

**BEFORE THE
PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of PACIFIC GAS AND ELECTRIC
COMPANY, a California corporation, for a
Permit To Construct the Shepherd Substation
Project Pursuant to General Order 131-D

A.10-12-003

(U 39 E)

**AMENDMENT TO PACIFIC GAS AND ELECTRIC COMPANY'S
APPLICATION FOR A PERMIT TO CONSTRUCT
THE SHEPHERD SUBSTATION PROJECT**

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December 2, 2011

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I. INTRODUCTION

Pursuant to Rule 1.12 of the California Public Utilities Commission's ("Commission" or "CPUC") Rules of Practice and Procedure, Pacific Gas and Electric Company ("PG&E") hereby amends its Application No. 10-12-003 ("Application") to reflect additional distribution work and other minor project changes to its proposed substation project. Except as stated below, the original Application is unchanged and incorporated herein by reference.

On December 8, 2010, PG&E filed its Application for a Permit To Construct ("PTC") a new three-bank, 115/21 kilovolt ("kV") substation and associated power line interconnection in unincorporated Fresno County. After the Application was filed, PG&E engineers determined that additional distribution (low-voltage line) work would be needed to support the substation project, including rebuilding approximately one mile of distribution line outside of the previously-defined project area. Other project changes include extending the existing overhead distribution line north of the substation an additional one-half mile as underbuild on the new

power line to Copper Avenue,^{1/} and shifting the substation within its proposed boundary approximately 35 feet south to accommodate the power line connection. Additional information about the location of planned underground distribution feeders and pole locations is now available and is also provided.

To support this Amendment, attached as Exhibit A is a Supplement to the Proponent's Environmental Assessment ("PEA Supplement") containing additional analysis on the distribution work south of the substation that was not previously covered in the original application.^{2/} The PEA confirms that the additional work will not create a potentially-significant environmental impact under the California Environmental Quality Act ("CEQA").

II. AMENDMENT TO PROPONENT'S APPLICATION

A. Existing Project Description

As described in the Application, PG&E proposes to construct the Shepherd Substation Project, including a distribution substation, interconnection with the electrical supply grid, and up to nine distribution circuit outlets. Major elements of the project, which are described in more detail in the Proponent's Environmental Assessment ("PEA") filed with the Application, include:

- A new 115/21 kV distribution substation, with three 45 megavolt ampere ("MVA") transformers and a capacity of 135 megawatts (MW),
- A new, approximately 1.5-mile, double-circuit 115 kV power line on tubular steel poles ("TSPs") to connect the substation to the existing Kerckoff-Clovis-Sanger #1 115 kV Power Line,

1/ As with the existing approximately one-mile segment of this distribution line, the new segment will become underbuild on the new 115 kV power line interconnection.

2/ The PEA Supplement includes an environmental analysis of the distribution work that is outside of the original project area, and is incorporated herein by reference.

- Co-locating the existing distribution line extending approximately one mile north from the substation onto the new TSPs as underbuild,
- Up to three distribution circuits per transformer,
- One metal-clad building, 24 feet by 80 feet in size, to house the protection and control systems, and
- Two permanent paved access roads, approximately 35 feet long, from Sunnyside Avenue into the substation.

B. Updated Project Description

The major components of the project have not changed. The revisions to the project include:

- Replacing the existing above-ground 12 kV distribution circuit with a new, 21 kV circuit (reconductoring) on new wood poles along Sunnyside Avenue between Shepherd Avenue and Nees Avenue, a distance of approximately one mile;
- Extending the existing overhead distribution circuit north of the substation to Copper Avenue, an additional one-half mile beyond what was described in the PEA (Existing Distribution Circuit), as underbuild on the new power line's TSPs;
- Removing the communications wires ("OPGW") described in Section 2.6.1 of the PEA and shown on top of the new power line in several of the original PEA simulations;
- Shifting the equipment within the substation approximately 35 feet to the south, which will not change the footprint of the substation, but rather will modify the layout of the equipment within the walls of the substation, and change the location of entry and exit gates (*see* revised substation layout, Exhibit B, attached); and
- Shifting the TSP previously located at the corner of Sunnyside Avenue and Perrin Road north to a position within the power line alignment along Sunnyside Avenue approximately 65 feet from the centerline of the section corner.

Extending the existing distribution line an additional half-mile to Copper Avenue, removing the communications wires, and shifting the substation layout and pole do not alter the original environmental analysis in the PEA, although the simulations have been updated to incorporate these minor changes. (*See* Exhibit C and Section III below.) The overhead distribution line

reconductoring that will occur along Sunnyside Avenue, as well as details now available concerning the three underground distribution circuits leading south from the substation, are evaluated in the PEA Supplement, Exhibit A, which concludes that potential environmental impacts under CEQA will be less than significant.

III. REVISED PROJECT SIMULATIONS

Due to the minor project changes described above, the simulations originally included in the PEA have been updated to incorporate the changed project details and additional landscaping that has filled in since the original photographs were taken. At the request of the CPUC, new simulations were prepared using photographs taken with camera lens settings and focal lengths that represent a perspective more consistent with the human eye. A reference on each simulation indicates the lens type, setting, and camera type. Typically, photographs were taken using a digital camera set to a 35 millimeter (“mm”) focal length equivalent of 50-mm. The 50-mm equivalent focal length produces a 38.6° horizontal field of view, which approximates the detailed cone of human vision. The new photographs and revised simulations are attached as Exhibit C.

IV. EXHIBITS

The following exhibits are attached and incorporated by reference to this Amendment to the Application:

Exhibit A – PEA Supplement

Exhibit B – Revised Substation Layout

Exhibit C – Revised Project Simulations

V. CONCLUSION

For the reasons set forth above, PG&E hereby amends its Application to reflect the new substation location and other changes to the proposed project.

Dated in San Francisco, California, this 2nd day of December, 2011.

Respectfully Submitted,

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Exhibit A

PEA Supplement

**SUPPLEMENT TO THE PROPONENT'S ENVIRONMENTAL ASSESSMENT
FOR THE
APPLICATION OF PACIFIC GAS AND ELECTRIC COMPANY
FOR A PERMIT TO CONSTRUCT
THE SHEPHERD SUBSTATION PROJECT**

Prepared for:
Pacific Gas and Electric Company

Prepared by:
Transcon Environmental, Inc.

November 2011

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1.0 INTRODUCTION

On December 8, 2010, Pacific Gas and Electric Company (PG&E) filed an Application for a Permit to Construct the Shepherd Substation Project (Project) and supporting Proponent's Environmental Assessment (PEA). Following submittal of the Application, PG&E identified approximately one mile of overhead 12 kV distribution line that must be rebuilt and converted to 21 kV voltage to support the Project, as well as several other minor Project modifications. The Project modifications include:

- Replacing the existing above-ground 12 kV distribution circuit with a new, 21 kV circuit (reconductoring) on new wood poles along Sunnyside Avenue between Shepherd Avenue and Nees Avenue, a distance of approximately one mile (Overhead Distribution Circuit Reconductoring);
- Extending the existing overhead distribution circuit north of the substation to Copper Avenue, an additional one-half mile beyond what was described in the PEA, as underbuild on the new power line's TSPs;
- Removing the communications wires (OPGW) described in Section 2.6.1 of the PEA and shown on top of the new power line in several of the original PEA simulations;
- Shifting the equipment within the substation approximately 35 feet to the south, which will not change the footprint of the substation, but rather will modify the layout of the equipment within the walls of the substation, and change the location of entry and exit gates; and
- Shifting the TSP previously located at the corner of Sunnyside Avenue and Perrin Road north to a position within the power line alignment along Sunnyside Avenue approximately 65 feet from the section corner.

In addition to these modifications, PG&E has obtained additional details concerning the underground distribution circuits (Underground Distribution Circuits) to be installed south from the proposed substation as part of the initial Project. Portions of these circuits will also be constructed in areas beyond the boundaries analyzed in the PEA.

Extending the existing distribution circuit northward an additional one-half mile to Copper Avenue, removing the communications wires, and shifting the substation layout and pole do not alter the original PEA analysis. Accordingly, these minor Project modifications will not be further discussed. This Supplement to the Proponent's Environmental Assessment for the Application for a Permit to Construct the Shepherd Substation Project (PEA Supplement) describes and analyzes the environmental setting and impacts associated with the overhead and underground distribution work south of the substation (collectively "Distribution Circuits"), and was prepared pursuant to discussions with California Public Utilities Commission (CPUC) staff on August 10, 2011.

1.1 BACKGROUND

As discussed in the PEA, PG&E proposes to construct and operate Shepherd Substation, a 115/21 kilovolt (kV) electric substation on approximately five acres north of the City of Clovis in Fresno County, California. The substation will be located at the southwest corner of Sunnyside Avenue and Perrin Avenue. The power line interconnection will extend approximately 1.5 miles north from the substation to the south side of Copper Avenue, where it will interconnect with the existing Kerckhoff-Clovis-Sanger #1 115 kV Power Line. One existing overhead extending north approximately one mile from the substation will be extended an additional .5 mile to Copper Avenue and be placed as underbuild on the new power line interconnection. Three underground distribution circuits will lead south from the substation.

2.0 DESCRIPTION OF CHANGES REQUIRING ADDITIONAL ANALYSIS

The following Project component was not previously analyzed in the PEA:

- The existing above-ground 12 kV distribution line along Sunnyside Avenue will be replaced with the 21 kV circuit for approximately 1.0 mile between Shepherd and Nees avenues, and located on new wood poles (Overhead Distribution Circuit Reconductoring).

In addition, the following details are now available concerning the Underground Distribution Circuits that will be installed south of the substation. Each distribution circuit is described below from its point of origin at the substation.

- *Shepherd Avenue West 21 kV Distribution Line* – This distribution circuit will extend underground south approximately 0.5 miles along the west side of Sunnyside Avenue to Shepherd Avenue. It will turn west and extend approximately 0.4 miles along the north side of Shepherd Avenue before intercepting an existing underground distribution line. This distribution circuit will be bored under Enterprise Canal.
- *Sunnyside Avenue South 21 kV Distribution Line* – This distribution circuit will extend underground south approximately 0.5 miles along the west side of Sunnyside Avenue. It will be installed in the same trench as the Shepherd Avenue West Distribution Circuit. It will be bored under Shepherd Avenue, then rise up onto wood poles and become the Overhead Distribution Circuit Reconductoring.
- *Shepherd Avenue East 12 kV Distribution Line* – This distribution circuit will be bored under Sunnyside Avenue and extend underground south approximately 0.5 miles along the east side of Sunnyside Avenue to Shepherd Avenue. It will turn east and extend approximately 0.5 miles along the north side of Shepherd Avenue, where it will tie into the existing underground distribution circuit. The distribution circuit will be installed in an underground trench.

2.1 GENERAL CONSTRUCTION METHODS

The Overhead Distribution Circuit Reconductoring will require replacing the existing wood poles with somewhat taller wood poles. Construction of the Underground Distribution Circuits will primarily require trenching, but drilling may be used at road and canal crossings.

