

**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

Application No.

(U 39 E)

EXHIBIT B

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

WILLIAM MANHEIM
DAVID T. KRASKA
Law Department
Pacific Gas and Electric Company
Post Office Box 7442
San Francisco, CA 94120
Telephone: (415) 973-7503
Facsimile: (415) 972-5952
DTK5@pge.com

JO LYNN LAMBERT
Attorney at Law
707 Brookside Avenue
Redlands, CA 92373
Telephone: (909) 793-4942 or (415) 973-5248
Facsimile: (909) 793-8944
JLLm@pge.com

Attorneys for Applicant
PACIFIC GAS AND ELECTRIC COMPANY

PROPONENT'S ENVIRONMENTAL ASSESSMENT
SHEPHERD SUBSTATION PROJECT

Prepared by:
Transcon Environmental, Inc.
December 2010

TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY	viii
2.0	PROJECT DESCRIPTION	2
2.1	Project Overview	2
2.2	Project Location and Regional Context	3
2.2.1	Substation	3
2.2.2	Power Line Interconnection	9
2.3	Project Purpose and Need	11
2.3.1	Project Objectives	11
2.3.2	Project Need	11
2.3.3	Project Benefits Description	12
2.4	Alternatives	13
2.5	No Project Alternative	13
2.6	Project Facilities	14
2.6.1	Shepherd Substation	14
2.6.2	Power Line Interconnection	16
2.7	General Construction Methods	19
2.7.1	Construction Sequence	19
2.7.2	Construction Personnel and Equipment	23
2.8	Estimated Ground Disturbance	26
2.9	Construction Schedule	26
2.10	Operations, Maintenance, and Inspection	26
2.11	permits that may be Required	27
2.12	Right-of-Way Acquisition	27
2.13	Applicant Proposed Measures	27
3.0	ENVIRONMENTAL SETTING AND IMPACT ASSESSMENT SUMMARY	33
3.1	Aesthetics	34
3.1.1	Methodology	34
3.1.2	Existing Conditions	37
3.1.3	Impacts	40
3.1.4	References:	45
3.2	Agricultural, Land Use, and Recreational Resources	46
3.2.1	Methodology	47
3.2.2	Existing Conditions	47
3.2.3	Impacts	57
3.2.4	References	59
3.3	Air Quality	60
3.3.1	Methodology	60
3.3.2	Existing Conditions	61
3.3.3	Impacts	64
3.3.4	References	71
3.4	Biological Resources	72
3.4.1	Methodology	73
3.4.2	Existing Conditions	73
3.4.3	Impacts	86
3.4.4	References	90
3.5	Cultural Resources	91
3.5.1	Methodology	91
3.5.2	Existing Conditions	92
3.5.3	Impacts	95

3.5.4	References	96
3.6	Geology and Soils	97
3.6.1	Methodology	98
3.6.2	Existing Conditions	98
3.6.3	Impacts	100
3.6.4	References	103
3.7	Hazards and Hazardous Materials	104
3.7.1	Methodology	105
3.7.2	Existing Conditions	105
3.7.3	Impacts	107
3.7.4	References	109
3.8	Hydrology and Water Quality	110
3.8.1	Methodology	111
3.8.2	Existing Conditions	111
3.8.3	Impacts	112
3.8.4	References	115
3.9	Noise	116
3.9.1	Methodology	116
3.9.2	Existing Conditions	118
3.9.3	Impacts	119
3.9.4	References	122
3.10	Population, Housing, Public Services, and Utilities	123
3.10.1	Methodology	124
3.10.2	Existing Conditions	125
3.10.3	Impacts	126
3.10.4	References	129
3.11	Transportation and Traffic	130
3.11.1	Methodology	130
3.11.2	Existing Conditions	131
3.11.3	Impacts	133
3.11.4	References	135
4.0	CUMULATIVE ANALYSIS	136
4.1	Growth-Inducing Impacts	136
4.1.1	Significance Criteria	136
4.1.2	Analysis of Growth-Inducing Impacts	136
4.2	Cumulative Impacts	137
4.2.1	Significance Criteria	137

APPENDICES

APPENDIX A	Key Observational Points Visual Simulations
APPENDIX B	Property Owner List
APPENDIX C	Letters of Support
APPENDIX D	Air Emissions Calculations
APPENDIX E	Tribal Consultation Correspondence
APPENDIX F	Electric and Magnetic Fields

LIST OF FIGURES

FIGURE 2.1-1	Photograph: The area immediately north of the substation	2
FIGURE 2.1-2	Photograph: The almond orchard and nearest residential development	2
FIGURE 2.2-1	Project Vicinity Map.....	4
FIGURE 2.2-2	Project Site Map	5
FIGURE 2.2-3	Project Aerial Map (1 of 3).....	6
FIGURE 2.2-4	Project Aerial Map (2 of 3).....	7
FIGURE 2.2-5	Project Aerial Map (3 of 3).....	8
FIGURE 2.2-6	Number of Residences within 1,000 Feet of the Substation	9
FIGURE 2.2-7	Number of Residences within 1,000 Feet of the Power Line	11
FIGURE 2.6-1	Preliminary Substation Layout	15
FIGURE 2.6-2	Substation Profile.....	16
FIGURE 2.6-3	Photograph: Typical tangent tubular steel pole with vertical configuration	17
FIGURE 2.6-4	Tubular Steel Pole/Hybrid Pole Profile	18
FIGURE 2.6-5	Drop Down Structure Profile.....	18
FIGURE 2.7-1	Typical Pole Installation Illustration.....	22
FIGURE 3.1-1	Key Observation Points Map.....	36
FIGURE 3.1-2	Photograph: KOP 1	38
FIGURE 3.1-3	Photograph: KOP 2.....	38
FIGURE 3.1-4	Visual Simulation: Intersection of Sunnyside Avenue and Perrin Road	39
FIGURE 3.1-5	Visual Simulation: Intersection of Sunnyside Avenue and Shepherd Avenue	40
FIGURE 3.2-1	Agriculture Map.....	49
FIGURE 3.2-2	Land Ownership and Jurisdiction Map.....	51
FIGURE 3.2-3	Existing Land Use Map	52
FIGURE 3.2-4	Zoning Map	54
FIGURE 3.2-5	Planned Land Use Map.....	55
FIGURE 3.2-6	Proposed Land Use Map.....	56
FIGURE 3.3-1	Sensitive Receptors Map	68
FIGURE 3.4-1	Species Occurrences from the CNDDDB.....	74
FIGURE 3.4-2	Photograph: Power line interconnection location	76
FIGURE 3.4-3	Sensitive Habitat Map 1.....	78
FIGURE 3.4-4	Sensitive Habitat Map 2.....	79
FIGURE 3.8-1	Flood Hazard Map	113

LIST OF TABLES

TABLE 2.2-1	Project Component Legal Descriptions.....	3
TABLE 2.2-2	Residences within 1,000 Feet of the Perimeter of Shepherd Substation	9
TABLE 2.2-3	Residences within 1,000 Feet of the Power Line	10
TABLE 2.6-1	Power Line Design Characteristics	17
TABLE 2.6-2	Conductor Design Characteristics	19
TABLE 2.7-1	Substation Personnel and Equipment	23
TABLE 2.7-2	Power Line Interconnection Personnel and Equipment	25
TABLE 2.8-1	Estimated Ground Disturbance	26
TABLE 2.11-1	Summary of Discretionary Permits that May be Required	27
TABLE 2.13-1	Applicant's Proposed Measures	27
TABLE 3.0-1	CEQA Initial Study Checklist	33
TABLE 3.1-1	CEQA Initial Study Checklist – Aesthetics	34
TABLE 3.1-2	Existing Landscape Character	42
TABLE 3.2-1	CEQA Initial Study Checklist – Agriculture, Land Use, and Recreation	46
TABLE 3.2-2	Farmland Mapping and Monitoring Program Soils and Acreage for Fresno Co.	48

TABLE 3.3-1	CEQA Initial Study Checklist – Air Quality	60
TABLE 3.3-2	State and Federal Ambient Air Quality Standards.	62
TABLE 3.3-3	Monthly Climate Summary for the Fresno Airport.	64
TABLE 3.3-4	Summary of Ambient Air Monitoring Data for the North Villa Monitoring Station.	64
TABLE 3.3-5	Estimated Construction Emissions Substation/Power Line Construction per Day. ...	66
TABLE 3.3-6	Estimated Construction Emissions Substation/Power Line Construction per Year. ...	66
TABLE 3.3-7	Estimated Construction Related Greenhouse Gas Emission	69
TABLE 3.3-8	Estimated Operational Related Greenhouse Gas Emissions	70
TABLE 3.4-1	CEQA Initial Study Checklist – Biological Resources	72
TABLE 3.4-2	Habitat Suitability Assessment for Special Status Species	80
TABLE 3.5-1	CEQA Initial Study Checklist – Cultural Resources.....	91
TABLE 3.6-1	CEQA Initial Study Checklist – Geology and Soils, Minerals, and Paleontology.....	97
TABLE 3.6-2	Atwater Sandy, Loam Soil Properties.	99
TABLE 3.7-1	CEQA Initial Study Checklist – Hazards and Hazardous Materials	104
TABLE 3.8-1	CEQA Initial Study Checklist – Hydrology and Water Quality	110
TABLE 3.9-1	CEQA Initial Study Checklist – Noise.....	116
TABLE 3.9-2	Land Use Compatibility for Community Noise Elements.	117
TABLE 3.9-3	Fresno County Noise Element Standards.....	118
TABLE 3.9-4	Typical Noise Levels for Construction Equipment.	120
TABLE 3.10-1	CEQA Initial Study Checklist – Population, Housing, Public Services, Utilities....	123
TABLE 3.10-2	Employment and Income Data for Fresno County and California.....	125
TABLE 3.10-1	CEQA Initial Study Checklist – Transportation and Traffic.....	130
TABLE 3.11-2	Levels of Service Standards for State Routes Used to Access Project Vicinity.....	132

ACRONYMS

AAQS	Ambient Air Quality Standards
AB	Assembly Bill
ACS	American Cancer Society
AE	Exclusive Agricultural District
APMs	Applicant Proposed Measures
ASTM	American Society for Testing and Materials
BGEPA	Bald and Golden Eagle Protection Act
BP	Before Present
CAAQS	California Ambient Air Quality Standards
CAL	Cursory Analysis Level
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCAA	California Clean Air Act
CDFG	California Department of Fish and Game
CDHS	California Department of Health Services
CEE	Customer Energy Efficiency
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH ₄	Methane
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CTS	California Tiger Salamander
CWA	Clean Water Act
dB	decibels
dBA	decibels A-weighted
DOC	Department of Conservation
DPA	Distribution Planning Area
DPS	Distinct Population Segment
DTSC	Department of Toxic Substances Control
du/ac	dwelling unit per acre
ELF	Extremely Low Frequency
EMF	Electric and Magnetic Fields
EMFAC	Emissions Factors
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FAA	Federal Aviation Administration
FAL	Full Analysis Level
FC	Federal Candidate
FE	Federally Endangered
FEMA	Federal Emergency Management Agency

FIRM	Flood Insurance Rate Map
FT	Federally Threatened
GHG	Greenhouse Gas
GPS	Global Positioning System
GWP	Global Warming Potentials
H ₂ S	Hydrogen Sulfide
HFCs	Hydroflourocarbons
HCLW	Hazardous Waste and Control Law
KOP	Key Observation Point
kV	Kilovolt
kV/m	Kilovolts per Meter
LAFCO	Local Agency Formation Commission
Ldn	Day and Night Noise Levels
L _{eq}	Equivalent Continuous Sound Level
LOP	Limited Operating Period
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MG	Milliguass
MTCO _{2e}	Metric Tons CO ₂ Equivalent
MVA	Megavolt Ampere
MW	Megawatts
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NIEHS	National Institute of Environmental Health Services
N ₂ O	Nitrous Oxide
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O ₃	Ozone
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
Pb	Lead
PCBs	Polychlorinated Biphenyls
PE	Proposed Endangered
PEA	Proponent's Environmental Assessment
PFCs	Perflourocarbons
PM	Particulate Matter
ppm	Parts per Million
PT	Proposed Threatened
PTC	Permit to Construct
R	Rare
RAPID	Research and Public Information Dissemination
SAAQS	State Ambient Air Quality Standards
SCS	State Candidate Species
SE	State Endangered
SF ₆	Sulfur Hexafluoride
SJKF	San Joaquin kit fox
SJVAB	San Joaquin Valley Air Basin

SJVAPCD	San Joaquin Valley Air Pollution Control District
SJVRAQCB	San Joaquin Valley Regional Air Quality Control Board
SPAL	Small Project Analysis Level
SPCC	Spill Prevention Control Countermeasure
SO ₂	Sulfur Dioxide
SR	State Route
SSC	State Species of Concern
ST	State Threatened
SWPPP	Stormwater Pollution Prevention Plan
TSP	Tubular Steel Pole
μ/m ³	Micrograms per Cubic Meter
URBEMIS	Urban Emissions
USDA	United State Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V/m	Volts per Meter
VOC	Volatile Organic Compounds
WHO	World Health Organization

INDEX TO CPUC PEA REQUIREMENTS

CPUC PEA REQUIREMENTS	SECTION NUMBER
Cover Sheet	
Chapter 1: PEA Summary	
1. The major conclusions of the PEA	1.0, 3.0
2. Any areas of controversy	n/a
3. Any major issues that must be resolved including the choice among reasonably feasible alternatives and mitigation measures, if any;	1.0
4. Description of inter-agency coordination, if any; and	Appendix C, Application
5. Description of public outreach efforts, if any.	n/a
Chapter 2: Project Purpose and Need and Objectives (Note: This information is included in the Project Description)	
2.1 Overview Explanation of the objective(s) and/or Purpose and Need for implementing the Proposed Project.	2.3
2.2 Project Objectives Analysis of the reason why attainment of these objectives is necessary or desirable. Such analysis must be sufficiently detailed to inform the Commission in its independent formulation of project objectives which will aid any appropriate CEQA alternatives screening process.	2.3.2
Chapter 3: Project Description	
3.1 Project Location	
1. Geographical Location: County, City (provide project location map(s)).	2.2
2. General Description of Land Uses within the project site (e.g., residential, commercial, agricultural, recreation, traverses vineyards, farms, open space, number of stream crossings, etc.).	2.1, 2.2.1, 2.2.2
3. Describe if the Proposed Project is located within an existing property owned by the Applicant, traverses existing rights of way (ROW) or requires new ROW. Give the approximate area of the property or the length of the project that is in an existing ROW or which requires new ROWs.	2.12
3.2 Existing System	
1. Describe the local system to which the Proposed Project relates; include all relevant information about substations, transmission lines and distribution circuits. <i>Note: regional system maps would remain confidential for security reasons.</i>	2.3.2
2. Provide a schematic diagram and map of the existing system.	Figure 2.2-2
3. Provide a schematic diagram that illustrates the system as it would	Figure 2.6-1, Figure 2.6-2

CPUC PEA REQUIREMENTS	SECTION NUMBER
be configured with implementation of the Proposed Project.	
3.3 Project Objectives (Can refer to Chapter 2, Project Purpose and Need, if already described there.)	2.3
3.4 Proposed Project	
1. Describe whole of the Proposed Project. Is it an upgrade, a new line, new substations, etc.?	2.1, 2.3.1
2. Describe how the Proposed Project fits into the Regional system. Does it create a loop for reliability, etc.?	2.3
3. Describe all reasonably foreseeable future phases, or other reasonably foreseeable consequences of the Proposed Project.	2.3.3, 2.6.1
4. Provide capacity increase in MW. If the project does not increase capacity, state it.	Application
5. Provide GIS (or equivalent) data layers for the Proposed Project preliminary engineering including estimated locations of all physical components of the Proposed Project as well as those related to construction. For physical components, this could include but is not limited to the existing components (e.g., ROW, substation locations, poles, etc.) as well as the proposed pole locations, transmission lines, substations, etc. For elements related to construction include: proposed or likely lay-down areas, work areas at the pole sites, pull and tension sites, access roads (e.g., temporary, permanent, existing, etc.), areas where special construction methods may need to be employed, areas where vegetation removal may occur, areas to be heavily graded, etc. More details about this type of information are provided below. [NOTE: For security reasons, GIS data layers are submitted by PG&E Law Department under confidentiality restrictions.]	For security reasons, available GIS data layers will be submitted under PUC Section 583 confidentiality restrictions.
3.5 Project Components	
3.5.1 Transmission Line	
1. What type of line exists and what type of line is proposed (e.g., single-circuit, double-circuit, upgrade 69 kV to 115 kV).	2.1, 2.6.2
2. Identify the length of the upgraded alignment, the new alignment, etc.	2.1, 2.6.2
3. Would construction require one-for-one pole replacement, new poles, steel poles, etc.?	2.7.1.2
4. Describe what would occur to other lines and utilities that may be collocated on the poles to be replaced (e.g., distribution, communication, etc.).	2.2.2, 2.6.1, 2.6.2, 2.6.2.1, 2.7.1.2
3.5.2 Poles/Towers: Provide the following information for each pole/tower that would be installed <u>and</u> for each pole/tower that would be removed:	
1. Unique ID number to match GIS database information. [Law Department prefers that you renumber poles (1, 2, 3, etc.) rather than use existing poles numbers, for security reasons.]	For security reasons, Unique ID numbers for poles located along the distribution line have not

CPUC PEA REQUIREMENTS	SECTION NUMBER
	been provided. Available GIS data layers will be submitted under PUC Section 583 confidentiality restrictions.
2. Structure diagram and, if available, photos of existing structure. Preliminary diagram or “typical” drawings and, if possible, photos of proposed structure. Also provide a written description of the most common types of structures and their use (e.g., Tangent poles would be used when the run of poles continues in a straight line, etc.). Describe if the pole/tower design meets raptor safety requirements.	2.6.2.1, Figures 2.6-3, 2.6-4, 2.6-5
3. Type of pole (e.g., wood, steel, etc.) or tower (e.g., self-supporting lattice).	2.6.2.1
4. For poles, provide “typical” drawings with approximate diameter at the base and the tip; for towers, estimate the width at base and top.	2.6.2.1, Figures 2.6-3, 2.6-4
5. Identify typical total pole lengths, the approximate length to be embedded, and the approximate length that would be above ground surface; for towers, identify the approximate height above ground surface and approximate base footprint area.	2.6.2.1, Figures 2.6-3, 2.6-4, Table 2.13-1
6. Describe any specialty poles or towers; note where they would be used (e.g., angle structures, heavy angle lattice towers, stub guys); make sure to note if any guying would likely be required across a road.	2.6.2.1
7. If the project includes pole-for-pole replacement, describe the approximate location of where the new poles would be installed relative to the existing alignment.	n/a
8. Describe any special pole types (e.g., poles that require foundations, transition towers, switch towers, microwave towers, etc.) and any special features.	2.6.2.1
3.5.3 Conductor Cable	
3.5.3.1 Above-Ground Installation	
1. Describe the type of line to be installed on the poles/tower (e.g., single circuit with distribution, double circuit, etc.).	2.1, 2.6.2
2. Describe the number of conductors required to be installed on the poles or tower and how many on each side including applicable engineering design standards.	2.6.2.2
3. Provide the size and type of conductor (e.g., ACSR, non-specular, etc.) and insulator configuration.	2.6.2.2
4. Provide the approximate distance from the ground to the lowest conductor and the approximate distance between the conductors (i.e., both horizontally and vertically) Provide specific information at highways, rivers, or special crossings.	2.6.2.2, 2.7.1.2
5. Provide the approximate span lengths between poles or towers, note where different if distribution is present or not if relevant.	2.6.2.1

CPUC PEA REQUIREMENTS	SECTION NUMBER
6. Describe if other infrastructure would likely be collocated with the conductor (e.g., fiber optics, etc); if so, provide conduit diameter of other infrastructure.	2.2.2, 2.6.2, 2.6.2.1, 2.7.1.2
3.5.3.2 Below-Ground Installation	
1. Describe the type of line to be installed (e.g., single circuit cross-linked polyethylene-insulated solid-dielectric, copper-conductor cables).	n/a
2. Describe the type of casing the cable would be installed in (e.g., concrete-encased duct bank system); provide the dimensions of the casing.	n/a
3. Provide an engineering 'typical' drawing of the duct bank and describe what types of infrastructure would likely be installed within the duct bank (e.g., transmission, fiber optics, etc.).	n/a
3.5.4 Substations	
1. Provide "typical" Plan and Profile views of the proposed substation and the existing substation if applicable.	2.6.1, Figure 2.6-1
2. Describe the types of equipment that would be temporarily or permanently installed and provide details as to what the function/use of said equipment would be. Include information such as, but not limited to: mobile substations, transformers, capacitors, and new lighting.	2.6.1
3. Provide the approximate or "typical" dimensions (width and height) of new structures including engineering and design standards that apply.	2.6.1, Figure 2.6-2
4. Describe the extent of the Proposed Project. Would it occur within the existing fence line, existing property line or would either need to be expanded?	2.2.1, 2.6.1, 2.12
5. Describe the electrical need area served by the distribution substation.	2.3
3.6 Right-of-Way Requirements	
1. Describe the ROW location, ownership, and width. Would existing ROW be used or would new ROW be required?	2.12
2. If new ROW is required, describe how it would be acquired and approximately how much would be required (length and width).	2.12
3. List properties likely to require acquisition.	Appendix B
3.7 Construction	
3.7.1 For All Projects	
3.7.1.1 Staging Areas	
1. Where would the main staging area(s) likely be located?	2.7.1
2. Approximately how large would the main staging area(s) be?	n/a
3. Describe any site preparation required, if known, or generally describe what might be required (i.e., vegetation removal, new	n/a

CPUC PEA REQUIREMENTS	SECTION NUMBER
access road, installation of rock base, etc.).	
4. Describe what the staging area would be used for (i.e., material and equipment storage, field office, reporting location for workers, parking area for vehicles and equipment, etc.).	n/a
5. Describe how the staging area would be secured, would a fence be installed? If so, describe the type and extent of the fencing.	n/a
6. Describe how power to the site would be provided if required (i.e., tap into existing distribution, use of diesel generators, etc.).	n/a
7. Describe any grading activities and/or slope stabilization issues.	n/a
3.7.1.2 Work Areas	
1. Describe known work areas that may be required for specific construction activities (i.e., pole assembly, hill side construction, etc.).	2.8
2. For each known work area, provide the area required (include length and width) and describe the types of activities that would be performed.	2.8. Table 2.8-1
3. Identify the approximate location of known work areas in the GIS database.	For security reasons, available GIS data layers will be submitted under PUC Section 583 confidentiality restrictions.
4. How would the work areas likely be accessed (e.g., construction vehicles, walk in, helicopter, etc.)?	2.2.2, 2.7.1.1, 2.7.1.2
5. If any site preparation is likely required, generally describe what and how it would be accomplished.	2.7.1.1, 2.7.1.2
6. Describe any grading activities and/or slope stabilization issues.	2.7.1.1
7. Based on the information provided, describe how the site would be restored.	2.7.1.4, Table 2.13-1
3.7.1.3 Access Roads and/or Spur Roads	
1. Describe the types of roads that would be used and or would need to be created to implement the Proposed Project. See table below as an example of information required. Road types may include, but are not limited to: new permanent road; new temporary road; existing road that would have permanent improvements; existing road that would have temporary improvements, existing paved road; existing dirt/gravel road, and overland access.	2.2.2, 2.7.1.1, 2.7.1.2
2. For road types that require preparation, describe the methods and equipment that would be used.	n/a
3. Identify approximate location of all access roads (by type) in the GIS database.	For security reasons, available GIS data layers will be submitted under PUC Section 583 confidentiality restrictions.
4. Describe any grading activities and/or slope stabilization issues. See table in PEA Checklist as an example of information required. Road types may include, but are not limited to: new permanent	n/a

CPUC PEA REQUIREMENTS	SECTION NUMBER
road; new temporary road; existing road that would have permanent improvements; existing road that would have temporary improvements, existing paved road; existing dirt/gravel road, and overland access	
3.7.1.4 Helicopter Access	
1. Identify which proposed poles/towers would be removed and/or installed using a helicopter.	n/a
2. If different types of helicopters are to be used, describe each type (e.g., light, heavy or sky crane) and what activities they will be used for.	n/a
3. Provide information as to where the helicopters would be staged, where they would refuel, where they would land within the Project site.	n/a
4. Describe any BMPs that would be employed to avoid impacts caused by use of helicopters, for example: air quality and noise considerations.	n/a
5. Describe flight paths, payloads, hours of operations for known locations and work types.	n/a
3.7.1.5 Vegetation Clearance	
1. Describe what types of vegetation clearing may be required (e.g., tree removal, brush removal, flammable fuels removal) and why (e.g., to provide access, etc.).	2.7.1.1, 2.7.1.2
2. Identify the preliminary location and provide an approximate area of disturbance in the GIS database for each type of vegetation removal.	2.7.1.1, For security reasons, available GIS data layers will be submitted under PUC Section 583 confidentiality restrictions.
3. Describe how each type of vegetation removal would be accomplished.	2.7.1.1
4. For removal of trees, distinguish between tree trimming as required under GO-95D and tree removal.	n/a
5. Describe the types and approximate number and size of trees that may need to be removed.	2.7.1.1
6. Describe the type of equipment typically used.	Table 2.7-1
3.7.1.6 Erosion and Sediment Control and Pollution Prevention during Construction	
1. Describe the areas of soil disturbance including estimated total areas, and associated terrain type and slope. List all known permits required. For project sites of less than one acre, outline the best management practices (BMPs) that would be implemented to manage surface runoff. Things to consider include, but are not limited to, the following: <ul style="list-style-type: none"> • Erosion and Sedimentation BMP's; • Vegetation Removal and Restoration; and/or, • Hazardous Waste and Spill Prevention Plans. 	2.7.1.1, 2.6.1, 2.7.1.2

CPUC PEA REQUIREMENTS	SECTION NUMBER
2. Describe any grading activities and/or slope stabilization issues.	2.7.1.1, 2.7.1.2
3. Describe how construction waste (i.e., refuse, spoils, trash, oil, fuels, poles, pole structures, etc.) would be disposed.	2.7.1.4
3.7.1.7 Cleanup and Post-Construction Restoration	
1. Describe how cleanup and post-construction restoration would be performed (i.e., personnel, equipment, and methods). Things to consider include, but are not limited to, restoration of the following: Natural drainage patterns; wetlands; vegetation, and other disturbed areas (i.e. staging areas, access roads, etc).	2.7.1.4
3.7.2 Transmission Line Construction (Above Ground)	
3.7.2.1 Pull and Tension Sites	
1. Provide the general or average distance between pull and tension sites.	2.7.1.2
2. Provide the area of pull and tension sites, include the estimated length and width.	2.8
3. According to the preliminary plan, how many pull and tension sites would be required, and where would they be located? Please provide the location information in GIS.	2.1.7.2
4. What type of equipment would be required at these sites?	Table 2.7-2
5. If conductor is being replaced, how would it be removed from the site?	n/a
3.7.2.2 Pole Installation Removal	
1. Describe how the construction crews and their equipment would be transported to and from the pole site location. Provide vehicle type, number of vehicles, and estimated number of trips and hours of operation.	2.2.2, 2.7.1.2, Table 2.7-2
Pole and Foundation Removal	
1. Describe the process of how the poles and foundations would be removed.	2.7.1.2
2. Describe what happens to the hole that the pole was in (i.e., reused or backfilled)?	2.7.1.2
3. If the hole is to be filled, what type of fill would be used, where would it come from?	2.7.1.2
4. Describe any surface restoration that would occur at the pole site?	2.7.1.2
5. Describe how the poles would be removed from the site?	2.7.1.2
Top Removal If topping is required to remove a portion of an existing transmission pole that would now only carry distribution lines, please provide the following:	
1. Describe the methodology to access and remove the tops of these poles.	n/a

CPUC PEA REQUIREMENTS	SECTION NUMBER
2. Describe any special methods that would be required to top poles that may be difficult to access, etc.	n/a
<i>Pole Tower Installation</i>	
1. Describe the process of how the new poles/towers would be installed; specifically call out any special construction methods (e.g., helicopter installation) for specific locations or for different types of poles/towers.	2.7.1.2
2. Describe the types of equipment and their use as related to pole/tower installation.	Table 2.7-2
3. Describe actions taken to maintain a safe work environment during construction (e.g., covering of holes/excavation pits, etc.).	2.7.1.2
4. Describe what would be done with soil removed from a hole/foundation site.	2.7.1.2
5. For any foundations required, provide description of construction method(s), approximate average depth and diameter of excavation, approximate volume of soil to be excavated, approximate volume of concrete or other backfill required, etc.	2.7.1.2
6. Describe briefly how poles/towers and associated hardware are assembled.	2.7.1.2
7. Describe how the poles/towers and associated hardware would be delivered to the site; would they be assembled off-site and brought in or assembled on site?	2.7.1.2
8. Provide a table of pole/tower installation metrics and associated disturbance area estimates as in PEA Checklist 3.7.2.2	Table 2.6-1, Table 2.8-1
3.7.2.3 Conductor/Cable Installation	
1. Provide a process-based description of how new conductor/cable would be installed and how old conductor/cable would be removed, if applicable. Note, graphical representation of the general sequencing is helpful for the reader here.	n/a
2. Generally describe the conductor/cable splicing process.	n/a
3. If vaults are required, provide their dimensions and approximate location/spacing along the alignment.	n/a
4. Describe in what areas conductor/cable stringing/installation activities would occur.	2.7.1.2
5. Describe any safety precautions or areas where special methodology would be required (e.g., crossing roadways, stream crossing).	2.7.1.2
3.7.3 Transmission Line Construction (Below Ground)	
3.7.3.1 Trenching	
1. Describe the approximate dimensions of the trench (e.g., depth, width).	n/a
2. Describe the methodology of making the trench (e.g., saw cutter to	n/a

CPUC PEA REQUIREMENTS	SECTION NUMBER
cut the pavement, back hoe to remove, etc.).	
3. Provide the total approximate cubic yardage of material to be removed from the trench, the amount to be used as backfill and the amount to subsequently be removed/disposed of off-site.	n/a
4. Provide off-site disposal location, if known, or describe possible option(s).	n/a
5. If engineered fill would be used as backfill, provide information as to the type of engineered backfill and the amount that would be typically used (e.g., the top two feet would be filled with thermal-select backfill).	n/a
6. Describe if dewatering would be anticipated, if so, how the trench would be dewatered, what are the anticipated flows of the water, would there be treatment, and how would the water be disposed.	n/a
7. Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants that could be exposed as a result of trenching operations.	n/a
8. If a pre-existing hazardous waste were encountered, describe the process of removal and disposal.	n/a
9. Describe any standard BMPs that would be implemented.	n/a
3.7.3.2 Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling	
1. Provide the approximate location of the sending and receiving pits.	n/a
2. Provide the length, width and depth of the sending and receiving pits.	n/a
3. Describe the methodology of excavating and shoring the pits.	n/a
4. Describe the methodology of the trenchless technique.	n/a
5. Provide the total cubic yardage of material to be removed from the pits, the amount to be used as backfill and the amount to subsequently be removed/disposed of off-site.	n/a
6. Describe process for safe handling of drilling mud and bore lubricants.	n/a
7. Describe process for detecting and avoiding “fracturing-out” during HDD operations.	n/a
8. Describe process for avoiding contact between drilling mud/lubricants and streambeds.	n/a
9. If engineered fill would be used as backfill, provide information as to the type of engineered backfill and the amount that would be typically used (e.g., the top two feet would be filled with thermal-select backfill).	n/a
10. Describe if dewatering would be anticipated, if so, how the pit would be dewatered, what are the anticipated flows of the water, would there be treatment, and how would the water be disposed.	n/a
11. Describe the process for testing excavated soil or groundwater for	n/a

