmental analyses. For a consolidated list of all Applicant Proposed Measures and Mitigation Measures that are required to be implemented by PG&E, refer to Table C-1 in the Mitigation Implementation and Monitoring Plan (attached in Section C).

PG&E would also implement a Fire Suppression Plan, Work Area Protection Guide & Traffic Control Manual, and Revegetation Plan. These plans are appended to this document.

Electric and Magnetic Fields (EMF)

Recognizing that there is a great deal of public interest and concern regarding potential health effects from exposure to electric and magnetic fields (EMFs) from power lines, this Initial Study provides information regarding EMF associated with electric utility facilities. Potential health effects from exposure to electric fields from power 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. Unlike electric fields, magnetic fields are not easily shielded by objects or materials. Both electric and magnetic field strength attenuate rapidly with distance from the source. However, this Initial Study does not consider electric or magnetic fields in the context of CEQA and determination of environmental impact. This is because (a) there is no agreement among scientists that EMF does create a potential health risk, and (b) there are no defined or adopted CEQA standards for defining health risk for EMF. As a result, EMF information is presented for the benefit of the public and decision makers.

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

The EMF from power lines change their direction over time. The rate of this change in direction is referred to as a frequency and represents the number of times the fields change direction each second. For power lines in the United States, the frequency of change is 60 times per second and is defined as 60 Hertz (Hz) power. In Europe and many other countries, the frequency of electric power is 50 Hz. Radio and communication waves operate at much

**Table B-5
Applicant Proposed Measures (APM)**

Applicant Measure	Text
Air Quality	
APM-1	All construction personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction. This APM applies to the entire project site.
APM-2	All active construction areas, access roads, and staging areas will be watered at least twice daily in dry season as needed to control dust, unless it affects endangered species. This APM applies to the entire project site.
APM-3	All trucks hauling soil and other loose material will be covered or at least 2 feet of freeboard will be in place This APM applies to the entire project site.
APM-4	Construction vehicles will use paved roads to access the construction site when possible. This APM applies to the entire project site.
APM-5	Streets, paved access roads, and parking lots will be swept daily if visible soil material is carried onto adjacent public streets. This APM applies to the entire project site.
APM-6	Soil stabilizers will be applied to inactive construction areas on an as-needed basis. This APM applies to the entire project site.
APM-7	Exposed stockpiles of soil and other excavated materials will be enclosed, covered, or watered twice daily or treated with soil binders during the dry season. This APM applies to the entire project site.
APM-8	Vegetation in disturbed areas will be planted after the completion of construction. This APM applies to the entire project site.
APM-9	Construction workers will carpool when possible. This APM applies to the entire project site.
APM-10	No equipment will “idle” more than 5 minutes, although some equipment will require extended warm-up time or will remain in use (and running) while stationary (e.g., to power other equipment or when used for repetitive tasks). This APM applies to the entire project site.
Biological Resources	
APM-11	PG&E, its contractors, and agents will restrict all activities to the minimum area necessary to safely conduct project activities. This APM applies to the entire project site.
APM-12	All vehicle travel will be limited to existing access roads or clearly identified construction areas. This APM applies to the entire project site.

Table B-5 (Continued)
Applicant Proposed Measures (APM)

Applicant Measure	Text
APM-13	<p>Vehicle speed limits of 10 miles per hour will be monitored and enforced during construction in environmentally sensitive areas.</p> <p>This APM applies to the entire project site.</p>
APM-14	<p>Refueling of pick-up trucks will not occur at or adjacent to the construction site or within 100 feet of any wetland area. Containment tarps will be set up under the equipment before refueling to prevent spills. Operators will be required to stay with these vehicles during refueling operations.</p> <p>This APM applies to the entire project site.</p>
APM-15	<p>The following measures will be taken to prevent accidental wildfires.</p> <ul style="list-style-type: none">• Herbaceous vegetation will be cleared (by hand or weed whacker) on access roads and spurs, in pull or tension sites, and in work areas in the West of Bayshore parcel.• No campfires or trash burning will be allowed.• Smoking will be restricted to vehicle interiors. All cigarette butts will be disposed of in vehicle ashtrays.• The construction foreman will have a cellular phone on hand to immediately report a fire via 911, if one should occur. <p>This APM applies to the entire project site.</p>
APM-16	<p>All food-related trash items will be removed from the work area daily.</p> <p>This APM applies to the entire project site.</p>
APM-17	<p>Best management practices to reduce sedimentation and minimize erosion will be employed on all work sites.</p> <p>This APM applies to the entire project site.</p>
APM-18	<p>To minimize the potential for impacts to the California red-legged frog and San Francisco garter snake, construction of the West of Bayshore parcel will be limited to the period between August 1, 2003 and approximately November 1, 2003, or the first heavy rainfall, subject to extensions approved by the California Department of Fish and Game (CDFG).</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-19	<p>Before initiating the reconductoring activities and installation of guard structures, PG&E will designate a representative responsible for communications with CDFG and for overseeing compliance. The CDFG will be notified in writing of the representative's name, business address, and telephone number, and will be notified in writing if a substitute representative is designated.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-20	<p>Knowledgeable and experienced biologists approved by the CDFG will be retained by PG&E as biological monitors and will be present during all project activities within areas of San Francisco garter snake habitat to help avoid mortality or injury of an individual San Francisco garter snake and to minimize disturbance to the habitat. A biologist who holds or is named on a valid 10(a)(1)(A) Federal Scientific Collection permit issued by the U.S. Fish and Wildlife Service (USFWS) for handling San Francisco garter snake (hereinafter referred to as "permitted biologist") will be the only biologists allowed to handle San Francisco garter snake. All biological monitors will provide quality control and quality assurance for implementation of the mitigation measures to avoid mortality or injury to San Francisco garter snake. The biological monitors will ensure compliance with the</p>