2.1.1 Overhead Distribution Circuit Reconductoring and Wood Pole Replacement

Along Sunnyside Avenue south of Shepherd Avenue, the existing overhead distribution line will be reconducted (the wires replaced) and the wood poles will be replaced to become part of the Sunnyside Avenue South 21 kV Distribution Line. The wood poles will be completely removed and will be recycled, reused, or disposed of at a landfill facility that is authorized to accept treated wood pole waste in accordance with California Health and Safety Code section 25143.1.5(b). New wood poles will be installed as close to the location of the removed poles as possible. A comparison of the existing distribution line design characteristics with the rebuilt distribution line is provided in Table 2.1-1. One pull and one tension site will be necessary.

Feature	Existing Line	Rebuilt Line
Type of structure	Wooden poles	Wooden poles
Structure height	40–45 feet, with 34–40 feet above ground	Approximately 50 feet, with 43 feet above ground
Circuit configuration	Three phase 12 kV (three conductors)	Three phase 21 kV (four conductors)

2.1.2 Trenching for Underground Distribution Circuits

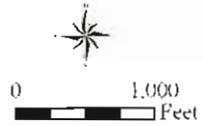
Trenching involves digging a trench approximately 18 inches wide and a minimum 42 inches deep with a backhoe. Once the trench is dug, cable and conduit will be installed. When the trench is ready for backfilling, the trench will be filled and the soil compacted. In-ground splice boxes, which are approximately 5 ½ feet by 9 ½ feet by 7 feet deep, will be installed as necessary. An estimated 18 vaults will be required.

2.1.3 Drilling Methods for Underground Distribution Circuits

One of two methods will be used to bore through soils when open trenching is not an option. Horizontal Directional Drilling (HDD) uses a hydraulically-powered horizontal drilling rig operating from the ground to bore beneath the surface. During boring activities, drilling fluid is pumped under high pressure through the drill stem to rotate the cutting head and return the soils to a pit at the entry point. Drilling fluids are comprised of a water/bentonite (dehydrated clay) mixture. The HDD contractor will be responsible for proper disposal of any soil cuttings, drilling mud, fluids, or waste in accordance with all federal, state, and local regulations. Once the hole is drilled, the PVC conduit that will hold the Underground Distribution Circuits will be pulled through the bore hole.

Infrequently, the high pressure drilling mud used during HDD escapes to the surface because of unanticipated soil properties. This is referred to as “fracturing-out” (frac-out). PG&E will implement Best Management Practices (BMPs) outlined in the *PG&E Horizontal Directional Drilling Manual* to prevent or contain frac-outs. (A copy of this manual will be provided separately to CPUC staff.)

The jack and bore drilling method requires digging an entry and an exit pit, each approximately 24 feet long by 16 feet wide by 6 feet deep, using an excavator or a backhoe. The walls will be shored if needed before the boring machine is lowered into the entry pit. The boring machine will push (i.e., jack) a steel casing horizontally through the soil while at the same time removing earth in the casing with a rotating auger. The auger carries loose soil through the auger and back to the entry pit where it is shoveled out of the pit. Once the casing is installed, conduits that will hold the Underground Distribution Circuits will be assembled and pulled through the steel casings.



Legend

- Shepherd Avenue West (all underground)
- Shepherd Avenue South (underground)
- Shepherd Avenue South (Overhead)
- Shepherd Avenue East (all underground)

Project Aerial
Shepherd Substation Project
Distribution Circuits Supplement

Figure 2.1-1



2.1.4 Soil Disposal

Soils excavated will be transported to the substation site for temporary storage, testing, and disposal. If classified as non-hazardous, soils may be used as backfill in trenches or as fill on the substation site. Any remaining unused soil will be disposed of in accordance with all federal, state, and local regulations.

2.1.5 Staging Area

The Shepherd Substation property will be used for material staging and storage.

2.1.6 Vegetation Removal

PG&E does not anticipate the need to remove any vegetation to install the Distribution Circuits.

2.2 ESTIMATES OF DISTURBANCE

Disturbances related to construction of the Distribution Circuits will be temporary. The only permanent disturbance will be the estimated 13 in-ground vaults, which will occupy a total area of less than 0.1 acres. Table 2.2-1 summarizes the estimated disturbance that will result from construction of these distribution circuits.

Feature	Dimensions	Area of Temporary Disturbance
Underground Distribution Circuits	15,200 linear feet by 40 feet	14.0 acres
Wood Pole Replacement	40 feet by 100 feet/pole	0.09 acres/pole
Stringing Setup Areas (pulling)	50 feet by 10 feet	0.05 acres
Stringing Setup Areas (tensioning)	50 feet by 10 feet	0.05 acres

2.3 CONSTRUCTION PERSONNEL AND EQUIPMENT

Construction of the Distribution Circuits will require a maximum workforce of approximately 17 people. Table 2.3.1 summarizes typical equipment used during distribution line construction.

TABLE 2.3-1 PRELIMINARY ESTIMATES OF DISTRIBUTION CIRCUIT PERSONNEL AND EQUIPMENT				
Primary Equipment Description	Primary Equipment Estimated Quantity	Estimated Number of Personnel	Estimated Activity Schedule	Estimated Usage
Overhead Reconductoring				
Digger Derrick (Line Truck) with Cargo Trailer	1	6	1.5 months	2 hrs/day at 5 days/week
Bucket Truck	2			2 hrs/day at 5 days/week
Wire Dolly	1			2 hrs/ day at 1 time/week
Rope Truck (Tension)	1			2 hrs/ day at 1 time/week
¼-ton Pick-up	1			2 hrs/day at 5 days/week
1.5-ton Pick-up	1			2 hrs/day at 5 days/week
Underground Electric Installation				
Boom Truck	1	6	1.5 months	2 hrs a day at 2 times/week
Wire Dolly	1			2 hrs a day at 2 times/week
1.5-ton Truck with Underdog (underground cable puller)	1			2 hrs a day at 2 times/week
¼-ton Pick-up	1			2 hrs a day at 5 days/week
1.5-ton Pick up	1			2 hrs a day at 5 days/week
Line Truck	1			2 hrs a day at 5 days/week
Splice Van	1			2 hrs a day at 2 days/week
Excavation: Trenching & Conduit Installation				
Water Truck (as needed)	1	5	2.5 months	2 hrs/day
26,000 lb Gas Crew Truck with Trailer	1			2 hrs/day
1-ton Pick-up Truck	1			2 hrs/day
10-yard Dump Truck with Trailer	1			2 hrs/day
Trencher	1			2 hrs/day
Bore Rig	1			12 hrs/bore 36 hours total

3.0 ENVIRONMENTAL ANALYSIS

The Environmental Analysis section supplements the information contained in the PEA. Only existing environmental conditions and potential impacts that were not previously discussed in the PEA are discussed in this PEA Supplement. Methodology, regulatory background, and significance criteria are not duplicated. Since the environmental conditions and impacts for Hazards and Hazardous Materials, Population/Housing/Public Services/Utilities, and Transportation and Traffic remain the same, those resources are not discussed in this PEA Supplement.

3.1 AESTHETICS

3.1.1 Existing Conditions

The setting is similar to the areas previously described in the PEA, except that the setting extends further south and has slightly higher home density. The distribution lines proposed for modification are located along roadways, resulting in an increased number of homes and anticipated number of viewers.

3.1.2 Impacts

Impacts from construction of the Distribution Circuits are estimated to be minor and unnoticeable to viewers. The area is not managed for aesthetic resources and is not an area known to be visually sensitive. The construction of the Distribution Circuits are therefore consistent with the goals and objectives of local management plans and public works operations for the area, and the Underground Distribution Circuits will have no impact on the current visual setting.

Based upon preliminary design, the Overhead Distribution Circuit Reconductoring will require replacement of the existing wood poles along Sunnyside Avenue south of Shepherd Avenue with new wood poles approximately five to ten feet taller, a difference that is not readily discernable. Additionally, the new wood poles will replace existing wood poles in place or nearly in place to the extent possible, creating little visual impact to the surrounding views. The new structures and conductor along this portion of the project will appear nearly the same in terms of scale, color, and form. Appendix A contains a photograph of the Key Observation Point (KOP) and a visual simulation of the rebuilt distribution line.

Supplement KOP 1 Analysis – Along Sunnyside Avenue looking south along the distribution circuit (Appendix A).

KOP 1 is located north of the intersection of Teague Avenue and Sunnyside Avenue. This view is typical for viewers along the Overhead Distribution Circuit Reconductoring. This location represents where most viewers will be able to see the rebuilt overhead distribution line, primarily from the viewpoint of motorists. This location receives moderate local traffic and is in a rural residential setting.

Sunnyside Avenue is comprised of residences and agricultural fields. The photograph (Appendix A) shows the use of the road for utility and residential uses. The edge of the road is typical of a rural setting without curb and gutter or sidewalks. Pasture and livestock fences also appear on lots adjacent to existing residents. Homes are typically set back with large mature vegetation between them and the road, which obstructs views to the street and the existing distribution line. The dominant forms in the existing setting are angular, linear and consistent with the road corridor, existing electric poles, and fences. The road is straight and flat, presenting a strong line. The result is a weak contrast to existing forms and lines. The color and texture will be unchanged because existing wood poles will be replaced with new wood poles. The introduction of the minor additional height to the existing poles will likely be unnoticeable to observers. No additional impacts to aesthetic resources will result from construction of the Distribution Circuits.

3.2 AGRICULTURAL, LAND USE, AND RECREATIONAL RESOURCES

3.2.1 Existing Conditions

Except for the differences listed below, the existing conditions described in the PEA remain unchanged.

Existing Land Use

- **Agriculture:** Agricultural lands are shown in Figure 3.2-1. A cattle ranch is located at Shepherd and Temperance avenues.
- **Residential:** Residential uses now include low-density housing (0–1 dwelling unit per acre [du/ac]) with ranchettes and rural residential to low density multiple family residential (14 du/ac) among developed subdivisions. Medium-density residential areas are mainly concentrated within the limits of the City of Clovis south of Shepherd Avenue. Land ownership and jurisdiction are shown in Figure 3.2-2.
- **Public and Quasi-public:** Public and quasi-public uses not previously described are shown in Table 3.2-1.
- **Business and Commercial:** Business and commercial land uses now include a small commercial center located at the corner of Nees and Fowler avenues. More commercial locations are concentrated adjacent to State Route (SR) 168.
- **Linear Facilities and Utilities:** A portion of SR 168 is within the study area (i.e., a one-mile buffer around facilities).
- **Recreation:** The study area encompasses more recreational parks than originally analyzed in the PEA. The parks are concentrated within the City of Clovis boundaries. Figure 3.2-3 shows these recreational areas.