CPUC PEA REQUIREMENTS	SECTION NUMBER
the presence of pre-existing environmental contaminants.	
12. If a pre-existing hazardous waste were encountered, describe the process of removal and disposal.	n/a
13. Describe any grading activities and/or slope stabilization issues.	n/a
14. Describe any standard BMPs that would be implemented.	n/a
3.7.4 Substation Construction	
1. Describe any earth moving activities that would be required; what type of activity and, if applicable, estimate cubic yards of materials to be reused and/or removed from the site For both site grading and foundation excavation.	2.6.1
2. Provide a conceptual landscape plan in consultation with the municipality in which the substation is located.	2.6.1
3. Describe any grading activities and/or slope stabilization issues.	2.7.1.1
4. Describe possible relocation of commercial or residential property, if any.	n/a
3.7.5 Construction Workforce and Equipment	
1. Provide the estimated number of construction crew members.	Tables 2.7-1, 2.7-2
2. Describe the crew deployment, would crews work concurrently (i.e., multiple crews at different sites); would they be phased, etc.	2.7.2
3. Describe the different types of activities to be undertaken during construction; the number of crew members for each activity i.e. trenching, grading, etc.; and number and types of equipment expected to be used for said activity. Include a written description of the activity. See example in PEA Checklist 3.7.5.	Tables 2.7-1, 2.7-2
4. Provide a list of the types of equipment expected to be used during construction of the Proposed Project as well as a brief description of the use of the equipment. See example in PEA Checklist 3.7.5.	Tables 2.7-1, 2.7-2
3.7.6 Construction Schedule	
1. Provide a Preliminary Project Construction Schedule; include contingencies for weather, wildlife closure periods, etc. Include Month Year, or Month Year to Month Year for each. See example in PEA Checklist 3.7.6.	2.9
3.8 Operation and Maintenance	
1. Describe the general system monitoring and control (i.e., use of standard monitoring and protection equipment, use of circuit breakers and other line relay protection equipment, etc.).	2.10
2. Describe the general maintenance program of the Proposed Project, include items such as: <ul style="list-style-type: none"> • Timing of the inspections (i.e., monthly, every July, as needed); • Type of inspection (i.e., aerial inspection, ground inspection); and • Description of how the inspection would be implemented. Things to consider, who/how many crew members; how would they 	2.10

CPUC PEA REQUIREMENTS	SECTION NUMBER
access the site (walk to site, vehicle, ATV); would new access be required; would restoration be required, etc.	
3. If additional full time staff would be required for operation and/or maintenance, provide the number and for what purpose.	n/a
3.9 Applicant Proposed Measures	
1. If there are measures that the Applicant would propose to be part of the Proposed Project, please include those measures and reference plans or implementation descriptions.	2.13
Chapter 4: Environmental Setting	
Note: PG&E has elected to combine Environmental Setting with the impact assessment. Detailed descriptions should be limited to those resource areas which may be subject to a potentially significant impact	
4.1 Aesthetics	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.1.2.2
• Local environment (site-specific)	3.1.2.2
• Regional environment	3.1.2.2
2. A description of the regulatory environment/context	3.1.2.1
• Federal	3.1.2.1
• State	3.1.2.1
• Local	3.1.2.1
4.2 Agriculture Resources	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.2.2.2
• Local environment (site-specific)	3.2.2.2
• Regional environment	3.2.2.2
2. A description of the regulatory environment/context	3.2.2.1
• Federal	3.2.2.1
• State	3.2.2.1
• Local	3.2.2.1
4.3 Air Quality	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.3.2.2
• Local environment (site-specific)	3.3.2.2
• Regional environment	3.3.2.2

CPUC PEA REQUIREMENTS	SECTION NUMBER
2. A description of the regulatory environment/context	3.3.2.1
• Federal	3.3.2.1
• State	3.3.2.1
• Local	3.3.2.1
4.4 Biological Resources	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.4.2.2
• Local environment (site-specific)	3.4.2.2
• Regional environment	3.4.2.2
2. A description of the regulatory environment/context	3.4.2.1
• Federal	3.4.2.1
• State	3.4.2.1
• Local	3.4.2.1
4.5 Cultural Resources	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.5.2.2
• Local environment (site-specific)	3.5.2.2
• Regional environment	3.5.2.2
2. A description of the regulatory environment/context	3.5.2.1
• Federal	3.5.2.1
• State	3.5.2.1
• Local	3.5.2.1
4.6 Geology, Soils and Seismic Potential	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.6.2.2
• Local environment (site-specific)	3.6.2.2
• Regional environment	3.6.2.2
2. A description of the regulatory environment/context	3.6.2.1
• Federal	3.6.2.1
• State	3.6.2.1
• Local	3.6.2.1

4.7 Hazards and Hazardous Materials	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.7.2.2
• Local environment (site-specific)	3.7.2.2
• Regional environment	3.7.2.2
2. A description of the regulatory environment/context	3.7.2.1
• Federal	3.7.2.1
• State	3.7.2.1
• Local	3.7.2.1
4.8 Hydrology and Water Quality	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.8.2.2
• Local environment (site-specific)	3.8.2.2
• Regional environment	3.8.2.2
2. A description of the regulatory environment/context	3.8.2.1
• Federal	3.8.2.1
• State	3.8.2.1
• Local	3.8.2.1
4.9 Land Use and Planning	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.2.2.2
• Local environment (site-specific)	3.2.2.2
• Regional environment	3.2.2.2
2. A description of the regulatory environment/context	3.2.2.1
• Federal	3.2.2.1
• State	3.2.2.1
• Local	3.2.2.1
4.10 Mineral Resources	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.6.2.2
• Local environment (site-specific)	3.6.2.2
• Regional environment	3.6.2.2
2. A description of the regulatory environment/context	3.6.2.1

• Federal	3.6.2.1
• State	3.6.2.1
• Local	3.6.2.1
4.11 Noise	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.9.2.2
• Local environment (site-specific)	3.9.2.2
• Regional environment	3.9.2.2
2. A description of the regulatory environment/context	3.9.2.1
• Federal	3.9.2.1
• State	3.9.2.1
• Local	3.9.2.1
4.12 Population and Housing	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.10.2.2
• Local environment (site-specific)	3.10.2.2
• Regional environment	3.10.2.2
2. A description of the regulatory environment/context	3.10.2.1
• Federal	3.10.2.1
• State	3.10.2.1
• Local	3.10.2.1
4.13 Public Services	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.10.2.2
• Local environment (site-specific)	3.10.2.2
• Regional environment	3.10.2.2
2. A description of the regulatory environment/context	3.10.2.1
• Federal	3.10.2.1
• State	3.10.2.1
• Local	3.10.2.1
4.14 Recreation	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.2.2.2

• Local environment (site-specific)	3.2.2.2
• Regional environment	3.2.2.2
2. A description of the regulatory environment/context	3.2.2.1
• Federal	3.2.2.1
• State	3.2.2.1
• Local	3.2.2.1
4.15 Transportation and Traffic	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.11.2.2
• Local environment (site-specific)	3.11.2.2
• Regional environment	3.11.2.2
2. A description of the regulatory environment/context	3.11.2.1
• Federal	3.11.2.1
• State	3.11.2.1
• Local	3.11.2.1
4.16 Utilities and Public Services	
1. A description of the physical environment in the vicinity of the project (e.g. topography, land use patterns, biological environment, etc.)	3.10.2.2
• Local environment (site-specific)	3.10.2.2
• Regional environment	3.10.2.2
2. A description of the regulatory environment/context	3.10.2.1
• Federal	3.10.2.1
• State	3.10.2.1
• Local	3.10.2.1
Chapter 5: Environmental Impact Assessment Summary	
5.1 Aesthetics Provide visual simulations of prominent public view locations, including scenic highways to demonstrate the before and after project implementation. Additional simulations of affected private view locations are highly recommended.	Appendix A
5.2 Agriculture Resources Identify the types of agricultural resources affected.	3.2.3.2
5.3 Air Quality	
1. Provide supporting calculations / spreadsheets / technical reports that support emission estimates in the PEA.	Appendix D

2. Provide documentation of the location and types of sensitive receptors that could be impacted by the project (e.g., schools, hospitals, houses, etc.). Critical distances to receptors is dependent on type of construction activity.	Figure 2.2-3 to 2.2-5, 3.3-1
3. Identify Project Green House Gas (GHG) emissions as follows:	
<ul style="list-style-type: none"> Quality GHG emissions from a business as usual snapshot. That is, what the GHG emissions will be from the proposed project if no mitigations were used 	3.3.3.2
<ul style="list-style-type: none"> Quantify GHG emission reductions from every Applicant Proposed Measure that is implemented. Itemize quantifications and place in a table format 	Table 3.3-7
<ul style="list-style-type: none"> Identify the net emissions of a project after mitigations have been applied. 	3.3.3.2
<ul style="list-style-type: none"> Calculate and quantify GHG emissions (CO₂equivalent) for the project including construction & operation. 	3.3.3.2
<ul style="list-style-type: none"> Calculate and quantify the GHG reduction based on reduction measures proposed for the project. 	3.3.3.2
<ul style="list-style-type: none"> Propose Applicant Proposed Measures (APM) to implement and follow to maximize GHG reductions. If sufficient, CPUC will accept them without adding further mitigation measures. 	Table 2.3-11
<ul style="list-style-type: none"> Discuss programs already in place to reduce GHG emissions on a system wide level. This includes Applicant's voluntary compliance with USEPA SF₆ reduction program, reductions from energy efficiency, demand response, LTPP, et al. 	3.3.3.2
5.4 Biological Resources - In addition to an impacts analysis:	
1. Provide a copy of the Wetland Delineation and supporting documentation (i.e., data sheets). If verified, provide supporting documentation. Additionally, GIS data of the wetland features should be provided as well.	n/a
2. Provide a copy of special status surveys for wildlife, botanical and aquatic species, as applicable. Any GIS data documenting locations of special-status species should be provided.	n/a
5.5 Cultural Resources - In addition to an Impacts Analysis:	
1. Cultural Resources Report documenting a cultural resources investigation of the Proposed Project. This report should include a literature search, pedestrian survey, and Native American consultation.	Due to the sensitivity of the information, the report will be submitted under PUC Section 853 confidentiality restrictions.
2. Provide a copy of the records found in the literature search.	Due to the sensitivity of the information, the report will be submitted under PUC Section 853 confidentiality restrictions.
3. Provide a copy of all letters and documentation of Native American consultation.	Appendix E

5.6 Geology, Soils and Seismic Potential - In addition to an impacts analysis:	
1. Provide a copy of geotechnical investigation if completed, including known and potential geologic hazards such as ground shaking, subsidence, liquefaction, etc.	This report or study is normally performed as part of the detailed design phase of work, which has not yet started.
5.7 Hazards and Hazardous Materials [Reference and list the documents that apply.] - In addition to an impacts analysis:	
1. Environmental Data Resources report.	Not yet prepared. To be provided separately to the CPUC on CD
2. Hazardous Substance Control and Emergency Response Plan.	Not yet prepared. To be provided separately to the CPUC on CD
3. Health and Safety Plan.	Not yet prepared. To be provided separately to the CPUC on CD
4. Worker Environmental Awareness Program (WEAP).	Not yet prepared. To be provided separately to the CPUC on CD
5. Describe what chemicals would be used during construction and operation of the Proposed Project. For example: fuels, etc. for construction, naphthalene to treat wood poles before installation.	3.7.3.2
5.8 Hydrology and Water Quality – In addition to an impacts analysis:	
1. Describe impacts to groundwater quality including increased run-off due to construction of impermeable surfaces, etc.	3.8.3.2
2. Describe impacts to surface water quality including the potential for accelerated soil erosion, downstream sedimentation, and reduced surface water quality.	3.8.3.2
5.9 Land Use and Planning - In addition to an impacts analysis:	
1. Provide GIS data of all parcels within 300' of the Proposed Project with the following data: APN number, mailing address, and parcel's physical address.	For security reasons, GIS data layers and electronic Excel Spreadsheet will be submitted under PUC Section 583 confidentiality restrictions
5.10 Mineral Resources - Data needs already specified under Chapter 3 would generally meet the data needs for this resource area.	
5.11 Noise	
1. Provide long term noise estimates for operational noise (e.g., corona discharge noise, and station sources such as substations, etc.).	3.9.3.2
5.12 Population and Housing Data needs already specified under Chapter 3 would generally meet the data needs for this resource area.	
5.13 Public Services	

Data needs already specified under Chapter 3 would generally meet the data needs for this resource area.	
5.14 Recreation Data needs already specified under Chapter 3 would generally meet the data needs for this resource area	
5.14 Transportation and Traffic Describe the likely probable routes that are the subject of the traffic analysis.	
1. Discuss traffic impacts resulting from construction of the Proposed Project including ongoing maintenance operations.	3.11.3.2
2. Provide a preliminary description of the traffic management plan that would be implemented during construction of the Proposed Project.	The traffic management plan has not yet been prepared. The Pedestrian and Traffic Control Plan will be submitted to the CPUC staff once developed.
5.16 Utilities and Services Systems	
1. Describe how treated wood poles would be disposed of after removal, if applicable.	2.7.1.2
5.17 Cumulative Analysis	
1. Provide a list of projects (i.e., past, present and reasonably foreseeable future projects) within the Project Area that the applicant is involved in.	4.2.1.1
2. Provide a list of projects that have the potential to be proximate in space and time to the Proposed Project. Agencies to be contacted include but are not limited to: the local planning agency, Caltrans, etc.	4.2.1.1
5.18 Growth-Inducing Impacts, If Significant	
1. Provide information on the Proposed Project's growth inducing impacts, if any. The information should include, but is not necessarily limited, to the following:	
• Any economic or population growth, in the surrounding environment that will directly or indirectly, result from the Proposed Project	4.1.2.1
• Any increase in population that could further tax existing community service facilities (i.e., schools, hospitals, fire, police, etc.), that will directly or indirectly result from the Proposed Project	4.1.2.1
• Any obstacles to population growth that the Proposed Project would remove	4.1.2.1
• Any other activities, directly or indirectly encouraged or facilitated by the Proposed Project that would cause population growth that could significantly affect the	4.1.2.1

environment, either individually or cumulatively	
Chapter 6: Detailed Discussion of Significant Impacts	
Note: With implementation of PG&E’s APMs, all impacts will be less than significant. Therefore this chapter is not required.	
6.2 Description of Project Alternatives and Impact Analysis	
1. Provide a summary of the alternatives considered that would meet most of the objectives of the Proposed Project and an explanation as to why they were not chosen as the Proposed Project.	
2. Alternatives considered and described by the Applicant should include, as appropriate:	
a. System or facility alternatives	2.4
b. Route alternatives	2.4
c. Route variations	2.4
d. Alternative locations.	2.4
3. A description of a “No Project Alternative” should be included.	2.4
4. If significant environment effects are assessed, the discussion of alternatives shall include alternatives capable of substantially reducing or eliminating any said significant environmental effects, even if the alternative(s) substantially impede the attainment of the project objectives, and are more costly.	n/a
6.3 Growth-Inducing Impacts	
Note: Growth-inducing impacts are addressed in the Impact Assessment	
Information required to analyze the Proposed Project’s effects on growth would vary depending on the type of project proposed. Generally, for transmission line projects the discussion would be fairly succinct and focus on the following:	
1. Would the Proposed Project foster economic or population growth, either directly or indirectly, in the surrounding environment?	4.1.2
2. Would the Proposed Project cause an increase in population that could further tax existing community service facilities (i.e., schools, hospitals, fire, police, etc.)?	4.1.2
3. Would the Proposed Project remove obstacles to population growth?	4.1.2
4. Would the Proposed Project encourage and facilitate other activities that would cause population growth that could significantly affect the environment, either individually or cumulatively?	4.1.2
6.4 Applicant Proposed Measures to address GHG Emissions	
Note: GHG Emissions and PG&E’s associated APM’s are discussed in the Air Quality chapter	
See the menu of suggested APM’s in PEA Checklist Section 6.4 that applicants can consider. Applicants can and are encouraged to propose other GHG reducing mitigations. Priority is given to on-site and/or nearby mitigation measures. Off-site mitigation measures within	2.13-1

California will be considered.	
Chapter 7: Other Process-Related Data Needs	
1. Excel spreadsheet that includes all parcels within 300 feet of any project component with the following data: APN number, owner mailing address, and parcels physical address. [Note: notice of all property owners within 300 feet is required under GO 131-D.]	Appendix B

1.0 EXECUTIVE SUMMARY

Pacific Gas and Electric Company (PG&E) proposes to construct and operate Shepherd Substation, a 115/21 kilovolt (kV) electrical substation on approximately 5.0 acres north of the City of Clovis in Fresno County, California. The project includes an approximately 1.5 miles long 115 kV overhead power line interconnection to link the substation to the existing power grid. Construction of the project will take approximately 12 months to complete.

The Shepherd Substation Project (project) is within the Woodward Distribution Planning Area (DPA), which includes northeast Fresno and northwest Clovis. Because this DPA has experienced consistent, increased electrical load growth, nearly all the electrical capacity within the DPA has been employed and the new substation is needed to meet increased electric demands.

This Proponent's Environmental Assessment (PEA) examines impacts that could result from the project to the environment. PG&E has proposed Applicant Proposed Measures (APMs) to minimize potential impacts. Implementation of the APMs described in section 2.13 will ensure that all project impacts will be less than significant

This PEA has been prepared in compliance with California Public Utilities Commission's (CPUC) PEA Guidelines (CPUC Information and Criteria List, Appendix B, Section V) as well as the CPUC's requirements for a Permit to Construct (PTC) pursuant to General Order 131-D.

2.0 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

PG&E proposes to construct Shepherd Substation, a 115/21 kV electrical substation needed to meet increased electric loads in parts of Fresno, Clovis, and unincorporated Fresno County. A 115 kV overhead power line interconnection, approximately 1.5 miles long, will be constructed to link the substation to the existing power grid. The project is located on approximately five acres in Fresno County, California, north of the City of Clovis. The project lies outside the city limits, approximately one-half mile north and east of Clovis's 2000 Sphere of Influence, an area targeted for potential future annexation. The substation will be constructed entirely within an active almond orchard surrounded by vacant land and across the road from low-density residential development. Photographs depicting the area north of the substation and east toward the nearest residence are included in Figure 2.1-1 and 2.1-2, respectively.



FIGURE 2.1-1 The area immediately north of the substation.



FIGURE 2.1-2 The almond orchard (left) and nearest residential development (right). The substation will be built in the orchard on the left. View facing north along Sunnyside Avenue.

The new power line is proposed to follow an existing distribution line north from the substation site over a combination of undeveloped land and low-density residential, quasi public, and agricultural lands. The existing distribution line extends just over half the distance of the 1.5 mile power line. The power line continues in rural pasture areas, parallel to property lines, and adjacent to low-density residential areas until it reaches Copper Road and the existing power line interconnection point. Managed flood control features and drainage areas provide large undeveloped tracks of land along the alignment. Some of these lands are fenced and some are used as pasture for livestock. Single family dwellings in the areas are often associated with agriculture or livestock uses.

2.2 PROJECT LOCATION AND REGIONAL CONTEXT

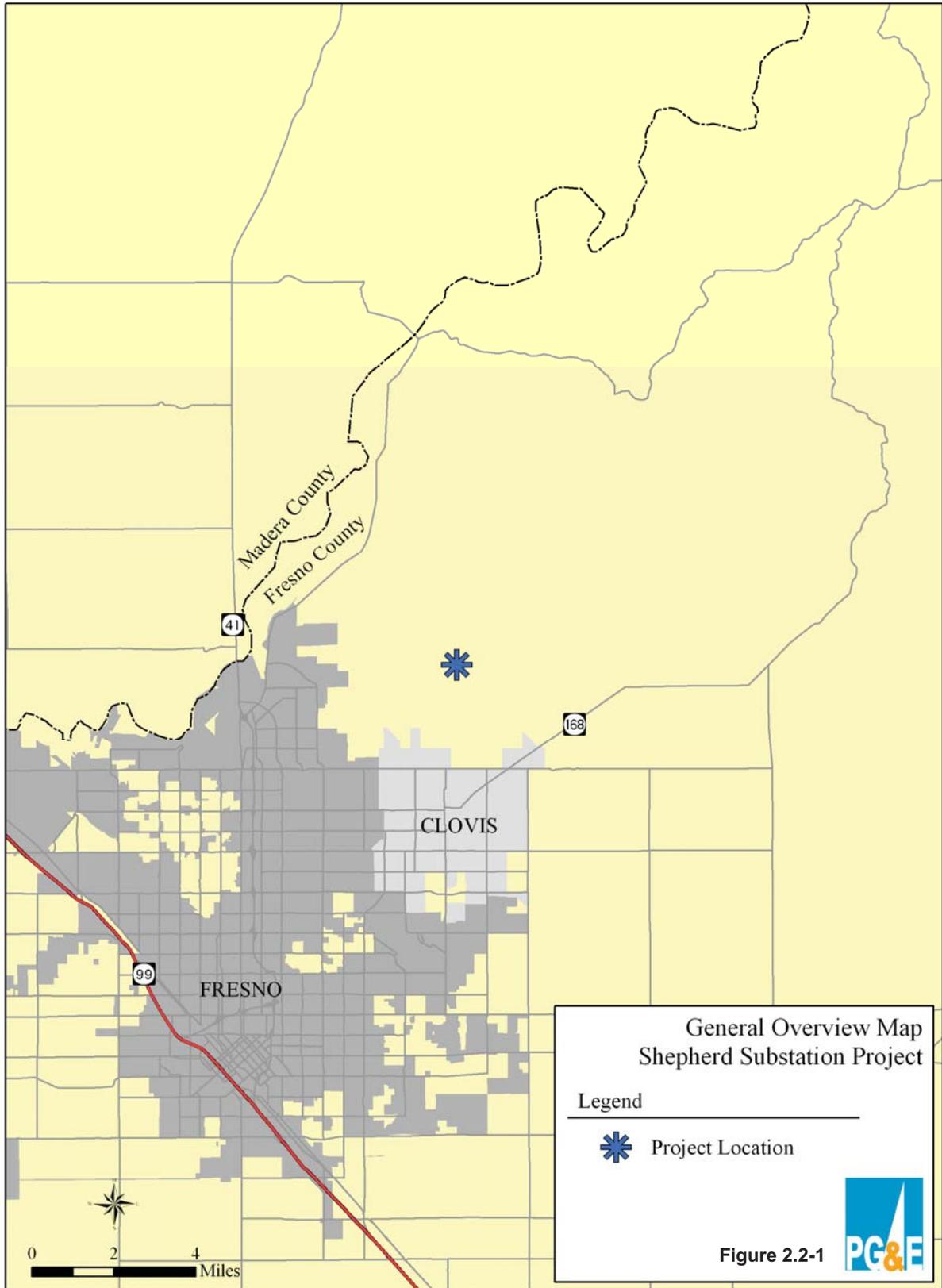
The project is located just north of the City of Clovis, Fresno County, California within the Woodward DPA, which serves northeast Fresno and northwest Clovis (Figure 2.2-1). The locations of proposed facilities are described in greater detail below. Table 2.2-1 displays the Township, Range and Sections in which the substation and power line interconnection will be located.

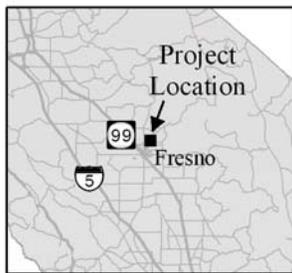
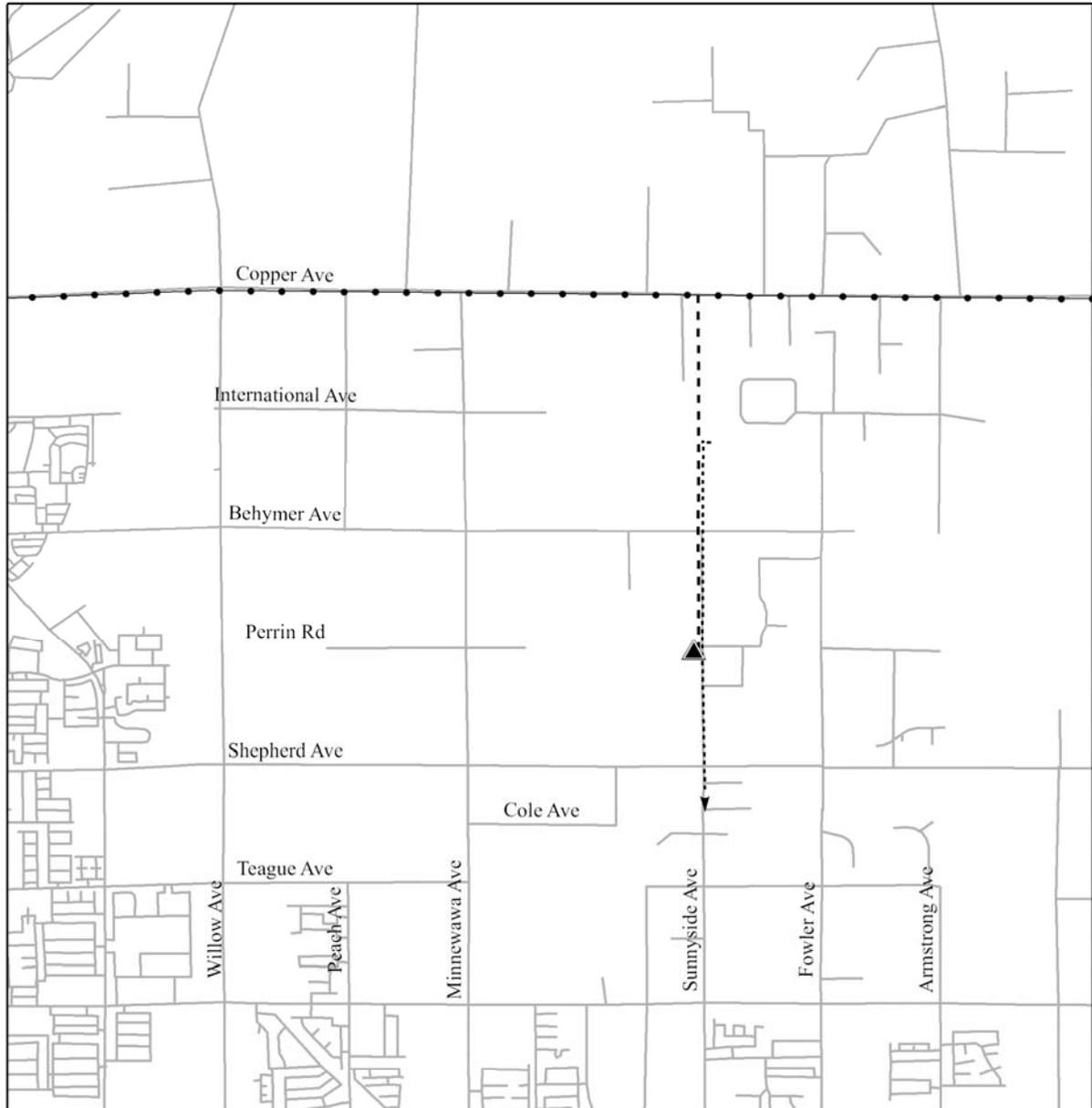
TABLE 2.2-1 Project Component Legal Descriptions*			
Project Component	Section(s)	Township	Range
Shepherd Substation	20	21 South	21 East
Power Line Interconnection	17, 20	21 South	21 East
* Mount Diablo Baseline and Meridian US Geological Survey (USGS) 7.5-minute quadrangle maps (Friant and Clovis)			

2.2.1 Substation

The proposed substation will be located at the southwest corner of Sunnyside Avenue and Perrin Avenue in Fresno County (Figures 2.2-2). Aerial photographs depicting project facilities are included as Figures 2.2-3, 2.2-4, and 2.2-5. This land has historically been cultivated and is currently planted as an almond orchard. The substation will be set back within the almond orchard approximately 55 and 65 feet along the east and north sides of the substation, respectively.

Existing land uses vary around the substation but are typically associated with a rural or low-density residential and agricultural character. The land immediately north of the proposed substation site is undeveloped, and further north is a Fresno Metropolitan Flood Control District water basin. To the east of the proposed substation site is Sunnyside Avenue, which has low-density housing (0-1 dwelling unit per acre (du/ac)) along its east side. To the south and west of the substation is more of the almond orchard that the substation will be built within.





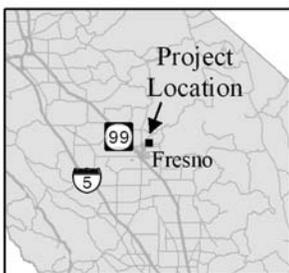
Legend

-  Proposed Substation
-  Power Line Interconnection
-  Existing 115kV Transmission Line
-  Existing 12kV Distribution Line

Shepherd Substation Project
Pacific Gas and Electric Company



FIGURE 2.2-2 

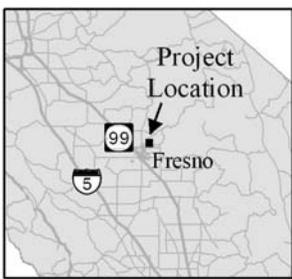


- Legend**
- Residence
 - 1000 Foot Buffer
 - Proposed Substation
 - Power Line Interconnection
 - Existing 115kV Power Line
 - Power Line Corridor

Shepherd Substation Project Aerial and Sensitive Receptors
 Pacific Gas and Electric Company
 Map 1 of 3



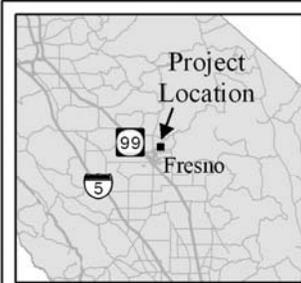
Figure 2.2-3



- Legend**
- Residence
 - 1000 Foot Buffer
 - Proposed Substation
 - Power Line Interconnection
 - Existing 115kV Power Line
 - Power Line Corridor

Shepherd Substation Project Aerial and Sensitive Receptors
 Pacific Gas and Electric Company
 Map 2 of 3





- Legend**
- Residence
 - 1000 Foot Buffer
 - Proposed Substation
 - Power Line Interconnection
 - Existing 115kV Power Line
 - Power Line Corridor

Shepherd Substation Project Aerial and Sensitive Receptors
 Pacific Gas and Electric Company
 Map 3 of 3

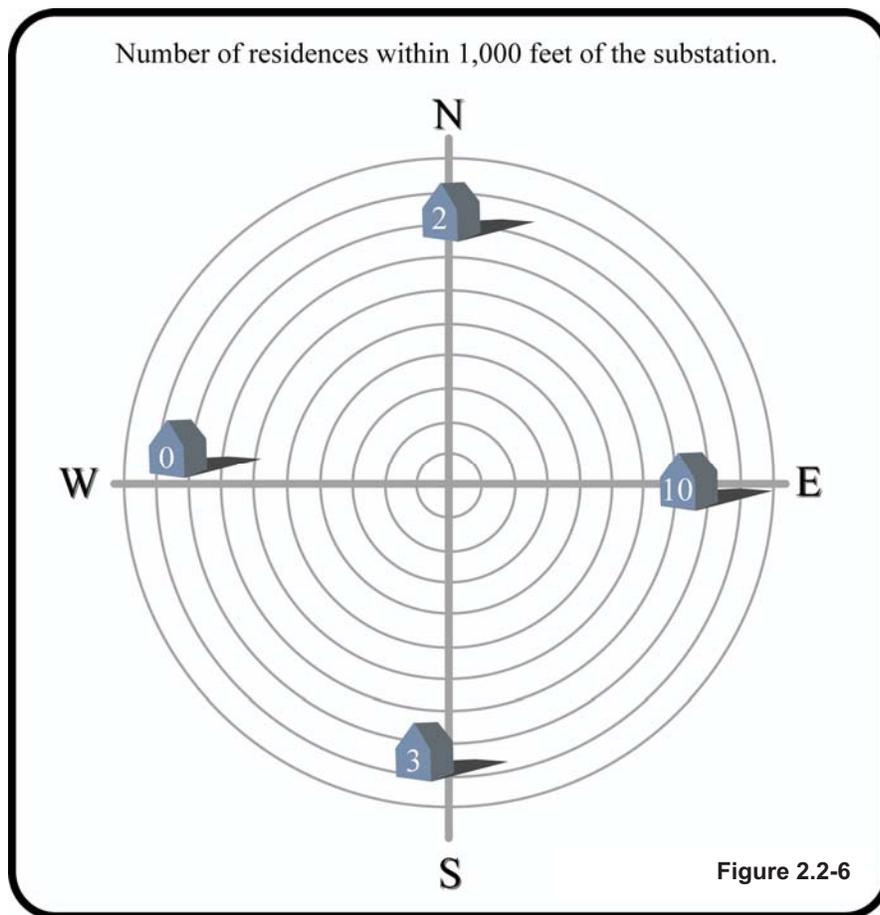


FIGURE 2.2-5

There are no commercial, religious, or public facilities within 1,000 feet of the substation. The number of residences within 1,000 feet of the substation is presented in Table 2.2-2. Figure 2.2-6 depicts the direction of the residences from the substation.