Table B-5 (Continued)
Applicant Proposed Measures (APM)

Applicant Measure	Text
	measures provided. The biological monitors will inspect each activity area daily immediately before activities begin and continually monitor in advance of the work crew. If a snake is found, the monitor will call a permitted biologist.
	This APM applies to the West of Bayshore parcel.
APM-21	PG&E, its contractors, and agents working on the West of Bayshore parcel will provide biological monitors with the express authority to order any immediate changes in project activities necessary to bring those activities into compliance or to otherwise avert a risk of imminent mortality or injury of San Francisco garter snake, and to stop any activity that cannot be or has not been brought into immediate compliance, provided that the job site foreman or other PG&E authority on-site deems it safe. The CDFG and the USFWS will be notified the same day or within 24 hours of circumstances that led biological monitors to halt work or to take other actions to ensure compliance or to otherwise avert threatened mortality or injury of San Francisco garter snake.
	This APM applies to the West of Bayshore parcel.
APM-22	Prior to drilling holes for guard structure poles, the following steps will occur. <ul style="list-style-type: none">• A permitted biologist will inspect the pole locations and a distance of 15 feet out from the pole location for rodent burrows.• All rodent burrows encountered will be hand dug by the permitted biologist to clear the burrows. A biological monitor may assist in clearing burrows only under the supervision of the permitted biologist.
	This APM applies to the West of Bayshore parcel.
APM-23	At the guard structures between Towers 4/36 and 4/37, and at Towers 4/38, 5/43, and 5/44, if no rodent burrows are found, the truck-mounted digger may be used exclusively to excavate the holes for the structure. If rodent burrows are found, the following procedure will apply. <ul style="list-style-type: none">• At the guard structures between Towers 4/37 and 4/38, and at Towers 4/38, and 5/43 and 5/44, the holes will be hand dug until the permitted biologist determines that all rodent burrows have been hand excavated or that the soil type or other relevant factors preclude the existence of additional rodent burrows. Once the permitted biologist has made this determination, the truck-mounted digger may be used to complete the holes for the structure.
	This APM applies to the West of Bayshore parcel.
APM-24	Prior to the removal of the two wood poles, PG&E will use the same procedures for inspecting the pole locations as described above for the guard structure poles.
	This APM applies to the West of Bayshore parcel.
APM-25	A biological monitor will inspect underneath any vehicle that is parked for 30 minutes or more immediately prior to moving the vehicle.
	This APM applies to the West of Bayshore parcel.

Table B-5 (Continued)
Applicant Proposed Measures (APM)

Applicant Measure	Text
APM-26	<p>At least one biological monitor will be continually present during the following activities.</p> <ul style="list-style-type: none">• Guard structure installation• Ground rod installation• Removal of the two wood poles• Movement of equipment larger than a pickup truck onto or off the site using access roads. A biological monitor will walk in front of the equipment and watch for snakes.• Movement of any equipment (including but not limited to line trucks, trailers, cranes, pickup trucks) into or off undisturbed areas as necessary to conduct activities adjacent to or in alignment of towers. <p>This APM applies to the West of Bayshore parcel.</p>
APM-27	<p>A biological monitor will walk in front of all vehicles in the West of Bayshore parcel, except for those using the Millbrae Substation access road, which is an improved and maintained access road.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-28	<p>Each biological monitor will be supplied with an operable cellular phone for the purpose of efficient communication on-site.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-29	<p>Each biological monitor will be supplied with a copy of the approved <i>Mitigation and Monitoring Plan</i> for the purpose of ready reference in the field.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-30	<p>PG&E will provide the CDFG and USFWS representatives with access to the biological monitors for purposes of discussing implementation of the measures to avoid mortality or injury of San Francisco garter snake.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-31	<p>PG&E, its contractors, and agents will restrict activity areas to the minimum area necessary to transport materials and equipment to towers and work areas.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-32	<p>Once work begins, all project-related parking and equipment storage will be confined to the established access roads or to areas outside the West of Bayshore parcel. Undisturbed areas will not be used for parking or equipment storage, except at the pull or tension sites and at sites where equipment use is required for multiple days. Project-related vehicle traffic will be restricted to established access roads or work areas adjacent to towers where equipment will be positioned to conduct the necessary tower, guard structure, and grounding activities.</p> <p>This APM applies to the West of Bayshore parcel.</p>