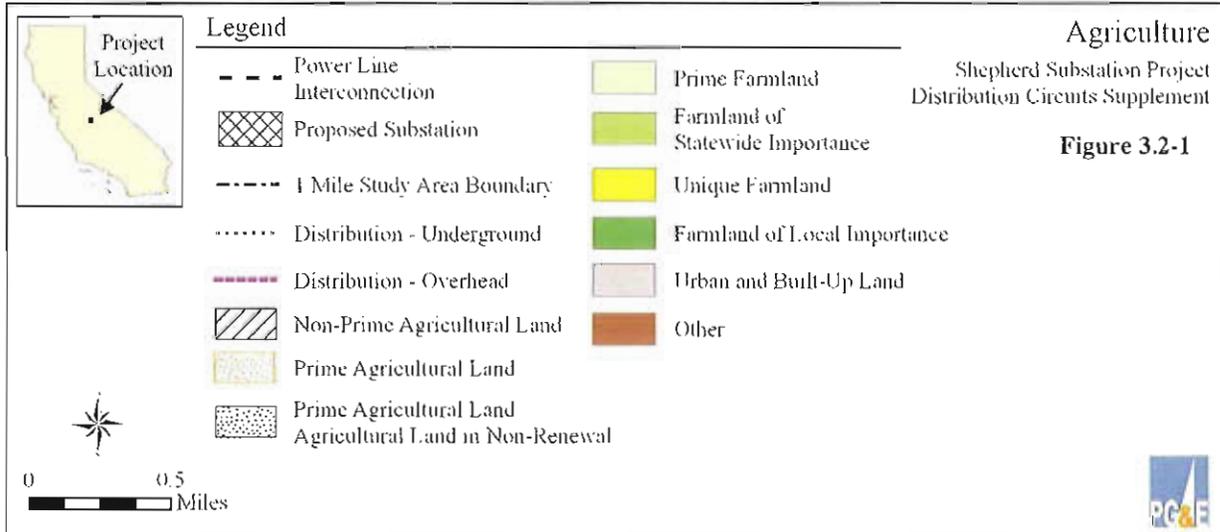
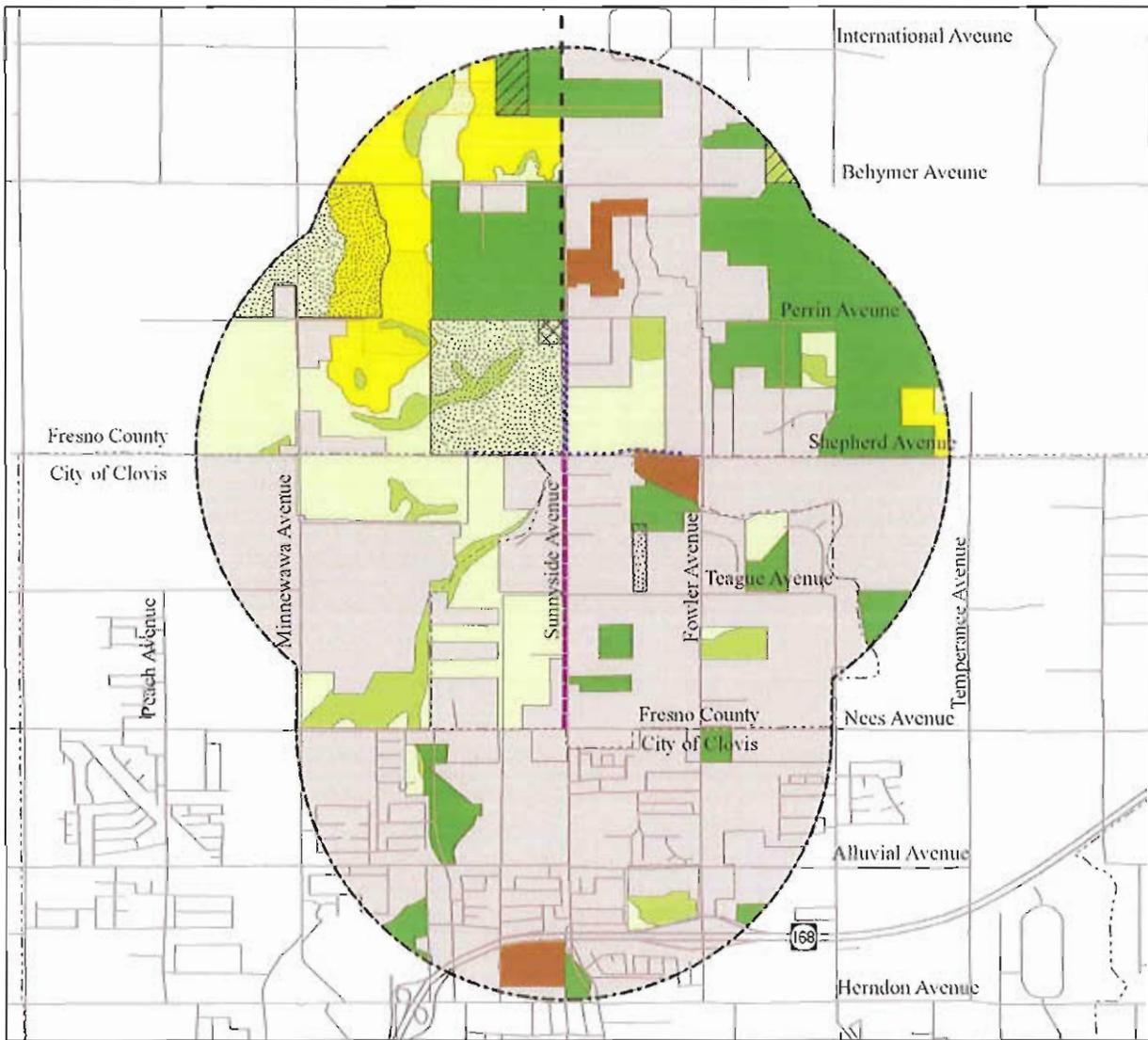
Public/Quasi-Public Land Use	Location
Buchanan High School	Teague and Minnewawa avenues
Century Elementary School	North Sunnyside and El Paso avenues
Fresno Metropolitan Flood Control District	Temperance Avenue, between Shepherd and Nees avenues
Fresno Metropolitan Flood Control District	North Sunnyside and Alluvial avenues
Jehovah Witness Church	North Sunnyside Avenue and SR 168
Lutheran Church	Fowler and Alluvial avenues
Clovis Missionary Baptist Church	Fowler Avenue just north of Alluvial Avenue

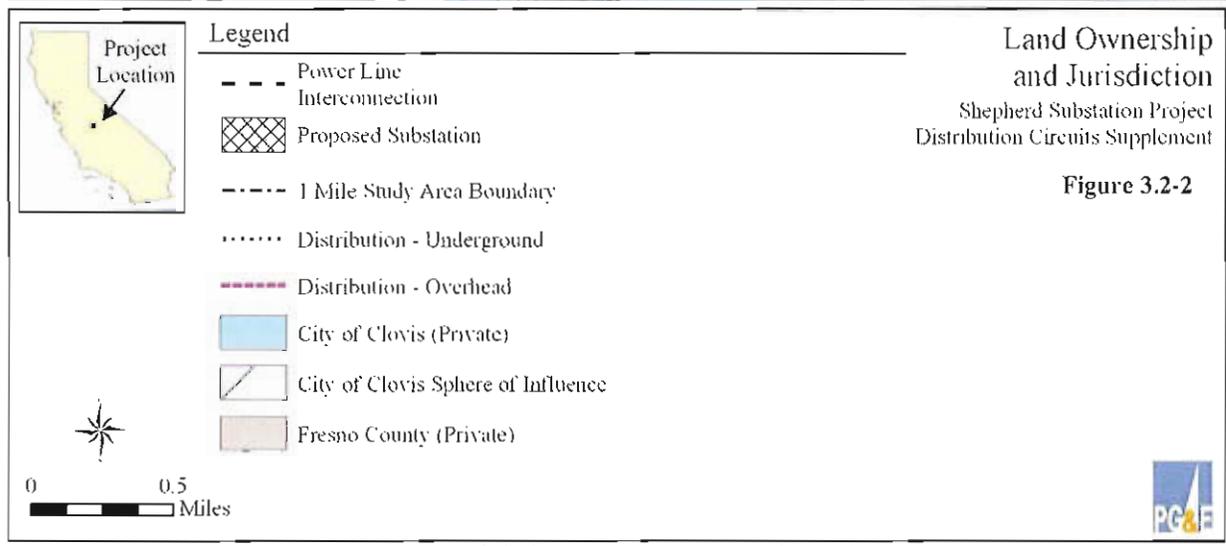
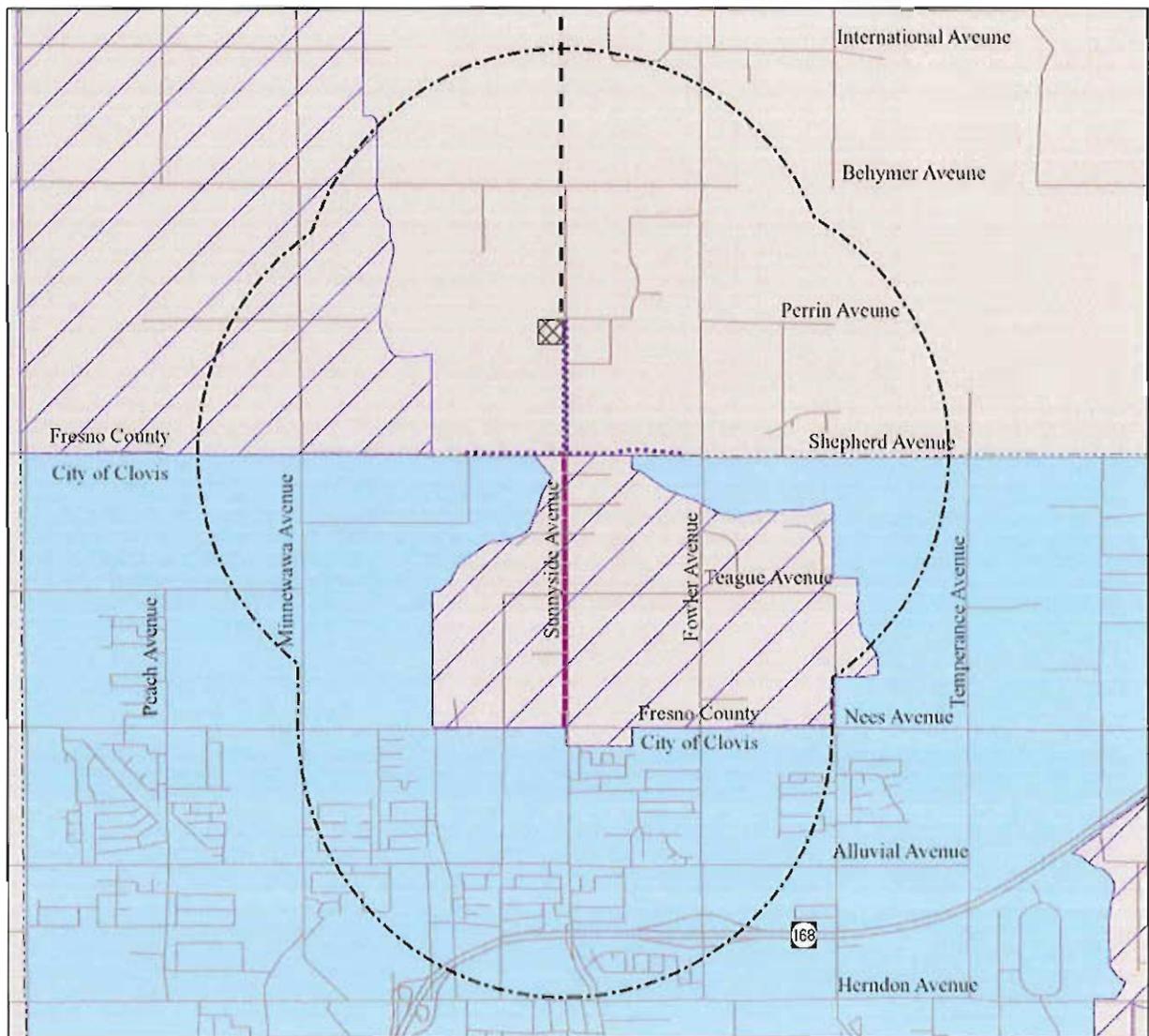
Zoning

