1 PROJECT DESCRIPTION

1.1 PROJECT OVERVIEW

Pacific Gas and Electric Company (PGandE) proposes to construct and operate a three-bank, 230/21 kilovolt (kV) distribution substati on and related facilities, known as the Delta 21 kV Distribution Planning Area (DPA) Capacity Increase Substation Project (Delta Substation project or project). The project is needed to relieve the electric system deficiency projected to occur in eastern Contra Costa County (County) and ensure safe and reliable electric service to existing and approved development in the eastern part of the County. The project area includes southern Antioch, Brentwood, Oakley, and portions of rural eastern Contra Costa County (see Figure 1-1). Table 1-1 lists existing and proposed developments that would be served by the new project.

The project consists of:

- installing a new, three-bank 230/21 kV distribution substation,
- replacing an existing transmission line tower with a new tower and installing a second tower with loop circuits approximately 600 feet in length to connect the substation to an existing 230 kV transmission line,
- installing six to nine distribution circuits (ultimate build-out)[1], and
- constructing a steel-reinforced concrete bridge and temporary asphalt access road to the substation.

Section 1.5 Project Facilities provides a complete description of the project and the permanent facilities to be constructed.

1.2 PROJECT LOCATION AND REGIONAL CONTEXT

The project is located in Contra Costa County, within the city limits of the City of Antioch (see Figure 1-1). The site of the proposed substation is a generally flat, 5.1-acre parcel of currently rural land owned in fee by PGandE, at the base of a hill, located approximately 1 mile south of the intersection of Lone Tree Way and Hillcrest Avenue and approximately 0.4 mile west of the intersection of Heidorn Ranch Road and Sand Creek Road. Due north of the project area, Sand Creek generally meanders in an east-west direction. At its closest, Sand Creek is approximately 250 feet from the substation site and is crossed by the proposed access road.

1 Although these distribution lines do not require formal approval from the California Public Utilities Commission (CPUC) under General Order 131-D, they are included in the project description to assist the Commission with its environmental review of this application under the California Environmental Quality Act (CEQA).

Figure 1-1: Project Overview Map

[INSERT 1-PAGE, 8.5 x 11 B&W PROJECT OVERVIEW MAP]

Table 1-1: Residential and Commercial Development

Project Name	Type of Development	Description (commercial, subdivision, etc.)	Status[1] Anticipated Construction Schedule
City of Antioch			
Bixbie Companies Development	Residential	217 homes	A
Nelson Ranch Development	Residential	415 homes	Project being processed
Sand Hill Properties Development	Residential	201 homes	INA
Sand Creek Ranch	Residential	211 homes	Project being processed
Sand Creek Active Adult Community	Residential	1500 units	INA
Hidden Glen Development	Residential	284 homes	Project being processed
Davidon Homes	Residential	562 homes	Project being processed
Rivergate Development	Residential	487 homes	U
Kaiser Permanente Antioch Medical Center	Medical Center and Hospital	78 acres (including 340,000 square feet of hospital space and 230,000 square feet of medical office space)	U
Empire Shopping Center	Commercial	13 acres	U
Lowe's Store (South Antioch)	Commercial	13 acres	U
Williamson Ranch Shopping Center	Commercial	3.1 acres	U
Lone Tree Business Center	Commercial	45 acres	A
Country Hills Office Center	Commercial	Multiple Projects (e.g., Commercial and College)	Projects in Various Stages: - Silicon Valley College; A - Commercial Development adjacent to Lone Tree; Project being Processed - Development at Country Hill/Deer Valley; application not yet received

Project Name	Type of Development	Description (commercial, subdivision, etc.)	Status[1] Anticipated Construction Schedule
Other future parcels along Lone Tree Corridor	Commercial	Commercial	Projects in Various Stages: – Mini-mall on eastside of Lone Tree Golf Course Road; U – Retail Development at corner of Lone Tree/Dallas Ranch; A
City of Oakley			
Kaufman & Broad—Western Pacific Development (Cyprus Grove Project)	Residential	660 homes	U
Bacchini Development (Ponderosa Homes)	Residential	176 homes	Project being processed
Magnolia Park	Residential	396 homes	Project being processed
Ryder Homes Development	Residential	356 homes	U
Stonewood 1 Development	Residential	245 homes	U
Rural East Contra Costa County—Discovery Bay and Bethel Island			
Hunters Cove Now called Ravenswood (Discovery Bay)	Residential	203 homes	U
Discovery Bay West (Discovery Bay)	Residential	2,000 homes	U
Cypress Lakes Development Now called SummerLake (Bethel Island)	Residential	1,330 homes	U
City of Brentwood			
Castello Property	Residential	116 homes	Project being processed
Rose Garden Development	Residential	511 homes	U
Rose Garden 2 Development	Residential	256 homes	U

Project Name	Type of Development	Description (commercial, subdivision, etc.)	Status[1] Anticipated Construction Schedule
Pulte Summerset IV Development	Residential	249 homes	U
Shea Homes Brentwood Hills Development	Residential	278 homes	U
Suncal Deer Ridge Development	Residential	1,031 homes	U
Meritage Homes Sterling Pinnacle Development	Residential	220 homes	U
Pinn Brothers Marseilles Development	Residential	579 homes	A
Braddock & Logan S & S Farms Development	Residential	311 homes	U
Blackhawk-Nunn Vineyards Development	Residential	2,000 homes	U
Bridle Gate Seeno Homes Development	Residential	221 homes	A
Brighton Station	Residential	199 homes	U
John Muir Medical Campus (Brentwood Medical Center)	Commercial	39.44 acres	U
CP Management Sand Creek Center	Commercial	14.91 acres	U
Arcadia Development (Lone Tree Plaza)	Commercial	71.86 acres	U
Balfour Center	Commercial	2.3 acres	Project being processed
Tri-City Plaza/Lucia Albers Commercial Center	Commercial	5.1 acres	A
Signature Properties Garin Commercial	Commercial	13 acres; 120 lots	U
Ray Williams Development	Commercial	2 acres; 3,000 sq. feet	A
Brentwood Commercial Center	Commercial	2.2 acres	Project being processed
Harvest Commerce Center	Commercial	4.88 acres; 58,233 sq. feet	A

Project Name	Type of Development	Description (commercial, subdivision, etc.)	Status[1] Anticipated Construction Schedule
Brockman Engineering Sunset Industrial	Commercial	2.5 acres	U
Jeff Tamayo Sunset Industrial	Commercial	3 acres	U
Best Western Motel	Commercial	0.92 acre; 28,260 sq. feet	U
CP Management Microtel Inn & Suites	Commercial	1.1 acres	A
In-Shape Health Club	Commercial	2.45 acres	U
Guthrie Commercial Complex, Phase 2	Commercial	4.34 acres; 19,984 sq. feet	A
Buzz Walker California Family Fitness	Commercial	10 acres	A
Brentwood Ready Mix	Commercial	4 acres; 60,000 sq. feet	A
Acorn Mini-Storage	Commercial	8.43 acres	U
Brentwood Medical Partners Office Building	Commercial	3.7 acres; 52,000 sq. feet	A
Lone Tree Center surrounding the Winco Food Store	Commercial	25.34 acres	U
Brentwood Police Station	Commercial	Empty building that was renovated. No major construction.	Not applicable—no new building
Brentwood Commercial Center	Commercial	2.2 acres	A
Other future parcels along the Highway 4 Bypass Corridor	Commercial		

[1]Status:
A Approved
U Under Construction
INA Information Not Available

While the project site and surrounding parcels are in open space with some agricultural use, the City of Antioch is currently proposing that the site be designated as Public/Quasi Public, which is consistent with use of the site for a substation. The parcel is located within the Sand Creek Focus Area, which is part of the Future Urbanization Area (FUA) #1. The lands north of the parcel are proposed as Low-Density Residential and Business Park. The lands to the south are proposed as Estate and Executive Residential, and Open Space. The lands to the east are proposed as Open Space and Senior Housing. The southwestern corner of the site is approximately 250 feet east of the Contra Costa to Cayetano 230 kV circuit, where the new substation will interconnect to the ISO controlled transmission grid. Figure 1-2 depicts current land uses and the boundaries of the 5.1-acre parcel. Detailed information on land use and the status of FUA #1 is provided in Chapter 11: Land Use, Recreation, and Agricultural Resources.