Table B-5 (Continued)
Applicant Proposed Measures (APM)

Applicant Measure	Text
APM-33	<p>When plywood or timber mats or steel plates are required to be placed in the case of wet or unstable ground, the following activities will occur.</p> <ul style="list-style-type: none">• A permitted biologist will inspect the area to be covered by the mats or plates for rodent burrows.• All rodent burrows encountered will be hand dug by the permitted biologist to clear the burrows. A biological monitor may assist in clearing burrows, only under the supervision of the permitted biologist.• If the mats or steel plates must remain in place for more than one day, dirt or sand bags will be used to seal the edges of the mats or plates to prevent snakes from crawling underneath. <p>This APM applies to the West of Bayshore parcel.</p>
APM-34	<p>When plywood or timber mats or steel plates are removed, a biological monitor will inspect underneath the mats or plates.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-35	<p>Driving off access roads, access spurs, or work areas is prohibited unless it is authorized as part of the Staging Plan or is an emergency subject to the PG&E foreman pre-empting the monitors to maintain minimum safety standards</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-36	<p>All entry gates to the West of Bayshore parcel that are not used for construction access will be locked at all times. All gates to the West of Bayshore parcel that are used for construction access will be kept closed when not in use during construction hours and will be locked during nonconstruction hours.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-37	<p>Biological monitors will designate access points to work sites off access roads in undisturbed areas for PG&E, its contractors, and agents.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-38	<p>PG&E, its contractors, and agents will conduct an orientation program for all persons who will work on the West of Bayshore parcel. The program will consist of a brief presentation given by a permitted biologist knowledgeable about the biology of the San Francisco garter snake and the terms in the approved <i>Mitigation and Monitoring Plan</i>. The education program will cover the biology of the San Francisco garter snake, its habitat needs, its status under the California Endangered Species Act (CESA), and the conservation and mitigation measures in the approved <i>Mitigation and Monitoring Plan</i>. A fact sheet containing this information will also be prepared and distributed. Upon completion of the orientation, employees will affix a small sticker to their hardhat and sign a form stating that they attended the training and understand all the conservation and mitigation measures. Those forms will be submitted to the CDFG at the end of construction or upon the agency's request.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-39	<p>Personnel who detect any snake on-site will immediately report their finding to a biological monitor, who will determine whether the detected snake is a San Francisco garter snake. Personnel will not attempt to capture or move any snake detected. If the biological monitor determines that the snake is not a San Francisco garter snake, the biological monitor may hand-capture and move the snake in a manner consistent with the approved <i>Mitigation and Monitoring Plan</i>. If the biological monitor determines that the detected snake is a San Francisco garter snake, or is unable to positively identify the snake, the biological monitor will notify the permitted biologist for appropriate action.</p> <p>This APM applies to the West of Bayshore parcel.</p>

Table B-5 (Continued)
Applicant Proposed Measures (APM)

Applicant Measure	Text
APM-40	<p>When overnight parking is necessary for equipment larger than a pickup truck, a containment tarp will be set up under the equipment to catch any leaking fuel or oil. No pickup trucks will be parked overnight on the West of Bayshore parcel.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-41	<p>All excess excavated material after project construction in Segment 1 is completed will be hauled off-site and disposed of properly. No material will be stockpiled on the West of Bayshore parcel.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-42	<p>Vegetation will not be cut closer than 4 to 6 inches to the ground, whether by hand or weed whacker. All other methods for vegetation removal, including but not limited to discing and herbicide application, will be prohibited.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-43	<p>All holes created for guard structure poles or ground rod placement will be backfilled with native soil or clean sand.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-44	<p>PG&E, its contractors, and agents will allow CDFG and USFWS representatives to accompany them to the project site without advance notice, subject to landowner permission and reasonable safety restrictions as PG&E requests.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-45	<p>Within sixty (60) days of completing construction on the West of Bayshore parcel, PG&E will provide the CDFG and the USFWS with a final, postconstruction compliance report. A knowledgeable, experienced biologist will prepare the report, which will include 1) construction dates; 2) verification that measures in the approved <i>Mitigation and Monitoring Plan</i> were fully implemented; 3) identification of any measures that were not fully implemented; 4) a description of project effects on San Francisco garter snake, San Francisco garter snake prey and habitat; and 5) other pertinent information.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-46	<p>Daily field monitoring forms will be maintained by the on-site biological monitors to document project implementation. Monitoring forms will describe the progress of the work, any difficulties encountered, observation of the San Francisco garter snake, and any other pertinent information regarding project implementation. These forms will be submitted weekly to the CDFG and USFWS for review.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-47	<p>PG&E will arrange a preactivity site meeting in consultation with the CDFG to allow its representatives to review the terms of the approved <i>Mitigation and Monitoring Plan</i>. The meeting will include: PG&E; its contractors and agents; permitted biologists and biological monitors; and the CDFG. Representatives from the USFWS and the CPUC will be invited. It will be held no more than thirty (30) days before the start of construction on the West of Bayshore parcel.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-48	<p>A post activity site meeting will be held for PG&E, its contractors, the CDFG, and the USFWS within two weeks after project completion to assess the effectiveness of the terms of the approved <i>Mitigation and Monitoring Plan</i>.</p> <p>This APM applies to the West of Bayshore parcel.</p>