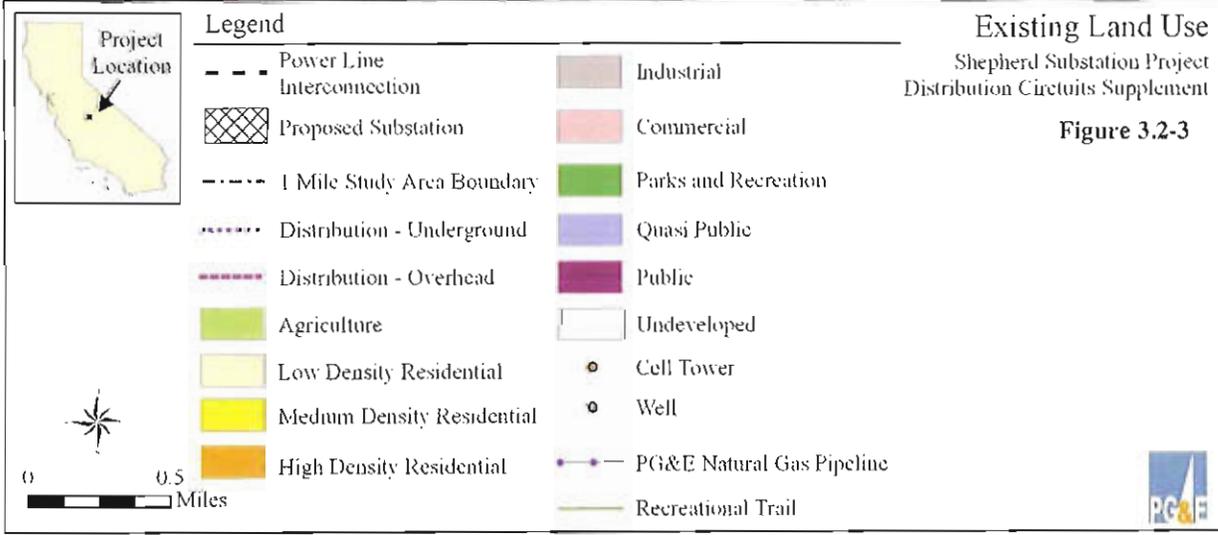
Zones within the study area are depicted in Figure 3.2-4. Most of the study area beyond the limits described in the PEA is classified as Rural Residential and Single Family Residential Districts. Commercial and Light Industrial zonings are found adjacent to SR 168.

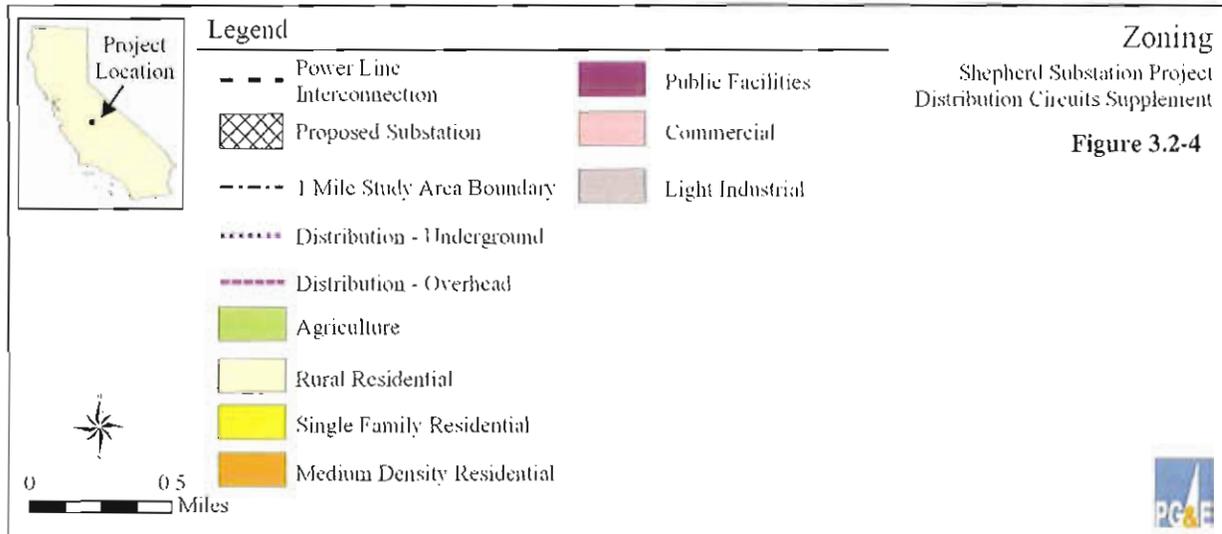
Planned Land Use

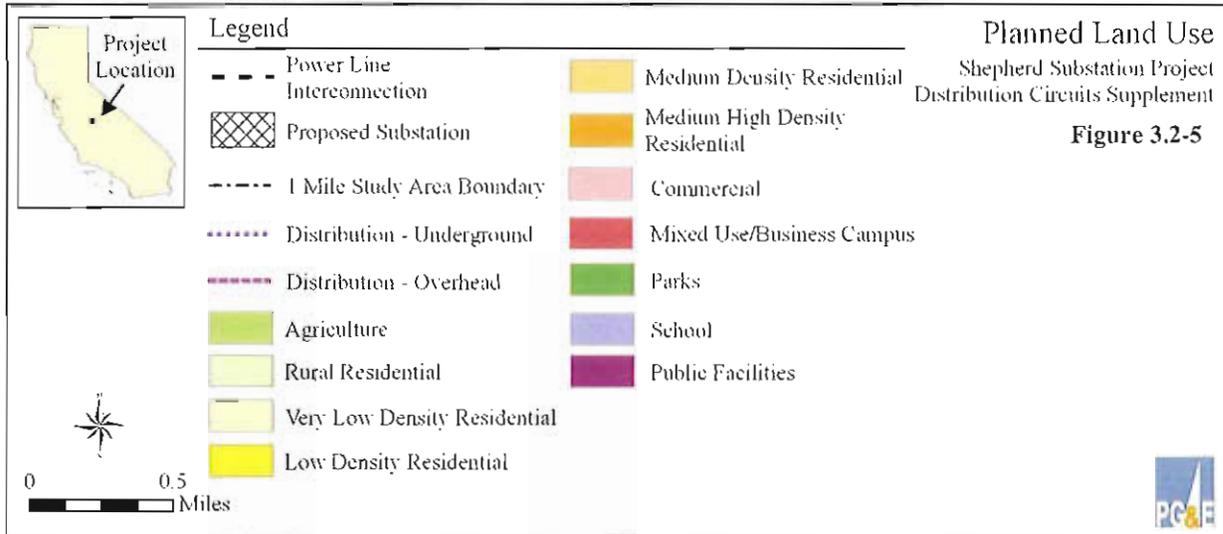
Planned land use information is depicted in Figure 3.2-5. Two new planned land use categories are within the study area. These are the commercial and public facilities categories.











3.2.2 Impacts

Impacts to agricultural, land use, and recreational resources do not differ from those described in the PEA.

3.3 AIR QUALITY

3.3.1 Existing Conditions

With the exception of additional residences and commercial properties discussed in the Agricultural, Land Use and Recreation section above, the environmental setting remains unchanged.

3.3.2 Impacts

Minor increases to air pollutant emissions will result from construction of the Distribution Circuits. These additional emissions do not change the conclusions regarding air quality impacts in the PEA. Emissions from construction of the Distribution Circuits are presented in Table 3.3-1 (pounds per day) and 3.3-2 (tons per year). Supporting data is included in Appendix B.

Pollutant	Estimated Construction Emissions (pounds/day)
Volatile Organic Compounds (VOC)	2.15
Nitrogen Oxides (NO _x)	29.81
Particulate Matter 10 micrometers or less (PM ₁₀)	71.93
Carbon Monoxide (CO)	12.95
Carbon Dioxide (CO ₂)	5,112.70
Sulfur Dioxide (SO ₂)	0.01

Pollutant	Estimated Construction Emissions (tons/year)
Volatile Organic Compounds (VOC)	0.06
Nitrogen Oxides (NO _x)	1.09
Particulate Matter 10 micrometers or less (PM ₁₀)	1.27
Carbon Monoxide (CO)	0.42
Carbon Dioxide (CO ₂)	172.34
Sulfur Dioxide (SO ₂)	0

3.4 BIOLOGICAL RESOURCES

In August 2011, a wildlife biologist conducted a reconnaissance level review of the Distribution Circuit alignments. Habitat was evaluated for its potential to accommodate special status species with a concentrated effort to identify signs and/or presence of special status species. Species occurrence records within a five-mile buffer of the Distribution Circuits are depicted in Figure 3.4-1. No special status species were identified as having the potential to occur within the project area. While a historic record of a California tiger salamander occurrence is present near the southern portion of the distribution line alignment along Sunnyside Avenue, this occurrence was reported in 1974 and is considered extirpated (CNDDDB 2011). The vernal pool habitat where observation occurred is no longer present, and the majority of the surrounding areas have been developed.