TABLE 2.2-2
Residences within 1,000 Feet of the Perimeter of Shepherd Substation

Distance from Substation (ft)	0-99	100-199	200-299	300-399	400-499	500-599	600-699	700-799	800-899	900-1,000
Number of Residences	0	0	2	1	2	0	3	5	0	2



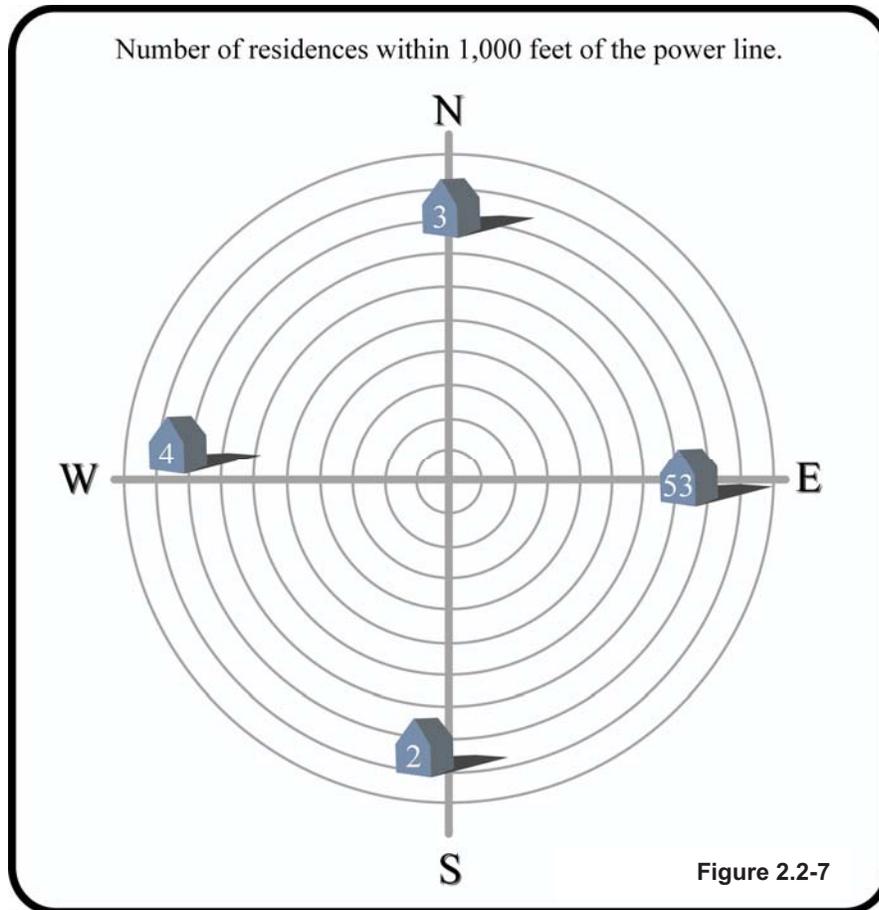
2.2.2 Power Line Interconnection

The proposed power line interconnection will extend approximately 1.5 miles north from the proposed substation to the south side of Copper Avenue where it will interconnect with the existing Kerckhoff-Clovis-Sanger #1 115 kV Power Line. The new power line route is adjacent to a mix of low-density housing, agricultural, quasi-public (i.e., the Fresno Metropolitan Flood Control District water basin), and undeveloped lands.

The power line will leave the north side of the substation approximately 200 feet west of Sunnyside Avenue, extending approximately 175 feet east to Sunnyside Avenue and then north along the west side of Sunnyside Avenue along the alignment of an existing electric distribution line. Sunnyside Avenue ends approximately 0.1 miles north of the proposed substation site, but the proposed power line will continue 0.25 miles north, co-located with the existing distribution line, along the property line between the Fresno Metropolitan Flood Control District water basin to the west and undeveloped land to the east to another segment of Sunnyside Avenue. Here, the new line and existing distribution line will continue north approximately 0.15 miles along the property line and fences between the Fresno Metropolitan Flood Control District water basin to the west and low-density residential housing to the east to Behymer Avenue. The line will continue north with the existing distribution line, spanning Behymer Avenue and continuing north along property lines and fences where there are no designated roads. The existing distribution line ends approximately 0.5 miles north of Behymer Avenue, but the new power line will extend approximately 0.5 miles further to Cooper Avenue and interconnect with the existing Kerckhoff-Clovis-Sanger #1 115 kV Power Line. The land use along the last one-mile segment is a mix of low-density residential housing, agricultural lands, and undeveloped land. Along the first 0.25 miles of this last mile, the power line will be constructed between a tree lined driveway to the east and an orchard to the west. The next 0.5 miles will generally be constructed between fenced backyards to the east and two large acre lots to the east that are mostly open space and have landscaped ponds on them. The last 0.25 miles of this last mile of the alignment will primarily be constructed within an orchard that has been cleared, but the power line will cut between two homes located near Copper Avenue.

There are no commercial, religious, or public facilities within 1,000 feet of the power line. The number of residences within 1,000 feet of the power line is presented in Table 2.2-3. Figure 2.2-7 depicts the direction of the residences from the substation.

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	1	6	1	6	7	8	8	6	14	5



2.3 PROJECT PURPOSE AND NEED

2.3.1 Project Objectives

The objectives of the Shepherd Substation Project are:

- *Meet Long-Term Capacity Needs:* Eliminate electric distribution capacity deficiencies beyond 2014.
- *Construct a New Substation to Reinforce the Existing System:* Maximize system efficiency and increase future flexibility by constructing a new distribution substation within the DPA.
- *Construct a New Substation Near Load Growth:* Minimize ratepayer costs and environmental impacts, and maximize system efficiency and reliability, by locating the new substation near the center of the load growth so that distribution circuits are short.

2.3.2 Project Need

The Woodward DPA serves the northeastern portion of the City of Fresno and the northwestern portion of the City of Clovis. The DPA is bounded by Shaw Avenue to the south, Palm Avenue to the west, Fowler Avenue to the east, and Copper Avenue and Friant Road up to Millerton Road to the north. This is a heavily residential and commercial area comprised primarily of large subdivisions

and commercial developments. The DPA is served by eight transformers at four existing 115/21 kV substations: Bullard, Clovis, Pinedale, and Woodward.

Pinedale Substation and Woodward Substation both have three 115/21 kV, 45 megavolt ampere (MVA) transformers. Bullard Substation has one 115/21 kV, 45 MVA transformer devoted to serving the Woodward DPA and two 115/12 kV, 45 MVA transformers serving the Central Fresno DPA. Clovis Substation has one 115/21 kV, 45 MVA transformer serving the Woodward DPA and two 115/12 kV, 45 MVA transformers serving the Clovis DPA. All are fully built out and, for this reason, a new substation is needed to accommodate existing and future growth from the remaining developable land within the DPA and from Clovis's proposed Northwest Village. To best serve the system's load, any new substation must be located such that it has strong ties to the 21 kV from Clovis Substation, which is isolated from the rest of the 21 kV system in the Woodward DPA.

The area growth rate is approximately 5.0 megawatts (MW) (1.5%) per year, and is still growing at a steady rate even in the recession. The current capacity of the DPA is 339.0 MW. The current load is 325.0 MW. In 2014, Woodward DPA is projected to be overloaded by 2.6 MW (0.8%) and in 2015 is projected to be overloaded by 7.5 MW (2.2%).

2.3.2.1 Area Load Growth

Residential and Commercial

The Woodward DPA has historically had a high rate of growth due to continued commercial development at River Park and in the area surrounding Woodward Park, both in northeastern Fresno. Residential growth in Fresno County is concentrated north of the Buchanan Education Complex and near Woodward Substation. In addition, the City of Clovis is in the planning phase of the Northwest Village Specific Plan, which is projected to open for development in 2012. The Northwest Village will be bounded by Shepherd Avenue to the south, Copper Avenue to the north, Willow Avenue to the west, and Sunnyside Avenue to the east.

Historically, the Woodward DPA has been among the first areas in the region to increase development when the economy recovers. Although development has been slowed due to current economic conditions, this area is anticipated to continue to grow rapidly due to the desirability of the area and its school district. Three out of the five Clovis Unified School District High Schools are within the Woodward DPA, including a new intermediate and high school, which anticipates full enrollment by 2011. In addition, the State Center Community College District constructed a new satellite campus in 2007 that is being expanded to accommodate additional students.

2.3.2.2 Voluntary Use Reduction

PG&E uses a program of voluntary reduction in electricity use, known as Customer Energy Efficiency (CEE). This program has been active over the past two decades and its cumulative reduction of electricity use has been substantial. Fresno and Clovis have active CEE programs. 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 reductions are included in the forecasts of peak growth.

2.3.3 Project Benefits Description

Completion of the Shepherd Substation will increase distribution capacity to serve electric customers in the cities of Clovis and Fresno and in unincorporated portions of Fresno County during peak

demand conditions. The project will support the connection of new residential and commercial customers and increase emergency capacity and reliability.

2.4 ALTERNATIVES

Only the No Project and proposed project alternatives are considered in this document because the California Environmental Quality Act (CEQA) does not require an analysis of alternatives where, as here, there are no significant impacts caused by the proposed project (Guidelines, Sec. 15126.6, subd. (a) and f (2)(A)). However, an alternatives analysis was conducted as part of the Shepherd Substation project to determine the appropriate location for the substation and power line interconnection. A description of this process can be found in the Application in accordance with GO 131-D Section IX.B.c. The criteria for choosing the substation site included:

- Proximity to the existing and future electric load center
- Proximity to existing electrical lines
- Minimum five-acre site
- Ability to serve the operational requirements of the electrical distribution system
- Compatibility with existing adjacent land uses
- Ability to meet electrical demand from uses approved or planned for development by local agencies
- Low potential for environmental impacts
- Minimized ratepayer cost
- Availability of the property for purchase

The analysis concluded that the proposed substation location will meet the identified criteria and is an ideal location for the project.

2.5 NO PROJECT ALTERNATIVE

The No Project Alternative would maintain the status quo, and would avoid potential impacts associated with construction of the proposed substation and new power line. However, this alternative is not considered a realistic option because it would not achieve the objectives of increasing Woodward DPA's distribution capacity to accommodate both planned and anticipated local load growth, and it does not address the need to provide safe and reliable electric service to existing and future customers in Fresno, Clovis and unincorporated Fresno County.

The No Project alternative would have a substantial impact on the communities PG&E serves. This alternative could impact human health and safety as a result of insufficient capacity and prolonged power outages, as severe and widespread overloading of the electric system could lead to equipment overheating and ultimately electrical and/or mechanical failures. These failures would result in electric service interruptions necessary to relieve overload during peak demand periods. As a result, PG&E would not be able to provide reliable service to existing customers, meet additional demand from these customers, or be able to serve new customers. This is true even with all current electric transmission and distribution systems working at maximum efficiency. Inability to provide reliable electrical service is inconsistent with plans for new development in the project area. PG&E anticipates future distribution capacity deficiencies to occur in the Woodward DPA beginning as early as 2014.

2.6 PROJECT FACILITIES

2.6.1 Shepherd Substation

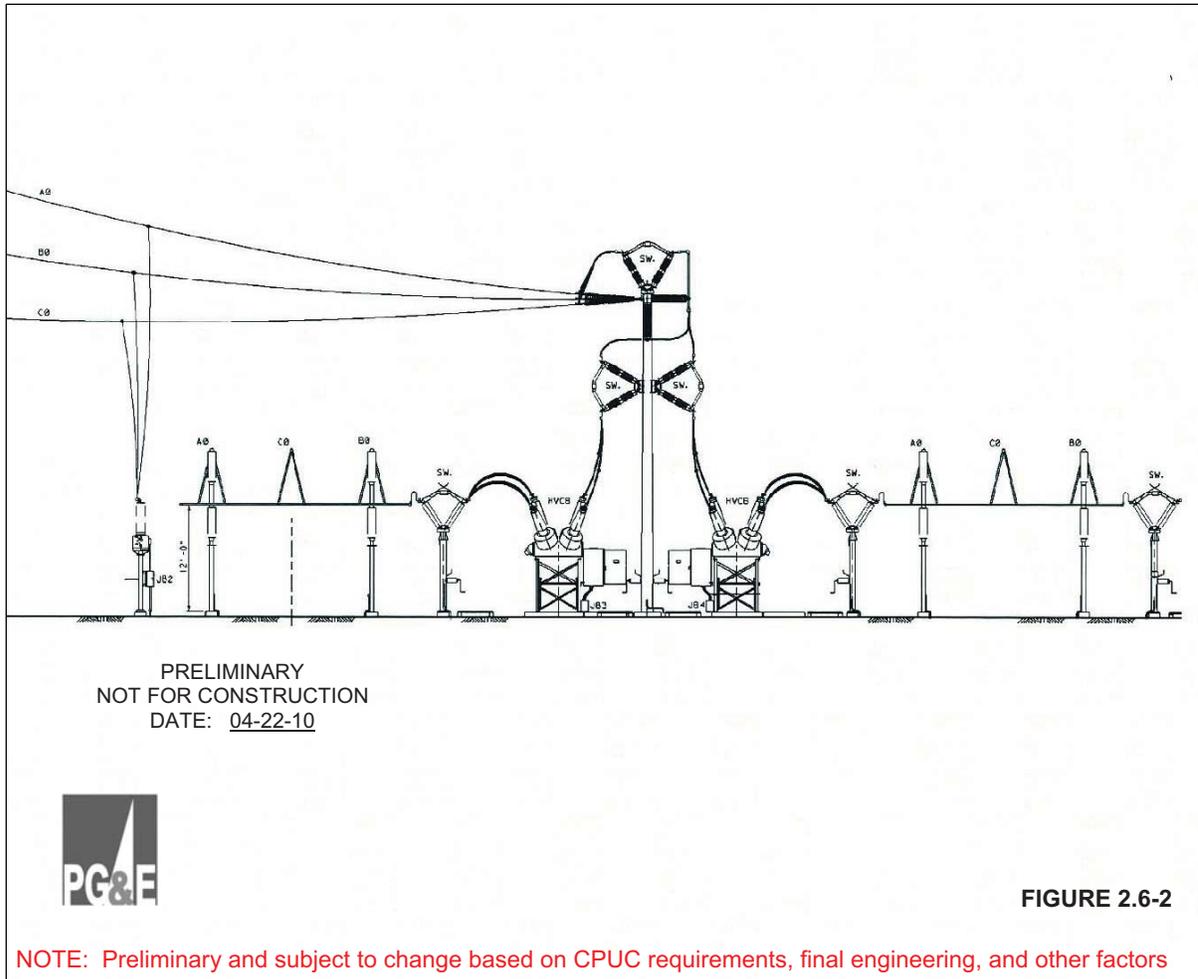
The 115/21 kV Shepherd Substation will be an unmanned, automated, low-profile electrical substation that will require only periodic maintenance. The project will include construction of an access road, distribution circuit outlets, and a power line interconnection to the existing electrical supply grid. Figure 2.6-1 depicts the preliminary typical layout of Shepherd Substation; Figure 2.6-2 is a typical profile of the substation.

Electrical power will enter the substation by a new double-circuit power line extending from the existing Kerckhoff-Clovis-Sanger #1 115 kV Power Line that parallels the south side of Cooper Avenue. Power will leave the substation at 21 kV through distribution feeder lines that will interconnect with the existing electrical distribution network. Construction will include the following components at full build out:

- A new 115/21 kV distribution substation, with three 45 MVA transformers.
- Up to three distribution circuits per transformer leaving the substation in underground conduit and either transitioning to an overhead position or remaining underground.
- Two paved access roads from Sunnyside Avenue to the substation.
- A storm water detention basin.
- A Spill Prevention Control Countermeasure (SPCC) concrete basin.

The substation will be constructed on an approximately five-acre parcel of land. The enclosed portion of the substation will be approximately 390 to 399 feet, and will be entirely situated within the approximately five-acre (roughly 466 foot square) parcel owned by PG&E. A neutral colored, pre-fabricated concrete wall will be constructed around the north and east sides of the substation and a chain link fence will be erected along the remaining sides. All fencing will be eight feet high. To create a vegetative screen, PG&E will leave three rows of almond trees between the substation fence and Sunnyside Avenue as well as three rows of almond trees along the north side of the substation.

PG&E will develop a Storm Water Pollution Prevention Plan (SWPPP) and will comply with all National Pollution Discharge Elimination System (NDPES) permit requirements. A storm water detention basin will be constructed within the substation. The basin will be engineered to acceptable industry standards as well as the Fresno County basin capacity criteria and design standards. Best Management Practices developed by PG&E for substation construction will also be followed.



Security lighting and telecommunication facilities will be installed for safety and security. Security lighting will consist of sodium vapor lamps and all exterior lighting will use non-glare light bulbs, designed and positioned to minimize casting light and/or glare to offsite locations. Light poles placed at each corner of the substation will be approximately ten feet high and constructed of galvanized steel. The lights will be controlled by a photocell that automatically turns the lights off during the day and on at night. Telecommunication facilities will consist of installing a fiber optic telecommunication line from an existing fiber optic line along Shepherd Avenue. The fiber optic line will be attached to wood poles supporting an existing PG&E electrical distribution line that travels north from Shepherd Avenue along Sunnyside Avenue.

2.6.2 Power Line Interconnection

A double-circuit, 115 kV power line will link the existing Kerckhoff-Clovis-Sanger #1 115 kV Power Line to Shepherd Substation. The power line interconnection will be approximately 1.5 miles long, and will be constructed from the Shepherd Substation north to Copper Avenue through a mix of low-density housing, agricultural land, quasi-public land, and undeveloped lands. An existing distribution line extends approximately one mile north from the proposed substation site. The new power line will follow the same alignment as the existing distribution line, which will be collocated on the new power line structures. The old distribution line wood poles will be removed.

2.6.2.1 Power Line Poles

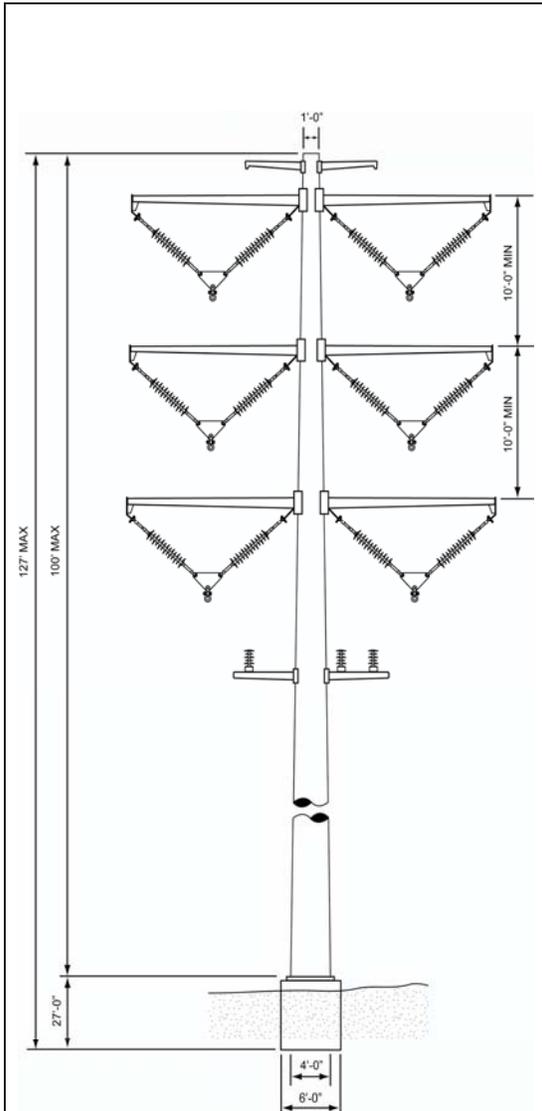
Two types of power line poles, a tubular steel pole (TSP) and hybrid pole (i.e., a pole resembling a TSP but with a concrete bottom and a fiberglass upper portion), will be installed. Power line pole characteristics are described in Table 2.6-1. Figure 2.6-3 depicts a typical tangent power pole of the type that will be used for this project. Although Figure 2.6-3 depicts a TSP pole, the hybrid pole is virtually the same in appearance.

TABLE 2.6-1 Power Line Design Characteristics	
Feature	Description
Type of structure	Tubular steel poles and hybrid poles
Structure height	Total height of structure above ground will be approximately 90-100 feet
Structure width	Structures are approximately 3-4 feet in diameter at base; concrete foundations will be approximately 5-6 feet in diameter
Span length	Approximately 500-660 feet
Structure foundations	All will be affixed to cast-in-place concrete foundations approximately 21-27 feet deep



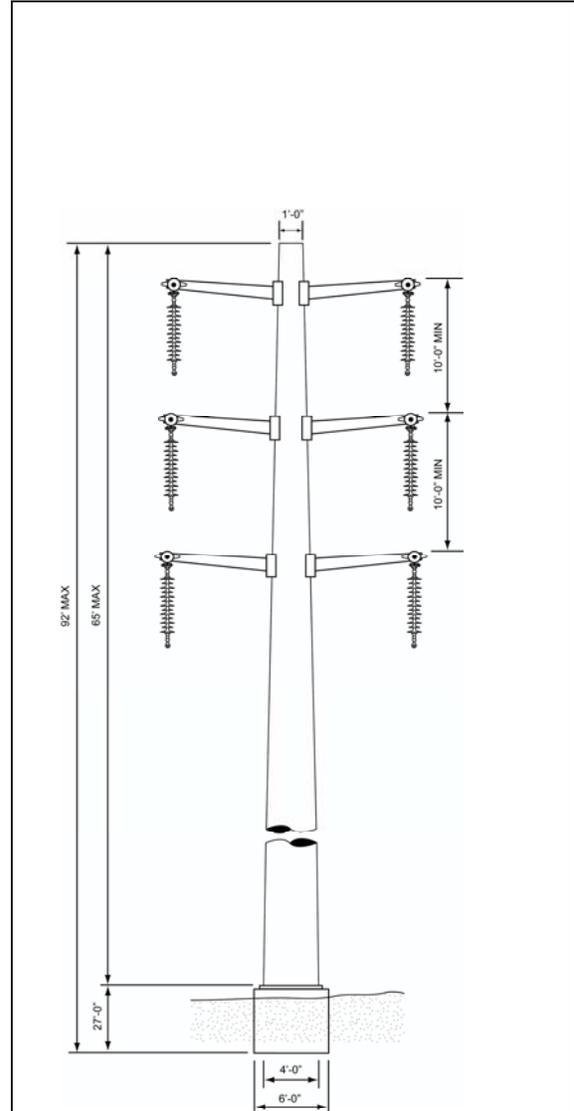
FIGURE 2.6-3 Typical tangent tubular steel pole with vertical configuration (Pole configurations are based upon preliminary engineering and may be subject to slight changes).

The preliminary power line design indicates that the power line will span the north side of the substation from a turning structure located near the intersection of Sunnyside and Perrin Avenues to a single TSP and each circuit will then angle south to drop down to a dead end structure within the substation; the dead end structures will be approximately 35 feet tall. A visual simulation depicting these poles as they enter the proposed substation is included in the Section 3.0 – Visual Resources. Figures 2.6-4 and 2.6-5 are profile drawings of a typical tangent TSP or hybrid pole and the drop down structure.



NOTE: Preliminary and subject to change based on CPUC requirements, final engineering, and other factors

FIGURE 2.6-4
Typical tangent TSP or hybrid pole.



NOTE: Preliminary and subject to change based on CPUC requirements, final engineering, and other factors

FIGURE 2.6-5
Typical drop down structure.

As stated above, the existing 12 kV distribution line located along a segment of the proposed power line alignment from Shepherd Substation to approximately 0.4 miles north of Behymer Avenue will be collocated on the proposed power line in the underbuild position.

2.6.2.2 Conductor

The typical conductor design characteristics are described in Table 2.6-2.

TABLE 2.6-2 Conductor Design Characteristics	
Feature	Description
Circuit configuration	Double circuit, one conductor per phase with three phases for each circuit in a vertical configuration
Conductor size and type	The diameter of the conductor is 1.75 inches, 61 strands of all aluminum weighing 2.177 pounds per foot; specular
Minimum ground clearance of conductor	30 feet under normal operations and 27 feet under emergency operations
Minimum ground clearance at road crossings	30 feet under normal operations and 27 feet under emergency operations
Horizontal distance between conductors	15 feet at each structure and a minimum of 10 feet in span
Vertical distance between conductors	10 feet minimum

2.7 GENERAL CONSTRUCTION METHODS

2.7.1 Construction Sequence

Substation construction and power line interconnection construction will occur simultaneously. Project construction will generally follow the order listed below:

1. Substation Construction
 - a. Land clearing, rough grading, and compaction of subgrade
 - b. Installation of security fence
 - c. Excavation of foundations, raceways, and ducts
 - d. Installation of grounding grid
 - e. Construction of the buswork structure
 - f. Installation of facilities
2. Power Line Interconnection Construction
3. Distribution Feeder Lines Construction
4. Cleanup Activities

Construction material for the substation and power line will be staged within the boundaries of the proposed Shepherd Substation. No additional areas will be required to stage materials.

2.7.1.1 Substation Construction

The substation will be constructed on an approximate 466 feet by 466 feet (approximately five acres) parcel of land used currently as an almond orchard. The site is currently flooded periodically for irrigation of the almond trees. The almond orchard contains mature trees that produce almonds.

Substation construction will begin by clearing most of the almond trees on the five acre parcel. Three rows of trees will remain on the north and east sides to provide screening. Trees will be disposed of in accordance with applicable rules and regulations. Once trees are cleared, grading and compacting of the site will begin to establish a flat surface, proper drainage, and predetermined compaction rates. The site is mostly flat, so extensive grading will not be required. All grading will be in compliance with Fresno County grading requirements. Based on preliminary designs, approximately 8,500 cubic yards of clean fill will be required to bring the substation site to the correct elevation.

For security, an eight-foot-high perimeter fence with two access gates will be constructed around the substation periphery. The fence will be chain link on two sides (south and west) and a pre-fabricated concrete wall on the other two sides (north and east), with almond trees located outside of the fence. Two entrances will be located along Sunnyside Avenue at the extreme north and south ends of the substation. Two ten foot swing gates will be installed at each entrance.

Following site preparation, below-grade construction will occur. PG&E will construct foundations, a storm water detention basin, a Spill Prevention Control Countermeasure (SPCC) concrete basin, raceways, and underground conduit. Interior lighting and telecommunication facilities will be installed for operations, safety, and security. Reinforced concrete subsurface footings and concrete slabs will be installed along with the grounding grid. Substation equipment foundations will be approximately 16 feet deep.

Once the below-grade construction is complete, aboveground steel structures, circuit breakers, transformers, switchgears, buses, and other electrical equipment will be installed. Equipment will be bolted or welded to slabs and footings and connected to the ground grid. The maximum height of the substation equipment will be approximately 35 feet for the dead-end structures supporting the 115 kV power line interconnection; transformers, switches, and buswork will all be approximately 15 feet tall. Substation structures and equipment will be a neutral gray color.

The substation will include three 45 MVA transformers, each containing approximately 12,200 gallons of mineral oil. (The mineral oil does not contain polychlorinated biphenyls [PCBs]). The SPCC concrete basin will be sufficiently sized to contain the transformer coolant liquid from the largest transformer to contain any accidental spills.

PG&E will construct two paved, 20-foot-wide access roads between Sunnyside Avenue and the substation. The roads will be at the north and south ends of the substation and will be approximately 35 feet in length. Access roads and roads within the substation will be paved.

2.7.1.2 Power Line Interconnection Construction

Access

Where the power line alignment is located along property lines in roadless areas, vehicles and equipment will travel down the center of the right-of-way. No access roads will be constructed. The area is flat, so grading and earthwork to allow for equipment to access pole locations is not expected to be needed. Where existing roads are present, they will be utilized. Heavy construction vehicles and equipment will require access to the location of each new structure, but not necessarily along the length of the entire alignment between structures. Local roads such as Sunnyside Avenue, Behymer Avenue, and Copper Avenue provide access to points along the alignment.

Foundation Excavation and Installation

No foundation is required for hybrid poles. The base of hybrid poles will be buried. Foundations will be installed for tubular steel poles.

Where foundations are required, a tracked power auger will be used to excavate approximate five to six foot diameter holes to a depth of approximately 21 to 27 feet. Approximately 2,280 feet³ of soil will be excavated and replaced with approximately the same volume of concrete where foundations are installed. A boom truck will be used to set rebar cage and anchor bolts. Any holes that are required to be left open overnight will be covered and secured. Concrete pole foundations will be cast in place following excavation along with bolts for attaching poles to the foundations. Grading will not be required for these activities.

Foundation excavation will require access to structure sites by a power auger or drill, material truck, and ready-mix concrete truck. Soils left over after poles have been erected will be spread at the structure location or, if necessary, transported for offsite disposal in accordance with applicable laws.