Table B-5 (Continued)
Applicant Proposed Measures (APM)

Applicant Measure	Text
APM-49	<p>To avoid incidental take of San Francisco garter snake resulting from loss or disturbance of habitat, all related construction materials for the project will be removed from the site in a manner consistent with the terms of the approved <i>Mitigation and Monitoring Plan</i>.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-50	<p>A biologist or horticulturist will inspect the site within the West of Bayshore parcel and determine whether reseeding is needed. In uplands, areas of bare soil will be reseeded with a commercially available annual grass seed mix similar to that of existing species on the parcel.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-51	<p>If necessary, weeds will be pulled, cultivated or sprayed after one full season of growth.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-52	<p>If PG&E or any of its employees, contractors, or agents kills or injures an individual San Francisco garter snake or finds any such animal dead or injured, project activities will be halted immediately on the West of Bayshore parcel and the CDFG and USFWS will be notified immediately of the discovery. PG&E will not allow work to resume until receiving authorization from the USFWS and CDFG.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-53	<p>Any dead or injured special-status species will be turned over to the CDFG, the USFWS, or their agents.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-54	<p>A written report detailing the date, time, location, and general circumstances under which a dead or injured San Francisco garter snake was found will be submitted to the USFWS no later than three business days after the incident.</p> <p>This APM applies to the West of Bayshore parcel.</p>
APM-55	<p>To minimize the potential for impacts to sensitive butterfly species, construction activities at San Bruno Mountain will be limited to the period between September 1, 2003 and February 28, 2004, subject to extensions approved by USFWS.</p> <p>This APM applies to San Bruno Mountain.</p>
APM-56	<p>All access in the project area will be restricted to the routes and seasonal timeframes identified above, subject to extensions approved by USFWS.</p> <p>This APM applies to San Bruno Mountain.</p>
APM-57	<p>Helicopters will be used to transport in and out some crews and materials and to assist with the line reconductoring work unless precluded by terrain or safety issues. If helicopters cannot be used, crews will access towers using existing roads, and where access by truck is unavailable, only foot traffic will be allowed.</p> <p>This APM applies to San Bruno Mountain.</p>
APM-58	<p>All access and construction vehicle parking will be restricted to existing roads. Necessary vehicles belonging to the biological monitors and construction supervisors will be parked at the nearest point on existing access roads.</p> <p>This APM applies to San Bruno Mountain.</p>

Table B-5 (Continued)
Applicant Proposed Measures (APM)

Applicant Measure	Text
APM-59	<p>All vehicles will be brought in clean and free of weeds. Vehicles will be thoroughly washed, including under the chassis, prior to entering San Bruno Mountain.</p> <p>This APM applies to San Bruno Mountain.</p>
APM-60	<p>A qualified biological monitor will train all project staff before the start of construction regarding habitat sensitivity, identification of species of concern, and required practices within the habitat area. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will affix a small sticker to their hardhat and sign a form stating that they attended the training and understand all of the conservation and mitigation measures.</p> <p>This APM applies to the entire project site.</p>
APM-61	<p>A qualified biologist will monitor all construction activity. The monitor will have the authority, if the job site foreman or other PG&E authority on site deems it safe, to stop and/or redirect project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project. Because any work involving high-voltage transmission lines has implications for human safety, health, and property, the decision of the PG&E job foreman will take precedence. Note that it would be unsafe to stop the job during some activities, especially when the conductors are moving.</p> <p>This APM applies to the entire project site.</p>
Cultural Resources	
APM-62	<p>Prior to the initiation or construction or ground-disturbing activities, PG&E will train all construction personnel to understand the potential for exposing subsurface cultural resources and to recognize possible buried cultural resources. Training shall inform all construction personnel of the anticipated procedures that will be followed upon the discovery or suspected discovery of archaeological materials, including Native American remains and their treatment.</p> <p>This APM applies to the entire project site.</p>
APM-63	<p>Upon discovery of possible buried cultural materials (including potential Native American skeletal remains), work in the immediate area of the find shall be halted and PG&E's archaeologist notified. Once the find has been identified and evaluated, PG&E's archaeologist will make the necessary plans for treatment of the find(s) and mitigation of impacts if the finds are found to be significant according to California Environmental Quality Act (CEQA). State law shall be followed in the event of the exposure of Native American skeletal remains.</p> <p>This APM applies to the entire project site.</p>
APM-64	<p>Prior to the initiation of construction or ground-disturbing activities, all construction personnel shall receive environmental training. The training will include discussion of the possibility of buried paleontological resources and the procedure to follow if paleontological resources are encountered. If buried paleontological materials are discovered in the project area:</p> <ul style="list-style-type: none">• work in the immediate area of the find will be halted,• an experienced paleontologist will be notified, and an experienced paleontologist will identify the find and make the necessary plans for treatment of the find. <p>This APM applies to the entire project site.</p>