3.4.1 Environmental Setting

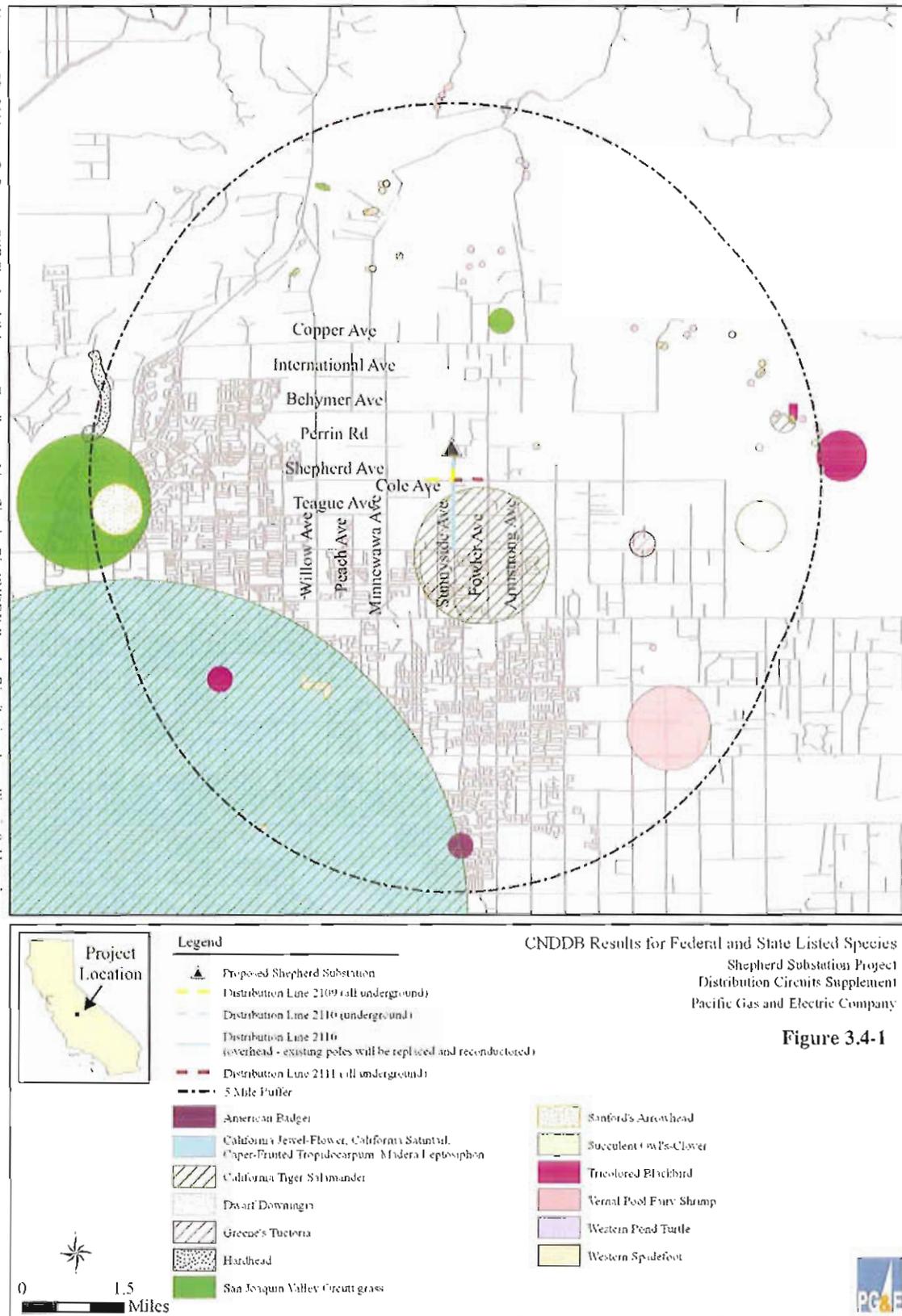
The Distribution Circuits are located in the same general combination of developed and agricultural lands as described in the PEA. Figure 3.4-2 depicts the vegetative communities and land uses surrounding the Distribution Circuits. Three areas identified as disturbed grassland are present, but these disturbed grasslands are small areas of native and non-native grassland species surrounded by development that are intermittently disked, grazed, or otherwise cleared. They are of limited habitat value for plants and animals. Water features not previously described in the PEA include Enterprise Canal and Dry Creek, both of which flow through the central portion of the Distribution Circuit alignments. In addition, other small, seasonal drainage features and a large pond are present along the alignments. These water features will not be impacted by construction activities since the Distribution Circuits will either span the features or, in areas where the line is proposed to be buried, will be bored under the feature.

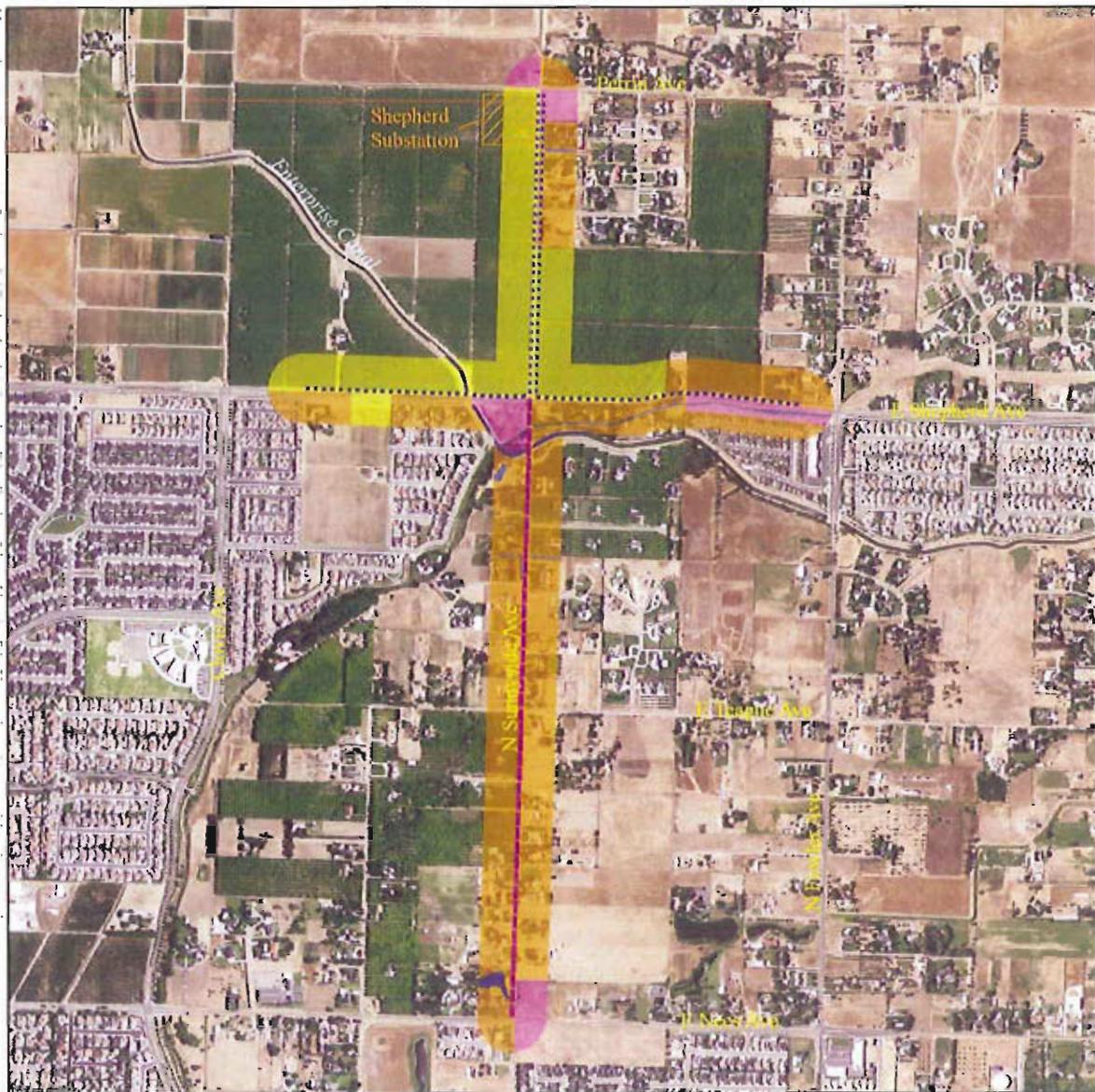
3.4.2 Impacts

No additional impacts to biological resources will result from construction of the Distribution Circuits.

3.4.3 References

California Department of Fish and Game Natural Diversity Database (CNDDDB)
2011 RareFind (Version 3.1.0) [Software]. URL <http://www.dfg.ca.gov/biogeodata/cnddb> [Accessed August 2011].





- Legend**
- Distribution - Underground
 - - - - - Distribution - Overhead
 - Yellow Agriculture
 - Orange Developed Land
 - Pink Disturbed Grasslands
 - Purple Water Feature



Vegetation Communities Map

Shepherd Substation Project
Distribution Circuits Supplement

Figure 3.4-2



3.5 CULTURAL RESOURCES

3.5.1 Existing Conditions

With two minor exceptions, the environmental setting remains unchanged.

First, Dry Creek, which approximates its prehistoric alignment, is crossed perpendicularly by the overhead portion of the Sunnyside Avenue South 21 kV Distribution Line, and it runs adjacent to the Shepherd Avenue East 21 kV Distribution Line for a distance of 2,000 feet. Drainages, such as Dry Creek, have a higher potential for having associated prehistoric sites. However, it is not known whether Dry Creek was a dependable enough water source to have been attractive to Native Americans; no prehistoric archaeological sites have been identified near Dry Creek in the vicinity of the Distribution Circuits.

Second, the underground Shepherd Avenue West distribution circuit and the overhead portion of the Sunnyside Avenue South each cross Enterprise Canal. The 28-mile-long canal was constructed between 1870 and 1880 by the Enterprise Canal Company to deliver water from the Kings River to potential agricultural lands in north Fresno. The circuits would cross the canal approximately three miles from its terminus. Between 2003 and 2004, Fresno Irrigation District dredged the canal, constructed measuring stations with telemetry, rebuilt the automated canal headgate structure, repaired flumes, removed abandoned bridges, and increased capacity. In 2010, a 1910s-era spillway and siphon at the junction of the canal and Dry Creek was replaced (U.S. Bureau of Reclamation 2009).

3.5.2 Impacts

Because no prehistoric archaeological sites have been identified near Dry Creek in the vicinity of the Distribution Circuits, no potential impacts to Dry Creek are anticipated. As to Enterprise Canal, the Distribution Circuits will cross the 1870s–1880s-era canal at two locations. However, the Shepherd Avenue West 21 kV Distribution Line will be bored under the canal, and the Sunnyside Avenue South 21 kV Distribution Line will cross the canal overhead without touching it, attached to wood poles. Thus, as explained further below, neither crossing will impact Enterprise Canal.