Structure Assembly and Erection

Structure assembly and erection activities include mobilizing construction vehicles, equipment and poles along existing roads and rights-of-way, and assembling and erecting the structures. Sections of new structures and associated hardware will be delivered by flatbed truck to each structure site where erection crews will assemble them on the ground. Using a large crane, crews will position structures onto their foundations. Typical tubular steel pole installation is depicted in Figure 2.7-1. Hybrid pole bases will be buried rather than attaching them to a foundation.

Conductor and Ground Wire Stringing

Once poles are erected, conductor will be strung from conductor pull and tension sites at the end of the power line interconnection alignment. Reels of conductor and overhead shield wire will be delivered to the pulling and tensioning sites and, since the area is level, little or no earth moving will be required to provide access. Sites free of woody vegetation will be selected, if possible, to avoid unnecessary vegetation removal. The conductors and shield wires will be attached to the power poles and then pulled into place from these locations.

Crews will then install insulators and sheaves. Sheaves are rollers attached to the lower end of the insulators at the end of each pole structure cross-arm. The sheaves allow crews to pull sock lines, rope or wire used to pull power line interconnection conductors into place. Once the equipment is set up, a light-weight vehicle will pull the sock line from one pole to the next. At each pole, the sock line will be hoisted to the cross-arm and passed through the sheaves on the ends of the insulators. Conductor will then be attached to the sock line and pulled through each supporting structure while under tension. Once each conductor is pulled into place, it is pulled to a pre-calculated sag and then tension-clamped to the end of each insulator. The final step of the conductor installation process is to remove the sheaves and install vibration dampers and accessories.

Prior to pulling and tensioning, workers will install temporary guard structures where the line crosses Behymer Avenue to prevent sock line or conductors from dropping onto the road. No energized electric lines will be crossed.

Co-location of Distribution Line

The existing distribution line along approximately one mile of the proposed power line will be moved onto the power line structures. The old distribution line wood poles will be removed. Prior to bringing down the poles, bucket trucks will be used to elevate workers to remove cross arms and

wires. A boom truck will be used to loosen old poles as needed and pull the old wood poles directly out of the ground. In some instances, the poles may be cut at the base or just below the surface and the buried portion left in place. All holes will be filled with imported fill and a seed mixture would be applied as necessary. All old poles, associated hardware, and any other debris will be removed from the project and disposed of properly. Any chemically treated wood poles would be disposed of in accordance with applicable rules and regulations. The distribution line will be installed on the new power line structures in the underbuild position.

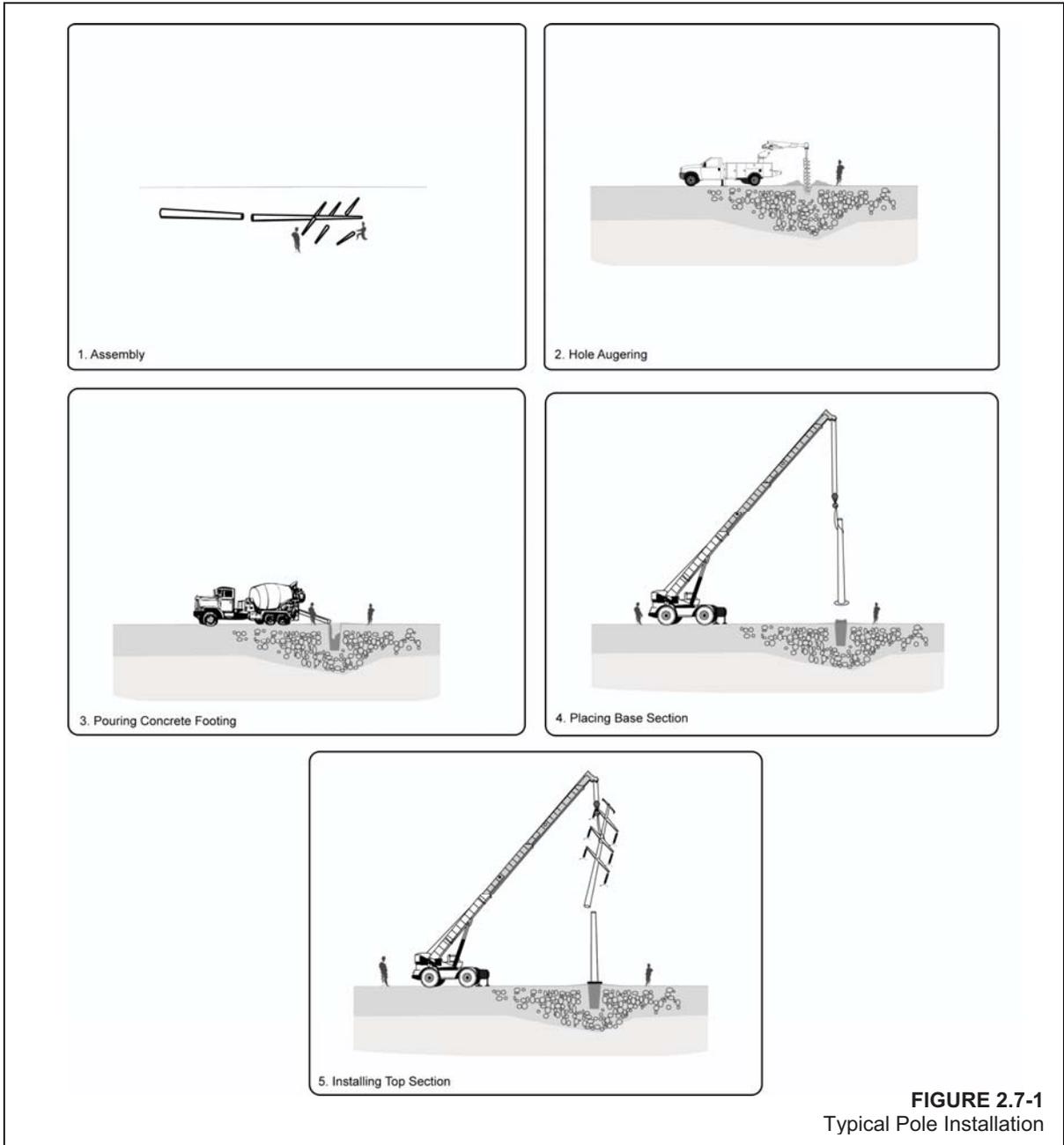


FIGURE 2.7-1
Typical Pole Installation

2.7.1.3 Distribution Feeder Lines Construction

Within the substation, the 21 kV distribution feeder lines will be placed in underground conduit. Initially, three feeder lines are planned for the substation, but distribution lines will be added for areas of demand on an as needed basis. The distribution lines will be placed underground as they leave the substation; outside of the substation they may be attached to poles or remain underground. Where aboveground lines are required, the poles will typically be wood, approximately 50 feet tall and spaced, on average, 225 feet apart. Line trucks and boom trucks will be used for construction along with a mechanical auger to dig holes approximately six feet in depth. The placement of distribution lines will be based on the location of the current load growth, existing electrical distribution facilities in the area, and the location of roads and existing PG&E rights-of-way.

2.7.1.4 Cleanup Activities

PG&E will ensure that the construction site is kept clean during the construction period. Trash will be picked up daily and either removed from the work site or properly contained. Upon completion of construction activities, a final cleanup of the work area will be performed. Final grading will ensure that contours match those of the surrounding area. Re-seeding or other restoration will be done as necessary.

2.7.2 Construction Personnel and Equipment

Construction of the project will be conducted in stages. For this reason, personnel will conduct multiple functions, and equipment will access the various work locations on multiple trips. All material will be delivered to the project area by truck. During construction of the substation and power line, a traffic control plan will be implemented if necessary for temporary obstructions along roadways. Truck trips are estimated to peak during the transport of clean fill for substation construction. Estimated truck trips at the peak period will be approximately 40 to 45 round trips of heavy-duty trucks per day. This peak period is expected to last approximately two weeks.

Typical equipment used during substation construction and for maintenance operations is summarized in Table 2.7-1. Table 2.7-2 provides the same information for power line interconnection construction.

TABLE 2.7-1				
Substation Personnel and Equipment				
Primary Equipment Description	Primary Equipment Quantity	Number of Personnel	Estimated Activity Schedule	Estimated Usage per Day
Grading				
Water Trucks	1	8	18 days	4 hours
½-Ton Pick-up Truck, 4X4	2			2 hours
980 Loader	1			8 hours
Grader	1			8 hours
Vibratory compactor	1			6 hours
Survey				
½-Ton Pick-up Truck, 4X4	2	2	5 days	8 hours
Civil (foundation, underground conduit, ground grid, etc. construction)				
1-Ton Crew Cab 4X4	2	8	18 days	4 hours

TABLE 2.7-1				
Substation Personnel and Equipment				
Primary Equipment Description	Primary Equipment Quantity	Number of Personnel	Estimated Activity Schedule	Estimated Usage per Day
Fork Lift	1			2 hours
Dump truck	1			1 hour
Stake bed truck	1			2 hours
Drill rig	2			2 hours
Tractor	1			3 hours
Trencher	1			4 hours
Electrical (MEER, switchracks, conductor, circuit, breakers, etc.)				
1-Ton Crew Cab 4X4	2	12	80 days	4 hours
½-Ton Pick-up Truck, 4X4	4			4 hours
Carryall vehicles	2			4 hours
Cranes	2			4 hours
Lift truck	1			4 hours
Man-lifts	2			4 hours
Transformer Setup				
1-Ton Crew Cab 4X4	2	5	20 days	2 hours
Carryall vehicle	1			2 hours
Crane	1			6 hours
Forklift	1			6 hours
Processing trailer	1			12 hours
Low bed truck	1			4 hours
Test Facilities				
½-Ton Pick-up Truck, 4X4	1	2	60 days	2 hours
Paving				
1-Ton Crew Cab Flat Bed, 4X4	1	8	20 days	4 hours
Dump trucks	2			6 hours
Road paver	1			1 hour
Skip loaders	2			6 hours
Fence Construction				
½-Ton Pick-up Truck, 4X4	1	6	20 days	4 hours
1-Ton Crew Cab Flat Bed, 4X4	1			4 hours
Bobcat	1			1 hour
3-Ton Flat Bed Truck	3			1 hour

TABLE 2.7-2				
Power Line Interconnection Personnel and Equipment				
Primary Equipment Description	Primary Equipment Quantity	Number of Personnel	Estimated Activity Schedule	Estimated Usage per Day
Survey				
½-Ton Pick-up Truck, 4X4	4	4	1 day	5 hours
Install Foundations				
1-Ton Crew Cab Flat Bed, 4X4	4	6	32	4 hours
70-Ton Crane Truck	1			7 hours
15 Ton Boom Truck	1			7 hours
Pole Haul				
35-40 ton crane to off load poles	1	8	4 days	10 hours
40-foot Flat Bed Truck and Trailer	2			10 hours
Pole Assembly				
15-Ton Crane Truck	1	8	4 days	10 hours
1-Ton Crew Cab Flat Bed, 4X4	1			10 hours
Conductor Single Circuit				
1-Ton Crew Cab Flat Bed, 4X4	2			5 hours
Wire Trucks and Trailers	1			10 hours
¾-Ton Pick-up Truck, 4X4	2	20		5 hours
30-Ton Manitex	2		4 days	10 hours
Static Tensioner	1			10 hours
3 Drum Strawline Pullers	1			10 hours
30lk 3 Drum Puller	1			10 hours
Restoration				
Road Grader	1	6	2 days	10 hours
Water Trucks	4			2 hours
Lowboy Truck and Trailer	1			6 hours
Excavator	1			10 hours
Skip Loader	1			10 hours

2.8 ESTIMATED GROUND DISTURBANCE

Estimates of ground disturbance associated with construction and operation of the project are summarized in Table 2.8-1.

TABLE 2.8-1 Estimated Ground Disturbance			
Project Feature	Estimated Ground Disturbance	Estimated Temporary Disturbance Area	Estimated Permanent Disturbance Area
TSP and Hybrid Pole Sites	50 foot radius at each pole	0.18 acres	<0.01 acres
Stringing Setup Areas (pulling)	150 feet x 300 feet	2.0 acre	—
Stringing Setup Areas (tensioning)	150 feet x 300 feet	2.0 acre	—
New Access Roads*	0 acres	0 acres	—
Shepherd Substation	5.0 acres	—	5.0 acres
* No new access roads will be constructed. Equipment will travel overland.			

2.9 CONSTRUCTION SCHEDULE

Construction is scheduled to begin in June of 2012 and is anticipated to take approximately twelve months to complete. Construction crews will work during daylight hours (7 a.m. to 6 p.m.) on weekdays unless otherwise required for project safety or to take advantage of the limited times when the power line can be taken out of service.

2.10 OPERATIONS, MAINTENANCE, AND INSPECTION

The operation of Shepherd Substation will be controlled remotely from PG&E's Fresno Control Center located at 650 O Street, Fresno, California. Telecommunication lines, including alarm systems, will connect the substation to the control center.

Routine inspections by substation personnel will occur monthly or as needed under emergency conditions. Routine inspection will include inspection of hardware, insulator keys, and conductors. Equipment at Shepherd Substation will be inspected annually to allow the detection of problems with corrosion, equipment alignment, or foundations. Vegetation trimming will be conducted in accordance with the CPUC's General Order 95 (Rules for Overhead Electric Line Construction).

The power line interconnection will be inspected annually. Routine maintenance will include replacing faulty insulators and tightening nuts and bolts, as needed. Under normal conditions, a more comprehensive inspection is done every three to five years. In addition, power lines are sometimes damaged by storms, floods, vandalism, or accidents and require immediate repair. Emergency repair operations will involve the prompt deployment of crews to repair and replace damaged equipment.

2.11 PERMITS THAT MAY BE REQUIRED

The CPUC is the lead agency for CEQA review. This PEA has been developed in accordance with the CPUC's General Order 131-D requirements as part of the PTC application. This and other discretionary approvals that may be required for the project are summarized in Table 2.11-1.

TABLE 2.11-1 Summary of Discretionary Permits that May be Required	
Agency	Permit
Department of the Interior, Fish and Wildlife Service	Endangered Species Act, Section 7
California Department of Transportation	Transportation Permit (oversized vehicles)
California Public Utilities Commission	Permit to Construct
California Office of Historic Preservation	National Historic Preservation Act, Section 106 (not anticipated)

2.12 RIGHT-OF-WAY ACQUISITION

PG&E purchased the property rights for the 5.0-acre substation site and is acquiring the property rights for an approximate 60-foot wide right-of-way for the power line interconnection. Addresses of property owners identified within 300 feet of the proposed substation and power line interconnection are included in Appendix B.

2.13 APPLICANT PROPOSED MEASURES

Table 2.13-1 contains APMs proposed by PG&E to minimize potential impacts to resources.

TABLE 2.13-1 Applicant's Proposed Measures	
APM No.	Description
AESTHETICS	
APM Visual-1	Construct a prefabricated concrete wall on the north and east sides of the substation and leave three rows of existing almond orchard trees on the east and north sides of the substation to minimize contrast with the existing visual character of the area.
APM Visual-2	Design security lighting at the substation in a way such that all lighting is directed inwards. In addition, all exterior lighting will be hooded to reduce light pollution.
AGRICULTURAL, LAND USE, AND RECREATIONAL RESOURCES	
APM LU-1	The power line corridor will not be open to public access where there is currently not existing access. Access in areas where no access currently exists will be secured.
<i>(NOTE: The first eight APMs are measures recommended by the San Joaquin Valley Air Pollution Control District. APMs 10-12 are designed to maximize emission reductions for criteria pollutants as well as green house gases.)</i>	
APM Air-1	All disturbed areas which are not being actively used for construction purposes will be stabilized of dust emissions using water or covered with a tarp or other suitable covering.
APM Air-2	All unpaved roads utilized for accessing the project will be stabilized by spraying with water.

TABLE 2.13-1 Applicant's Proposed Measures	
APM No.	Description
APM Air-3	All ground disturbing activities will be effectively controlled of fugitive dust emissions by application of water or by presoaking.
APM Air-4	When materials are transported offsite, all material will be covered or wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
APM Air-5	All operations will remove the accumulation of mud or dirt from adjacent public streets at the end of each workday.
APM Air-6	Trackout (i.e., dirt and mud transported on vehicle tires and transferred to the pavement upon existing the work area) will be removed at the end of each workday when it extends 50 or more feet from the site.
APM Air-7	Speeds of vehicles and equipment operating on unpaved surfaces will be limited to no more than 15 miles per hour.
APM Air-8	Dust suppressants or watering will be used to ensure that dust is controlled to less than 20 percent opacity when winds exceed 20 miles per hour.
APM Air-9	PG&E will continue to be an active member of the SF ₆ Emission Reduction Partnership, which focuses on reducing emissions of SF ₆ from transmission and distribution sources. PG&E will also continue to institute new rules for more accurately monitoring its equipment for SF ₆ leaks and immediately repairing leaks that are discovered. PG&E will ensure that all breakers purchased for this project will have a manufacturer's guaranteed SF ₆ leakage rate of 0.5 percent per year or less.
APM Air-10	When feasible, vehicles will be shut off rather than left idling unnecessarily. Some equipment or vehicles may require extended start up times. For such equipment, a common sense approach will be used to determine idling times. Normal idling will not exceed five minutes, as required by California law.
APM Air-11	To the extent feasible, all diesel fueled off-road construction equipment with 50 horsepower or greater engines shall at a minimum meet U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) Tier 1 engine standards. Compliance records will be kept by the general construction contractor. This APM is not applicable to equipment permitted by the local air quality district or certified through CARB's Statewide Portable Equipment Registration Program, or single specialized equipment that will be used for less than five total days.
APM Air-12	PG&E will incorporate the following measures into its construction plans to further reduce greenhouse gas emissions: <ul style="list-style-type: none"> • Encourage construction workers to carpool by establishing carpooling to construction sites where feasible to do so. • Encourage recycling of construction waste. • Minimize welding and cutting by using compression of mechanical applications where practical and within standards.
BIOLOGY	
APM Bio-1	Effective erosion and sediment control measures will be in place at all times during construction.
APM Bio-2	To prevent the spread of noxious weeds, only equipment which has been washed and is free of caked on mud, dirt, and other debris which could house plant seeds will be allowed in the project area.
APM Bio-3	Disturbed areas will be revegetated as soon as possible following project completion.
APM Bio-4	A native grass seed mix will be used for reseeding disturbed areas.

TABLE 2.13-1 Applicant's Proposed Measures	
APM No.	Description
APM Bio-5	The number of access routes, staging areas, and total area of the work sites will be kept to the minimum necessary.
APM Bio-6	Worker environmental training will be conducted prior to initiating project construction activities, which will detail sensitive species of the project area and those conservation measures which have been identified to minimize impacts to them. In addition, workers will be informed about the presence, life history, and habitat of these species. Training will also include information on federal and state laws protecting migratory birds.
APM Bio-7	A biological monitor will be onsite during ground disturbing activities near or in sensitive habitat areas (i.e., at a minimum during ground disturbing activities within 2,000 feet of seasonal wetlands) in order to minimize impacts to salamanders. Before the start of work each morning, the biological monitor will check under all equipment and stored supplies left in the work area overnight within 2,000 feet of suitable habitat. The monitor will have the authority to stop work or determine alternative work practices in consultation with agencies and construction personnel, as appropriate, if construction activities are likely to impact sensitive biological resources. The biological monitor will document monitoring activities in a daily log summarizing construction activities and environmental compliance. The daily logs will be included in the project report submitted to the agencies following completion of construction.
APM Bio-8	All work will be done in a manner which minimizes disturbance to wildlife and habitat.
APM Bio-9	All food waste and associated containers will be disposed of in closed lid containers.
APM Bio-10	No vehicle maintenance or refueling will occur within 100 feet of water bodies.
APM Bio-11	Proper spill prevention and cleanup equipment shall be readily available.
APM Bio-12	Vehicles should remain on roads wherever possible.
APM Bio-13	No pets or firearms are permitted within the project area.
APM Bio-14	Sensitive areas will be clearly flagged or marked. These areas are to be avoided wherever possible in order to minimize impacts.
APM Bio-15	Vehicle speeds will be kept to less than 15 miles per hour when traveling off of roads.
APM Bio-16	A preconstruction survey for California tiger salamanders will be conducted by a qualified biologist within one week prior to the start of ground-disturbing construction activities in work areas within 2,000 feet of suitable habitat. Areas of potential breeding habitat where small mammal burrows are present will also be surveyed. If salamanders are found, the biologist will remove the individuals and take them to a location agreed upon by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG).
APM Bio-17	Before the start of work each morning, the biologist will check under any equipment and stored constructed supplies left in the work area overnight within 600 feet of suitable habitat.
APM Bio-18	All pole holes will be backfilled or covered at the end of the work day.
APM Bio-19	PG&E will consider the location of season wetlands in the design of the power line. No power line poles will be placed in seasonal wetlands or within 100 feet of seasonal wetlands to prevent the potential loss or degradation of these areas. Prior to construction the perimeter of the seasonal wetland will be flagged for avoidance.

TABLE 2.13-1 Applicant's Proposed Measures	
APM No.	Description
APM Bio-20	Suitable habitat areas (i.e., seasonal wetlands, ponds, canals) within the project area will be identified during preconstruction surveys. These areas will be mapped and clearly marked in the field, and will be avoided during construction.
APM Bio-21	Ground-disturbing construction activities occurring within 2,000 feet of suitable habitat areas for the California tiger salamander should be completed during a limited operating period (LOP) when salamanders are no longer breeding and are generally residing in upland burrows. The prescribed LOP is when seasonal wetlands are dry or before the first substantial rain event (generally April 30 to October 31).
APM Bio-22	Additional conservation measures and/or mitigation recommended by the USFWS and CDFG through consultation for the California tiger salamander will be incorporated into the project. Any APMs that conflict with permits issued by the USFWS and/or CDFG will be superseded by those resource agency permit requirements.
APM Bio-23	If construction activities are scheduled to occur during the avian breeding season (March 31 to August 31), a preconstruction survey for migratory birds shall be conducted by a qualified biologist. If active nests are found, appropriate spatial buffers between construction activities and the nest will be established to ensure nesting is not abandoned. Work within the buffers will not proceed until the nestlings have fledged or the nest becomes inactive.
APM Bio-24	Avian Power Line Interaction Committee Guidelines in accordance with the <i>Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006</i> ¹ will be incorporated into the power line design to minimize the likelihood of avian electrocutions. ¹ Avian Power Line Interaction Committee. 2006. <i>Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006</i> . Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, California.
CULTURAL	
APM Cult-1	The applicant shall inform and train all construction personnel on how to identify cultural resources and the procedures to follow in the event of an unanticipated discovery.
APM Cult-2	If the applicant revises the location of proposed facilities and ground-disturbing activities that affect areas beyond those surveyed for this PEA, those areas will be subjected to a cultural resources inventory to ensure that any newly identified sites are avoided by ground-disturbing activities.
APM Cult-3	The applicant will minimize or avoid impacts to any potentially significant prehistoric and historic resources that might be discovered during construction by implementing standard protocols that include ceasing all work within 50 feet of the discovery, protecting the discovery from further impacts, and immediately contacting a PG&E Cultural Resources Specialist.
APM Cult-4	If human remains are discovered, work in the immediate vicinity will stop immediately and a PG&E Cultural Resources Specialist will be contacted. The location of the discovery will be secured to prevent further impacts and the location will be kept confidential. The Cultural Resources Specialist will evaluate the discovery and will contact the Fresno County Coroner upon verifying that the remains are human. If the coroner determines the remains are Native American, the Native American Heritage Commission (NAHC) shall be contacted and the remains will be left in situ and protected until a decision is made on their final disposition.

TABLE 2.13-1 Applicant's Proposed Measures	
APM No.	Description
GEOLOGY AND SOILS	
APM Geo-1/ APM WQ-1	<p>Erosion Control and Sediment Transport Plan implementation. An Erosion Control and Sediment Transport Plan will be prepared in association with the Stormwater Pollution Prevention Plan (SWPPP). This plan will be prepared in accordance with the Water Board guidelines and other applicable Best Management Practices. Implementation of the plan will help stabilize disturbed areas and waterways and will reduce erosion and sedimentation. The plan will designate Best Management Practices that will be followed during construction activities. Erosion-minimizing efforts may include measures such as:</p> <ul style="list-style-type: none"> • Avoiding excessive disturbance of steep slopes. • Using drainage control structures (e.g., straw wattles or silt fencing) to direct surface runoff away from disturbed areas. • Strictly controlling vehicular traffic. • Implementing a dust-control program during construction. • Restricting access to sensitive areas. • Using vehicle mats in wet areas. • Revegetating disturbed areas, where applicable, following construction. In areas where soils are to be temporarily stockpiled, soils will be placed in a controlled area and will be managed with similar erosion control techniques. Where construction activities occur near a surface waterbody or drainage channel and drainage from these areas flows towards a waterbody or wetland, stockpiles will be placed at least 100 feet from the waterbody or will be properly contained (such as berming or covering to minimize risk of sediment transport to the drainage). Mulching or other suitable stabilization measures will be used to protect exposed areas during and after construction activities. Erosion-control measures will be installed, as necessary, before any clearing during the wet season and before the onset of winter rains. Temporary measures, such as silt fences or wattles intended to minimize erosion from temporarily disturbed areas, will remain in place until disturbed areas have stabilized. • The SWPPP will be designed specifically for the hydrologic setting of the project. Best Management Practices documented in the Erosion Control and Sediment Transport Plan will also be included in the SWPPP.
APM Pal-1	<p>Environmental training will be provided to workers regarding the protection of paleontological resources and procedures to be implemented in the event fossil remains are encountered by ground-disturbing activities. This training may be combined with other environmental training for the project, provided that the program elements pertaining to cultural resources are provided by a qualified instructor meeting applicable professional qualification standards.</p> <p>In the unlikely event that previously unidentified paleontological resources are uncovered during implementation of the project, all ground disturbing work would be temporarily halted or diverted away from the discovery to another location. PG&E's paleontological resources specialist or his/her designated representative will inspect the discovery and determine whether further investigation is required. If the discovery is significant, but can be avoided and no further impacts would occur, the resource will be documented in the appropriate paleontological resource records and no further effort will be required. If the resource is significant, but cannot be avoided and may be subject to further impact, PG&E will evaluate the significance of the resources, and implement data recovery excavation or other appropriate treatment measures, in coordination with the landowner, as recommended by a qualified paleontologist.</p>
HAZARDS AND HAZARDOUS MATERIALS	

TABLE 2.13-1 Applicant's Proposed Measures	
APM No.	Description
APM Haz-1	Emergency spill response and clean up kits will be available on site and readily available for the cleanup of any accidental spill. Construction crews will be trained in safe handling and clean-up responsibilities prior to the initiation of construction.
APM Haz-2	In the event of an accidental spill, the substation is equipped with a retention basin that meets Spill Prevention Containment and Countermeasures (SPCC) Guidelines (40 CFR 112). The SPCC will be sufficiently sized to accommodate the accidental spill of all mineral oil from the largest transformer located at the substation. The substation will also be equipped with lead-acid batteries to provide backup power for monitoring, alarm, protective relaying, instrumentation and control, and emergency lighting during power outages. Containment will be constructed around and under the battery racks, and the SPCC will address containment from a battery leak.
APM Haz-3	A water truck will be available onsite during dry conditions, as assessed by the construction foreman, to prevent the ignition or spread of a wildfire. The work site will be sprayed a minimum of three times per day during dry conditions.
HYDROLOGY AND WATER QUALITY	
APM WQ-2	PG&E will avoid working within seasonal wetlands and ponds. No poles will be placed within 100 feet of seasonal wetlands.
APM WQ-3	PG&E will engineer a permanent basin with the substation perimeter to capture on-site stormwater, clean it of potential pollutants, and infiltrate it into the local groundwater table. Sizing and design of the facility will follow industry best practices.
NOISE	
APM Noise-1	Construction will not occur before 6:00 a.m. or after 9:00 p.m. on any day except Saturday or Sunday, when construction will not occur before 7:00 a.m. or after 5:00 p.m.
APM Noise-2	Construction equipment will use noise reduction devices that are no less effective than those originally installed by the manufacturer.
APM Noise-3	Where feasible, construction traffic will be routed to avoid sensitive noise receptors such as residences, schools, religious facilities, hospitals, and parks.
APM Noise-4	Stationary equipment used during construction will be located as far as practical from sensitive noise receptors.
APM Noise-5	Unnecessary engine idling will be limited.
APM Noise-6	Where feasible, equipment will be used that is specifically designed for low noise emissions and equipment powered by electric or natural gas as opposed to diesel or gasoline.
APM Noise-7	Residents in areas of heavy construction noise will be notified prior to commencing construction activities. Notification should include written notice and the posting of signs in appropriate locations with a contact number that residents can call with questions and concerns.
TRANSPORTATION	
APM Tran-1	Deliveries will be made during normal construction hours.

3.0 ENVIRONMENTAL SETTING AND IMPACT ASSESSMENT SUMMARY

This section summarizes impacts on the human environment resulting from the construction, operation, and maintenance of the Shepherd Substation Project. Overall project impacts are summarized in Table 3.0-1 and are evaluated for each resource in sections 3.1 – 3.11.

TABLE 3.0-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?			X	
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			X	
c) Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?			X	

3.1 AESTHETICS

This section of the PEA addresses the aesthetics, or visual resources, and the potential impacts associated with the construction, operations, and maintenance of the project. Implementation of the APMs will ensure that impacts to aesthetics will be less than significant.

TABLE 3.1-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
AESTHETICS Would the project:				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surrounding?			X	
d) Create a new source of substation light or glare which would adversely affect day or nighttime views in the area?			X	

3.1.1 Methodology

The visual resource study area is the area where project impacts reasonably affect viewers. The study area has clear visibility with minor changes in elevation which allow meaningful views to one mile. Views beyond one mile would be considered too distant to have an adverse effect. Development, topography, and existing trees combined with the proposed facilities make the analysis of more distant views unmeaningful for impact characterization. Therefore, the study area was determined to be a one mile distance from project elements. The study area is delineated on Figure 3.1-1.

Project elements visible within the study area include substation structures and bus work, electric power lines, and two short access roads and substation gates. All project elements are located within Fresno County. The study area is primarily in Fresno County with the exception of areas at the south end of the study area that are part of the City of Clovis, and/or within the City of Clovis sphere of influence (see Section 3.2.2.1).