higher frequencies: 500,000 Hz to 1,000,000,000 Hz. The information presented in this document is limited to the EMF from power lines at frequencies of 50 or 60 Hz.

Electric Fields. Electric fields from power lines are created whenever the lines are energized, with the strength of the field dependent directly on the voltage of the line creating it. Electric field strength is typically described in terms of kilovolts per meter (kV/m). Electric field strength attenuates rapidly as the distance from the source increases. Electric fields are shielded by most objects or materials such as trees or houses.

At reasonably close distances, electric fields of sufficient strength in the vicinity of power lines can cause the same phenomena as the static electricity experienced on a dry winter day, or with clothing just removed from a clothes dryer, and may result in electric discharges when touching long metal fences or large vehicles. An acknowledged potential impact to public health from electric transmission lines is the hazard of electric shock. Electric shocks from transmission lines are generally the result of accidental or unintentional contact by the public with the energized wires.

Magnetic Fields. Magnetic fields from power lines are created whenever current flows through power lines at any voltage. The strength of the field is directly dependent on the current in the line. Magnetic field strength is typically measured in milligauss (mG). Similar to electric fields, magnetic field strength attenuates rapidly with distance from the source. Unlike electric fields, magnetic fields are not easily shielded by objects or materials.

The nature of a magnetic field can be illustrated by considering a household appliance. When the appliance is energized by being plugged into an outlet but not turned on so no current would be flowing through it, an electric field will be generated around the cord and appliance, but no magnetic field will be present. If the appliance is switched on, the electric field will still be present and a magnetic field will be created. The electric field strength is directly related to the magnitude of the voltage from the outlet and the magnetic field strength is directly related to the magnitude of the current flowing in the cord and appliance.

EMF exists in the environment both naturally and as a result of human activities. The geomagnetic field of the earth ranges from 500 to 700 mG (Carstensen, 1987). In areas not immediately adjacent to transmission lines, EMF exists as a result of other electric power uses such as neighborhood distribution lines, household wiring, and electrical equipment or appliances. Public exposure to these fields is widespread and encompasses a very broad range of field intensities and durations. Research on ambient magnetic fields in homes and buildings in several western states found average magnetic field levels within rooms to be approximately 1 mG, while in the immediate area of appliances, the measured values ranged from 9 to 20 mG (Severson et al., 1988, Silva et al, 1988). Tables B-6 and B-7 indicate typical sources and levels of EMF exposure the general public experiences from appliances.

**Table B-6
Typical Electric Field Values for Appliances, at 12 Inches**

Appliance	Electric Field Strength (kV/m)
Electric blanket	0.25*
Broiler	0.13
Stereo	0.09
Refrigerator	0.06
Iron	0.06
Hand mixer	0.05
Phonograph	0.04
Coffee pot	0.03

* 1 to 10 kV/m next to blanket wires (Enertech, 1985).

**Table B-7
Magnetic Field from Household Appliances**

Appliance	Magnetic Field (mG)	
	12" Distant	Maximum
Electric range	3 to 30	100 to 1,200
Electric oven	2 to 25	10 to 50
Garbage	10 to 20	850 to 1,250
Refrigerator	0.3 to 3	4 to 15
Clothes washer	2 to 30	10 to 400
Clothes dryer	1 to 3	3 to 80
Coffee maker	0.8 to 1	15 to 250
Toaster	0.6 to 8	70 to 150
Crock pot	0.8 to 1	15 to 80
Iron	1 to 3	90 to 300
Can opener	35 to 250	10,000 to 20,000
Mixer	6 to 100	500 to 7,000
Blender, popper, processor	6 to 20	250 to 1,050
Vacuum cleaner	20 to 200	2,000 to 8,000
Portable heater	1 to 40	100 to 1,100
Fans / blowers	0.4 to 40	20 to 300
Hair dryer	1 to 70	60 to 20,000
Electric shaver	1 to 100	150 to 15,000
Color TV	9 to 20	150 to 500
Fluorescent fixture	2 to 40	140 to 2,000
Fluorescent desk lamp	6 to 20	400 to 3,500
Circular saws	10 to 250	2,000 to 10,000
Electric drill	25 to 35	4,000 to 8,000

Source: Gauger, 1985.