In 2010, the U.S. Bureau of Reclamation (BOR) constructed a new spillway and siphon as part of Enterprise Canal for the Big Dry Creek Improvement Project. The Sunnyside Avenue South and Shepherd Avenue West distribution circuits will cross the canal 275 feet and 420 feet from this construction, respectively. The BOR consulted with the California State Historic Preservation Office (SHPO) regarding the National Register of Historic Places (NRHP) eligibility of, and effects to, the canal. The California SHPO determined that:

At present the Bureau of Reclamation lacks the resources to fully evaluate the 28-mile-long Enterprise Canal and its appurtenant structures and features, but acknowledges that it is likely eligible for the National Register of Historic Places (NRHP) for its importance in the development of northern Fresno County and the Cities of Fresno and Clovis. For the purposes of this undertaking, the Bureau of Reclamation will treat the Enterprise Canal as eligible for the NRHP under Criterion A...(CA SHPO 2009)

Because of this ruling, even though the resource has not been previously listed, Enterprise Canal is considered a historical resource for purposes of this analysis.

A project with an effect that may cause a substantial adverse change in the significance of a historical resource results in a significant effect on the environment. However, such a substantial adverse change is defined as “physical demolition, destruction, relocation, or alteration of the resource or its immediate

surroundings such that the significance of that resource would be materially impaired” (Section 15064.5). At both locations where Enterprise Canal is to be crossed, no such substantial adverse changes are to occur. Neither the boring under the canal nor the crossing over the canal will cause a substantial adverse change in the significance of this historic resource as defined in Section 15064.5.

3.5.3 References

California State Historic Preservation Office (CA SHPO)

2009 Letter to Bureau of Reclamation regarding Enterprise Canal at Big Dry Creek Improvement Project, Fresno County, California (Project No. 10-SCA-015), dated November 30, 2009.

U.S. Bureau of Reclamation

2009 Draft Environmental Assessment: Enterprise Canal at Big Dry Creek Improvement Project, Fresno Irrigation District, Fresno County, California. Fresno. USBOR Mid Pacific Region South Central California Area Office, Fresno, CA.

3.6 GEOLOGY AND SOILS

3.6.1 Existing Conditions

With the exception of different soils series being present, the existing conditions are the same as described in the PEA. Soils along the Distribution Circuit alignments generally have the same characteristics as those described in the PEA. New soils present along the alignments are listed in Table 3.6-1. Forty percent of the alignments are comprised of Atwater sandy loam (ArA), previously described in the PEA. Like the Atwater series, other soils along the alignments are well drained, do not flood, and are more than 80 inches above the water table. The two exceptions are Riverwash and Tujunga loamy sand (TzbA) soils that are found along Dry Creek and flood frequently (Riverwash) or occasionally (Tujunga). These soils will not be affected because the project will span the creek with an overhead crossing.

**TABLE 3.6-1
SHEPHERD SUBSTATION DISTRIBUTION CIRCUIT SOILS**

NRCS Map Unit	Soil Series	Percent Distribution in Project Area
AtA	Atwater sandy loam, moderately deep, 0–3 percent slopes	10%
Gf	Grangeville fine sandy loam	25%
Ha	Hanford coarse sandy loam	<5%
Hc	Hanford sandy loam	10%
Ra	Ramona sandy loam	<5%
Rh	Riverwash	<5%
TzbA	Tujunga loamy sand, 0–3 percent slopes	<5%

Source: NRCS/USDA 2011

3.6.2 Impacts

No additional impacts to geology or soil resources will result from construction of the Distribution Circuits.

3.6.3 References

Natural Resource Conservation Service, U.S. Department of Agriculture (NRCS/USDA)
2011. *Web Soil Survey of Eastern Fresno Area, California*. Located online at
<http://websoilsurvey.nrcs.usda.gov>

3.7 HYDROLOGY AND WATER QUALITY

3.7.1 Existing Conditions

The Shepherd Avenue West 21 kV Distribution Line will cross Enterprise Canal along Shepherd Avenue. The Sunnyside Avenue South 21 kV Distribution Line will cross Dry Creek along Sunnyside Avenue just south of the Shepherd Avenue intersection. Federal Emergency Management Agency (FEMA) floodplain maps were reviewed to identify any designated 100-year floodplains (FEMA 2009). Flood Insurance Rate Map panel 06019C-1580H identifies Zone A and Zone AH floodplains within the Distribution Circuit alignments (Figure 3.7-1). Zone A is a flood hazard area with a one percent annual chance of flooding with no identified depth of flooding. Zone AH is a flood hazard area with a one percent annual chance of flooding at a depth of one to three feet.

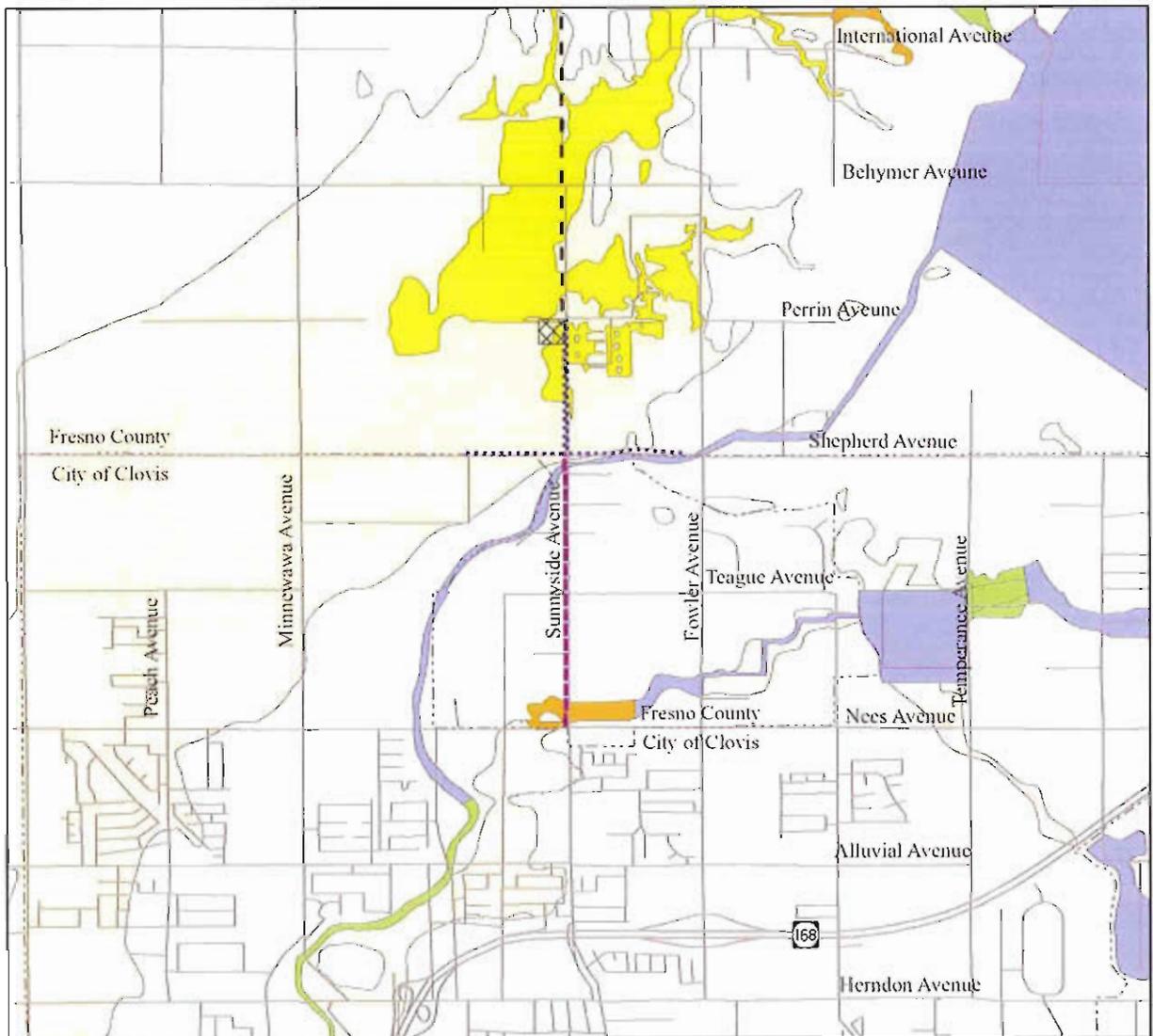
3.7.2 Impacts

Trenches for the underground facilities will be partially within the FEMA-designated 100-year flood hazard area along Sunnyside Avenue. Approximately 1,150 feet of trench work for buried distribution lines on both sides of Sunnyside Avenue will be installed within the FEMA-designated Zone AH floodplain immediately south of Shepherd Substation. An additional 100 feet of the FEMA-designated Zone A floodplain will be crossed for the overhead portion of the new distribution line located at the Dry Creek crossing on Sunnyside Avenue just south of Shepherd Avenue. The Distribution Circuits are not expected to alter existing drainage patterns. Likewise, the underground circuit along Shepherd Avenue will be bored under Enterprise Canal, eliminating potential impacts to the drainage. At the Sunnyside Avenue crossing of Dry Creek, the distribution circuit will span over the canal/creek crossing and will not alter the drainage pattern.

No water quality impacts are expected. During HDD drilling activities, the HDD contractor will be responsible for proper disposal of any soil cuttings, drilling mud, fluids, or waste in accordance with all federal, state, and local regulations. PG&E will implement all BMPs outlined in the *PG&E Horizontal Directional Drilling Manual* to prevent and, if necessary, contain frac-outs.

3.7.3 References

Federal Emergency Management Agency
2009 FEMA Map Service Center, Map Search – Quick Order.
<http://msc.fema.gov/webapp/wcs/stores/servlet/CategoryDisplay>. Accessed August 2011.

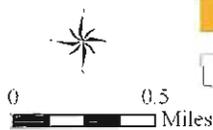


Legend

- - - Power Line Interconnection
- Distribution - Underground
- ▣ Proposed Substation
- Distribution - Overhead

Flood Hazard Zones

- Zone A - Annual Chance of Flooding 1.0%
- Zone AE - Annual Chance of Flooding 1.0%. Flood Elevations Determined
- Zone AH - Flood Depths of 1-3 Feet. Usually Pondered
- Zone AO - Flood Depths of 1-3 Feet. Usually Sheet Flow on Sloping Terrain
- Zone X - Annual Chance of Flooding 0.2%