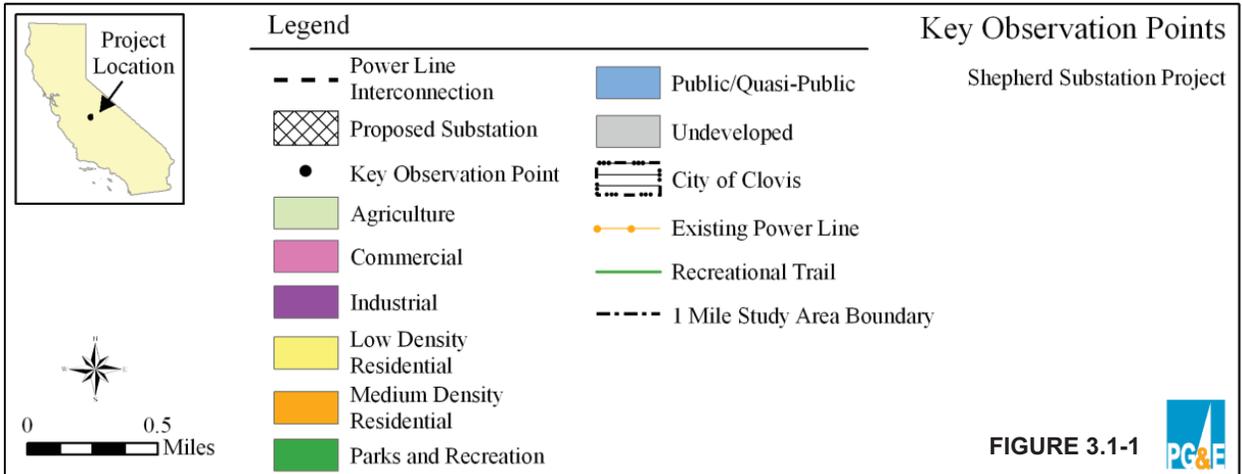
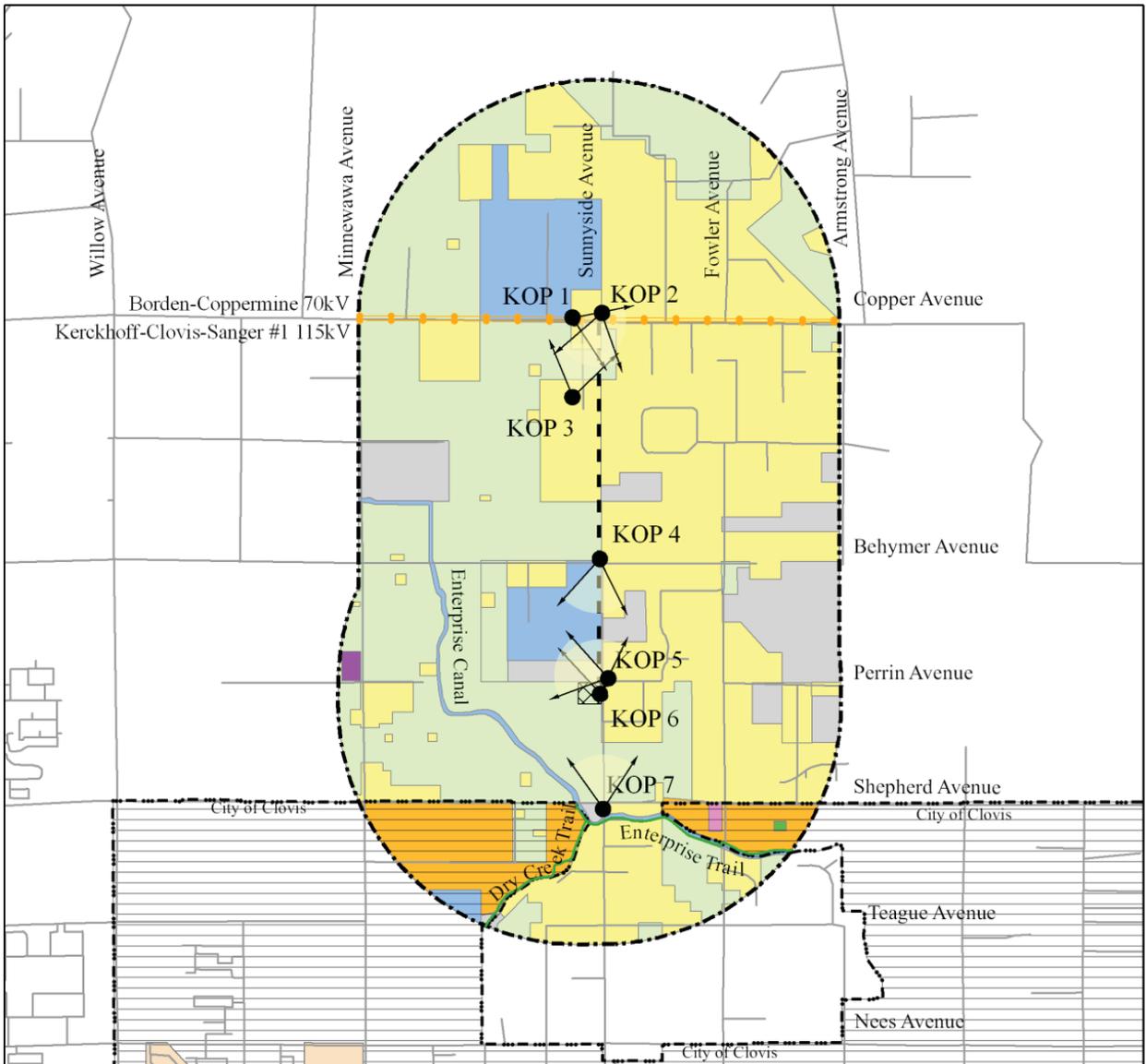
The study area is largely located on private land with one notable exception of a large retention basin managed by the Fresno Metropolitan Flood Control District. Fresno County and the City of Clovis both have policies for minimizing impacts and recognizing aesthetic values for the area, but do not have established methods for analyzing visual impacts. Therefore, the Federal Scenery Management

System used by the Forest Service (Forest Service 1995), one of several well-tested and widely-used Federal visual analysis methods for characterizing visual settings and performing impact analysis, was the basis for this evaluation. The analysis performed for the project involved establishing a baseline (existing conditions) and evaluating potential impacts from the project by identifying existing elements of landscape character, including form, line, color, texture, pattern, and scale, which were compared with proposed project elements (e.g., power line structures, substations). Contrast levels were measured, and a determination of the management objectives for visual quality was derived from the examples of how the area is used and appears.

Key Observational Points (KOPs) represent prominent and important viewing areas within the study area. KOPs are established to form a foundation from which an analysis can be performed. Analysis was performed from seven KOPs. Each KOP is located on the map illustrated in Figure 3.1-1. KOPs were selected based on the following three criteria:

1. Frequency – The number of viewers, including along travel routes and other high use areas.
2. Duration – The length of time the project would be visible to any single viewer group (generally residential areas).
3. Quality – Designated scenic areas or recreational areas where a higher quality viewshed is expected.

From each KOP, a simulation has been created to depict the possible views of the power line and/or substation. Figure 3.1-1 depicts the KOPs for the project.



3.1.2 Existing Conditions

3.1.2.1 Regulatory Background

Federal

There are no federal regulations, policies, or guidelines relative to the study area.

State

There are no state regulations, policies, or guidelines relative to the study area.

Local

The CPUC has jurisdiction over the siting, design, and construction of the project and it is not subject to local discretionary land-use regulations. The following analysis of local regulations relating to visual resources is provided for informational purposes and to assist with CEQA review. Fresno County and the City of Clovis general plans include policies to maintain and enhance the aesthetic qualities of the area. Goals and policies addressing aesthetics are as follows.

Fresno County – Policy PF-J.2: The County shall work with local gas and electric utility companies to design and locate appropriate expansion of gas and electric systems, while minimizing impacts to agriculture and minimizing noise, electromagnetic, visual, and other impacts on existing and future residents.

City of Clovis – Chapter 6 Policy 3.2: Recognize Dry Creek Canal, Enterprise Canal, and other major waterways as important open space corridors for flood control, trail systems, water quality control and visual amenities.

3.1.2.2 Environmental Setting

The distinctive visual features of the study area are its open character, primarily agricultural fields and orchards mixed with single family residential development. Views typically focus on individual lots and adjacent open areas; e.g., flood control, pasture, or agriculture. Homes vary in condition, style, and age ranging from small modest single-story to large multistory homes. Some farming equipment and sheds accompany lots and homes.

Typically, landscapes of high visual quality are composed of unique landscape features (e.g., landmarks, distinctive landforms or a unique grove of trees), water features (streams, rivers, ocean frontage), scenic vistas, and/or distinct compositions. The study area does not have these high visual quality elements. Figures 3.1-2, 3.1-3 and 3.1-4 depict the typical existing visual setting at the substation location and along the power line.

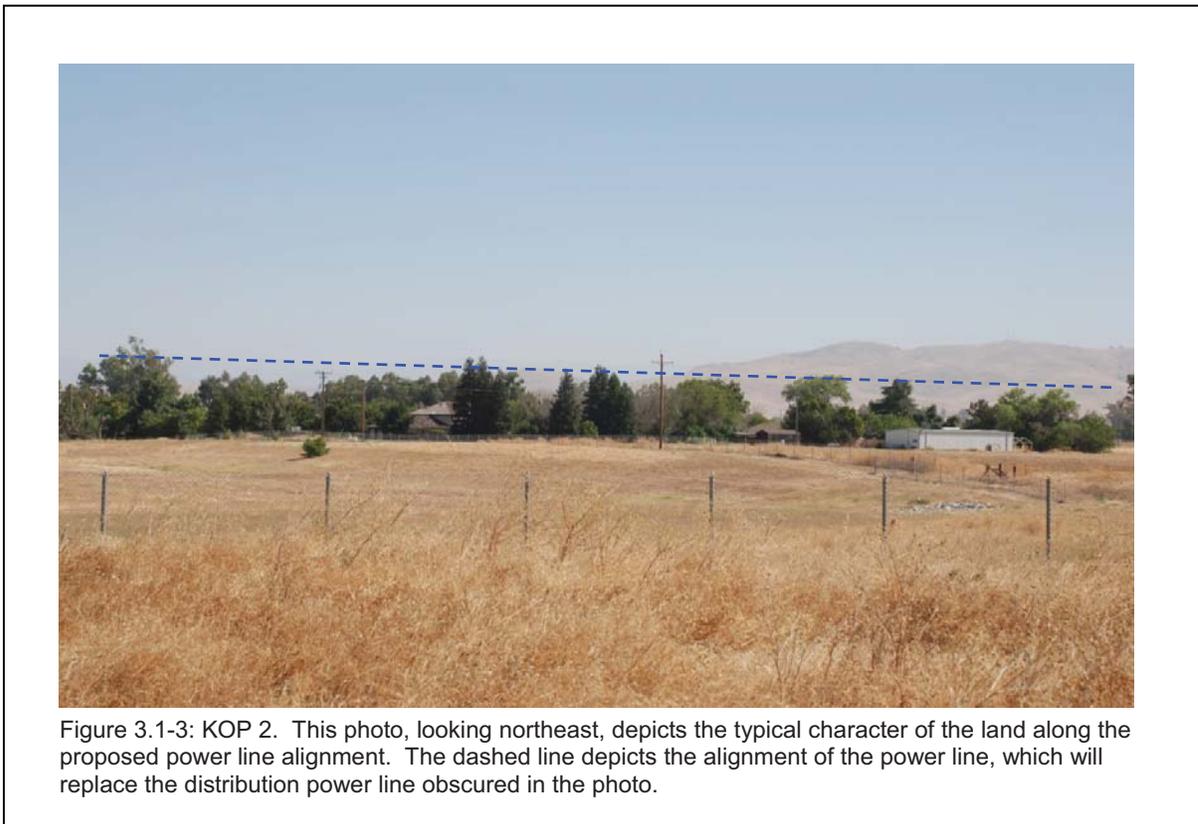
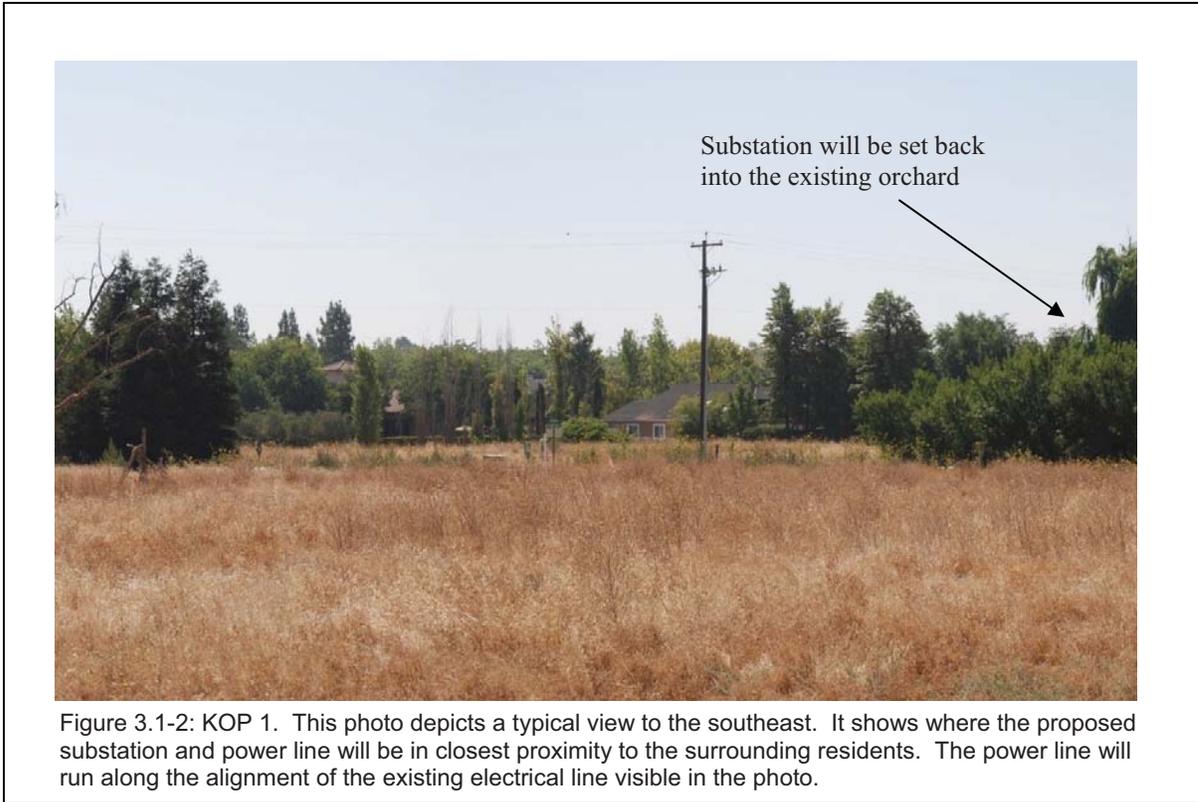
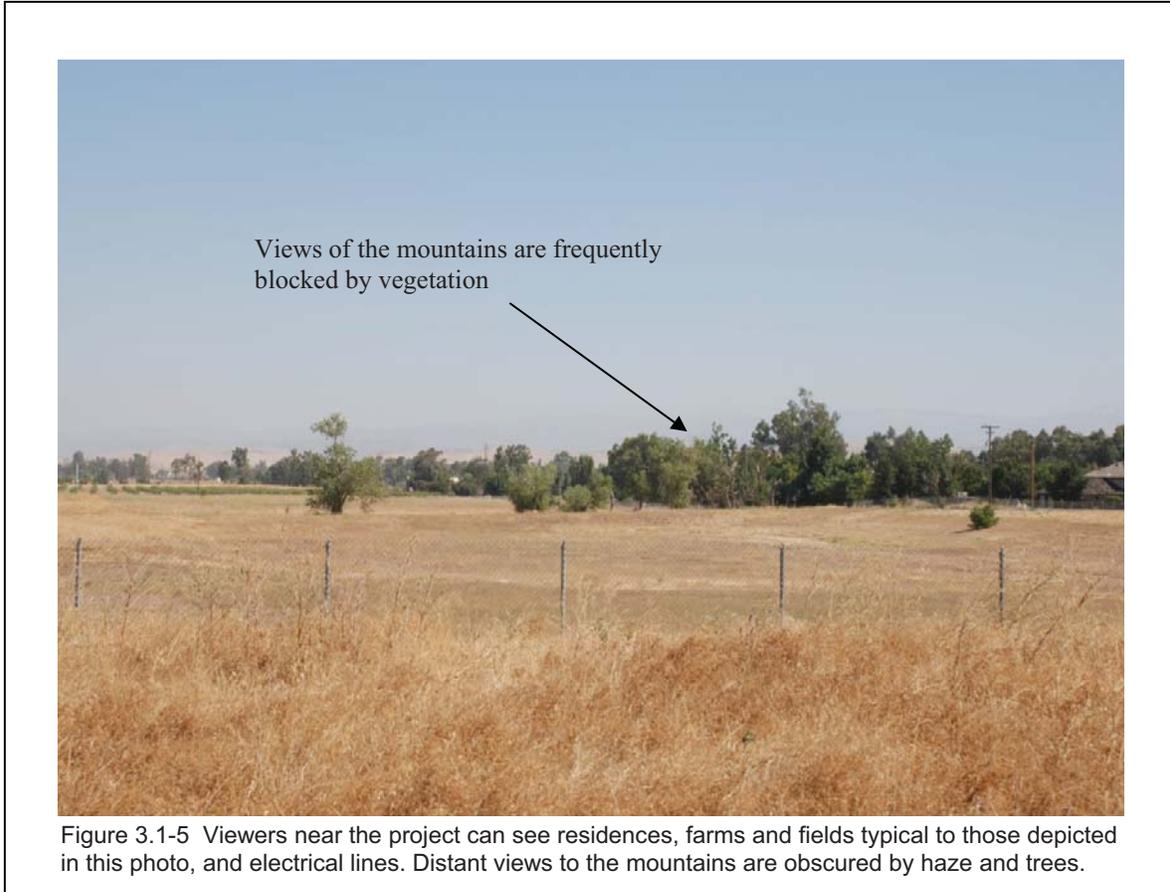




Figure 3.1-4 This photo, looking northwest, depicts the typical visual landscape west of the proposed power line alignment.

There are no specially designated scenic areas (scenic byway, scenic corridor, etc.) located within the study area. The landscape is predominately flat with views to the north and east of the Sierra Nevada foothills at a distance of approximately three miles. Views of the mountains are often obstructed by vegetation, houses, existing infrastructure elements, air quality, and lighting conditions (Figure 3.1-5). The landscape to the south and west is flat and provides views to the horizon when unobstructed; however, small vertical features like trees and houses limit the distant views. Typical views throughout the study area are of orchards, field crops, and residential or suburban areas. Recreational trails are found along Dry Creek and the Enterprise Canal. A future park site/trailhead, near the intersection of Shepherd Avenue and Sunnyside Avenue and a future expansion of both the Dry Creek and Enterprise trails are proposed and may have views of project elements. These trails are depicted in Figure 3.1-1.



3.1.3 Impacts

3.1.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts to aesthetics may be considered significant if the project will:

- Have a substantial, adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; and/or
- Create a new source of substantial light or glare, which will adversely affect day or nighttime views in the area.

Factors considered in applying these criteria to determine significance include the extent of project visibility from residential areas, public open space, and designated scenic routes; the degree to which the various project elements will contrast with or be integrated into the existing landscape; the extent of change in the landscape's composition and character; and the number and sensitivity of viewers. Project conformance with public policies regarding visual quality was also taken into account.

3.1.3.3 Environmental Impacts

The following section discusses significance criteria for impacts to aesthetics derived from the CEQA checklist.

Would the project:

a) Have a substantial adverse effect on a scenic vista?

No impact. There are no designated scenic vistas in the study area.

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?

No impact. The project is not visible from any state or federally designated scenic highway and will therefore have no effect on the scenic resources associated with that designation.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Less than significant. The project will not result in significant impacts to the visual quality of the area. The most important views for residents are toward the east and of the Sierra Nevada Mountain Range. These views will remain unobstructed by the power line and substation for residents located to the east of the power line and substation. The project will not have a significant impact to the residents located to the west of the power line and substation. Typically these views are obstructed by existing haze, vegetation, and structures. The substation and power line are similar in nature to existing visual disturbances, including electrical power and distribution structures, urban infrastructure, and development that contains similar elements of form, line, color, and texture. Contrast levels would be low in most circumstances because of the presence of existing power lines, physical features with similar line color and texture distance, and limited views of the project elements. The existing power lines and other infrastructure elements have established contrast in vegetation and property lines, which allows the existing power line to be absorbed by the landscape instead of dominating views. This ability to absorb represents lower contrast levels and lower impacts to viewers and thus the project will not measurably alter the landscape's original appearance.

Furthermore the project is located so as to minimize impacts to agriculture areas, and the residents of the community. It is also located away from trail systems, and at the edge of the major waterways of the area. Views of the project from the recreational trails and proposed park/trailhead are screened by orchards or limited by distance. The project design and APM Visual-1 will ensure that impacts to the existing visual quality of the area will be less than significant. A summary of the analysis performed to reach this conclusion follows.

Visual simulations, and other data collected, were evaluated at each of the KOPs to determine the effect of the project on the existing landscape character in terms of the elements of form, line, color, texture, pattern, and scale. Values for visual contrast between the existing condition and the proposed project were used to describe the variation in contrast. A strong visual contrast level signifies the project is in direct opposition to the existing landscape character. A weak visual contrast level signifies the project is in harmony with the existing landscape character. The results of this analysis are summarized in Table 3.1-2. Each KOP description below gives a more thorough explanation of setting, and character for a given location. Simulations have been prepared and are included in appendix A as Figures 1-7.

TABLE 3.1-2 Existing Landscape Character Contrast level: 1 = Strong (substantial or significant adverse effect), 2 = Moderate (medium adverse effect), 3 = Weak (No or less than significant adverse effect).						
KOP	Form	Line	Color	Texture	Pattern	Scale
KOP 1	2	2	3	3	3	2
KOP 2	3	2	3	3	3	2
KOP 3	2	2	3	3	2	3
KOP 4	2	3	3	3	3	2
KOP 5	2	2	3	3	3	3
KOP 6	2	3	3	3	3	2
KOP 7	3	3	3	3	3	3

KOP 1 – Along Copper Avenue West of the Interconnection Point of the Power Line (Figure 1- Appendix A).

KOP 1 is located along Copper Avenue approximately 0.1 mile west of the interconnection point of the power line to the existing PG&E grid. To the west of this KOP is a low density residential area. The photo shows a relatively unobstructed view across a recently cleared orchard, with a recently constructed home partially blocking the view. Beyond the cleared orchard a sharp line of trees is visible marking the property line of the cleared orchard with residential lots, out of view, but located to the east. The majority of these trees are an active orchard in which a single home is located. The power line runs along this boundary. Near the left edge of the photo Copper Avenue extends to the east as well as power lines on both the north and south side of Copper Avenue. Vertical elements present within the cleared orchard include a small wind turbine and wood poles supporting an electrical distribution line.

Views of the power line from this KOP will primarily be from motorists as they drive along Copper Avenue. The posted speed along this road is 50 mph, so views will be fleeting. While the existing electrical lines along Copper Avenue already create contrast in terms of scale and line in the landscape, new visible elements will result from the approximate 95 foot tall TSP towers. Impacts would be low due to the existing landscape.

The majority of residents in this vicinity would have limited views of the project due to surrounding homes and landscaped yards. The residence located within the cleared orchard will have unobstructed views of the power line. Overall, the addition of the proposed power line would pose weak adverse effects from this viewing location.

KOP 2 – Along Copper Avenue just East of the Interconnection Point of the Power Line (Figure 2 - Appendix A).

This KOP is located along Copper Avenue further east of KOP 1. The view is south along the proposed power line. This location is a low density residential area. The view shows the contrast between the active orchard and the cleared orchard with a residence

fronting Copper Avenue. Just out of view to the left is a residence tucked into the orchard. The simulation illustrates the view residents would have along Copper Avenue. The turning structure that will connect the proposed power line into the existing power line is depicted at a height of 80 feet from a distance of approximately 75 feet. The additional height of the new power line will add additional contrast in scale, and line to nearby residents, and to passerby traveling along Copper Avenue. The tops of other structures are visible over the orchard trees. The majority of the residents near this location (residents along North Purdue Avenue) will have more limited views of the project than represented in this simulation, due to neighbors' vegetation, and landscaping. The additional height of the structures would pose weak to moderate impacts.

KOP 3 – West of Power Line Midway between Copper Avenue, and International Avenue (Figure 3 - Appendix A).

This KOP is located to the east of a large home that is located between Copper Avenue, and Behymer Avenue. The view is to the east and is largely unobstructed across residential property that has been left as open space. A stark line of vegetation delineates the boundary with subdivided residential lots located to the east.

Viewers from this location are limited to a handful of scattered homes. The simulation depicts the power line at a distance of approximately one-tenth of one mile away. The vegetation behind the power lines will help to diffuse the contrast that the new structures will impose on the viewers in this area, but the structures will be visible. The impact from this location is estimated to be weak.

KOP 4 – West of the Intersection of Behymer Avenue and Sunnyside Avenue (Figure 4 - Appendix A).

This KOP is located near some scattered residences along Behymer Avenue. The view to the south looks across a large water retention basin. What is considered Sunnyside Avenue but more resembles a long driveway in this area is visible left of the retention basin. Four residences gain access to their homes via this drive. The closest power pole is located approximately 80 feet away. The substation is located one-half of one mile away and is not visible in this simulation. The broad openness from this KOP allows for extended views of the power line structures. Views of the substation will be screened by the almond orchard, and limited by distance. This more populated residential area has a high absorption capacity, or high tolerance for the changes the project will impose. Impacts to this viewing area are weak to moderate.

KOP 5 – East of the intersection of Sunnyside Avenue and Perrin Avenue (Figure 5 - Appendix A).

This KOP is located east of the proposed substation location and was taken from a point along Perrin Avenue. The majority of the view in the foreground is across an undeveloped lot. The right side of this photo depicts vegetation planted along the front of a residential property to screen it from the Perrin Avenue. The majority of the background is occupied by the orchard in which the substation will be built. Just north of the orchard is an undeveloped lot.

The simulation, depicted from the property boundary of a residence, is located approximately 125 feet from project elements. Residents along Perrin Avenue would see the project most while driving to and from their homes as they pass in front of the substation along Sunnyside Avenue. For motorists, the typical driving speed along Sunnyside Avenue would pose fleeting views of the substation elements. The proposed substation would be screened on all four sides by an existing almond orchard in addition

to a prefabricated concrete wall on the north and east sides of the substation as outlined in APM Visual-1. The last two structures of the power line before it enters the substation will be the main introduced visible elements.

Once residents are at their homes within the residential neighborhood, views of the project would be further reduced by distance and by additional screening from surrounding homes and landscapes. Screening, in combination with speed of travel will pose weak impacts to motorists and residents in the neighborhood.

KOP 6 – South of the intersection of Sunnyside Avenue and Perrin Avenue (Figure 6 - Appendix A).

This KOP is located east of the proposed substation along Sunnyside Avenue. The almond orchard dominates the view. Sunnyside Avenue and a driveway are visible in the foreground of the photo. To the north of the orchard the view opens up as it gives way to undeveloped land. The east side of Sunnyside is lined with residents (not in the view).

The simulation depicts the substation boundary at a distance of approximately 100 feet. Residents along Sunnyside Avenue would have obstructed views of the substation due to the almond trees that will remain along the east side of the substation and vegetation in their yards. Residents located on roads east of Sunnyside Avenue will have views of the project elements while traveling along Sunnyside Avenue to reach their homes, or when vegetation is sparse enough to pose glimpses of the project. The structure to be located at the northeast corner of the substation will be the most visible element. As mentioned in KOP 6, APM Visual-1 will ensure that impacts are less than significant from this KOP location.

KOP 7 – Intersection of Sunnyside Avenue and Shepherd Avenue (Figure 7 - Appendix A).

KOP 7 is located at the busiest intersection in proximity of the substation which is near the jurisdictional limits of the City of Clovis. The Enterprise Canal and Dry Creek converge just to the west of this intersection and each has a developed recreational trail adjacent to its banks. The substation is located approximately one-half mile north of KOP 7. KOP 7 is within a transitional area, located between more dense residential subdivisions and agricultural fields. Views to the south (out of view) are suburban or rural, including homes and infrastructure. The view in the photo (facing north) is dominated by an almond orchard.

Distance and vegetation from this location will hide almost all project elements from viewers at this location, thus resulting in a negligible adverse effect. The recreational trails and park areas will have limited views of the project due to distance and vegetation. The project is in conformity with the city and county management objectives.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less than significant. The substation will be equipped with four ten foot tall light poles placed in each of the four corners of the substation for security. Lights will be hooded and directed inward as outlined in APM Visual-2. The proposed tubular steel poles have a dull, galvanized finish designed to reduce glare. The project design and APM Visual-2 will ensure that impacts from light and glare will be less than significant.

3.1.4 References:

Clovis General Plan 1993. Located online at <http://www.ci.clovis.ca.us/Search/Results.aspx?k=General%20PLan>. Accessed October 28, 2010.

Fresno County 2000 General Plan. Located online at <http://www.co.fresno.ca.us/departmentpage.aspx?id=19705>. Accessed October 28, 2010.

Landscape Aesthetics, A Handbook for Scenery Management. December 1995. U.S. Department of Agriculture, Forest Service, Agriculture Handbook No. 701.

3.2 AGRICULTURAL, LAND USE, AND RECREATIONAL RESOURCES

This section of the PEA addresses potential agricultural, land use, and recreational impacts associated with the construction, operations, and maintenance of the project. This section also describes environmental and regulatory settings. Implementation of the APMs will ensure that impacts to agricultural, land use, and recreational resources will be less than significant.

TABLE 3.2-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
AGRICULTURE RESOURCES				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			X	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?			X	
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?			X	
LAND USE AND PLANNING				
Would the project:				
a) Physically divide an established community?			X	
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
RECREATION				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X

TABLE 3.2-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

3.2.1 Methodology

Information about the agricultural, land use, and recreational resources of the project area was compiled through site visits (October and November 2008, and August 2010) and analysis of the City of Clovis' and Fresno County's general plans and zoning ordinances (City of Clovis 1993; Fresno County 2000, 2009). Agricultural, land use, and recreational resources are described within one mile of the proposed facilities, referred to as the study area.

3.2.2 Existing Conditions

3.2.2.1 Regulatory Background

Federal

There are no federal agricultural, land use, or recreational regulations, policies, or guidelines relative to the project area.

State

The Williamson Act, officially known as the California Land Conservation Act of 1965, is a California law that provides for reduced property tax to owners of farmland and open-space land in exchange for a minimum ten-year agreement that the land will not be developed or otherwise converted to another use. The intent of this Act is to promote voluntary land conservation, particularly farmland conservation.

A Williamson Act contract is automatically renewed every year unless non-renewed. A notice of non-renewal begins a nine year non-renewal period. During the non-renewal period, property taxes gradually increase until, at the end of the nine year period, the contract is terminated and all land development rights are returned to the landowner.

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations. The following analysis of local regulations relating to agriculture, land use, and recreational resources is provided for informational purposes and to assist with CEQA review.

Local regulation of agriculture, land use, and recreation is encoded in the general plans and zoning ordinances of the City of Clovis and Fresno County. Although PG&E is not subject to local discretionary permitting, ministerial permits will be secured as required. To gather information for the project, PG&E met with City of Clovis and Fresno County planners to discuss potential concerns.

Fresno County and the City of Clovis officials provided support for the project and expressed their support in letters included in Appendix C.