1.3 EXISTING REGIONAL ELECTRIC SYSTEM

1.3.1 Background

An electric power system typically consists of power plants, transmission substations, distribution substations, and overhead or underground electric lines. Power is delivered from the generating plants to customers through wires and cables, but the power is converted to higher and lower voltages several times for different purposes.

At the generating plants, the electric power is stepped up to a higher voltage, known as the transmission voltage. Stepping up to a higher voltage reduces the amount of current that flows through the wires, thereby allowing power to be delivered from generating plants to major load centers with fewer wires. Once the power has been delivered to the major load centers, it is stepped down to a voltage level suitable for delivery to individual customers.

Transmission and distribution substations are used to step up or step down the voltage and to route the power over the transmission and distribution lines. In the PGandE transmission system, power is transmitted at 500 kV, 230 kV, 115 kV, 70 kV, and 60 kV.

In the eastern Contra Costa County area, electric power is transmitted to regional substations at voltages of 230 kV, 115 kV, and 60 kV. The power is then distributed to customers using overhead or underground distribution lines at voltages of 21 kV, 12 kV, and 4 kV. The local delivery system voltage is further stepped down for individual customer use.

1.3.2 Transmission System

PGandE's existing regional transmission system is summarized in Table 1-2. Transmission systems that serve and/or cross the Delta 21 kV DPA are included.

1.3.3 Distribution System

The electric distribution system in the Delta 21 kV DPA is comprised of 21 kV distribution circuits, with a 4 kV distribution feeder supplied from a small 21/4 kV step-down unit substation. PGandE's distribution planning criteria call for placing substations in suburban areas

approximately four miles from each other in order to create back ties and support for adjacent substation outages (PGandE, DCS Guideline D-G0069, 1999).

1.3.3.1 21 kV System

Three major substations supply the existing 21 kV distribution system: Brentwood, Contra Costa, and Kirker. These substations and an approximate four-mile radius, as defined by PGandE's distribution planning criteria, are located on Figure 1-3. The Contra Costa and Kirker substations are presently built out to maximum capacity. Brentwood Substation is already planned for maximum capacity build out in 2006. The existing substations are, therefore, not able to pick up additional load as demand in the DPA increases.

1.3.3.1.1 Brentwood Substation

The Brentwood Substation is located southeast of central Brentwood on Sellers Avenue between Balfour Road and Highway 4. The substation serves customers in Brentwood, Oakley, and unincorporated areas of Contra Costa County, including Byron, Knightsen, and Discovery Bay. The substation consists of two 230/21 kV transformer banks.The Contra Costa to Brentwood 230 kV circuit supplies the Brentwood Substation. A third 230/21 kV bank and one 21 kV circuit are planned at the Brentwood Substation in 2005. An additional 21 kV circuit on the new bank is planned for 2006. With the addition of the third bank and two circuits the substation will be built out to its designed capacity.

1.3.3.1.2 Contra Costa Substation

The Contra Costa Substation is located off Wilbur Avenue north of Highway 4 in the City of Antioch and serves customers in Antioch, Brentwood, and Oakley. The substation has two 230/21 kV banks, and one 115/21 kV bank. The Lambie Switching Station to Contra Costa 230 kV circuit supplies the Contra Costa Substation. There is no room to install additional banks or circuits at this substation.

1.3.3.1.3 Kirker Substation

Kirker Substation, located off Power Avenue west of Railroad Avenue in Pittsburg, serves customers in the cities of Antioch, Bay Point, and Pittsburg. It is supplied by the Pittsburg-Kirker-POSCO 115 kV circuit. The substation currently consists of two 115/21 kV banks, and one 115/21 kV bank. There is no room to install additional banks or circuits at this substation.

1.3.3.2 4 kV System

The 4 kV system contains one unit substation (Whitney Substation), supplied by the Kirker 2106 distribution line. A unit substation includes small, self-contained banks that transform voltage from one primary voltage (most typically 21 kV or 12 kV) to a lower primary voltage (generally 4 kV) in a small, fenced yard with minimal additional facilities. Unit substations usually serve older residential areas where conversion of the primary voltage to one of the standard higher voltages in the surrounding area has not taken place.

Figure 1-2: Proposed Site C Aerial Map

[INSERT 1-PAGE, 8.5 x 11 COLOR PROJECT LOCATION AERIAL MAP]

[BACK PAGE OF 1-PAGE COLOR FIGURE]

Table 1-2: Regional Transmission System

Circuits	Origin	Location Within Delta Distribution Planning Area (DPA)	Service
500 kV System			
Vaca Dixon – Tesla Table Mountain – Tesla	Pacific Intertie	Cross eastern edge of DPA	Do not directly serve load in Delta DPA Play a major role in the flow of power involving the Western Electric Coordinating Council transmission grid
230 kV System			
Contra Costa – Las Positas Contra Costa – Cayetano Contra Costa – Moraga #1 Contra Costa – Moraga #2 Contra Costa – Delta Switching Yard Peabody – Contra Costa Sub	Contra Costa Switchyard	Cross through middle of DPA	Deliver power to various area load centers out of the Delta DPA
Contra Costa – Brentwood Lambie Switching Station – Contra Costa Sub Contra Costa Power Plant – Contra Costa Sub	Contra Costa Switchyard	Cross through middle of DPA	Deliver power to the Delta DPA via Brentwood and Contra Costa substations

Circuits	Origin	Location Within Delta Distribution Planning Area (DPA)	Service
Pittsburg – Tesla #1 Pittsburg – Tesla #2 Pittsburg – Tidewater Pittsburg – Sobrante #2 Pittsburg – San Mateo Pittsburg – East Shore Pittsburg – Tassajara Pittsburg – San Ramon	Pittsburg Switchyard	Cross western edge of DPA	Delivers power to various area load centers out of the Delta DPA
115 kV System			
Pittsburg – Columbia Steel Pittsburg – Kirker – POSCO Pittsburg – Clayton #1 Pittsburg – Clayton #3 Pittsburg – Martinez #1 Pittsburg – Martinez #2		Cross through DPA	Serves various stations along their lengths and stations outside of the Delta DPA Generally serve industrial, commercial, and residential load in the Delta DPA
60 kV System			
Contra Costa – Pittsburg Contra Costa – Balfour Willow Pass – Contra Costa		Cross through DPA	Serves various stations along their lengths, and stations outside of the Delta DPA Generally serve industrial, commercial, and residential load in the Delta DPA