Source: Fresno County 2007

Flood Hazard Map

Shepherd Substation Project
Distribution Circuits Supplement

Figure 3.7-1



3.8 NOISE

3.8.1 Existing Conditions

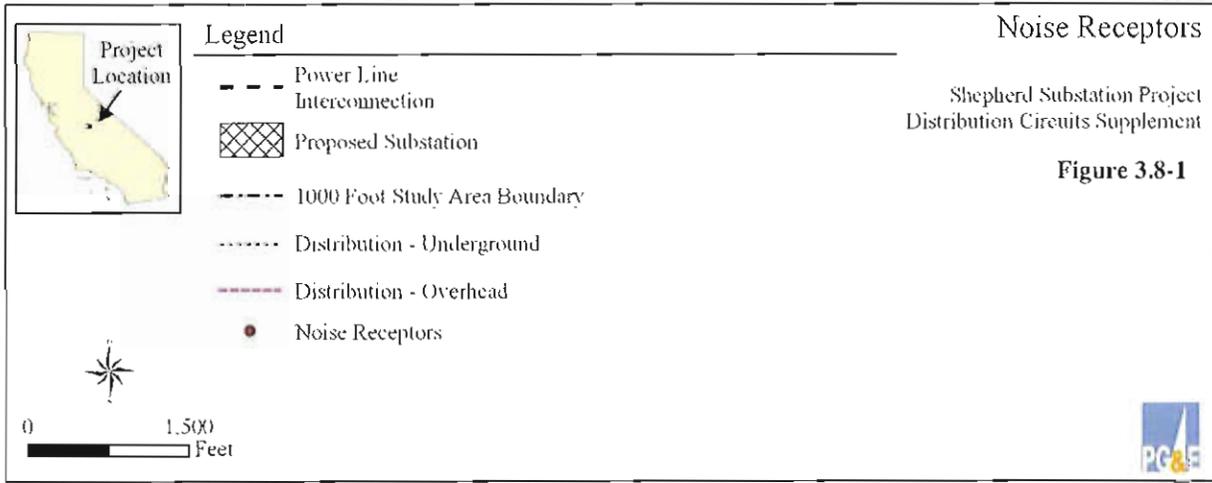
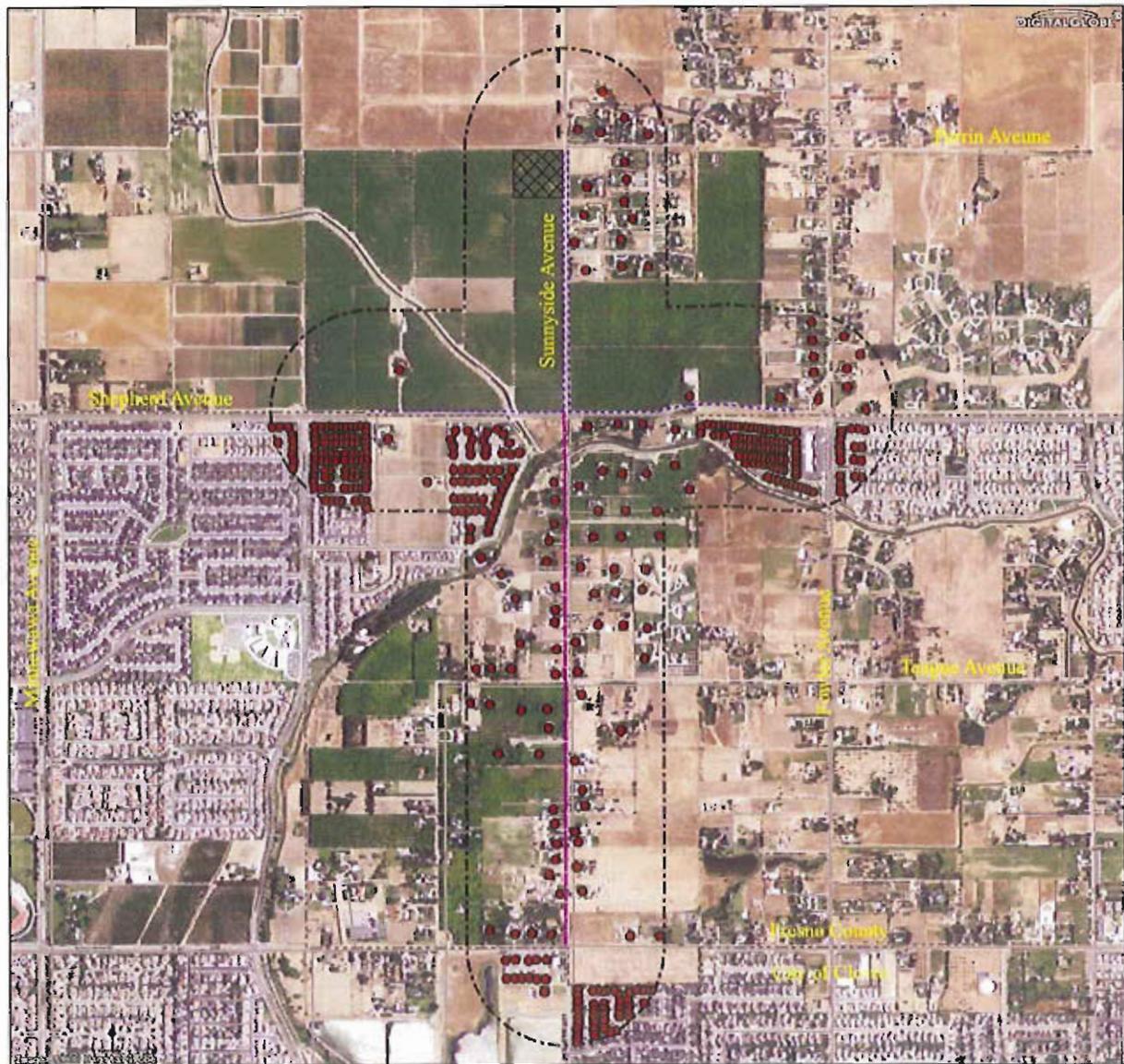
With the exception of a minor increase in the number of sensitive noise receptors, the environmental setting remains unchanged (Figure 3.8-1). Sensitive noise receptors are limited to residences scattered along the Distribution Circuit alignments, the nearest residence being approximately 50 feet away. Field visits confirmed that no other sensitive noise receptors (i.e., churches, schools, hospitals) are located within 1,000 feet of the alignments.

Table 3.8-1 shows a breakdown of residences within 1,000 feet of distribution circuits at 100-foot intervals.

Distance (feet)	0–99	100– 199	200– 299	300– 399	400– 499	500– 599	600– 699	700– 799	800– 899	900– 1,000
Number of Residences	12	35	39	48	42	59	44	48	46	40

3.8.2 Impacts

No additional noise impacts will result from construction of the Distribution Circuits.



4.0 CUMULATIVE ANALYSIS

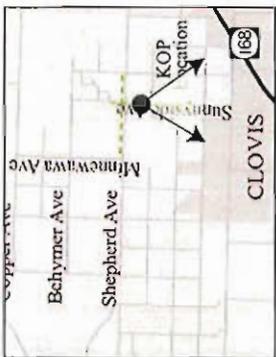
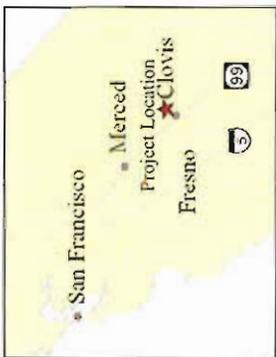
Construction of the Distribution Circuits will not result in any growth-inducing impacts or cumulative impacts beyond those described in the PEA. In regards to cumulative impacts, there are no other projects in the Distribution Circuit study area beyond those described in the PEA.

APPENDIX A

KEY OBSERVATIONAL POINT / VISUAL SIMULATION



North of Intersection of Teague Avenue and Sunnyside Avenue -- This photograph, looking south along Sunnyside Avenue, depicts a typical view of the existing distribution lines. The landscape along Sunnyside Avenue is mixture of rural residences and agricultural lands.



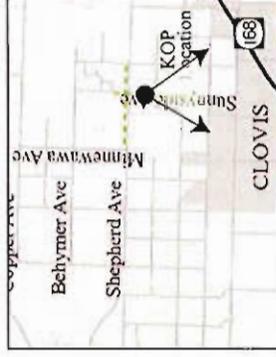
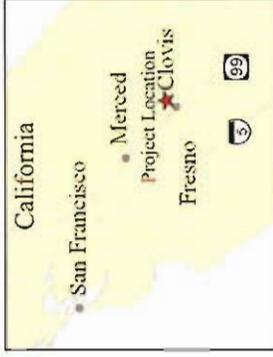
Shepherd Substation Project
Distribution Circuit Supplement
KOP 1 Photograph



Photographed with a Canon Rebel T1i, 18-55mm lens, 1/2000 sec, f/2.8



North of Intersection of Teague Avenue and Sunnyside Avenue -- This simulation shows the rebuilt distribution line along Sunnyside Avenue. Based upon preliminary designs, the distribution line will be rebuilt in the same location.



Shepherd Substation Project
 Distribution Circuit Supplement
 KOP 1 Simulation



Photographed with a Canon Rebel T1i, 18-55mm lens, 32mm focus.

APPENDIX B
AIR QUALITY SUPPORTING DATA

TABLE B-1 CONSTRUCTION EMISSION FACTORS												
Construction Phase	Phase Duration	Equipment Type ¹	Number	HP ²	Load Factor ²	Operation Hours/Yr	Pollutant Emissions Factor (g/bhp/hour) ²					
							ROG	CO	NO _x	SO _x	PM	CO ₂
Overhead Reconductoring	1.5 months	Pick-up (other)	2	190	0.62	60	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		Digger Derrick (bore/drill rigs)	1	291	0.75	60	0.204	0.76 3	2.337	0.004	0.084	426.6 08
		Bucket Truck (other)	2	190	0.62	60	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		Rope Truck (other)	1	190	0.62	12	0.237	0.84 2	2.75	0.003	0.094	352.6 63
Underground Electric Installation	1.5 months	Boom Truck (other)	1	190	0.62	24	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		1.5-ton truck with Underdog (other)	1	190	0.62	24	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		¼ ton pick-up (other)	1	190	0.62	24	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		1.5 ton pick-up (other)	1	190	0.62	24	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		Line truck (other)	1	190	0.62	24	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		Splice van (other)	1	190	0.62	24	0.237	0.84 2	2.75	0.003	0.094	352.6 63
Excavations: Trenching and Conduit Installation	2.5 months	Bore Rig	1	290	0.75	36	0.204	0.76 3	2.337	0.004	0.084	426.6 08
		26,000 lb Gas Crew Truck With Trailer (other general industrial equipment)	1	238	0.51	60	0.297	0.78 1	3.188	0.003	0.108	290.0 93
		Trucks (other)	1	190	0.62	60	0.237	0.84 2	2.75	0.003	0.094	352.6 63
		Water Truck	1	189	0.5	100	0.319	0.83 7	3.144	0.004	0.112	324.2 22
		Trencher	1	63	0.75	100	0.992	3.18 2	5.971	0.005	0.51	426.6 08
		Dump Truck (other general industrial equipment)	1	238	0.51	100	0.297	0.78 1	3.188	0.003	0.108	290.0 93

¹Not all equipment types are included in the URBEMIS model. For equipment types not specifically included in URBEMIS, an assumption for similar equipment was made. In these cases, the actual equipment type is listed first, with the proxy used for the URBEMIS model included in parenthesis.

²Horsepower (HP), Load Factor, and Emissions Factors were obtained from the URBEMIS 2007 v9.2.4 model. The URBEMIS default IIP and Load Factors were used.