3.2.2.2 Environmental Setting

Agriculture

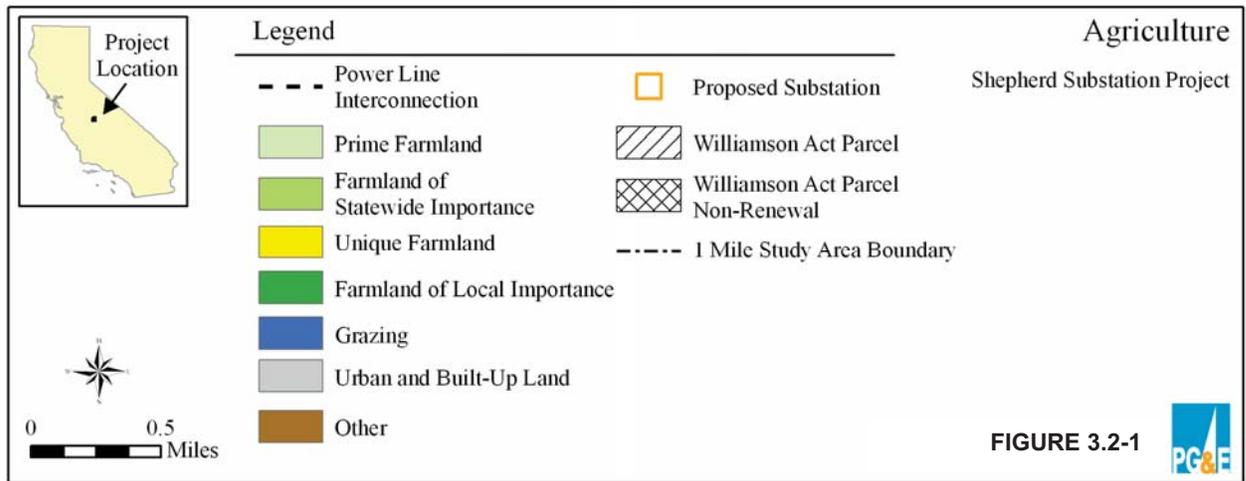
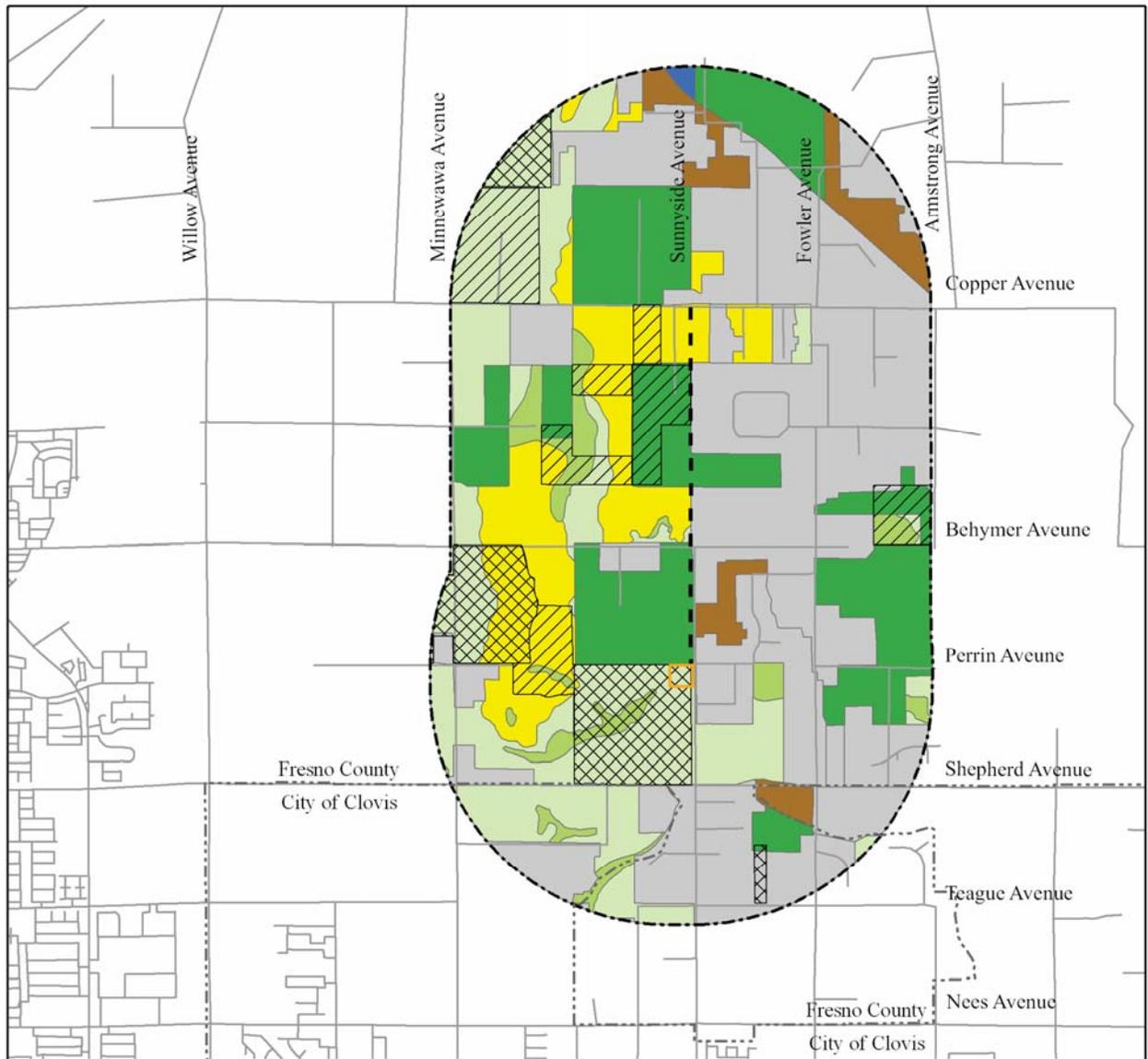
Fresno County has historically been California's top agricultural producing county. Agriculture continues to be a very important part of the local economy and is the dominant land use in the county (Table 3.2-2). The study area is located in the interface between predominantly agricultural land uses and urban land uses associated with the Fresno metropolitan area.

TABLE 3.2-2	
Farmland Mapping and Monitoring Program Soils and Acreage for Fresno County in 2006	
Category	Acres
Prime Farmland	713,085
Farmland of Statewide Importance	478,732
Unique Farmland	98,091
Farmland of Local Importance	95,547
<i>Importance Farmland Subtotal</i>	<i>1,385,455</i>
Grazing Land	827,114
<i>Agricultural Land Subtotal</i>	<i>2,212,569</i>
Urban and Built-up Land	115,364
Other Land	108,776
Water Area	4,911
<i>Total Area Inventoried</i>	<i>2,441,620</i>
Source: State of California, Department of Conservation 2008	

The majority of the study area is within an area designated by the California Department of Conservation (DOC) as Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, or Unique Farmland (Figure 3.2-1). The majority of project facilities are located on or cross DOC designated farmland. The proposed substation site is located on Prime Farmland (California DOC 2005, 2006, 2008, 2009).

In addition, several parcels within the study area have current Williamson Act contracts. A few of these parcels are in non-renewal, including the parcel upon which the substation is proposed. The proposed power line interconnection alignment also crosses parcels under Williamson Act contract, some active, and others in a state of non-renewal.

Pursuant to Section 51238 of the California Government Code, electrical facilities are a compatible use for lands under Williamson Act contracts.



Land Use and Planning

Land Ownership and Jurisdiction

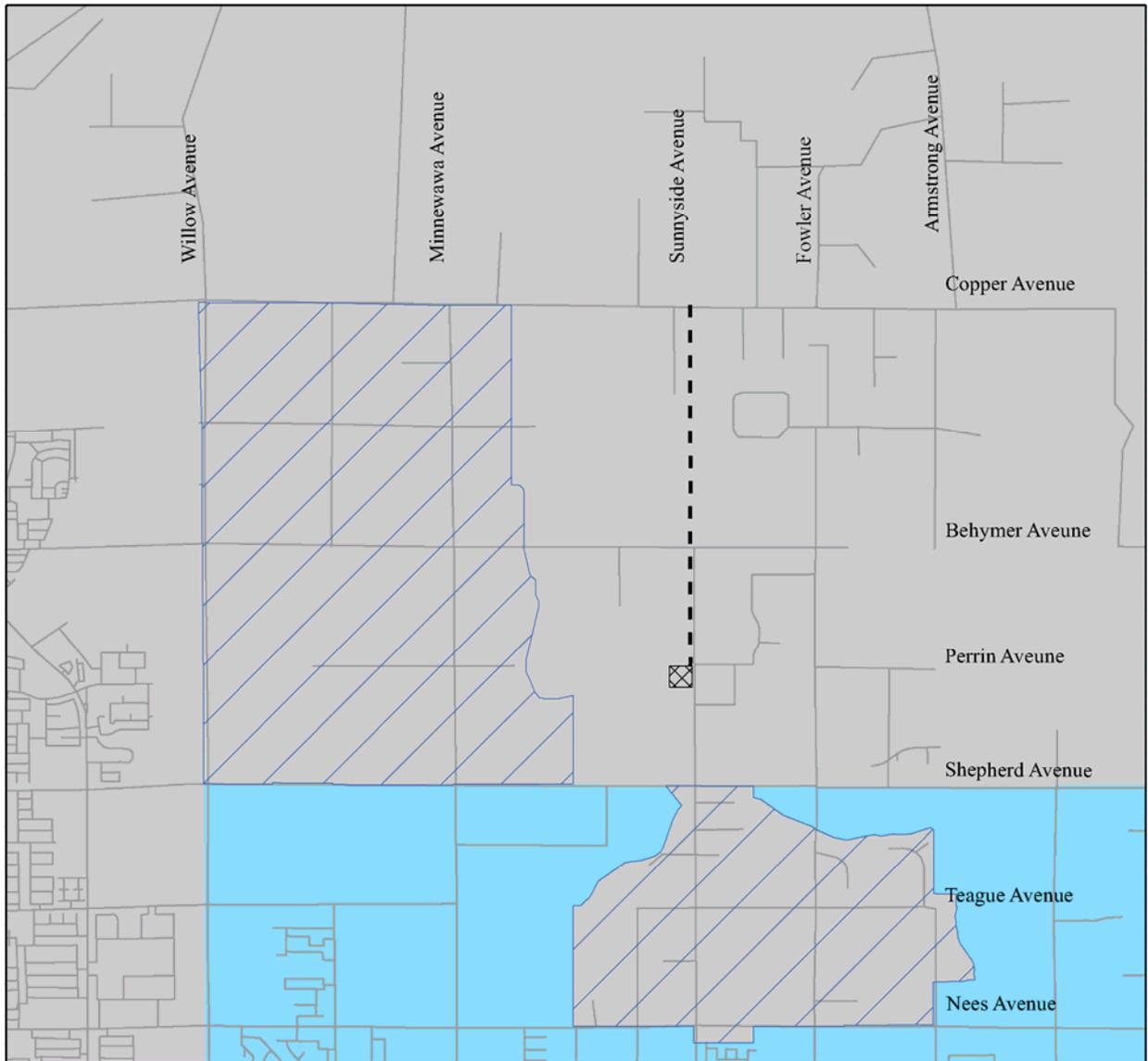
A portion of the study area is located within the City of Clovis, with the remainder located in unincorporated Fresno County. Some of the study area in the County is within the City of Clovis' "sphere of influence" (Figure 3.2-2). A sphere of influence is established by a Local Agency Formation Commission (LAFCO) and is "a plan for the probable physical boundaries and service area of a local agency" (California Government Code Section 56076). In other words, the sphere of influence represents an area likely to be annexed by the city in the near future. Jurisdiction over those lands within the sphere of influence remains with the County, but the County's General Plan is required to be consistent with the City's General Plan for that area.

The study area is located entirely on private lands. No federal or state lands are located within the study area.

Existing Land Use

Existing land use within the study area includes agricultural, residential, public and quasi-public, business and commercial, industrial, and recreational uses. There are also some recreational uses within the project vicinity (Figure 3.2-3).

- **Agriculture:** Most of the existing land use in the study area can be characterized as agricultural. Agricultural uses include the cultivation of almonds, citrus, and field crops. In addition, agricultural uses include accessory buildings used directly as part of agriculture operations. The Shepherd Substation site is located on a portion of an existing almond orchard.
- **Residential:** Residential uses incorporate all types of residential development, including low-density housing (0-1 du/ac) with ranchettes and rural residential, to medium-density housing (4-6 du/ac) among developed subdivisions. Rural and low-density residential areas are found throughout the study area, including most of the area to the east of Sunnyside Avenue and north of Shepherd Avenue. Medium-density residential areas are mainly concentrated within the limits of the City of Clovis, south of Shepherd Avenue.
- **Public and Quasi-Public:** Public and quasi-public uses typically include schools, churches, cemeteries, airports, and other land uses generally associated with public use. Within the study area, public and quasi-public uses include: 1) Harold Woods Elementary School, located at the intersection of Clovis and Teague avenues, 2) Fresno Metropolitan Flood Control District water basins, located near the intersection of Perrin and Sunnyside avenues and also north of Copper Avenue, east of the Sunnyside Avenue alignment, and 3) the New Hope Community Church, located along Nees Avenue just east of Clovis Avenue.
- **Business and Commercial:** Business, office, and commercial/retail land uses are limited within the study area. The Shepherd Glen commercial center, located at the intersection of Shepherd Avenue and Fowler Avenue, includes several retail businesses.
- **Industrial:** Industrial uses are limited within the study area to two locations along Minnewawa Avenue.
- **Linear Facilities and Utilities:** Linear facilities within the study area consist of utility transmission and distribution lines and ground transportation features. Utilities inventoried include electrical infrastructure, major pipelines, fiber optic lines, communication lines, wells, major canals, and major roads. According to the CPUC's General Order 131-D, Section I, power lines include electrical lines designed to operate between 50 and 200 kV. Power lines within the study area are operated by PG&E and include the Kerckhoff-Clovis-Sanger #1 115 kV Power Line along the south side of Copper Avenue and the Borden-Coppermine 70 kV Power Line along the north side of Copper Avenue. A major PG&E natural gas pipeline passes

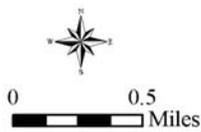


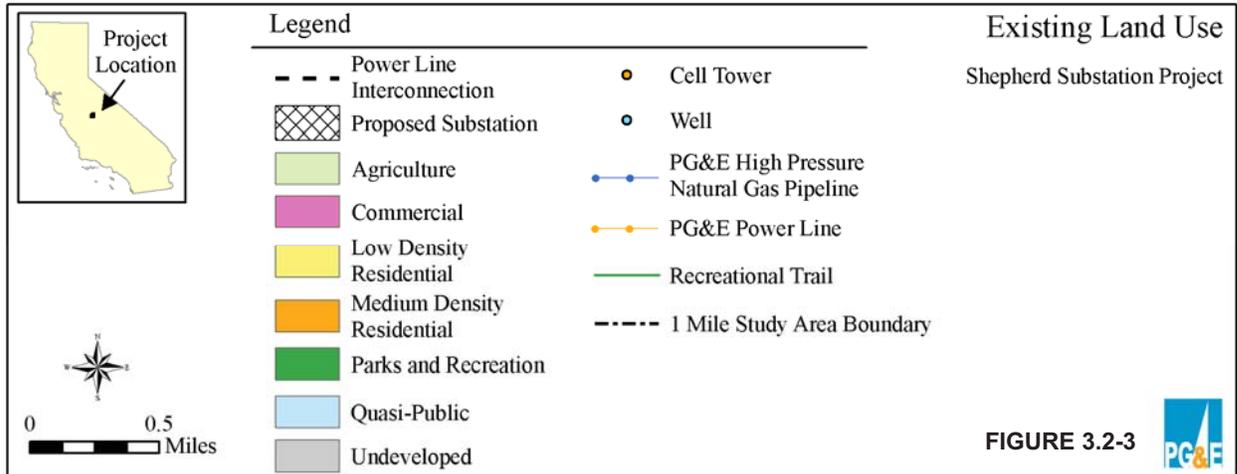
Legend

- Power Line Interconnection
- Proposed Substation
- City of Clovis (Private)
- City of Clovis Sphere of Influence
- Fresno County (Private)

Land Ownership and Jurisdiction
Shepherd Substation Project

FIGURE 3.2-2





through the study area. The pipeline runs along the north side of Shepherd Avenue, but trends to the south and east to the Fowler and Nees Compressor Station, located near the intersection of those avenues.

A variety of electrical distribution lines and communication lines extend throughout the study area. In addition, several communication towers and wells were identified and mapped. The Enterprise Canal bisects the study area. The canal passes the west and south sides of the proposed substation site, trending in a southeasterly direction. The canal is owned by Fresno Irrigation District and conveys water for irrigation and recharge. In addition, the canal provides flood protection to the cities of Clovis and Fresno through the diversion and conveyance of storm water.

- Recreation: Two existing recreational trails are located within the study area: 1) the Enterprise Trail, located adjacent to the Enterprise Canal, extends south of Shepherd Avenue and east of Sunnyside Avenue to Fowler Avenue, and 2) the Dry Creek Trail, which extends south of Shepherd Avenue and west of Sunnyside Avenue. In addition, several small parks are present in the vicinity of Deauville Town and Country subdivision, located at Fowler and Shepherd Avenues.

Zoning

As noted above, public utility facilities are not subject to local zoning or land use regulations, but such regulations have been considered as part of the environmental review process. Section 875 of the Fresno County Zoning Ordinance (2004) requests review and comment by the County of all projects subject to approval by the CPUC.

The proposed Shepherd Substation site is located in unincorporated Fresno County and is therefore under the County's jurisdiction. The substation site and most of the study area is zoned Exclusive Agricultural District (AE). Other zones within the project vicinity are depicted in Figure 3.2-4. The AE designation is intended to be used strictly for agriculture and support facilities. Permitted uses are outlined in the zoning ordinance and generally include activities associated with the maintenance and operation of agriculture and livestock operations, including single-family owner occupied dwellings. Additional permitted uses include electrical transmission and distribution substations.

Planned Land Use

Planned land use information was obtained from the general plans adopted by Fresno County and the City of Clovis and is depicted in Figure 3.2-5. The Fresno County General Plan accounts for all unincorporated areas of the County, including the location of the proposed facilities. These facilities will be located entirely on land designated as Agriculture, with uses intended to promote agriculture, agricultural-support services, and agriculturally-related activities. Fresno County's General Plan (2000) specifies that electrical substations within County jurisdiction are a non-agricultural use allowed by special permit.

Proposed Land Use

The City of Clovis is proposing a park extending to the north and south of Shepherd Avenue at the intersection of Shepherd and Sunnyside avenues. In addition, Fresno County has an extension of the Enterprise Trail planned from the proposed park, trending north along the Enterprise Canal. Proposed land use designations are depicted in Figure 3.2-6.

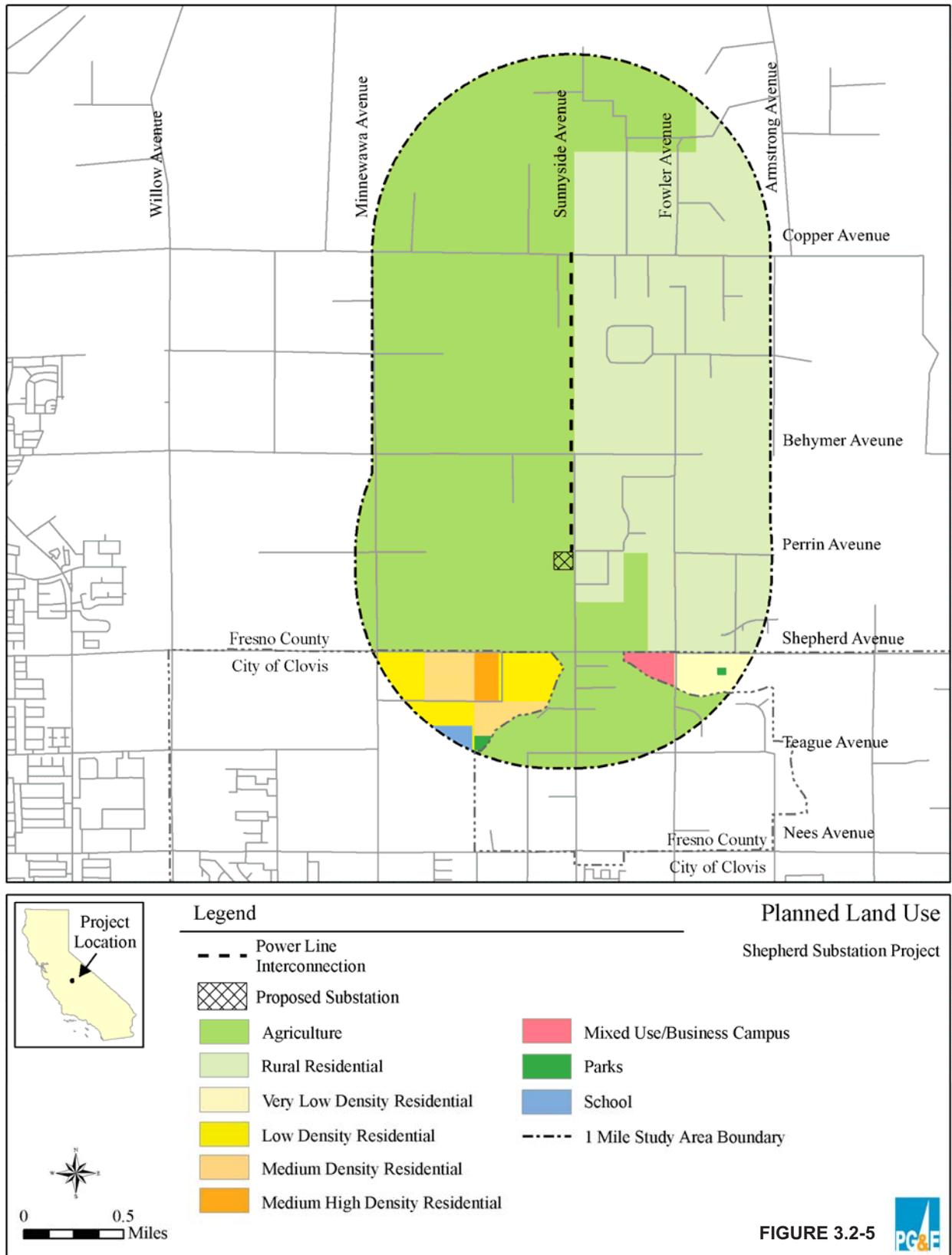


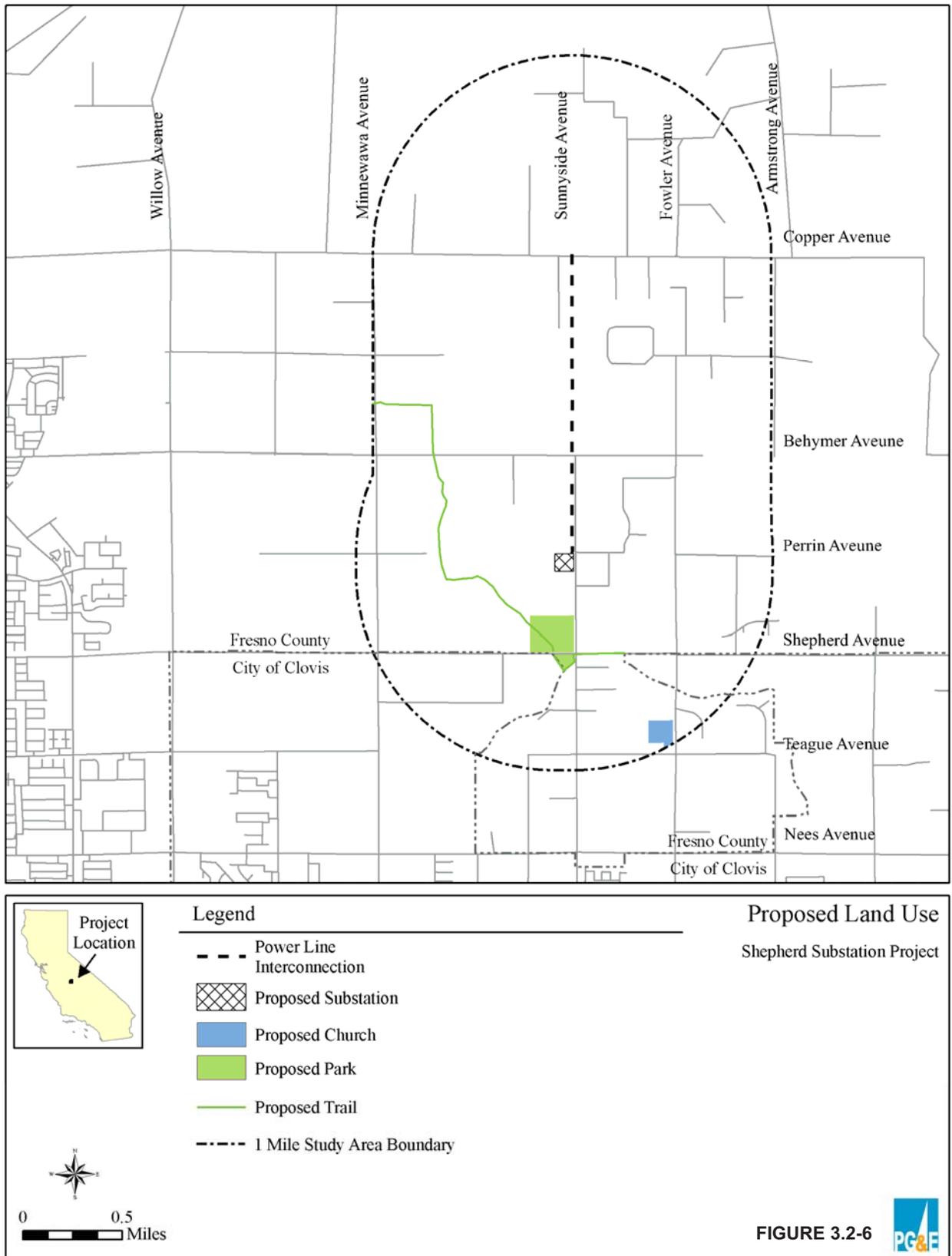
- Legend**
- Power Line Interconnection
 - Proposed Substation
 - Exclusive Agricultural District
 - Limited Agricultural District
 - Neighborhood Shopping Center
 - Single Family Residential District
 - Low Density Multiple Family Residential District
 - Rural Residential District
 - 1 Mile Study Area Boundary



Zoning
Shepherd Substation Project

FIGURE 3.2-4





A church facility is proposed for the northwest corner of Teague and Fowler Avenues. The conditional use permit for the church was approved by the Fresno County Planning Commission in September 2008.

Recreation

The City of Clovis and Fresno County have an extensive parks and recreation system, including both planned and proposed facilities (see Figure 3.2-6). Future expansion of the Dry Creek Trail will parallel the Enterprise Canal to the north of Shepherd Avenue. A park is also proposed at Shepherd Avenue, along the west side of Sunnyside Avenue.

3.2.3 Impacts

3.2.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts to agriculture, land use, and recreational resources may be considered significant if the following applies.

Agricultural

Agricultural resources impacts may be considered significant if they:

- Convert or otherwise result in changes that could result in converting Prime Farmland, Unique Farmland or Farmland of Statewide Importance to nonagricultural use; or
- Result in a conflict with existing zoning for agricultural use or Williamson Act contracts.

Land Use and Planning

Land use impacts may be considered significant if they:

- Physically divide an established community by creating a permanent barrier by which pedestrian or vehicle access to community features and services will be substantially impaired;
- Conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or
- Conflict with an applicable habitat conservation plan or natural community conservation plan.

Recreation

Recreational impacts may be considered significant if they:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated; or
- Result in the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

3.2.3.2 Environmental Impacts

The criteria used to determine the significance of impacts on agriculture, land use, and recreation are based on Appendix G of the CEQA Guidelines.

Would the project:

Agriculture

- a) **Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?**

Less than significant. The minimum mapping unit used by the California DOC in mapping DOC farmlands is ten acres. Ten acres is also the minimum acreage requirement for

individual parcels to enter into Williamson Act contracts (Section 51222 of the California Government Code). Thus, ten acres of converted agricultural land is considered the minimum threshold that could constitute a significant impact. Fresno County has 713,085 acres of Prime Farmland. The project will convert approximately 5.0 acres, or less than 0.001 percent of the total Prime Farmland in the County, to a non-agricultural use. Impacts will be less than significant.

b) Conflict with existing zoning for agricultural use or a Williamson Act contract?

Less than significant. The proposed substation parcel is currently under Williamson Act contract and is in a state of non-renewal. Government Code Section 51238 specifies that electric facilities, including the proposed substation and power line interconnection, are compatible uses and will not result in the violation of a current Williamson Act contract or prohibit the land from entering into a new contract. It is not necessary that the cancellation of the contract be completed prior to construction of the project. Impacts will be less than significant.

c) Involve other changes in the existing environment which, because of their location or nature, could result in conversion of Farmland to nonagricultural use?

Less than significant. The proposed project will convert approximately 5.0 acres of agricultural land to a non-agricultural use. However, it is not anticipated that the project will result in additional changes to the environment that will result in further conversion of Farmland to non-agricultural use. While the purpose and need of the project is in response to growth, the project itself is not growth inducing and will not lead to further loss of Farmland.

Land Use and Planning

a) Physically divide an established community?

Less than significant. The project will not physically divide an established community. The power line will be constructed along the perimeter of several parcels with rural land uses including residential, open space, pasture and flood control areas. Approximately 0.9 miles of the proposed 1.5 mile power line alignment will be built along an existing PG&E distribution line alignment and road. The remainder of the alignment follows property lines between two homes, one of which was recently built along Copper Avenue.

While the power line will result in new linear infrastructure between existing residences, construction and operation of the project will not a physically divide the residences. The permanent surface impacts will be limited to towers, which are spaced approximately 615 feet apart, and will not create a barrier between the properties. The existing observed activities will likely occur without significant changes. Future uses of the proposed right-of-way will need to be compatible with the safe operation and maintenance of the power line and, therefore, may prevent the development of new structures and buildings in the right-of-way.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Less than significant. Although not subject to local zoning and land use regulations, the proposed facilities are a compatible use under the Fresno County General Plan and Zoning

Ordinance. The proposed substation, if within County jurisdiction, would be a permitted use in the AE zone, subject to the County's review. No limitations on the placement of power lines are outlined in local regulations. Impacts will be less than significant.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No impact. No conservation plans are applicable.

Recreation

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No impact. The project is not growth inducing and will not increase the use of existing recreational facilities.

b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No impact. The project is not growth inducing and will not require additional recreational facilities.

3.2.4 References

California Department of Conservation. 2005. *Fresno County Williamson Act Lands 2005*. Fresno.

_____. 2006. *Rural Land Mapping Edition: Fresno County Important Farmland 2006*.

California Department of Conservation: Division of Land Resource Protection. Farmland Mapping and Monitoring Program. Sacramento.

_____. 2008. *California Farmland Conversion Report 2004 – 2006*. Located online at <http://www.conservation.ca.gov/dlrp/fmmp/pubs/2004-2006/Documents/2004-06%20Farmland%20Conversion%20Report.pdf>. Accessed November 2009.

_____. 2009. *Fresno County General Plan: Background Report*. Located online at <http://www.conservation.ca.gov/dlrp/lca/Pages/Index.aspx>. Fresno County Board of Supervisors. Accessed November 2009.

City of Clovis. 1993. *General Plan*. Located online at: <http://www.ci.clovis.ca.us/Government/PublicDocuments/PlanningZoningDocuments/Pages/GeneralPlan.aspx>. Accessed October 2009.

Fresno County. 2000. *Fresno County General Plan*. Located online at <http://www.co.fresno.ca.us/departmentpage.aspx?id=19705>.