Figure 1-3: 4-Mile Substation Radius Map

[INSERT 1-PAGE, 8.5 x 11 COLOR FOUR-MILE SUBSTATION RADIUS MAP]

[BACK PAGE OF 1-PAGE COLOR FIGURE]

1.3.3.3 Adjacent Distribution Planning Areas

In suburban areas, the electric distribution system forms a highly interconnected network with relatively few natural boundaries. It is often true that adjacent suburban DPAs are highly connected (with open switches between them), and that load near a DPA boundary occasionally is transferred from one DPA to another. Transfers are most common across connected boundaries between high-growth DPAs. The Delta 21 kV DPA is adjacent to five DPAs, as noted below:

- The Concord 21 kV DPA lies immediately west of the Delta 21 kV DPA and includes 21 kV substations at Clayton, Tidewater, Fairview, Lakewood, and Meadow Lane. Load transfers between the Concord 21 kV DPA and the Delta 21 kV DPA have been uncommon due to bank and circuit-loading restrictions in both DPAs, and because there are few circuit ties between the DPAs.

- The Willow Pass–Clayton 12 kV DPA is a very small DPA that lies beyond the west end of the Delta 21 kV DPA. It is supplied by two small 12 kV banks at two substations far away from the Delta 21 kV DPA load growth center. The Willow Pass – Clayton 12 kV DPA is too small to facilitate sufficient load transfers to the Delta 21 kV DPA.

- The Grand Island 21 kV DPA lies immediately north across the San Joaquin River in PGandE's Sacramento Division and consists of one substation, Grand Island, with two 115/21 kV banks with five 21 kV circuits. There is only one weak circuit tie to the Delta 21 kV DPA across the Antioch Bridge. The Grand Island 21 kV DPA is too small to facilitate sufficient load transfers to the Delta 21 kV DPA.

- The Tracy 12 kV DPA lies southeast of Byron in PGandE's Stockton Division and consists of four substations (Banta, Carbona, Herdlyn, and Tracy). The closest substation in the DPA, Herdlyn Substation, is 8.5 miles southeast of the Brentwood Substation, far from the center of load growth. There is one tie between Herdlyn and the Delta 21 kV DPA, along the Byron Highway. The Tracy 12 kV DPA is too small to facilitate sufficient load transfers to the Delta 21 kV DPA.

- The Middle River 12 kV DPA is on Jones Tract east across Old River in PGandE's Stockton Division and consists of one substation, Middle River, with a small, 60/12 kV transformer and three 12 kV circuits. Middle River Substation is approximately 5 miles east of the Diablo Division boundary, far to the east of the center of load growth. The Middle River 12 kV DPA is too small to facilitate sufficient load transfers to the Delta DPA.

1.3.3.4 Other Substations

Four existing substations are in the project vicinity:

- The Antioch 4 kV Substation in downtown Antioch consists of one 60/4 kV bank with four 4 kV circuits. There are no ties to the Delta 21 kV system.

- The Pittsburg 4 kV Substation in Pittsburg consists of one 60/4 kV bank with two 4 kV circuits. There are two ties with the Whitney 4 kV system, which is served from the Kirker 2106 distribution line.

- The Balfour 12 kV Substation at Balfour Road and Sellers Avenue in Brentwood consists of one 60/12 kV bank and one 12 kV circuit. There is a 21/12 kV autobank between Balfour Substation and the Brentwood 2112 circuit, which is used as an emergency backtie.

- The Marsh 4 kV Substation on Concord Avenue in the City of Brentwood serves only a PGandE gas facility and consists of one 60/4 kV bank. This substation currently feeds only the control building in the station. There are no distribution feeders.

1.4 PROJECT PURPOSE AND NEED

1.4.1 Project Objectives

The basic objectives of the Delta Substation project are as follows:

- **Meet Immediate Capacity Needs:** Provide the necessary electric distribution capacity to serve existing and new customers in the central portion of the Delta 21 kV DPA, including the new Kaiser Medical Center in Antioch, by the summer of 2007.

- **Meet Long-Term Capacity Needs:** Eliminate electric distribution capacity deficiencies expected to occur beyond 2007.

- **Locate New Substation To Reinforce Existing System:** Maximize system efficiency and increase future flexibility by constructing a new distribution substation within the limits of the DPA and approximately three to five miles from the existing distribution substations.

- **Locate New Substation Near Load Growth:** Minimize ratepayer costs and environmental impacts, and maximize system efficiency and reliability, by locating the new substation as close as possible to the center of the load growth so that feeder routes are as short as possible.

- **Locate New Substation on Undeveloped Site:** Minimize ratepayer costs by selecting a site for the new substation that avoids or minimizes the relocation of residences and businesses or the purchase of high-cost land.

Under California law, any routing alternative analyzed by the California Public Utilities Commission (CPUC) for this project must be capable of meeting these basic project objectives. (California Environmental Quality Act [CEQA] Guidelines, section 15126.6). Of course, CEQA does not call for an analysis of alternatives unless the proposed project will create significant unavoidable impacts. (CEQA Guidelines, sections 15126.6, subd. (a) and (f)(2)(A); see also Assigned Commissioner's Ruling dated October 16, 2002, A.01-07-004, p. 4 ["It is only if the initial study identifies potentially significant adverse impacts on the environment that cannot be mitigated that an environmental impact report will be prepared and alternatives considered."])

1.4.2 Project Need

The basis for PGandE's conclusion that the Delta Substation Project is needed is beyond the scope of this Permit to Construct (PTC) Application. As the CPUC has repeatedly acknowledged, "need" issues are beyond the scope of a PTC application. (See, for example, Assigned Commissioner's Ruling dated October 16, 2002, A.01-07-004, p. 5 ("the need for the project is outside the scope of this [Atlantic-Del Mar PTC] proceeding"); D.94-06-014, 55 CPUC 2d 87, 92 (PTC review "focuses solely on environmental concerns, unlike the CPCN process which considers the need for and economic cost of a proposed facility"); GO 131-D, Section IX.B.1.f ("an application for a permit to construct need not include . . .a detailed analysis of purpose and necessity").) Nonetheless, PGandE provides the following discussion of the purpose and need for the project for informational purposes.

The Delta 21 kV DPA has significant projected load growth due to major residential and commercial developments that are in various planning, approval, or construction stages. The electric demand in the DPA rapidly increased from 285.6 megawatts (MW) in 1995 to 373.7 MW by 2000, an average of more than 17 MW per year. Although load growth has abated somewhat since 2000, total electric demand in the Delta 21 kV DPA is projected to exceed 450 MW by 2010. Most of that growth is concentrated in the central portion of the DPA, where loads are projected to increase to 266.2 MW by 2007, exceeding available capacity by 3.8 MW. As a result of this load growth, PGandE forecasts that the ability of the electric system to safely and reliably serve the area will be exceeded by summer 2007 unless the new substation is built. See Section 1.4.3 for a further discussion of current capacity in the Delta 21 kV DPA.