Public Health and EMF Studies. For more than 20 years, questions regarding the potential effects within the environment of EMF from power lines have been asked, and research has been conducted to provide some basis for response. Earlier studies focused primarily on interactions with the electric fields from power lines. In the late 1970s, the subject of magnetic field interactions began to receive additional public attention and research levels have increased.

A substantial amount of research investigating both electric and magnetic fields has been conducted over the past 15 years; however, much of the body of national and international research regarding EMF and public health risks remains contradictory or inconclusive.

Scientists have found that EMF can produce a number of biological effects (Carstensen, 1987). These range from slowed heart rates to changes in the rate at which the body produces various compounds. Some of these effects are apparently related to the electric field while others are thought to be due to the magnetic field. These effects have been difficult to determine and often are only detectable at field strengths well in excess of those to which the public is exposed from power lines or household wiring and appliances. Although it has been found that EMF causes biological effects, there is no scientific basis to conclude that any of these biological effects have negative implications for public health at the field levels associated with power lines.

Research related to EMF can be grouped into three general categories: cellular level studies, animal and human experiments, and epidemiological studies. These studies have provided mixed results; some studies show an apparent relationship between magnetic fields and health effects, while other similar studies do not.

Since 1979, public interest and concern specifically regarding magnetic fields from power lines has increased. This increase has generally been attributed to publication of the results of an epidemiological study (Wertheimer and Leeper, 1979), which observed an association between the wiring configuration of distribution power lines outside of homes in Denver and the incidence of childhood cancer. Following publication of the Wertheimer and Leeper study, more than 50 major epidemiological studies regarding EMF have been conducted.

Scientific Panel Reviews. Numerous panels of expert scientists have convened to review the data relevant to the question of whether exposure to power-frequency EMF is associated with adverse health effects. These evaluations have been conducted in order to advise governmental agencies or professional standard-setting groups. These panels of scientists first evaluate the available studies individually, not only to determine what specific information they can offer, but also in terms of their experimental design, methods of data collection, analysis, and suitability of the authors' conclusions to the nature and quality of the data presented. Subsequently, the individual studies, with their previously identified strengths and weaknesses, are evaluated collectively in an effort to identify whether there is a consistent pattern or trend in the data that would lead to a determination of possible or probable hazards to human health resulting from exposure to these fields.

These reviews include those prepared by international agencies such as the World Health Organization (WHO, 1984; 1987) and the international Non-Ionizing Radiation Committee of the International Radiation Protection Association (IRPA/INIRC, 1990), as well as governmental agencies of a number of countries, such as the U.S. Environmental Protection Agency (USEPA), the National Radiological Protection Board of the United Kingdom, and the French and Danish Ministries of Health.

All of these panels have concluded that the body of data, as large as it is, does not provide evidence to conclude that exposure to EMF of the magnitude expected during the operation of electric transmission lines causes cancer or otherwise constitutes a health hazard.

In May 1999, the National Institute of Environmental Health Sciences (NIEHS) submitted to Congress its report titled, *Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, containing mixed conclusions regarding EMF and health effects. The conclusions of this report state “using criteria developed by the International Agency for Research on Cancer, none of the Working Group considered the evidence strong enough to label ELF-EMF exposure as a known human carcinogen or probable human carcinogen. However, a majority of the members of this Working Group concluded that exposure to power-line frequency ELF-EMF is a possible carcinogen.” Congress has not taken any action following issuance of this report and further research is being conducted since this Working Group was unable to determine that EMF does result in any health effects.

Policies, Standards, and Regulations Regarding EMF. A number of counties, states, and local governments have adopted or considered regulations or policies related to EMF exposure. The reasons for these actions have been varied; in general, however, the actions can be attributed to addressing public reaction to and perception of EMF as opposed to responding to the findings of any specific scientific research. Following is a brief summary of activity in this area.

International Activity. The International Radiation Protection Association, in cooperation with the World Health Organization, has published recommended guidelines (INRC, 1998) for EMF exposures. For the general public, the limits are 4.2 kV/m for electric fields, and 830 mG for magnetic fields. Neither of these organizations has any governmental authority nor recognized jurisdiction to enforce these guidelines. However, because they were developed by a broad base of scientists, these guidelines have been given merit and are considered by utilities and regulators when reviewing EMF levels from electric power lines.

National Activity. Although the USEPA has conducted investigations into EMF related to power lines and health risks, no national standards have been established. The number of studies sponsored by the USEPA, the Electric Power Research Institute (EPRI), and other institutions has increased dramatically in the past few years. Several bills addressing EMF have been introduced at the congressional level and have provided funding for research; however, no bill has been enacted that would regulate EMF levels.