_____. 2009. Fresno County Ordinance Code. Located online at <http://www.co.fresno.ca.us/DepartmentPage.aspx?id=19723>.

Fresno County Planning and Land Use. 2000. *Fresno County General Plan, Open Space and Conservation Element*.

Fresno County Zoning Division 2004. *The Ordinance Code of the County of Fresno*. Fresno.

Governor's Office of Planning and Research 1997. *Local Agency Formation Commission's, General Plans and City Annexations*. Sacramento.

3.3 AIR QUALITY

This section describes the regulatory and environmental setting, expected project emissions, and potential impacts to air quality and Greenhouse Gas (GHG) emissions as a result of the project. Implementation of the APMs will ensure that impacts to air quality from project construction will be less than significant.

TABLE 3.3-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
AIR QUALITY				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.				
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			X	
e) Create objectionable odors affecting a substantial number of people?				X
GREENHOUSE GAS EMISSIONS				
Would the project:				
f) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
g) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing emissions of greenhouse gases?				X

Impacts to air quality from operation of the project will also be less than significant, since the substation will be an unmanned facility and only negligible emissions will occur from potential leakage from breakers, and periodic maintenance of the substation and power line interconnection.

3.3.1 Methodology

Emission rates from project construction were estimated using URBEMIS 2007 9.2.4 software. Daily emissions vary throughout the construction period depending on the type of equipment and duration of use. Project construction criteria pollutant emissions were calculated with the implementation of the APMs. These measures include watering graded areas to control dust emissions, and reducing

equipment idling times. Equipment shutoff was assumed to reduce use time by five percent. Construction GHG emissions were calculated both before and after implementation of the APMs.

Operation emissions of GHG were calculated using the California Air Resources Board (CARB) emissions factors (EMFAC) (2006) model, maximum SF₆ leakage rates, and the global warming potentials (GWP) of each GHG produced. GHG emissions estimates are presented as either carbon dioxide (CO₂) emissions or carbon dioxide equivalent (CO₂e) emissions. CO₂ includes only carbon dioxide emissions (global warming potential = 1), whereas CO₂e emissions include methane (CH₄), nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆), multiplied by their GWP.

Detailed emissions calculations are found in Appendix D. The project is located within the San Joaquin Valley Air Basin (SJVAB), and under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Project impacts were analyzed with respect to the *Guidance for Assessing and Mitigating Air Quality Impacts, 2002 revision*, developed by the SJVAPCD.

3.3.2 Existing Conditions

3.3.2.1 Regulatory Background

Federal

The federal Clean Air Act of 1970 (as amended in 1990) required the U.S. Environmental Protection Agency (EPA) to develop standards for pollutants considered harmful to public health or the environment. Two types of National Ambient Air Quality Standards (NAAQS) were established. Primary standards protect public health, while secondary standards protect public welfare, by including protection against decreased visibility, and damage to animals, crops, landscaping and vegetation, or buildings. NAAQS have been established for six “criteria” pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), and lead (Pb).

State

The California Air Resources Board (CARB) is the state agency responsible for implementing the federal and state Clean Air Acts. CARB has established California Ambient Air Quality Standards (CAAQS), which include all criteria pollutants established by the NAAQS, but with additional regulations for Visibility Reducing Particles, sulfates, hydrogen Sulfide (H₂S), and vinyl chloride.

The project is located within the San Joaquin Valley Air Basin, which includes San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and parts of Kern counties. It falls under the jurisdiction of the SJVAPCD.

Air basins are classified as attainment, nonattainment, or unclassified. Attainment is achieved when monitored ambient air quality data is in compliance with the standards for a specified pollutant. Non-compliance with an established standard will result in a nonattainment designation and an unclassified designation indicates insufficient data is available to determine compliance for that pollutant.

Standards and attainment status for listed pollutants in the SJVAPCD can be found in Table 3.3-2. Note that both state and federal standards are presented.

TABLE 3.3-2 State and Federal Ambient Air Quality Standards						
Pollutant	Averaging Time	CAAQS	NAAQS Primary	NAAQS Secondary	Federal Attainment Status for SJVAB	State Attainment Status for SJVAB
O ₃	8 hours	0.07 ppm	0.075 ppm	0.075 ppm	Nonattainment	Nonattainment
	1 hour	0.09 ppm	—	—	—	Nonattainment
PM ₁₀	Annual arithmetic mean	20 µ/m ³	—	—	—	Nonattainment
	24 hours	50 µ/m ³	150 µ/m ³	150 µ/m ³	Nonattainment*	Nonattainment
PM _{2.5}	Annual arithmetic mean	12 µ/m ³	15 µ/m ³	15 µ/m ³	Nonattainment	Nonattainment
	24 hours	—	35 µ/m ³	35 µ/m ³	Nonattainment	—
CO	8 hours	9 ppm	9 µ/m ³	—	Attainment	Attainment
	1 hour	20 ppm	35 µ/m ³	—	Attainment	Attainment
NO ₂	Annual arithmetic mean	0.03 ppm	0.053 ppm	0.053 ppm	Attainment	Attainment
	1 hour	0.18 ppm	—	—	—	Attainment
SO ₂	Annual arithmetic mean	—	0.03 ppm	—	Attainment	—
	24 hours	0.04 ppm	0.14 ppm	—	Attainment	Attainment
	3 hours	—	—	0.5 ppm	Attainment	—
	1 hour	0.25 ppm	—	—	Attainment	Attainment
Pb	30 day average	1.5 µ/m ³	—	—	—	Attainment
	Calendar year	—	1.5 µ/m ³	1.5 µ/m ³	Attainment	—
	Rolling three-month average	—	0.15 µ/m ³	0.15 µ/m ³	Attainment	—
Visibility reducing particles	8 hours	**	—	—	—	Unclassified
Sulfates	24 hours	25 µ/m ³	—	—	—	Attainment
H ₂ S	1 hour	0.03 ppm	—	—	—	Unclassified
Vinyl chloride	24 hours	0.01 ppm	—	—	—	Attainment

µ/m³ = micrograms per cubic meter; ppm = parts per million
 * As a whole is designated as nonattainment, however, recent data indicates attainment has been reached, and SJVAB has applied for reclassification to attainment status.
 ** Nonattainment for visibility reducing particles is defined as the amount of particles present to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent.

Additional State regulations include:

- CARB Portable Equipment Registration Program – This program was designed to allow owners and operators of portable engines and other common construction or farming equipment to register their equipment under a statewide program so they may operate it statewide without the need to obtain a permit from the local air district.
- U.S. EPA/CARB Off-Road Mobile Sources Emission Reduction Program – The California Clean Air Act (CCAA) requires CARB to achieve a maximum degree of emissions reductions from off-road mobile sources to attain State Ambient Air Quality Standards (SAAQS); off-road mobile sources include most construction equipment. Tier 1 standards for large compression-ignition engines used in off-road mobile sources went into effect in California in 1996. These standards, along with ongoing rulemaking, address emissions of nitrogen oxides (NO_x) and toxic particulate matter from diesel engines. CARB is currently developing a control measure to reduce diesel PM and NO_x emissions from existing off-road diesel equipment throughout the state.
- California Global Warming Solutions Act – Established in 2006, Assembly Bill 32 (AB 32) requires that California's GHG emissions be reduced to 1990 levels by the year 2020. This will be implemented through a statewide cap on GHG emissions, which will be phased in beginning in 2012. AB 32 requires CARB to develop regulations and a mandatory reporting system to monitor global warming emissions levels.

Regional

The SJVAPCD has several rules and regulations that may apply to the project:

- SJVAPCD Rule 3135 (Dust Control Plan Fees) – This rule requires the project applicant to submit a fee in addition to a Dust Control Plan. The purpose of this rule is to recover the SJVAPCD's cost for reviewing these plans and conducting compliance inspections.
- SJVAPCD Rules 4101 and 4102 – This rule applies to any source of air contaminants and prohibits the visible emissions of air contaminants or any activity which creates a public nuisance.
- Rule 4601 (Architectural Coatings) – This rule limits volatile organic compounds (VOC) from architectural coatings. This rule specifies architectural coatings storage, clean up, and labeling requirements. It is applicable to any person who supplies, sells, offers for sale, applies, or solicits the application of any architectural coating, or who manufactures any architectural coating for use within the district.
- SJVAPCD Rule 4641 – This rule applies to use of asphalt for paving new roadways or restoring existing roadways disturbed by project activities.
- SJVAPCD Rules 8011 and 8081 (Regulation VIII) – This regulation is designed to reduce PM₁₀ emissions by reducing fugitive dust. Regulation VIII requires implementation of control measures to ensure that visible dust emissions are substantially reduced.

3.3.2.2 Environmental Setting

Climate

The climate of the San Joaquin Valley is characterized by long, hot summers and stagnant, foggy, winters. Precipitation is low and temperature inversions are common. These characteristics are conducive to the formation and retention of air pollutants. These characteristics are in part influenced by the surrounding mountains which intercept precipitation and also act as a barrier to the passage of cold air and air pollutants. The nearest weather monitoring station to the project is located at the Fresno airport, approximately seven miles south of the project location. Temperature and precipitation information compiled at the Fresno airport station are summarized in Table 3.3-3.

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temp (°F)	54.5	61.5	67.0	74.5	83.5	91.7	98.2	96.3	90.5	79.7	65.3	54.6	76.5
Average Minimum Temp (°F)	37.5	40.6	43.8	47.9	54.3	60.4	65.6	63.9	59.4	51.0	42.4	37.2	50.3
Average Total Precipitation (inches)	2.11	1.90	1.87	1.01	0.37	0.14	0.01	0.01	0.16	0.51	1.14	1.58	10.80

Ambient Air Quality

The San Joaquin Valley Regional Air Quality Control Board (SJVRAQCB) has established a network of air quality monitoring sites throughout their jurisdiction to measure concentrations of criteria pollutants. The nearest air quality monitoring station to the project area is the Clovis – North Villa Avenue monitoring site located at 908 N. Villa Avenue, Clovis, California. This monitoring station is approximately four miles south of the project location.

Three pollutants, ozone, PM₁₀, and PM_{2.5}, were identified as being in nonattainment status. A summary of these pollutants at the Clovis–North Villa monitoring location are shown in Table 3.3-4.

Pollutant	Averaging Time	CAAQS Exceedances (number of days exceeding standards)			NAAQS Exceedances (number of days exceeding standards)		
		2006	2007	2008	2006	2007	2008
O ₃	8 hours	66	58	60	51	30	60
	1 hour	37	14	33	2	0	5
PM ₁₀	24 hours	73	*	78.8	0	0	0
PM _{2.5}	24 hours	**	**	**	28.0	51.5	42.5

* Insufficient data to determine.
 ** There are no CAAQS for PM_{2.5} with a 24 hour averaging time.

3.3.3 Impacts

3.3.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts to air quality may be considered significant if the project will:

- Conflict with or obstruct implementation of the applicable air quality plan,
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standards (AAQS),
- Create a potential public health hazard or involve the use, production or disposal of materials which pose a hazard to people or plant or animal populations in the area affected,

- Expose sensitive receptors to substantial pollutant concentration,
- Create objectionable odors affecting a substantial number of people, and/or
- Alter air movement, moisture or temperature, or change in climate, either locally or regionally.

In addition, a project is considered to be significant at the state, regional, or area level if it interferes with the attainment or maintenance of state or national AAQS.

The CEQA Guidelines do not specifically describe what thresholds of significance should be or how they may be used. Appendix G of the CEQA Guidelines lists a variety of potentially significant effects, but does not provide a means of judging whether they are indeed significant. The agency governing air quality standards in the project area, the SJVAPCD, has established guidelines for determining significant thresholds and they are recommended for use by lead agencies in reviewing Initial Studies. The SJVAPCD thresholds of significance are described in its *Guide for Assessing and Mitigating Air Quality Impacts* (2002).

Greenhouse Gases

On December 30, 2009, the California Resources Agency adopted amendments to the CEQA guidelines for greenhouse gas emissions. On February 16, 2010, the Office of Administrative Law approved the amendments and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010. According to these amendments, impacts to GHGs may be considered significant if the project will:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, and/or
- Conflict with an applicable plan, policy or regulation adopted for the purposes of reducing the emissions of greenhouse gases.

Prior to the adoption of the above amendments, CARB staff developed state-wide interim thresholds of significance for GHG that could be adopted by local agencies for their own use. The interim guidance divides projects analyzed under CEQA into two categories, industrial and residential/commercial, and provides significance criteria for each. For industrial projects, such as this project, CARB proposed a quantitative significance threshold of 7,000 metric tons CO₂ equivalent (MTCO₂e/yr) per year from operation of non-transportation-related greenhouse gas sources.

3.3.3.2 Environmental Impacts

The following section discusses significance criteria for impacts on air quality and GHG emissions derived from the CEQA Checklist.

Would the project:

- a) Would the project conflict with or obstruct implementation of the applicable air quality plan?**

No impact. The SJVAPCD is the primary agency responsible for managing local air quality. A project would obstruct the implementation of the applicable air quality plan if it caused population or employment growth beyond what is allowed for in the plan. The proposed project consists of an unmanned substation and power line interconnection. It will create no new permanent employment positions. During peak construction, PG&E estimates 20 to 25 workers needed on site. Because construction and operation of the project will not cause population or employment growth beyond that allowed in the plan, the project will have no impact and no mitigation is required.

b) Violate any air quality standard or contribute significantly to an existing or projected air quality violation?

Less than significant impact. Construction of the project will occur over a period of approximately 12 months. Emissions of criteria pollutants and greenhouse gases from project construction will occur from vehicle and equipment exhaust, fugitive dust from travel on unpaved surfaces, and earth moving and site grading activities. These emissions were estimated using URBEMIS 2007 9.2.4 software. The CPUC requires that every project quantify GHG emissions from a business-as-usual condition, as well as after APMs have been implemented. Thus, project GHG emissions were calculated both with and without implementation of the APMs under letter f below.

A summary of the daily construction emissions are presented in Table 3.3-5 and the annual emissions from construction are presented in Table 3.3-6. The estimated emissions are conservative, as the URBEMIS software does not allow for many of the proposed APMs to be applied when calculating emissions. APMs included in the emission calculations include applying soil stabilizers, replacing ground cover in disturbed areas, watering exposed surfaces, and reducing equipment idling times. It was assumed that requiring equipment to be shut-off rather than idling unnecessarily will reduce daily vehicle operation times by five percent.

TABLE 3.3-5	
Estimated Construction Emissions for Substation and Power Line Interconnection Construction (pounds/day)	
Pollutant	Estimated Construction Emissions (pounds/day)
VOC	7.98
NO _x	143.88
PM ₁₀	27.30
CO	36.27
CO ₂	18,836
SO ₂	0

TABLE 3.3-6	
Estimated Construction Emissions for Substation and Power Line Interconnection Construction (tons/year)	
Pollutant	Estimated Construction Emissions (tons/year)
VOC	0.16
NO _x	2.86
PM ₁₀	0.27
CO	0.81
CO ₂	370.42
SO ₂	0

SJVAPCD has established significance thresholds of 10 tons per year for two pollutants, VOC and NO_x. These thresholds apply only to operational activities. No specific emission significance thresholds have been established for construction activities. However, the project's construction emissions for VOC and NO_x fall well below the operational thresholds.

While project-related emissions were calculated as part of this PEA, a quantification of emissions is not necessary to determine if the project will result in a significant impact based upon guidance from the SJVAPCD. The SJVAPCD uses a three-tiered approach to determine the appropriate level of project analysis. The three levels are the Small Project Analysis Level (SPAL), Cursory Analysis Level (CAL), and Full Analysis Level (FAL). The SPAL is the screening level and projects under this level require no further analysis. To verify a project is under SPAL, the project size or trip volume must be verified to be less than a pre-calculated amount established by the SJVAPCD and found in the SJVAPCD *Guide for Assessing and Mitigating Air Quality Impacts* (2002). At approximately 5.0 acres (217,800 ft²), the project is under the pre-calculated SPAL for light industrial land uses of 510,000 ft² and the project is well under the daily trip volume of 1,506 trips per day (SJVAPCD 2002).

For projects at the SPAL project level, the *Guide for Assessing and Mitigating Air Quality Impacts* (2002) highlights that many pollutants may be produced during project construction, but advises that the main pollutant of concern is PM₁₀. The SJVAPCD requires implementation of control measures, rather than a detailed quantification of emissions. The SJVAPCD has determined that compliance with implementation of their recommended control measures constitutes sufficient mitigation to reduce PM₁₀ impacts to a level considered less than significant. PG&E will adhere to control measures recommended by the SJVAPCD, included as APM Air-1 through Air-8 (Table 2.13-1).

During project operation, vehicular emissions associated with periodic maintenance of the facilities and potential SF₆ leaks from substation transformers will be the only sources of emissions. PG&E personnel will visit the substation site approximately once per month and the power line once per year, with additional visits as needed for emergencies. Since these emissions will be negligible, impacts associated with this periodic maintenance will be less than significant. To further reduce potential operation emissions, PG&E will implement standard best management practices, as outlined in APM Air-9 (Table 2.13-1), to reduce potential SF₆ emissions.

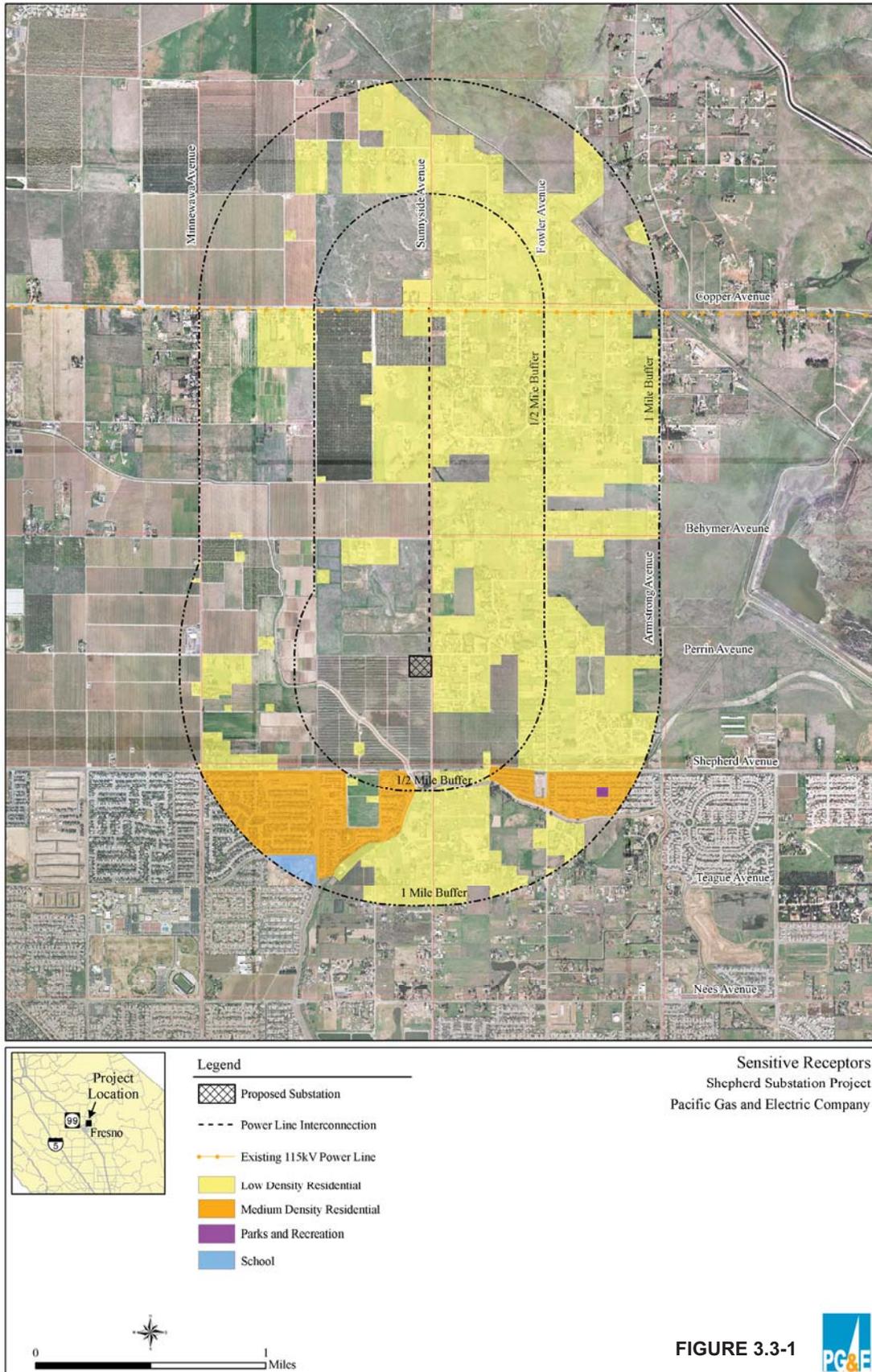
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less than significant impact. Construction of the project will result in temporary, localized air emissions. Other construction activities occurring in the vicinity of the proposed project may also generate emissions, which when considered cumulatively, could result in a greater impact. All other construction activities will be required to follow the same measures as the proposed project regarding nuisances and dust control (APM Air-1 through Air-8). With these measures in place for all construction activities in the area, emissions are expected to be less than significant.

Operation emissions of criteria pollutants by the project are expected to be negligible, as they are restricted to vehicular emissions from periodic maintenance of an unmanned facility and potential SF₆ leaks from substation breakers as discussed above.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less than significant impact. Sensitive receptors include land uses such as schools, rest homes, medical facilities, parks and recreational areas, and residences. A map of sensitive receptors within one-half mile of the project can be found in Figure 3.3-1.



There are no commercial, religious, or public facilities within 1,000 feet of the project. Residences within 1,000 feet of the project were presented in Tables 2.2-2 and 2.2-3.

During project construction, the primary pollutant generated from project activities that could impact nearby residences will be dust. As previously mentioned, APM Air-1 through Air-8 (Table 2.13-1), which are derived from SJVAPCD guidance, will be implemented to control project emissions.

Operation of the project will not expose sensitive receptors to substantial pollutant concentrations as facilities are generally non-emitting facilities.

e) Create objectionable odors affecting a substantial number of people?

No impact. Project construction will create some odors related to the operation of diesel and gasoline vehicles and equipment. Low-sulfur diesel fuels will be used to reduce odors. Odors will be temporary and limited to the construction period. The construction of the project is not anticipated to generate significant objectionable odors.

No odor generation is anticipated as a result of operational activities.

f) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than significant impact. There are no established CEQA thresholds of significance for GHG emissions; however, the CPUC requires a quantitative approach for analyzing GHG emissions. The CPUC requires that every project quantify GHG emissions from a business-as-usual condition as well as after applicant proposed measures have been implemented. A summary of GHG emissions from construction activities is presented in Table 3.3-7. Emissions of the majority of GHG will be temporary and limited to the construction period.

Business as Usual (no mitigation)		With 5% Equipment Use Reduction	
Pounds/Hour	Tons/Year	Pounds/Hour	Tons/Year
20,039	397	18,836	370

¹ – Emissions values are expressed in CO₂ rather than CO₂e, as the URBEMIS model does not include values for other GHGs. Although not included in these estimates, emissions of GHGs other than CO₂ for construction activities are expected to be less than 1 % of total emissions.

Substation facilities require no CO₂ generating equipment. Operation of the project will generate GHG emissions from vehicle use during routine maintenance and potential SF₆ emissions. Vehicle use emissions will be limited to approximately one vehicle round-trip monthly for maintenance and facility inspection. SF₆ is a potential emission that may occur from failure of circuit breakers during the operation of the substation. SF₆ is a non-hazardous, inert gas that is used as both an arc-quenching and insulating medium in high-voltage switchgear, circuit breakers, and gas-insulated substations. It is the best circuit breaker electrical insulation medium available under current technology. As outlined in APM Air-9 (Table 2.13-1), PG&E will install new breaker designs that focus on reducing the

chance of SF₆ leaks. These state-of-the-art circuit breakers are designed and guaranteed to have an annual leak rate of one-half of one percent or less.

Annual SF₆ emissions for the substation, should they occur, are expected to be a maximum of 14.1 metric tons CO₂e per year, per circuit breaker for a total of 70.5 metric tons CO₂e. Table 3.3-8 includes a summary of estimated operational GHG emissions. PG&E will also incorporate APM Air-10 through Air-12 (Table 2.13-1) into its construction plans to further reduce GHG emissions.

TABLE 3.3-8 Estimated Operational Related Greenhouse Gas Emission ¹		
Source	GHG	CO₂e (metric tons)
Circuit Breaker Potential Leakage	SF ₆	14.1
Vehicle use (based on 1 maintenance trip per month)	CH ₄ , CO ₂	1.4
Total	CH₄, CO₂, SF₆	15.5

1 – Emissions values are expressed in CO₂e and include SF₆ emissions from circuit breaker emissions and vehicle use estimated at 1 trip per month. Vehicle use estimations were calculated using EMFAC 2007.

g) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing emissions of greenhouse gases?

No impact. CARB staff is continuing to draft rules to implement the Assembly Bill 32 Scoping Plan. CARB has identified “Discrete Early Actions” that can be implemented to reduce greenhouse gas emissions from the years 2007 to 2012. PG&E will implement these measures and policies as they become effective and are applicable to this project. In addition, PG&E is implementing the following voluntary company-wide actions to further reduce greenhouse gas emissions:

- PG&E supports the Natural Gas STAR, a program promoting the reduction of methane (at least 21 times as potent as CO₂ on a per ton basis) from natural gas pipeline operations. Since 1998, PG&E has avoided the release of thousands of tons of methane.
- In June 2007, PG&E launched the ClimateSmart program, a voluntary greenhouse gas emission reduction program that allows its customers to balance out the greenhouse gas emissions that are produced by the energy they use, making their energy use “climate neutral.” For ClimateSmart customers, PG&E calculates the amount needed to make the greenhouse gas emissions associated with the customer’s energy use “climate neutral” and adds this tax deductible amount to their monthly energy bill. One hundred percent of customer payments are applied to funding new greenhouse gas emission reduction projects in California, such as projects that capture methane gas from dairy farms and landfills and those that conserve and restore California’s forests.
- PG&E is offsetting all of the greenhouse gas emissions associated with the energy used in PG&E’s buildings by participating in its ClimateSmart program. In 2007, this amounted to over 50,000 tons of CO₂ reductions.

3.3.4 References

California Air Resources Board. 2006. *EMFAC2007 v2.3*. Calculating Emission Inventories for Vehicles in California.

San Joaquin Valley Air Pollution Control District. 2002. *Guidance for Assessing and Mitigating Air Quality Impacts, 2002 Revision*. Planning Division, Fresno, California. 96 pp.

3.4 BIOLOGICAL RESOURCES

This section describes the biological resources that occur within the project area and identifies potential impacts to sensitive species and their habitat that may result from construction, operation, and maintenance of the project. This section also provides a description of the biological regulatory and environmental setting. Implementation of the APMs described in this section will ensure that impacts to biological resources will be less than significant.

TABLE 3.4-1				
CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
BIOLOGICAL RESOURCES				
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or US Fish and Wildlife Service (USFWS)?			X	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS?			X	
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

3.4.1 Methodology

A wildlife biologist conducted a reconnaissance level review of the project area in November 2008. Subsequent field visits were conducted to further assess habitat by a botanist and wildlife biologist in July 2009 and March 2010. 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.

Special status species are species protected under the Federal and California state Endangered Species Act (ESA) or listed as category 1 or 2 rare plants by the California Native Plant Society (CNPS). Species that may occur in the project area were identified using information from the California Natural Diversity Database (CNDDDB) and the US Fish and Wildlife Service (USFWS) Sacramento Office for Clovis and Friant quadrangle maps and the ten surrounding quadrangles, which includes: Academy, Round Mountain, Sanger, Malaga, Fresno South, Fresno North, Lanes Bridge, Little Table Mountain, Millerton Lake West, and Millerton Lake East (Calflora 2009, CDFG 2009, CNPS 2009). Species occurrence records within a five mile buffer of the proposed project area are depicted in Figure 3.4-1.

3.4.2 Existing Conditions

3.4.2.1 Regulatory Background

Federal

Endangered Species Act

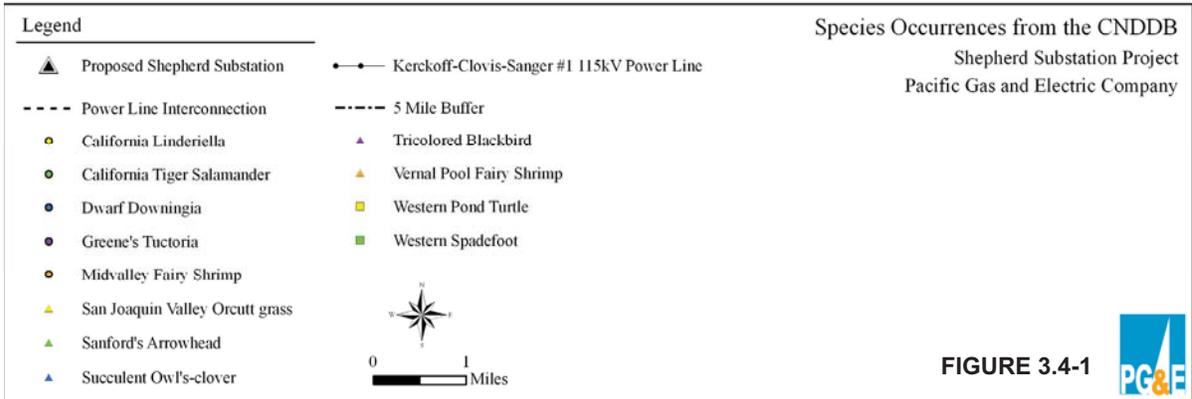
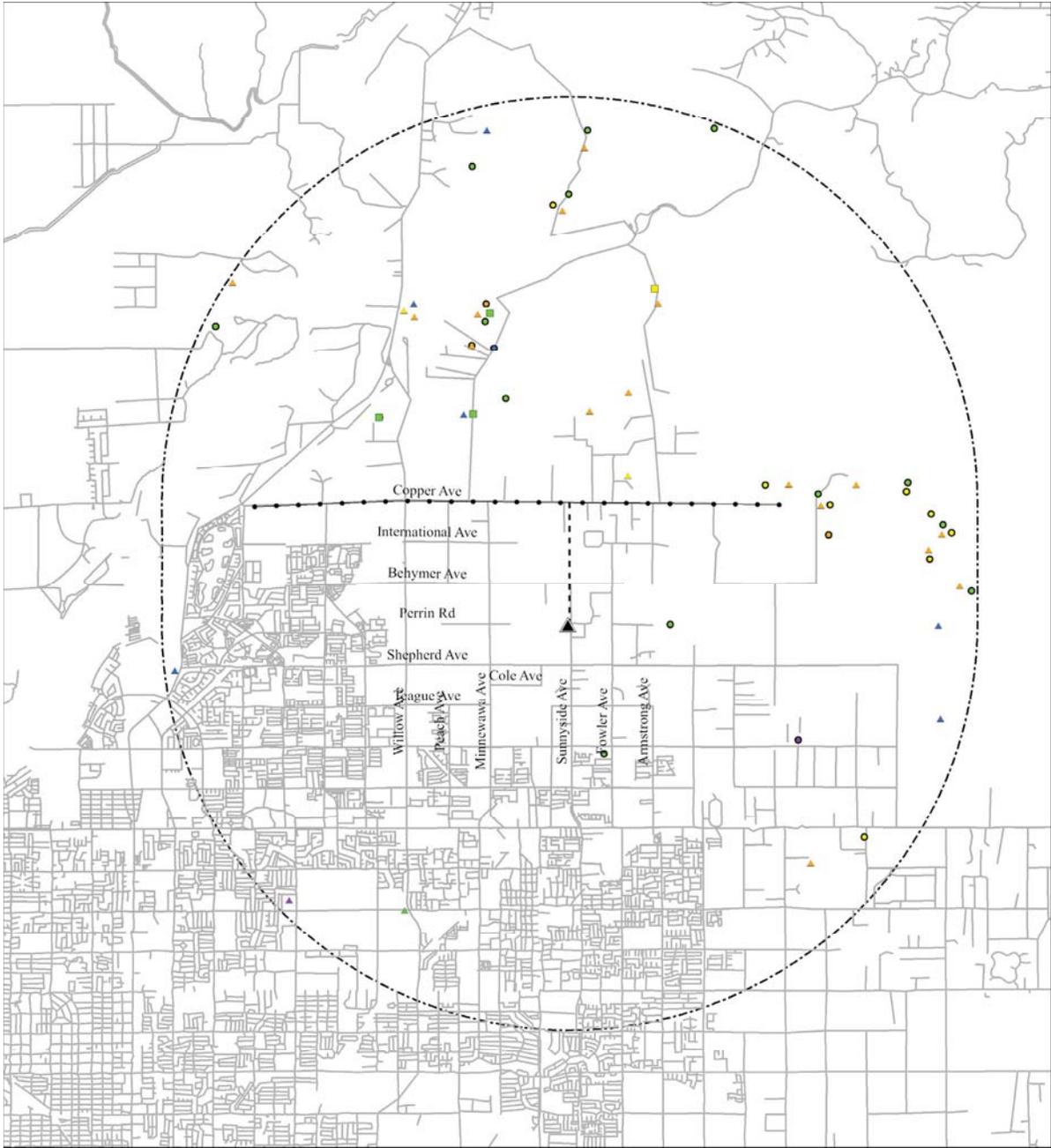
The federal ESA provides protection for plants and animals listed as threatened or endangered by the USFWS and National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA). Section 9 of the Act (50 CFR 17.3) prohibits the take, possession, sale, or transport of any ESA listed species. Take is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, capture, collect, or attempt to engage in any such conduct.” Section 7 requires formal consultation for any federal activity that could potentially impact any listed species or its critical habitat.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) provides protection for all migratory birds. This protection extends to all migratory bird nests and their eggs. The full list of species protected under this act can be found in 50 CFR 10.13.