Service interruptions can occur because of increased electric demand. As demand increases, powerline conductors and power transformers will reach and exceed their rated capacities. When the demand on the equipment exceeds its rated capacity, the equipment becomes overheated and can be damaged.[2] The electric system is designed with protective and control equipment to prevent this type of damage. Circuit breakers remove equipment from service during equipment failures or when pre-set design limits are reached. Removing equipment from service leads to power outages in the areas served by the affected powerlines and transformers.

The Delta Substation project proposes to meet the projected electric demand by constructing a new three-bank substation and new 21 kV distribution circuits. The project will relieve the electric system deficiency that is projected to occur in the Delta 21 kV DPA, and ensure the ability of the system to safely and reliably serve the area without interruptions or emergency conditions that would otherwise result from the deficiency. Because of limited capacity and physical space in existing distribution substations, a new distribution substation must be constructed from which to extend the necessary 21 kV distribution circuits.

[2] The electrical and mechanical properties of materials in the equipment will irreversibly degrade when the heat build-up exceeds design thresholds. For example, prolonged overheating of powerline conductors will cause the conductors to lose elasticity and eventually fail mechanically. The conductors can then drop to the ground and become a safety hazard. Likewise, when a power transformer becomes overheated, the insulating materials in the transformer are degraded and may not be capable of preventing permanent damage and equipment failure.

The proposed substation site is located centrally in the DPA and near the center of the load growth. Figure 1-3a shows the Site C Substation (proposed alternative) in relation to the Delta 21 kV DPA. The existing Contra Costa and Kirker substations are on the northern edge of the DPA and further west, far from the center of load growth. The existing Brentwood Substation will have no room for further capacity additions after the third bank and one 21 kV circuit is installed in 2005 and a second circuit for that bank is installed in 2006.

1.4.3 Area Load Growth

1.4.3.1 Residential and Commercial Development

The central portion of the Delta 21 kV DPA is continuing to experience significant load growth due to ongoing and planned future residential and commercial development. As shown in Table 1-2, more than 10,000 homes and approximately three-dozen commercial facilities including a 570,000 square foot medical center and hospital, are proposed for, or currently under, development.

1.4.3.2 Load Growth Projections

1.4.3.2.1 Traditional Load Forecasting

PGandE's traditional load forecasting model is based on a "least square" linear regression analysis in which PGandE determines the anticipated base future annual increase in peak load based on seven years of historical peak load data.[3] This load projection is then adjusted to reflect historic and future block loads and load transfers into or out of the DPA. These incremental block loads must also be built into the forecast, as appropriate. To qualify as a block-load addition to the linear regression-based load growth forecast, a single new business load must be greater than 1.5 percent of the area peak load and occur infrequently in the area.[4] Therefore, to qualify as a block load, a new business load must be more than 5 MW in the Delta 21 kV DPA. The Kaiser Permanente Medical Center that includes a 150-bed hospital (340,000 square feet) and medical office space (230,000 square feet), planned for completion in July 2007, is expected to add a block load of 7.3 MW in the City of Antioch. It is the only projected block load in the Delta 21 kV DPA.

1.4.3.2.2 Voluntary Reduction

PGandE uses a program of voluntary reduction in electricity use, known as Customer Energy Efficiency (CEE). PGandE has had an active CEE program over the past two decades. Its cumulative reduction of use has been substantial. For any given planning area, the historical CEE energy and peak demand impacts have been subsumed within the peak load demands experienced year by year and thus, their impacts are included in the forecast of peak growth. The Delta 21 kV DPA has an active CEE program.

[3] Least square, or multi-variable, linear regression is a method of approximating a general trend without matching individual data points. The regression is a "best fit" straight line though a set of known data points; it can be used to project the trend into the future.

[4] Criteria according to PGandE's Guide for Planning Area Distribution Facilities (UO Guideline G12004).

Figure 1-3a: Delta 21 kV Distribution Planning Area Location Map

[INSERT COLOR FIGURE]

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1.4.3.3 Recent Load Trends and Projections

In 2001, PGandE experienced greatly reduced peak loads across its entire system, including the Delta 21 kV DPA. Those reductions in peak demand were a result of a number of factors, including:

- a general economic slowdown across the nation;
- a downturn in high-tech industries, particularly in the San Francisco Bay Area;
- the impact of rising retail electric rates resulting from the hugely increased cost of purchasing power, and perhaps even more importantly, the expectation of further increases;
- a strong conservation message from the utilities, regulators, and the State of California, reinforced by PGandE's California 20/20 Rebate Program[5] and by mandatory rotating outages in the early summer; and
- a mild summer with only one brief hot spell between a weekend and the July 4 holiday.

In 2002 and 2003, the Delta 21 kV DPA loads rebounded significantly from the 2001 lows, but remained below pre-2001 projections. In 2004, the Delta 21 kV DPA loads again dropped, while loads in the central portion remained essentially flat compared to the prior year. It appears that the summer of 2004 was one of the mildest experienced in years, and that most of the warmer days occurred on weekends when demands are typically lower than on weekdays. Since air conditioning contributes significantly to peak load in the area, peak demand would have been higher had the temperature been hotter, as is typical in the area. Only two hot spells occurred in summer 2004; however, this service territory normally experiences five to seven hot spells each summer.

The Delta 21 kV DPA consists of two distinct areas, different in many respects. The western portion, including Pittsburg, Bay Point, and a portion of Antioch (mainly the older portion), is made up of older residential communities with a fairly high proportion of industrial loads, modest load growth, and a climate with milder temperatures due to the proximity of the Sacramento River. The proposed project serves the remainder of the DPA, including the rest of Antioch and the cities of Brentwood and Oakley, and large portions of unincorporated Contra Costa County. This portion usually has higher summer temperatures, is characterized by a significant number of recently built homes and associated commercial development, and has a very high growth rate. Residential development in the central area of the DPA, unlike much of the state, has hardly slowed with the economic downturn.

[5] The California 20/20 Rebate Program established a limited term "Rate Reward" energy conservation program funded by the Department of Water Resources. The rate reward (credit) was based on a 20 percent reduction in the average daily usage amount on a monthly basis for each of the four billing periods beginning in June, July, August, and September of 2001, compared to the corresponding billing periods from the summer of 2000.

PGandE's Delta 21 kV DPA historic peak loads and load projections are presented graphically in Figure 1-4. The peak load in the Delta 21 kV DPA increased by 88.1 MW between 1995 and 2000, an average of more than 17 MW per year. Based on a linear regression of the peak demands over the past seven years, peak demand in the entire Delta 21 kV DPA is projected to increase by an average of only 8.4 MW per year from 2005 to 2010. However, the projection for the central portion of the DPA, also based on seven years of historical peak loads, indicates expected load increases of 11.4 MW per year. The capacity of the central portion of the DPA is 224.4 MW, which is the total of the capacities of the two banks at Brentwood Substation plus the capacities of the seven feeders from Contra Costa Substation. Peak loads in 2004 were 225.1 MW in the central portion of the DPA. Although capacity in this area will increase to 262.4 MW with the addition of a third bank and two 21 kV circuits at Brentwood Substation, the load in the central portion of the DPA is projected to be 266.2 MW by 2007, exceeding the total capacity by approximately 3.8 MW. Preliminary data from summer 2005 indicates significantly higher loads than projected; final data will be available in fall 2005.