The 1999 NIEHS report to Congress suggested that the evidence supporting EMF exposure as a health hazard was insufficient to warrant aggressive regulatory actions. The report did suggest passive measures to educate the public and regulators on means aimed at reducing exposures. NIEHS also suggested that the power industry continue its practice of siting lines to reduce exposures and to explore ways to reduce the creation of magnetic fields around lines.

State Activity. Several states have adopted limits of electric field strength within transmission line right of way. Florida and New York are the only states that currently limit the intensity of magnetic fields from transmission lines. These regulations include limits within the right of way as well as at the edge of the right of way and cover a broad range of values. Table B-8 lists the states regulating EMF and their respective limits. The magnetic field limits were based on an objective of preventing field levels from increasing beyond levels currently experienced by the public and are not based upon any link between scientific data and health risks (Morgan, 1991).

**Table B-8
EMF Regulated Limits (by State)**

State	Electric Field (kV/m)	Magnetic Field (mG)	Location	Application
500 kV Lines	10		in right of way	Single Circuit
Florida (codified)	2	200	edge of right of way	Single Circuit
	2	250	edge of right of way	Double Circuit
230 kV Lines or less	8		in right of way	
Florida (codified)	2	150	edge of right of way	230 kV Lines or less
Minnesota	8		in right of way	> 200 kV
Montana (codified)	1		edge of right of way	> 69 kV
	7		in right of way	road crossings
New Jersey	3	under consideration	edge of right of way	Guideline for complaints
New York	1.6	200	edge of right of way	> 125 kV, > 1 mile
	7		in right of way	public roads
	11		in right of way	public roads
	11.8		in right of way	other terrain
North Dakota	9		in right of way	Informal
Oregon (codified)	9		in right of way	230 kV, 10 miles

Source: Public Utilities Commission of Texas.

Elsewhere in the United States, several agencies and municipalities have taken action regarding EMF policies. These actions have been varied and include requirements that the fields be considered in the siting of new facilities. The manner in which EMF is considered has taken several forms. In a few instances, a concept referred to as “prudent avoidance” has been adopted. Prudent avoidance, a concept proposed by Dr. Granger Morgan of Carnegie-Mellon University, is defined as “...limiting exposures which can be avoided with small investments of money and effort” (Morgan, 1991). Some municipalities or regulating agencies have proposed limitations on field strength, requirements for siting of lines away from residences and schools, and, in some instances, moratoria on the construction of new transmission lines. The origin of these individual actions has been varied, with some initiated by regulators at the time of new transmission line proposals within their community, and some by public grassroots efforts.

In 1991, CPUC initiated an investigation into EMF associated with electric power facilities. This investigation explored the approach to potential mitigation measures for reducing public health impacts and possible development of policies, procedures, or regulations. Following input from interested parties, the CPUC implemented a decision (93-11-03), which requires the use of low-cost or no-cost mitigation measures for electric facilities requiring certification under General Order 131.

CPUC Decision 93-11-013 created the California EMF Program to research and provide education and technical assistance on the possible health effects of exposure to EMF from power lines and other uses of electricity. In addition to funding research and policy analysis on this issue, the EMF Program provides education and technical assistance to government agencies, professional organizations, businesses, and members of the general public. Under the CPUC decision, this program is funded by money provided by the state's investor-owned utilities and is based in the State Department of Health Services (DHS). The California EMF Program produces periodic reports to the CPUC, and its goal is to make the research, policy analysis, and educational products useful to the CPUC in future decision-making.

In response to CPUC decision 93-11-013, PG&E implemented Transmission Line EMF Design Guidelines, which PG&E has implemented for past projects. This decision also implemented a number of EMF measurement, research, and education programs. The CPUC did not adopt any specific limits or regulations on EMF levels related to electric power facilities.⁹
Surrounding Land Uses and Setting:

The existing 60 kV power line is located within an approximately 140-foot-wide existing transmission line right of way for its entire approximately 12-mile length. The line travels primarily through urban, built-out commercial, and industrial areas over the southern half of the route, and county parklands, open space, and residential areas over the northern half. It spans sensitive wetland or habitat areas between the San Mateo and Millbrae substations (in the West of Bayshore parcel) and on San Bruno Mountain. Table B-1 above provides detail on the existing land uses in the project vicinity.

9. Surrounding Land Uses and Setting:

The existing 60 kV power line is located within an approximately 140-foot-wide existing transmission line right of way for its entire approximately 12-mile length. The line travels primarily through urban, built-out commercial, and industrial areas over the southern half of the route, and county parklands, open space, and residential areas over the northern half. It spans sensitive wetland or habitat areas between the San Mateo and Millbrae substations (in the West of Bayshore parcel) and on San Bruno Mountain. Table B-1 above provides detail on the existing land uses in the project vicinity.