**BEFORE THE
PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of PACIFIC GAS AND ELECTRIC
COMPANY, a California corporation, for a
Permit To Construct the Shepherd Substation
Project Pursuant to General Order 131-D

A.10-12-003

(U 39 E)

Exhibit B

Revised Substation Layout

**BEFORE THE
PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of PACIFIC GAS AND ELECTRIC
COMPANY, a California corporation, for a
Permit To Construct the Shepherd Substation
Project Pursuant to General Order 131-D

A.10-12-003

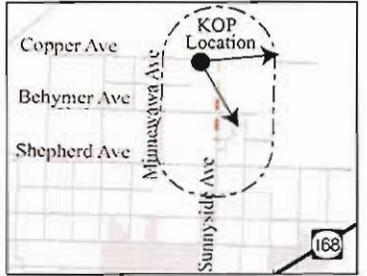
(U 39 E)

Exhibit C

Revised Project Simulations

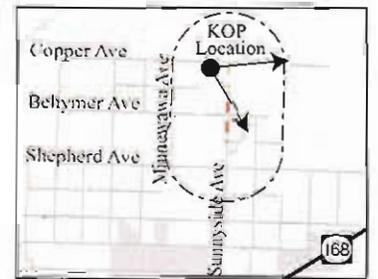


East Copper Avenue -- This photograph depicts a view to the east from the intersection of East Copper Avenue and Sunnyside Avenue. It shows the existing condition of the area.



Shepherd Substation Project
KOP 1 Photograph

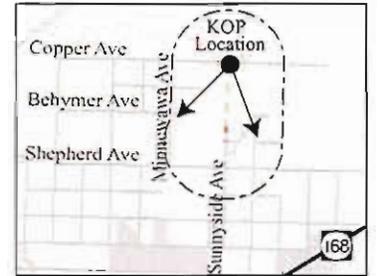
Photographed with a Canon Rebel T1i, 18-55mm lens, 32mm focus



Shepherd Substation Project
KOP I Simulation

East Copper Avenue -- This simulation depicts the proposed power line connecting to the existing 115 kV power line parallel to East Copper Avenue. This view is east from the intersection of Sunnyside Avenue and East Copper Avenue. Based upon preliminary designs, the structure along Copper Avenue is depicted at approximately 85 feet tall; other structures are depicted at approximately 95 feet tall.

Photographed with a Canon Rebel T1i, 18-55mm lens, 32mm focus

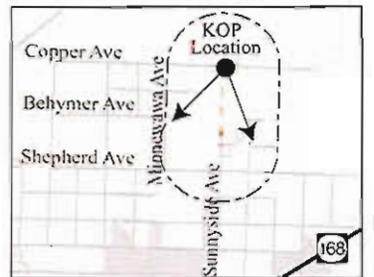


Shepherd Substation Project
KOP 2 Photograph



Copper Avenue -- This photograph depicts a view to the southwest from a residence along Copper Avenue. It shows the existing condition of the area.

Photographed with a Canon Rebel T1i, 18-55mm lens, 29mm focus



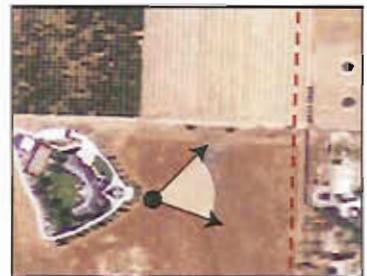
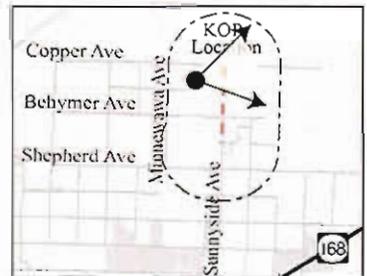
Shepherd Substation Project
KOP 2 Simulation



Copper Avenue -- This simulation depicts the power line connecting to the existing 115 kV power line that parallels East Copper Avenue. The view looks southwest along the proposed power line. Based upon preliminary designs, the structure along Copper Avenue is depicted at a height of approximately 85 feet; other structures are depicted at approximately 95 feet.

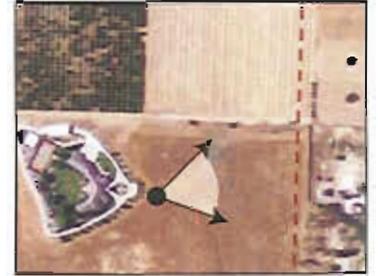
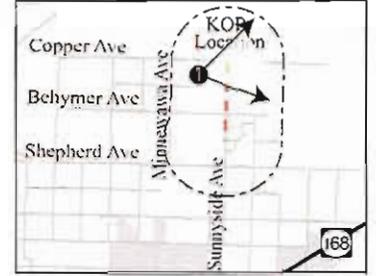


Pasture between Copper Avenue and Behymer Avenue -- This is a view to the northeast from a nearby residence.
It shows the existing condition of the area.



Shepherd Substation Project
KOP 3 Photograph





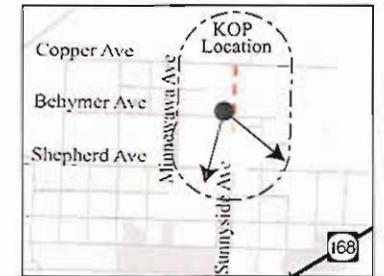
Shepherd Substation Project
KOP 3 Simulation

Pasture between Copper Avenue and Behymer Avenue -- This simulation depicts a view to the northeast from the area near a residence west of the proposed power line. Based upon preliminary designs, the structures are depicted at an approximate height of 95 feet.

Photographed with a Canon Rebel T1i, 18-55mm lens, 27mm focus

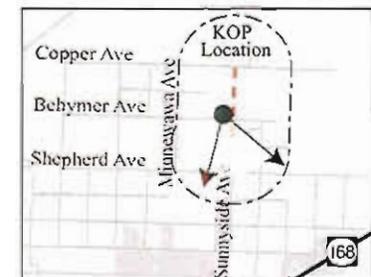


Intersection of Behymer Avenue and the power line -- This photograph depicts a view to the south along the existing distribution lines. The open area on the right side of the photograph is where the pasture and flood retention areas are located.



Shepherd Substation Project
KOP 4 Photograph

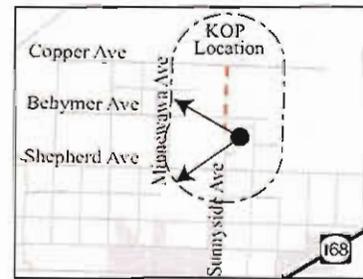




Shepherd Substation Project
KOP 4 Simulation



Intersection of Behymer Avenue and the power line -- This simulation depicts a view to the south looking along the proposed power line with the proposed substation in the distance. The open area on the right side of the photograph is where the pasture and flood retention areas are located. Based upon preliminary designs, structures are depicted at approximately 95 feet tall except for the structure identified above as being approximately 75 feet tall.



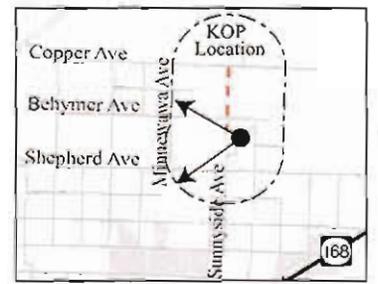
Shepherd Substation Project
KOP 5 Photograph

East of Sunnyside Avenue along Perrin Road -- This photograph depicts a view to the west toward an agricultural field and an almond orchard. It shows the existing condition of the area.

Photographed with a Canon Rebel T1i, 18-55mm lens, 32mm focus



East of Sunnyside Avenue along Perrin Road -- Nearby residences would have views of the proposed substation as well as the proposed power line from this viewpoint. The substation wall and entry gates are visible through the almond orchard. Based upon preliminary designs, the structure located within the background is depicted at approximately 75 feet tall, and the turning structure is depicted at approximately 95 feet tall.

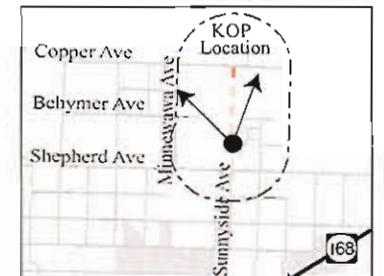


Shepherd Substation Project
KOP 5 Simulation

Photographed with a Canon Rebel T1i 18-55mm lens, 32mm focus

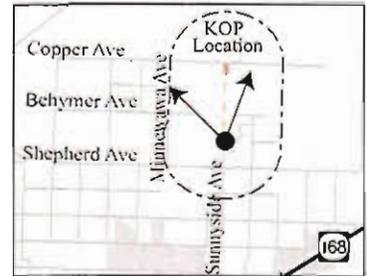


Sunnyside Avenue looking toward Perrin Road intersection -- This photograph depicts a view to the northwest toward almond orchards and agricultural fields. It shows the existing condition of the area.



Shepherd Substation Project
KOP 6 Photograph





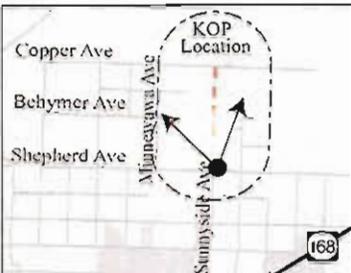
Shepherd Substation Project
KOP 6 Simulation

Sunnyside Avenue looking toward Perrin Road intersection -- This viewpoint is located at the edge of the nearest residence located directly across the street from the proposed substation. The substation wall and entry gates are visible through the almond orchard, which will remain as depicted. Based upon preliminary designs, the structures on the right are depicted at approximately 95 feet tall with the structure on the left is depicted at a height of approximately 75 feet tall.

Photographed with a Canon Rebel T1i, 18-55mm lens, 32mm focus



Intersection of Sunnyside Avenue and Shepherd Avenue -- This photograph depicts a view to the northwest along Sunnyside Avenue toward almond orchards and residences. It shows the existing condition of the area.



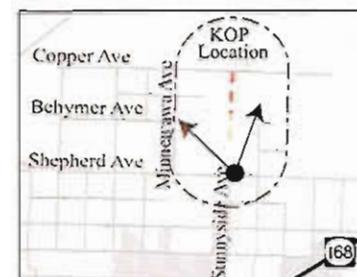
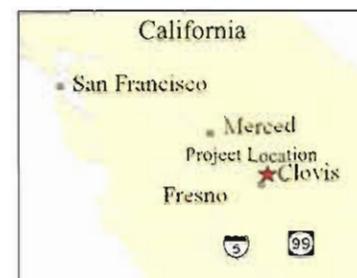
Shepherd Substation Project
KOP 7 Photograph



Photographed with a Canon Rebel T3i, 18-55mm lens, 28mm focus



Substation



Shepherd Substation Project
KOP 7 Simulation



Intersection of Sunnyside Avenue and Shepherd Avenue -- This is the primary entrance point for the project area and is adjacent to the nearest designated recreation feature (an existing recreational trail and proposed park). The proposed Shepherd Substation and 115 kV power line are located approximately 0.5 miles north of this viewpoint, along the west side of Sunnyside Avenue, and are barely visible.