PGandE updates all load forecasts every year. In the event that an update for the Delta 21 kV DPA, or for the central portion of the DPA, indicates that the load growth is different than forecast, the project would be timed to match the faster or slower growth.

1.4.4 Electric System Requirements

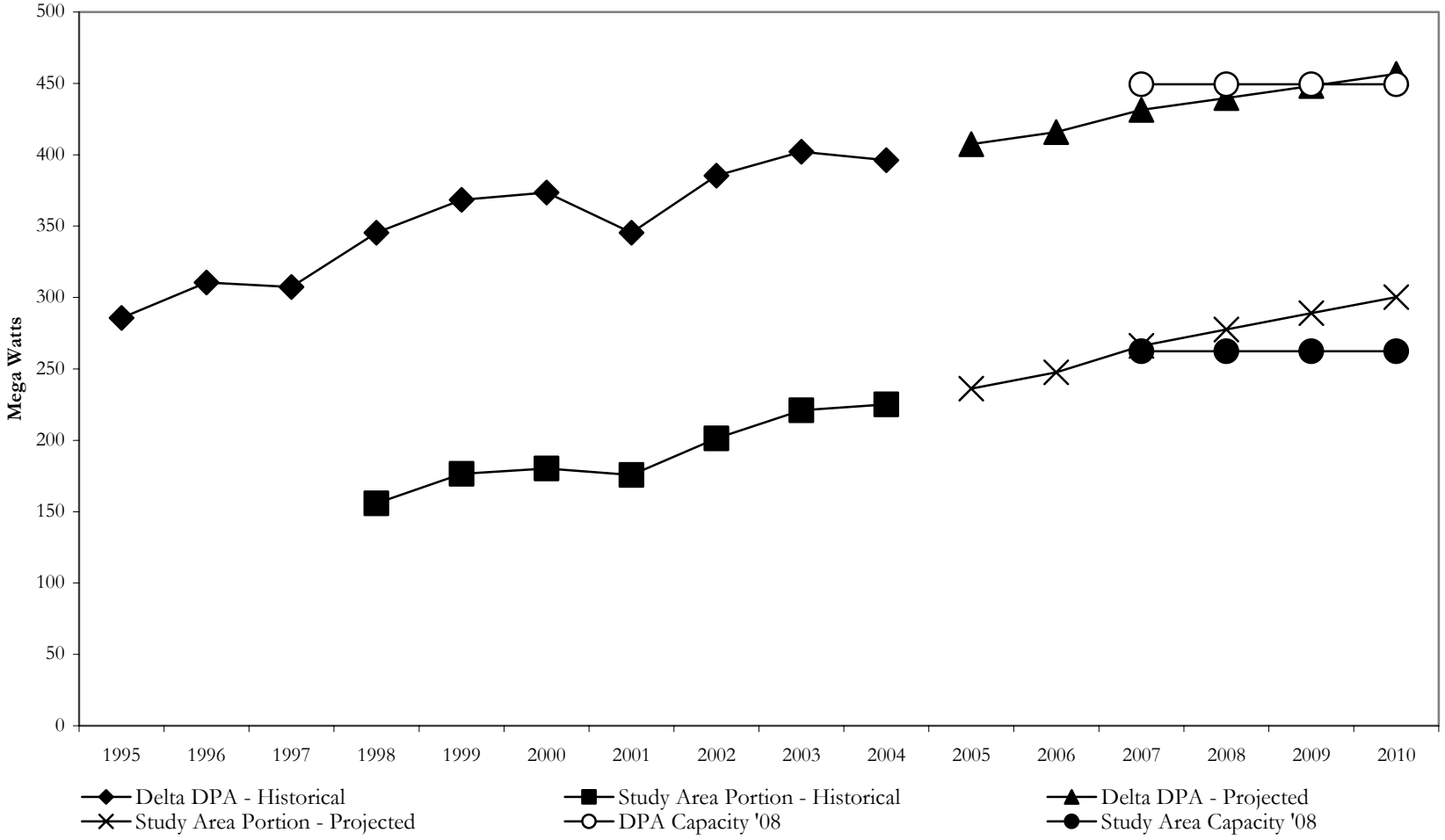
1.4.4.1 Distribution System Requirements

A new Brentwood Substation circuit in 2006 is the last available addition to PGandE's existing electrical 21 kV system in the DPA without the addition of a new substation. To meet the expected load growth and demand for electricity in the Delta 21 kV DPA, PGandE proposes construction of a new substation and a new 21 kV distribution circuit. The new distribution substation is required due to limited capacity and physical space in existing distribution substations. The new distribution substation will be close to the center of the most rapid load growth in the DPA.

Construction of the new substation and one new 21 kV circuit will eliminate the projected capacity deficiency in 2007. The new 21 kV substation circuit will provide the necessary distribution capacity to serve new and existing customers in the central portion of the Delta 21 kV DPA, including Kaiser Medical Center in Antioch. Construction of the new substation will allow for the installation of future additional transformer banks and 21 kV circuits, which will eliminate any distribution capacity deficiencies expected to occur in the years beyond 2007. Additional transformer banks and 21 kV circuits would be installed in the future as needed.

The ultimate distribution circuit arrangement at the new substation will be installation of six to nine 21 kV distribution circuits. Some of these circuits may be located in existing PGandE easements. The 21 kV distribution circuits will be a combination of overhead conductors on poles and underground cable in conduit.

Figure 1-4: Historical and Projected Loads



1.4.4.2 Transmission System Requirements

The increase in electric demand and the resulting need to build a new distribution substation in the Delta 21 kV DPA requires construction of a short, approximately 600-foot-long double-circuit interconnection to connect this substation to the existing transmission system.

The existing Contra Costa to Cayetano 230 kV circuit is near the project site. A short, 230 kV double-circuit interconnection will be required to loop the existing Contra Costa to Cayetano 230 kV circuit into the substation. One existing tower will be replaced and an additional structure will be added to carry the conductor into the substation.

1.5 PROJECT FACILITIES

PGandE proposes to construct and operate a substation (Site C Substation), including distribution circuit outlets, interconnection with the electrical supply grid, and an access road in the Delta 21 kV DPA. Major elements of the project, which are described in more detail in the following sections, include:

- installing a new, three-bank 230/21 kV distribution substation,
- replacing an existing tower located approximately 300 feet southwest of substation property with a new tower with loop arms (Tower 2),
- installing a new tower (Tower 1) adjacent to the substation with loop circuits approximately 600 feet long connecting to Towers 1 and 2,
- installing loop circuits approximately 600 feet long from Tower 1 to the dead-end structures located in the substation,
- installing six to nine distribution circuits (ultimate build-out) as a combination of overhead conductors and underground cable in conduit, and
- constructing a steel-reinforced concrete bridge and temporary asphalt access road to the substation from the ending of an existing road (Heidorn Ranch Road).

1.5.1 Site C Substation

Construction of the Site C Substation will require approximately 5.1 acres of temporary construction work area. The permanent footprint of the substation (walled-in area) will measure approximately 3.5 acres. A typical three-bank substation layout is provided as Figure 1-5 and a corresponding profile of a typical three-bank substation is provided as Figure 1-6.