10. Other Public Agencies Whose Approval is Required:

In addition to the Permit to Construct required by the CPUC, PG&E would likely be required to obtain permits and/or approvals from other federal, state, and local agencies. Table B-9 below lists the potential permits and approvals required for project construction. In determining some permit requirements, PG&E corresponded with the Native American Heritage Commission, the US Army Corps of Engineers, the California Department of Fish and Game, and the US Fish and Wildlife Service. The agency correspondence is attached as Appendix G.

**Table B-9
Potential Permit Requirements**

Regulatory Authority	Agency	Jurisdiction/Purpose
Federal		
Section 404 Nationwide Permit	U.S. Army Corps of Engineers (ACOE)	Work in “Waters of the United States,” including wetlands
Section 7 consultation (through ACOE review process); Biological Opinion	U.S. Fish and Wildlife Service	Potential to affect threatened and endangered species (federal)
Air traffic	Federal Aviation Administration	Permission to fly in the San Francisco International Airport zone for tower work
Section 106 review (through ACOE review process)	Advisory Council on Historic Preservation	Potential to affect cultural resources
State		
Permit to Construct/Notice of Exempt Construction	California Public Utilities Commission	Overall project approval and California Environmental Quality Act review, if required
Section 401 Water Quality Certification	California Regional Water Quality Control Board	Consistency with state water quality standards
Endangered species consultation; Take Avoidance Agreement	California Department of Fish and Game	Potential to affect protected species (state)
Master Permit—amend the annual list of projects	Bay Conservation and Development Commission	Crossing waters of the San Francisco Bay subject to tidal action

Table B-9
Potential Permit Requirements

Regulatory Authority	Agency	Jurisdiction/Purpose
Railroad Encroachment Permit	Caltrain	Temporary encroachment on railroad right-of-way as part of site and tension site for Tower 8/66
Encroachment Permit	California Department of Transportation	Temporary encroachment on Interstate 380 right-of-way under interchange in two locations for use as pull or tension site (Towers 6/52 and 6/53)
Road Encroachment Permit	California Department of Transportation	Overhead crossings of US 101 in three locations
Local		
Encroachment Permit	Bay Area Rapid Transit (BART)	Overhead crossing of tracks near Towers 5/43 and 5/44
Site Activity Permit	San Mateo County	Construction on San Bruno Mountain in Habitat Conservation Plan area
Encroachment Permit	City of San Mateo	Encroachment on city streets for temporary guard structures or flaggers
Encroachment Permit	Burlingame	Encroachment on city streets for temporary guard structures and encroachment in Nerli Lane for pull site
Grading Permit	Burlingame	Construction of control building and substation modifications
Building Permit	Burlingame	Construction of replacement control building
Encroachment Permit	Millbrae	Encroachment on city streets for temporary guard structures or flaggers
Encroachment Permit	San Bruno	Encroachment on city streets for temporary guard structures or flaggers
Encroachment Permit	South San Francisco	Encroachment on city streets for temporary guard structures or flaggers
Encroachment Permit	Brisbane	Encroachment on city streets for temporary guard structures or flaggers
Grading Permit	Brisbane	Substation modifications

Source: PG&E, 2002.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- | | | |
|--|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agricultural Resources | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology / Soils |
| <input type="checkbox"/> Hazards and Hazardous Materials | <input type="checkbox"/> Hydrology / Water Quality | <input type="checkbox"/> Land Use / Planning |
| <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Population / Housing |
| <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation / Traffic |
| <input type="checkbox"/> Utilities / Service Systems | <input type="checkbox"/> Mandatory Findings of Significance | |

ENVIRONMENTAL DETERMINATION

On the basis of this initial evaluation:

I find that the Proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the applicant. A MITIGATED NEGATIVE DECLARATION will be prepared.

I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.

I find that the Proposed Project MAY have a "potentially significant impact" or "potentially significant impact unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An EIR is required, but it must analyze only the effects that remain to be addressed.

I find that although the Proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

Rob Feraru, Manager
Analysis Branch, Energy Division
California Public Utilities Commission

Date

EVALUATION OF ENVIRONMENTAL IMPACTS

Introduction

This Initial Study includes analyses of the 16 environmental issue areas listed below per section number. These issue areas incorporate the topics presented in CEQA's Environmental Checklist (identified in Appendix G to CEQA Guidelines).

B-1	Aesthetics	B-9	Land Use/Planning
B-2	Agricultural Resources	B-10	Mineral Resources
B-3	Air Quality	B-11	Noise
B-4	Biological Resources	B-12	Population/Housing
B-5	Cultural Resources	B-13	Public Services
B-6	Geology/Soils	B-14	Recreation
B-7	Hazards and Hazardous Materials	B-15	Transportation/Traffic
B-8	Hydrology/Water Quality	B-16	Utilities/Service Systems

Explanations for the checklist findings, as well as existing conditions are provided for each environmental issue area.