Figure 1-5: Typical Three-Bank Substation Layout

[INSERT 1-PAGE, 8.5 x 11 B&W TYPICAL DIAGRAM]

Figure 1-6: Typical Three-Bank Substation Profile

[INSERT 1-PAGE, 8.5 x 11 B&W TYPICAL DIAGRAM]

The Site C Substation will require installation of steel bus support racks, high voltage breakers, power transformers, and switchgears. Major equipment to be installed includes:

- 230 kV bus structures for an initial ring bus connection and arranged for an ultimate configuration for three 230 kV transmission circuits and three 230/21 kV power transformers,
- six 230 kV circuit breakers (for switching and protecting three transmission lines and three 230/21 kV power transformers),
- three 230/21 kV power transformers,
- three 21 kV metal-clad switchgears,
- six to nine 21 kV distribution circuits, and
- one digital microwave communications equipment.

PGandE will install related electric equipment at the substation, including 230 kV disconnecting switches, electrical reactors, instrument transformers, protective relaying, metering and control equipment, remote supervisory control and data acquisition equipment, telemetering equipment, an auxiliary alternating current and direct current power system, an electric grounding system, and underground conduits or trench systems. The unmanned substation will have automated features and remote control capabilities.

The maximum height of the substation equipment will be approximately 50 feet for the dead-end structures that support the 230 kV looped lines and for the future dead-end structures that will support the connection from the ring bus to the required 230 kV line and 230/21 kV power transformer for the ultimate configuration. Each of the three 21 kV switchgears is furnished with an outdoor enclosure for weather protection. The initial 21 kV switchgear enclosure will be approximately 67 feet long, 18 feet deep, and 12 feet high. It will house the protection, instrumentation, and communication equipment, including the 21 kV circuit breakers for the initial distribution circuits. The other two 21 kV switchgear enclosures are for future installation and each is approximately 44 feet long, 17 feet deep, and 12 feet high. The switchgear enclosure will be covered in steel sheeting with a sloped roof. This structure and all the equipment in the substation will be neutral gray in color. All structures will be painted or finished with a non-reflective treatment. For security purposes, an 8-foot-tall, pre-cast wall will enclose the substation. An earth tone colored, decorative wall design and landscaping plan will be submitted for review and approval by the appropriate local jurisdiction. Both the wall and landscaping will be appropriate for future adjacent land uses.

This project requires installation of a high-speed line current relay package to ensure protection of personnel, equipment, and coordination with adjacent transmission lines. Line current differential protection relays require a high quality communications path to operate properly. To achieve this, a digital microwave will be installed, consisting of an approximately 40-foot-tall steel pole with a 6-foot-diameter microwave dish set on top.

Security lighting for the substation will consist of sodium vapor lamps. Exterior lighting will include the use of non-glare light bulbs. Lighting fixtures will be located and designed to avoid casting light or glare toward off-site locations. The light poles will be approximately 10 feet high, hot-dipped, galvanized steel posts. These poles will be erected at each corner of the substation. Substation outdoor lighting will be controlled by photocell that will automatically turn on the lights at night and turn them off during the day. More information on the appearance of the substation and landscaping, including a simulation of the project, is included in Chapter 4: Aesthetics.

The substation will have three 45-MVA transformers with two to three distribution circuits per transformer. A single transformer will contain 12,200 gallons of mineral oil, for a total of 36,600 gallons of mineral oil, for the three-bank configuration. The mineral oil does not contain polychlorinated biphenyls (PCBs). A spill prevention and containment basin (SPCC basin) will be installed to contain spills in the unlikely event of a mineral oil release. The SPCC basin will be designed to contain the entire coolant volume of the transformer. See Chapter 9: Hazards and Hazardous Materials for greater detail on hazardous material releases. The substation is designed to ultimately accommodate nine distribution feeders. Installation of the distribution feeders is further discussed below.

1.5.2 Transmission Interconnection and Distribution Lines

1.5.2.1 Transmission Interconnection

The project will require looping the existing Contra Costa – Cayetano 230 kV circuit into and out of the Site C Substation. The scope of work involves replacing an existing tower located approximately 300 feet southwest of substation property. A new replacement tower (Tower 2) with loop arms will be installed with loop circuits about 600 feet long from the loop tower to new tower (Tower 1) adjacent to the substation. These new structures are shown in Figures 1-7 and 1-8. Loop circuits will then continue to the dead-end structures in the substation.

1.5.2.2 Distribution Lines

Table 1-3 summarizes the length (in miles) of the conceptual distribution line requirements for the installation of the initial two circuits. At the present rate of growth in electric demand, the remaining seven circuits would be installed roughly every other year. The physical location of each new circuit will depend on the following:

- the location of the current load growth,
- existing electric distribution facilities in the area (either existing today or built with other new circuits, or built to serve new residences or other loads), and
- the location and status of roads (PGandE normally locates new electric distribution circuits along roads) and required rights-of-way.

Figure 1-7: New Tower 1

[INSERT 1-PAGE, 8.5 x 11 B&W NEW TOWER 1 DRAWING]

Figure 1-8: Replacement Tower 2

[INSERT 1-PAGE, 8.5 x 11 B&W REPLACEMENT TOWER 2 DRAWING]

Table 1-3: Conceptual Distribution Line Requirements

Circuit	Approximate Length of Circuit Installation (miles)		
	Underground	Overhead (Temporary)	Total
1	2.28	0.5	2.78
2	3.24	0.5	3.74

The new 21 kV distribution lines will extend underground within the perimeter of the substation and, once they are clear of the substation walls, will connect to a temporarily installed overhead distribution line. The temporary overhead distribution line will extend on approximately 50-foot-tall wood poles, located along public roads and rights-of-way, until it reaches the existing surrounding distribution system. The poles will have an average spacing of 225 feet. Extensions through new developments will be constructed underground.

The City of Antioch has proposed to extend the four-lane Hillcrest Avenue past the east side of the substation. When Hillcrest Avenue is extended past the substation as proposed, this will provide a path for underground distribution lines out of the substation. Before the road is extended past the substation, the distribution feeder lines will be placed on temporary overhead distribution lines, as described above, and these distribution lines will be converted to underground once the Hillcrest Avenue extension is in place. When future developments are constructed near the substation site, the existing overhead distribution lines along Hillcrest Avenue will then be converted to underground distribution lines, and any new line extensions will be constructed underground.

1.5.3 Access and Ancillary Areas

During construction, access to the substation site will be via Highway 4, Deer Valley Road, Lone Tree Way, and Heidorn Ranch Road as described in Chapter 14: Transportation and Traffic. The existing access to the substation site is via a dirt road extending from the southern end of Heidorn Ranch Road. The existing dirt road crosses Sand Creek approximately 300 feet from the end of the paved road via a 72-inch galvanized-steel culvert that is in very poor condition. Since the culvert and existing road profile are not adequate to withstand heavy equipment traffic, PGandE proposes to replace the culvert with a steel-reinforced concrete bridge measuring approximately 50 feet in length and 16 feet in width. Concrete support abutments will be constructed within the bank of Sand Creek to allow for unobstructed water flow within the creek channel. PGandE will also construct a temporary asphalt access road leading into the substation site. The approximately 16-foot-wide temporary access road will measure approximately 2,600 feet in length.

Current development plans for the City of Antioch indicate that Hillcrest Avenue will be extended southerly to connect with Balfour Road. The road extension will run along the eastern boundary of the substation site. Once the extension is complete, the temporary access road will be cut and connected to Hillcrest Avenue via a curb cut entering the southbound lanes. At that time, access to the substation will be via Hillcrest Avenue.

Generally, parking and lay down and staging areas for construction materials and equipment will be within the substation site and 120-foot right-of-way for the transmission line loop. In addition to these areas, a 100- by 200-foot area will be staked in the field to identify the construction work limits at the tower sites.

1.6 GENERAL CONSTRUCTION METHODS

1.6.1 Typical Construction Equipment

Typical construction equipment and machinery that will be used during construction of the substation, access road, transmission loop, and distribution lines are listed in Table 1-4.

1.6.2 General Construction Sequence

Construction activities will generally occur in the following order:

- Bridge and access road construction
- Rough grading and compaction of the substation subgrade
- Construction of the security wall and all buswork structure, transmission tower, and building foundations
- Construction of the overhead lattice for the buswork, and the switchgear enclosure with the system control and data acquisition equipment
- Construction of the first 230/21 kV transformer, the 21 kV switchgear, the 230 kV circuit interconnection, and the microwave tower
- Construction of distribution feeders
- High voltage connection and testing
- Cleanup and landscaping
- Substation commissioning

Table 1-4: Typical Construction Equipment

Equipment	Use
Access Road, Substation, and Tower 1 and 2 Construction Activities	
1/2-ton pickup trucks	Transport construction personnel
3/4-ton pickup trucks	Transport construction personnel
Crew-cab trucks (3/4 to 1 ton)	Transport construction personnel
Road grader, six wheel	Grade road
Dozer with sheepsfoot	Road grading/shaping
Powered road roller	Subgrade compaction
Water trucks	Dust and fire control
Oiler trucks	Road construction
Motorized asphalt layer	Road construction
Finish road roller	Asphalt lift compaction
Boom truck	All construction activities
2-ton flat bed trucks	Haul materials
Flat-bed boom truck	Haul and unload materials
Dump trucks (5 to 10 ton)	Haul spoil and import materials
Semi-tractor trailer	Haul structure components
Construction trucks and trailers (2 to 60 ton)	Haul materials
Tiltbed and lowboy trailers	Haul equipment
Rigging truck	Haul tools and equipment
Stinger crane/flatbed (10 to 20 ton)	Material placement and form removal
40-ton crane	Material placement
Small mobile cranes (< 12 tons)	Load and unload materials
15-, 30-, and 80- ton mobile cranes	Erect structures/install transformers
Mechanic truck	Service and repair equipment
Shop vans	Store tools
Crawler-mounted auger	Excavate foundations
Truck-mounted digger	Excavate foundations
Track-mounted backhoe	Excavation

Equipment	Use
Rubber tired backhoe	Excavation
D6 and D8 Bulldozer	Excavation
Crawler backhoe	Excavate foundations
Puller	Pull conductor wire
Tensioner	Pull conductor wire
Wire reel trailer	Haul wire
Air compressor	Operate air tools
Air tampers	Compact soil around poles
Portable generators	Power tools
Concrete trucks	Transport concrete
Concrete mixer trucks	Haul concrete
Concrete pump truck	Pumps concrete to foundations
Fuel trucks	Refuel equipment
Aerial lift trucks	String conductor wire

1.6.3 Bridge and Access Road Construction

Grading, contouring, and replacing an existing culvert with a steel-reinforced concrete bridge structure across Sand Creek will be required for construction of the temporary access road. The access road will be engineered and constructed to city and County standards to withstand heavy equipment for construction and maintenance purposes and will be used on a regular basis throughout construction.

Grading for the access road will include the removal of existing vegetation within the road limits for access road construction. The overall width of the road will be up to 24 feet, including the 16-foot-wide asphalt road surface, two 2-foot-wide shoulders, and two 2-foot-wide drainage ditches. Engineered fill will be incorporated to stabilize and backfill the access road, and all cuts and fills will be 2:1 (50 percent) slope. During construction of the substation, the asphalt road will be used for construction equipment and vehicle access. Following construction of the Hillcrest Avenue extension, the asphalt and roadbed materials will be removed and the area will be restored to preconstruction contours. The steel-reinforced concrete bridge structure across Sand Creek will remain in place. The bridge is proposed to be used for emergency vehicle access to the adjacent proposed subdivision once it is constructed.

1.6.4 Substation Construction

The substation will be constructed on an undeveloped site. Site preparation will begin with vegetation clearing and grading to create a level surface for the substation pad, followed by installation of the 8-foot-tall wall and the subsurface ground grid. Once the surrounding wall secures the site, excavation and construction of the subsurface footings for all the aboveground structures will begin. Reinforced concrete footings and slabs will be constructed to support structures and equipment. Once the concrete has cured, installation of the aboveground steel structures, circuit breakers, transformers, switchgears, buses, and other electrical equipment, including associated control system hardware, will be installed.

Structures will be erected to support buses, switches, overhead conductors, instrument transformers, and other electrical equipment, as well as to terminate incoming circuits. Supports for the aluminum bus structures will be fabricated from low profile, tubular steel structures. Structures within the substation will be grounded to the station-grounding grid. Equipment will be placed on slabs and footings, and either bolted or welded securely to exceed the Uniform Building Code seismic requirements. Equipment slated for installation includes high-voltage circuit breakers and air switches, tie structures and bus work, high-voltage instrument transformers and line traps, control and power cables, metering, relaying, and communication equipment. Gravel will be installed within the walled substation site.

1.6.5 Transmission Interconnection Construction

The construction for the transmission interconnection work is divided into two phases; installation of towers, and installation of conductor.

1.6.5.1 Installation of Towers

Towers 1 and 2 will be accessed via the access road to the Site C Substation. Prior to commencement of work at these sites, a 100- by 200-foot area will be staked in the field to identify the construction work limits at the tower sites. Additionally, a 12-foot-wide temporary access road will be staked in the field linking the Site C Substation with the new Tower 2, the replacement Tower 1, and the existing tower to be removed.

Placement of steel lattice towers will require boring four holes, one for each structure leg. Each hole will be approximately 5 feet in diameter and 10 to 16 feet deep. Workers will place reinforcing steel in each hole along with stub angles that formulate part of the tower leg itself. Concrete forms that extend 2 or 3 feet above natural ground level will be placed over each hole and concrete will be placed around the reinforcing steel and stub angles up to the top of the form.

The double-circuit lattice steel towers will have three vertical support levels, each supporting two phases consisting of a single conductor on each side of the tower. Steel tower components packaged in bundles by tower type will be delivered to the tower site. Individual towers will be assembled immediately adjacent to the tower foundations and raised into place with a crane. For setting up the crane, a pad measuring 100 feet by 200 feet will be prepared at each tower location. After the structure is set on the foundation, crews will tighten all bolts, attach insulators to the cross arms, and prepare the towers for the conductor-stringing operation.

1.6.5.2 Stringing Conductor

Before conductor installation begins, temporary clearance structures will be installed at road crossings and other locations where the new conductors may accidentally come into contact with electrical or communication facilities and/or vehicular traffic during installation. These clearance structures consist of one or two poles on either side of the feature crossed with a "V" shaped cargo net tensioned between the support structures.

The actual conductor stringing operation begins with the installation of sheaves or stringing blocks. The sheaves are rollers attached to the cross arm of the supporting structure. The sheaves allow the individual conductor to be pulled through each structure until the conductor is ready to be pulled up to the final tension position.

When the pull and tension equipment is set in place, a sock line (a small cable used to pull in the conductor) is pulled from tower to tower using ground equipment. After the sock line is installed, the conductor is attached to the sock line and pulled in, or strung, using the tension-stringing method. This involves pulling the conductor through each tower under a controlled tension to keep the conductor elevated above crossing structures, roads, and other facilities.

After the conductor is pulled into place, sags are adjusted to a pre-calculated level. The conductor is then clamped to the end of each insulator hardware as the sheaves are removed. The final step of the conductor installation is to install vibration dampers and other accessories.

1.6.6 Distribution Line Installation

The initial 21 kV distribution circuits will be installed on a wood pole line installed along the route of the future extension of Hillcrest Avenue, and will run on the east side of the substation.

The underground 21 kV distribution outlets extending from the substation will rise on wood poles adjacent to the substation site. These poles are 50 feet long, and are embedded in the ground at a depth of 6 feet. The line will extend to the north and south along the future roadway, with an average span of 225 feet. Typical construction sequence will be to auger the pole holes, set the framed poles, and string the aluminum overhead conductors. This work will be constructed using line trucks and boom trucks. These new facilities will be tied into the existing distribution facilities in the surrounding area.

When the extension of Hillcrest Avenue is constructed and the area surrounding the substation site is further developed, these overhead facilities will be replaced with underground distribution facilities.

1.6.7 Cleanup

Cleanup operations involve final grading to original contours and cleaning up all disturbed areas, including temporary workspace and the access road. PGandE will conduct a final survey to ensure that cleanup activities have been successfully completed as required. Additionally, landscaping, including irrigation, will be installed around the perimeter of the substation.

1.6.8 Construction Workforce

The workforce will vary depending on the activities in progress and the particular phase of construction. During grading and road construction, a workforce of approximately 12 workers will be needed over an approximate six-week period. The security wall, buswork structure, transmission towers, and substation foundation work will require approximately 20 laborers and supervisors. During installation of the switchgear enclosure and overhead work, the number of workers on-site will range from 20 to 24. As phases of the work are completed, the workforce at the substation site will gradually decline. A small workforce of approximately four to six workers will remain at the substation site to complete required project cleanup and landscape activities.

1.7 CONSTRUCTION SCHEDULE

Construction is scheduled to begin as early as August 2006 to meet an in-service date of June 1, 2007. Substation construction will require approximately eight months of activity over a 10- to 12-month timeframe.[6] To complete grading and road construction before the onset of winter, those activities will begin in August, as soon as permits and agency approvals have been granted.

1.8 OPERATIONS AND MAINTENANCE

1.8.1 System Monitoring and Control

Operation of distribution equipment in the substation and the associated distribution lines will be controlled from the PGandE Diablo Control Center in Concord, California. Operation of transmission equipment in the substation and the associated transmission lines will be controlled from the PGandE Pittsburg Control Center in Pittsburg, California. Station and line alarms for the substation will be connected by phone lines and sent to the control center. If an alarm is triggered, personnel will be dispatched to the location of the alarm.

1.8.2 Facility Inspection

Regular inspection of electric lines, support systems, and instrumentation and control is critical for the safe, efficient, and economical operation of the project. All of the structures will be inspected from the ground on an annual basis for corrosion, misalignment, and foundation condition. Ground inspection will include inspection of hardware, insulator keys, and conductors. This inspection will also check conductors and fixtures for corrosion, breaks, broken insulators, and bad splices. The electric lines will be inspected for sag. Annual ground inspections will be performed on poles, anchors, and right-of-way conditions. Trimming of landscaping trees will be conducted in accordance with the CPUC's General Order 95.

Under normal circumstances, the station will be controlled remotely, and routine inspections by substation personnel will occur on a monthly basis or as needed under emergency conditions. Permanent parking for facility inspections, operations, and maintenance will be entirely within the substation site or access road at the entrance to the substation site.

[6] Storm events during the rainy season (December to March) could preclude construction activities from occurring.

1.9 REQUIRED APPROVALS

The CPUC is the lead state agency for CEQA review of this project. In accordance with CPUC General Order No. 131-D, PGandE is submitting a Proponent's Environmental Assessment as part of its application for a Permit to Construct (PTC). In addition to the PTC, Table 1-5 summarizes the permits from other federal, state, and local agencies that may be needed for the project.

Table 1-5: Permits and Approvals That May Be Required

Permit/Approval	Agency	Jurisdiction/Purpose
Federal Agencies		
Nationwide or Individual Permit (Section 404 of the Clean Water Act)	U.S. Army Corps of Engineers	Waters of the United States, including wetlands
Section 7 Consultation (Endangered Species Act)	U.S. Fish and Wildlife Service	Threatened and Endangered Species Biological Opinion
Section 106 Consultation (National Historic Preservation Act)	Advisory Council on Historic Preservation	Cultural Resource Management Plan (if appropriate)
State Agencies		
Permit to Construct	California Public Utilities Commission	Overall project approval and California Environmental Quality Act (CEQA) review
National Pollutant Discharge Elimination System—General Construction Storm Water Permit	California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB)	Permit applies to all construction projects that disturb more than 1 acre
Section 401 Water Quality Certification (or waiver thereof)	RWQCB	Requests the RWQCB's certification that the project is consistent with state water quality standards
Endangered Species Consultation (through CEQA review process)	California Department of Fish and Game (CDFG)	Consultation on state-listed species; incidental take authorization (if required)
Section 1601 Streambed Alteration Agreement	CDFG	This permit applies to instream work
Consultation (through CEQA review process)	State Historic Preservation Officer	Cultural resources management (if appropriate)

Permit/Approval	Agency	Jurisdiction/Purpose
Authority to Construct/Permit to Operate	Bay Area Air Quality Management District	Air-emission reduction and monitoring
Local Agencies		
Roadway Encroachment Permit	Contra Costa County; City of Antioch	Ministerial permit to install distribution lines in roadway right-of-way
Roadway Encroachment Permit	Contra Costa County; City of Antioch	Ministerial permit to install distribution facilities in roadway right-of-way
Welding, Grading, and Building Permits	Contra Costa County; City of Antioch	Ministerial permission to conduct welding, grading, and building activities

1.10 RIGHT-OF-WAY ACQUISITION

PGandE already owns the proposed substation site. The current easement owned by PGandE for the existing Contra Costa – Cayetano Circuit #2 and Contra Costa – Los Positas Circuit #1 230 kV transmission lines west of the project site is 200 feet in width. PGandE will acquire a new 120-foot-wide easement near the southwest corner of the substation site for the transmission line interconnection (refer to Figure 1-5).

Land entitlement issues are not part of the regulatory proceeding in which the CPUC is considering whether to grant or deny PGandE's application for a Permit to Construct. Rather, any land rights issues will be resolved in subsequent negotiations and/or condemnation proceedings in the proper jurisdiction, following the decision by the Commission on PGandE's application. (See, for example, Jefferson-Martin 230 kV Transmission Project, A.02-04-043, D.04-08-046, p. 85).

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