Bald Eagle and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668c) provides protection for bald and golden eagles. This protection extends to eagle nests and their eggs. It prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs and also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.



Clean Water Act

The Clean Water Act (CWA) is intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 CFR 1251). The regulations implementing the CWA protect waters of the U.S. including streams and wetlands (33 CFR 328.3). The CWA requires states to set standards to protect, maintain, and restore water quality by regulating point source and some non-point source discharges. Under Section 402 of the CWA, the NPDES permit process was established to regulate these discharges. Construction projects that involve ground disturbance of one acre or more are required to comply with the NPDES permit process. Project proponents must develop a Storm Water Pollution Prevention Plan (SWPPP), which outlines Best Management Practices for controlling storm water runoff from construction sites.

State

California Endangered Species Act

The California Endangered Species Act (CESA) provides protection for candidate plants and animal species as well as those listed as rare, threatened, or endangered by the California Department of Fish and Game (CDFG). This act prohibits the take of any such species unless authorized. Section 2081 authorizes the state to issue incidental take permits. The state definition of take applies only to acts that result in the death of or adverse impacts to protected species.

California Environmental Quality Act

CEQA requires state and local agencies to follow mandated procedures in order to determine the environmental effects within their jurisdiction that may result from proposed activities.

California Fish and Game Code

The California Fish and Game Code requires state agencies to comply with regulations that promote the protection and conservation of threatened and endangered species. Regulations in place include:

- California Species Preservation Act – provides for the protection and enhancement of listed species in California.
- Fully Protected Species – designates certain species as “fully protected” and prohibits take of these species.
- Protection for Birds – makes it unlawful to take, possess, or harm any bird, its nest, or its eggs.
- Native Plant Protection Act – prohibits the take of rare, threatened, or endangered plants.

Local

Although PG&E is not subject to local land-use regulations, the following overview of local regulations relating to biological resources is provided for informational purposes and to assist with CEQA analysis.

Fresno County General Plan

The Fresno County General Plan “is a comprehensive, long-term framework for the protection of the county's agricultural, natural, and cultural resources and for development in the county” (Fresno County General Plan 2000). The Open Space and Conservation Element in the Fresno County General Plan focuses on “protecting and preserving natural resources, preserving open space areas,

managing the production of commodity resources, protecting and enhancing cultural resources, and providing recreational opportunities.”

3.4.2.2 Environmental Setting

The proposed project is located in a low- and medium-density residential rural area on the outskirts of the greater Fresno metropolitan area. Most of the project area has been developed or altered in some manner. The substation site is located entirely within an active almond orchard. The power line interconnection generally passes through a mix of land use types, the majority of which are large acre, ranch style, residential lots, but also includes a segment adjacent to the Fresno Metropolitan Flood Control District water basins located immediately north of the proposed substation site and the existing almond orchard. Figure 3.4-2 depicts typical habitat observed along the power line interconnection alignment (i.e., single dwelling lots located on or bordered by large open lots).



FIGURE 3.4-2 Power line interconnection location. Photograph location is near the end of Sunnyside Avenue and was taken facing north. On the left side of the photograph is the water basin used by the County. The power line interconnection would generally be built in the location of the existing wood pole distribution line seen adjacent to the fence.

Habitat Types

The proposed substation is located entirely within an almond orchard. The power line interconnection passes through California annual grassland, agricultural lands, and developed/landscaped lands. Two ponds and two seasonal wetlands are located along the power line alignment.

Agricultural Lands

Agricultural lands observed in the project area consist primarily of irrigated almond orchards. Trees are planted in rows and flood irrigated. The substation site is located entirely within an almond orchard and the power line passes adjacent to an almond orchard.

California Annual Grassland

This vegetation type dominates areas along the power line alignment where agricultural or residential development and the associated infrastructure are not present. California annual grasslands are a mix of native and non-native grasses and herbs. The vegetation height is generally no more than three feet. Species observed include but are not limited to filaree (*Erodium* spp.), tar plant (*Hemizonia* spp.), prickly lettuce (*Lactuca serriola*), medusahead grass (*Taeniatherum caput-medusae*), and rat-tail fescue (*Vulpia myuros*).

Developed Lands

Developed lands occur along the power line alignment. These areas consist of planted lawns, planted landscape trees and shrubs, roadways, driveways and other infrastructure associated with residential housing.

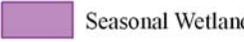
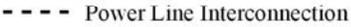
Waters

Two man-made freshwater ponds are located along the power line alignment and are depicted on the Sensitive Habitat Maps (Figures 3.4-3 and 3.4-4). The two ponds are each approximately five acres in surface area. An irrigation ditch connects the two ponds. The irrigation ditch is a small two foot wide grass-lined canal that is approximately 0.25 miles long. Willow trees (*Salix* spp.) and eucalyptus (*Eucalyptus* spp.) grow along the irrigation ditch connecting the ponds, but in a narrow single row of trees. Other species present on the edges of the ponds include sedges (*Carex* spp.), turkey mullein (*Eremocarpus setigerus*), spikerush (*Eleocharis* spp.), monkey flower (*Mimulus* spp.), and tules (*Scirpus* spp.).

Two seasonal wetlands were observed along the power line alignment and are depicted on the Sensitive Habitat Maps (Figures 3.4-3 and 3.4-4). One is a small, 0.01 acre depression where rushes (*Juncus* spp.) and moist soils were observed during a winter field visit. This area was disced for agricultural purposes in the summer and appears to be used to graze horses. The other seasonal wetland is approximately 0.6 acres and is located immediately north of and connects with the freshwater ponds. Low standing water was present during a winter site visit. Rushes were growing in the area as well as numerous other species including fiddleneck (*Amsinckia* spp.), wild oats (*Avena fatua*), soft chess (*Bromus mollis*), ripgut brome (*Bromus diandrus*), black mustard (*Brassica nigra*), Jerusalem oak (*Chenopodium botrys*), and yellow starthistle (*Centaurea solstitialis*).



Legend

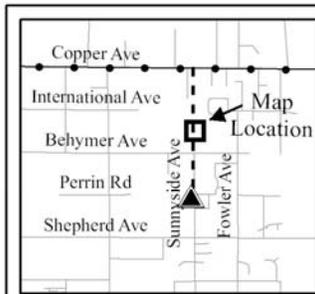
-  Pond
-  Seasonal Wetland
-  Power Line Interconnection

Sensitive Habitat Map
Shepherd Substation Project
Pacific Gas and Electric Company



FIGURE 3.4-3





Legend

-  Pond
-  Seasonal Wetland
-  Power Line Interconnection



0 200 Feet

Sensitive Habitat Map
Shepherd Substation Project
Pacific Gas and Electric Company

FIGURE 3.4-4



3.4.2.3 Special Status Species

A total of 25 special status species with the potential to occur within the proposed project area were identified. Table 3.4-2 details species information and an assessment of the probability of encountering them on the project site. The majority of the protected species were evaluated and eliminated from further review based on the following criteria:

- The proposed action is outside the species known geographic range.
- The project area does not contain conditions known to support the species.
- The project action will not alter or adversely affect habitat of the species.

Seven species, the succulent owl's clover (*Castilleja campestris* ssp. *succulenta*), dwarf downingia (*Downingia pusilla*), spiny-sepaled button-celery (*Eryngium spinosepalum*), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), vernal pool fairy shrimp (*Branchineta lynchi*), California tiger salamander (*Ambystoma californiense*) (CTS), and San Joaquin kit fox (*Vulpes macrotis mutica*), have the potential to occur within the project area.

TABLE 3.4-2			
Habitat Suitability Assessment for Special Status Species			
(within the Clovis, Friant, Academy, Round Mountain, Sanger, Malaga, Fresno South, Fresno North, Lanes Bridge, Little Table Mountain, Millerton Lake West, and Millerton Lake East quadrangle maps)			
Species	Status	Suitable Habitat	Rationale of Habitat Assessment
PLANTS			
Succulent owl's clover <i>Castilleja campestris</i> ssp. <i>succulenta</i>	FT, SE 1B.2	Yes	This species is found only in vernal pools along the lower foothills and valleys on the eastern San Joaquin Valley in the Southern Sierra Foothills Vernal Pool Region. See species analysis following this table.
California jewel-flower <i>Caulanthus californicus</i>	FE, SE 1B.1	No	This jewel flower occurs in nonnative grassland, upper Sonoran sub-shrub scrub, and cismontane juniper woodland. The naturally-occurring populations known to exist today are distributed in three concentrations: (1) Santa Barbara Canyon, (2) the Carrizo Plain, and (3) the Kreyenhagen Hills in Fresno County. There are no known populations of this species within the project area.
Dwarf downingia <i>Downingia pusilla</i>	2.2	Yes	Dwarf downingia occurs in vernal pools and similar ephemeral pools. In California, it is only known to occur in the Central Valley and southern north coast range. See species analysis following this table.
Spiny-sepaled button-celery <i>Eryngium spinosepalum</i>	1B.2	Yes	This species occurs in vernal pools, swales, and depressions in valley grassland communities in the Central Valley. It is known to occur in claypan vernal pools where soil is neutral to alkaline. See species analysis following this table.
California satintail <i>Imperata brevifolia</i>	2.1	No	California satintail is found in a variety of habitats: Chaparral, Coastal scrub, Mojavean desert scrub, Meadows and seeps, and Riparian scrub. The habitat known to support this species does not occur within the project area.

TABLE 3.4-2			
Habitat Suitability Assessment for Special Status Species			
(within the Clovis, Friant, Academy, Round Mountain, Sanger, Malaga, Fresno South, Fresno North, Lanes Bridge, Little Table Mountain, Millerton Lake West, and Millerton Lake East quadrangle maps)			
Species	Status	Suitable Habitat	Rationale of Habitat Assessment
Madera leptosiphon <i>Leptosiphon serrulatus</i>	1B.2	No	This species occurs in Tulare, Fresno, Mariposa, Kern, and Madera Counties in open dry areas. It occurs in Chapparel/Foothill/Cismontane woodlands and yellow pine forest communities. The habitat known to support this species does not occur within the project area.
San Joaquin Valley Orcutt grass <i>Orcuttia inaequalis</i>	FT, SE 1B.1	Yes	This species is endemic to the Southern Sierra Foothills Vernal Pool Region of the San Joaquin Valley. See species analysis following this table.
Hairy Orcutt grass <i>Orcuttia pilosa</i>	FE, SE, 1B.1	No	Hairy Orcutt grass is found on high or low stream terraces and alluvial fans between 25 and 125 meters in elevation. It grows in Northern Basalt Flow, Northern Claypan, and Northern Hardpan vernal pools within annual grasslands. Currently, the main area of concentration is the Vina Plains in Tehama County. Other occurrences are in the Southern Sierra Foothills Vernal Pool Region and Solano-Colusa Vernal Pool Region, including Madera, eastern Stanislaus and Glenn counties. There are no records of this species within five miles of the project area. There are no occurrences within Fresno County.
Hartweg's golden sunburst <i>Pseudobahia bahiifolia</i>	FE, SE 1B.1	No	Hartweg's golden sunburst occurs in open grasslands and grasslands on the edge of blue oak forests, almost always on the north or northeast facing side of Mima mounds. They typically grow on shallow, well-drained, fine-textured soils. The habitat known to support this species does not occur within the project area.
San Joaquin adobe sunburst <i>Pseudobahia peirsonii</i>	FT, SE, 1B.1	No	This species inhabits valley and foothill grasslands, and cismontane woodland communities. It typically grows in heavy clay soils on grassy valley floors or rolling foothills. The clay soils known to support this species do not occur within the project area.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	1B.2	No	This species is known to occur in the Central Valley and delta region of California. It occurs in marshes, ditches, swamps, sloughs, ponds, and slow-moving streams with a silty or muddy bottom. The habitat known to support this species does not occur within the project area.
Caper-fruited tropidocarpum <i>Tropidocarpum capparideum</i>	1B.1	No	This species is known to occur in Alameda, Contra Costa, Glenn, Monterey, Santa Clara, and San Joaquin Counties. It occurs in alkaline soils of grasslands in lowlands and valleys that are less than 200 meters in elevation. The habitat known to support this species does not occur within the project area.
Greene's tuctoria <i>Tuctoria greenei</i>	FE, R 1B.1	No	This grass species is a small, tufted annual. It occurs in Butte, Tehama, Merced, and Shasta counties. This species has been extirpated from Fresno, Tulare, Stanislaus, Madera, and San Joaquin Counties. The project occurs in Fresno County, and this species no longer occurs in Fresno County.

TABLE 3.4-2			
Habitat Suitability Assessment for Special Status Species			
(within the Clovis, Friant, Academy, Round Mountain, Sanger, Malaga, Fresno South, Fresno North, Lanes Bridge, Little Table Mountain, Millerton Lake West, and Millerton Lake East quadrangle maps)			
Species	Status	Suitable Habitat	Rationale of Habitat Assessment
INVERTEBRATES			
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE	No	This species of shrimp inhabits rather large, cool vernal pools with moderate turbidity that last until June. This species is known to occur in Glenn, Tehama, Stanislaus, Yolo, Butte, Solano, Merced, and Ventura Counties. This species is not known to occur in Fresno County.
Vernal fairy shrimp <i>Branchineta lynchi</i>	FT	Yes	The vernal fairy shrimp occurs in vernal pools of varying sizes in the southern and Central Valley areas of California. See species analysis following this table.
AMPHIBIANS			
California tiger salamander <i>Ambystoma californiense</i>	FT	Yes	This species occurs in central California in lowlands or low foothills at elevations less than 2,000 feet where aquatic sites are present for breeding. They typically breed in natural vernal or ephemeral ponds but will breed in artificial ponds that mimic natural conditions. See species analysis following this table.
California red-legged frog <i>Rana aurora draytonii</i>	FT	No	This frog inhabits deep, still or slow-moving water of ephemeral or permanent streams or ponds, which are surrounded by dense, shrubby riparian vegetation such as arroyo willow, cattails, and bulrushes. The juveniles seem to favor open, shallow aquatic habitats with dense submergents. California red-legged frogs are found from Shasta County south to the Mexican border. They can also be found in central Nevada where populations have been introduced. Significant numbers of this species can be found in the small coastal drainages between Point Reyes in Marin County and Santa Barbara in Santa Barbara County. Red-legged frogs are not known to occur in vicinity of the project area.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	FT	No	This beetle species is dependent upon the presence of mature elderberry species (Genus <i>Sambucus</i>). They are typically found in local population clusters in riparian habitats less than 2,000 feet in elevation. There are no elderberry plants within the project area.
FISH			
Delta smelt <i>Hypomesus transpacificus</i>	FT	No	The delta smelt is tolerant of a wide salinity range. Most of its life will be spent in the highly productive brackish-water habitat associated with the fresh water edge of the mixing zone and it will migrate upstream into river channel and tidally-influenced backwater sloughs to spawn in freshwater. The delta smelt is known to spawn in the Sacramento River and in Barker, Lindsey, Cache, Georgiana, Prospect, Beaver, Hog, and Sycamore sloughs. They also spawn north of Suisun Bay in Montezuma and Suisun sloughs and their tributaries. The brackish waters known to support this species do occur within the project area.

TABLE 3.4-2			
Habitat Suitability Assessment for Special Status Species			
(within the Clovis, Friant, Academy, Round Mountain, Sanger, Malaga, Fresno South, Fresno North, Lanes Bridge, Little Table Mountain, Millerton Lake West, and Millerton Lake East quadrangle maps)			
Species	Status	Suitable Habitat	Rationale of Habitat Assessment
Central Valley steelhead <i>Oncorhynchus mykiss</i>	FT	No	This Evolutionary Significant Unit (ESU) pertains to steelhead of the Central Valley. This species is found in cool, clear streams, large rivers, and water bodies with cobble and boulder substrates. This ESU migrates between freshwater and marine habitats. The breeding range is identified as the Sacramento-San Joaquin River system. There are no suitable waterways within the project area to support this species.
BIRDS			
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	FC, SE	No	The western yellow-billed cuckoo inhabits riparian areas with dense shrubs and a developed canopy. The canopy is often composed of cottonwood and sycamore trees. The project area does not encounter the riparian habitat known to support this species.
REPTILES			
Blunt-nosed leopard lizard <i>Gambelia sila</i>	FE, SE	No	This lizard is found in association with other burrowing animals. It prefers burrows in pond loam in sparsely vegetated areas. They are known to occur in valley and foothill grassland, salt brush scrubland, iodine bush grassland and <i>Sueda</i> flats communities. The project does not occur in vegetative communities known to support this species.
Giant garter snake <i>Thamnophis gigas</i>	FT, ST	No	The USFWS lists four habitat requirements for the species: adequate water during the active season, emergent herbaceous wetland vegetation, grassy banks with open area for basking, and higher elevation uplands for cover and refuge from flooding. The project area does not contain suitable aquatic habitat to support this species.
MAMMALS			
Fresno kangaroo rat <i>Dipodomys nitratooides exilis</i>	FE	No	This species occurs in grasslands and chenopod scrub communities on the San Joaquin Valley floor. It prefers areas with flat, friable soils that stay moist year round. The habitat known to support this species does not occur within the project area.
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	FE, ST	Yes	The San Joaquin kit fox (SJKF) occurs in various grassland and scrubland communities. They require loose-textured sandy soils for burrowing and suitable prey base. SJKF are generally restricted to the San Joaquin valley. Fragmented populations and isolated individuals may extend out from this range. See species analysis following this table.

TABLE 3.4-2			
Habitat Suitability Assessment for Special Status Species (within the Clovis, Friant, Academy, Round Mountain, Sanger, Malaga, Fresno South, Fresno North, Lanes Bridge, Little Table Mountain, Millerton Lake West, and Millerton Lake East quadrangle maps)			
Species	Status	Suitable Habitat	Rationale of Habitat Assessment
<p><u>USFWS categories:</u> Endangered (FE) – Taxa in danger of extinction throughout all or a significant portion of its range; Threatened (FT) – Taxa likely to become endangered within the foreseeable future throughout all or a significant portion of its range; Candidate (FC) – Species for which the USFWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened. Candidate species, however, are not protected legally because proposed rules have not been issued; Proposed Endangered (PE) – Any species for which a proposed rule has been published in the Federal Register to list the species as endangered under the Endangered Species Act; Proposed Threatened (PT) – Any species for which a proposed rule has been published in the Federal Register to list the species as threatened under the Endangered Species Act.</p> <p><u>CDFG categories:</u> Endangered (SE) – Taxa in danger of extinction throughout all or a significant portion of its range; Threatened (ST) – Taxa likely to become endangered within the foreseeable future throughout all or a significant portion of its range; Rare (R) – Species that, although not currently threatened with extinction, is found in such minimal numbers throughout its range that it may become endangered if current environments deteriorate; Candidate Species (SCS) – Species that has been officially under review by the CDFG for addition to the threatened or endangered species. [Source: CDFG Fish and Game Code]. Species of Concern (SSC) – Animals not listed under the federal Endangered Species Act or the California Endangered Species Act, but which nonetheless 1) are declining at a rate that could result in listing, or 2) historically occurred in low numbers and known threats to their persistence currently exist.</p> <p><u>CNPS categories:</u> 1A – Presumed extinct in California; 1B – Rare or Endangered in California and elsewhere; 2 – Rare or endangered in California, more common elsewhere.</p>			

Seven special status species have the potential to occur within the project area. These species are described below. Potential impacts to the species are presented in Section 4.4.4.3.

Succulent Owl's Clover

Succulent owl's clover, also known as fleshy owl's clover, was listed as endangered under the California ESA in September 1979, and as threatened under the Federal ESA on March 26, 1997. Critical habitat was designated August 6, 2003 and revised August 11, 2005. It is found only in vernal pool habitats along the eastern San Joaquin Valley in the Southern Sierra Foothills Vernal Pool Region (USFWS 2010a). This species typically grows near the margins of vernal pools and swales, and is often found on acidic soils (USFWS 2010a). The largest threats to this species are habitat loss and fragmentation from urbanization, agricultural conversion, and mining. Nonnative invasive species also pose a threat.

Dwarf Downingia

Dwarf downingia is a CNPS List 2 plant, meaning that it is rare, threatened, or endangered in California, but more common elsewhere. The species occurs in vernal pools, mesic grasslands, and along the margins of small lakes and ponds. The species generally occurs in areas of low vegetative cover. The species flowers from March to April. Threats to the species include urbanization, agriculture, grazing, and industrial forestry.

Spiny-sepaled Button-celery

Spiny-sepaled button-celery is a CNPS 1B.2 plant. Listing as 1B means that the species is rare, threatened, or endangered in California and elsewhere. The 0.2 means that the species is fairly

endangered in California. The species inhabits vernal pools and valley and foothill grasslands. Currently it is known from Fresno, Madera, Merced, Stanislaus, Tulare, and Tuolumne counties (CNPS 2009). Threats to the species include development, grazing, road maintenance, and agriculture.

San Joaquin Valley Orcutt Grass

San Joaquin Valley Orcutt grass is listed as threatened under the Federal ESA and as endangered under the California ESA. Critical habitat was established for the species in 2003, and amended in 2006. The species is endemic to California, where it has always been restricted to the Southern Sierra Foothills Vernal Pool Region of the San Joaquin Valley (USFWS 2010b). *Orcuttia* plants grow underwater for three months or more and have evolved specific adaptations for aquatic growth (Keeley 1998; USFWS, Sacramento 2010c).

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp was listed as threatened under the Federal ESA on September 19, 1994. Critical habitat was designated on August 6, 2003 and revised on August 11, 2005. The species is endemic to grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains of California. The species is found within a variety of vernal pool habitats. It has been collected in large vernal pools but is more frequently found among smaller pools. Most often the pools are smaller than 0.05 acres in size (USFWS 2005). The species remains dormant during the dry season when the pools are dry and when they begin to fill they emerge and start reproducing. Typically the shrimp are observed in pools from December to early May. Threats to the species include habitat loss and degradation (USFWS 2005).

California Tiger Salamander

The central California Distinct Population Segment (DPS) of the California tiger salamander was listed as threatened under the Federal ESA on August 4, 2004 and threatened under the California ESA on March 3, 2010. The central California DPS occurs in the Central Valley. The salamander has been extirpated from much of its range, and has lost significant amounts of habitat. The loss of habitat has been largely a result of population growth and agricultural expansion (Natureserve 2008). The California tiger salamander spends most of the year underground in mammal burrows or small holes in terrestrial habitats such as grasslands, woodlands, and savannas. The salamander spend nearly their entire life underground, in the burrows of California ground squirrels (*Spermophilus beecheyi*) or Botta's pocket gopher (*Thomomys bottae*) (Barry and Shaffer 1994, Cook et al. 2006). During the breeding season (November to April) they migrate up to two kilometers during rainy nights to reach appropriate breeding habitat. Their breeding habitat consists of shallow ponds or wetlands. These wetlands can be semi-permanent or ephemeral.

San Joaquin Kit Fox

The San Joaquin kit fox (SJKF) was listed as endangered under the Federal ESA on March 11, 1967 and as threatened under the California ESA on June 27, 1971. No critical habitat has been designated for the species. A Recovery Plan for the SJKF was prepared in 1998. Prior to 1930, the SJKFs range extended from southern Kern County north to Tracy, San Joaquin County, on the west side, and near La Grange, Stanislaus County, on the east side (Grinnell et al. 1937; USFWS 1998). The SJKF is often associated with open grasslands and oak savannas. Agricultural areas (e.g., irrigated row crops, orchards, vineyards) are used for foraging. Orchards may support prey species, if the grounds are not manicured, but typically denning potential among orchards is low due to increased predatory potential. Kit foxes often den in suitable habitat located adjacent to agricultural areas where they can forage (Bell 1994; Scott-Graham 1994).

3.4.3 Impacts

3.4.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts to biology resources may be considered significant if the project will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as threatened or endangered, or as a candidate, sensitive, or special-status species (including MBTA species) in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Result in the introduction or spread of a noxious weed or substantially increase the dispersal and spread of existing populations of noxious weeds such that an existing plant community or wildlife habitat is substantially degraded; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other governmental habitat conservation plan.

3.4.3.2 Environmental Impacts

The following section discusses significance criteria for impacts on biology resources derived from the CEQA Checklist.

Would the project:

- a) **Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (CDFG) or US Fish and Wildlife Service (USFWS)?**

Less than significant impact. Seven sensitive species have the potential to occur within the project area. Potential impacts to each species are summarized below.

Succulent Owl's Clover

Succulent owl's clover could potentially occur in the seasonal wetlands observed within the project area. However, it is unlikely to occur in the smaller of the two seasonal wetlands because this area appears to be routinely disced to create grazing habitat for the private landowner's horses. The CNDDDB records and Recovery Plan indicate a small concentration of this species located north of Copper Avenue between Highway 41 and Academy in the less developed area of the valley floor and foothills of the Sierra Nevada Mountains. No succulent owl's clover was observed in the seasonal wetlands. As mentioned previously, no impacts to the seasonal wetlands and species occupying the wetlands are expected to result

from the project. PG&E will avoid seasonal wetlands by placing structures outside of wetlands. There is no designated critical habitat within the project area. The nearest critical habitat for the succulent owl's clover is approximately two miles northeast of the project area.

Dwarf Downingia

There is potential for dwarf downingia to occur in seasonal wetlands within the project area. However, it is unlikely to occur in the smaller of the two seasonal wetlands because this area appears to be routinely disced. This species was not recorded during surveys of the project area; however, appropriate floristic period surveys were not performed. As mentioned previously, no impacts to the seasonal wetlands and species occupying the wetlands are expected to result from the project. PG&E will avoid seasonal wetlands by placing structures outside of wetlands.

Spiny-sealed Button-celery

There is potential for spiny-sealed button-celery to occur in seasonal wetlands within the project area. However, it is unlikely to occur in the smaller of the two seasonal wetlands because this area appears to be routinely disced. This species was not recorded during surveys of the project area; however, appropriate floristic period surveys were not performed. As mentioned previously, no impacts to the seasonal wetlands and species occupying the wetlands are expected to result from the project. PG&E will avoid seasonal wetlands by placing structures outside of wetlands.

San Joaquin Valley Orcutt Grass

There is potential for San Joaquin Valley Orcutt grass to occur in seasonal wetlands within the project area. However, it is unlikely to occur in the smaller of the two seasonal wetlands because this area appears to be routinely disced. This species was not recorded during surveys of the project area. As mentioned above, no impacts to the seasonal wetlands and species occupying the wetlands are expected to result from the project. PG&E will avoid seasonal wetlands by placing structures outside of wetlands. There is no designated critical habitat within the project area. The nearest critical habitat for San Joaquin Valley Orcutt grass is approximately two miles northeast of the project area.

Vernal Pool Fairy Shrimp

Two seasonal wetlands were observed along the project alignment and there is potential for vernal pool fairy shrimp to occur in them. Fairy shrimp were not observed in the pools during site visits. There are several vernal pool fairy shrimp records within five miles of the project area north of Copper Avenue where there are several vernal pools. No impacts to the vernal pool fairy shrimp are expected to result from the project because seasonal wetlands will be avoided. Seasonal wetlands will be flagged for avoidance by a biological monitor prior to construction. PG&E will avoid seasonal wetlands. PG&E will not place any poles or other facilities within 100 feet of the seasonal wetlands. Additionally, workers will receive an "environmental awareness" training prior to commencing work activities to brief them on sensitive biological resources. Avoidance and location of vernal pools will be highlighted. To limit the potential of introducing invasive weeds which can deteriorate the quality of vernal pools, ground-disturbing equipment used for construction will be required to be washed prior to entering the worksite. There is no designated critical habitat within the project area. The nearest critical habitat for the vernal pool fairy shrimp is located approximately two miles northeast of the project area.

California Tiger Salamander

California tiger salamander could potentially occur within the project area along the power line alignment near the freshwater ponds and seasonal wetlands. The nearest record of a California tiger salamander is from 2006 and was recorded approximately 1.25 miles east of the project area in a flood control channel (CNDDDB 2009). Several CNDDDB records exist in the area north of Copper Avenue. Given the low-density, rural community nature of the habitat, there is connectivity between sites where the salamander has been documented and the project area that could be used by migrating California tiger salamander. As such, seasonal wetlands identified along the alignment could serve as potential breeding habitat. Additional water sources in the project area include the two freshwater ponds, which are connected by a small irrigation ditch. The freshwater ponds are not likely suitable breeding habitat due to the presence of predatory fish. Potential impacts to the California tiger salamander could result from loss or degradation of habitat, and death or injury if struck or crushed by equipment and vehicles during construction. To minimize impacts to the salamander, PG&E will limit construction activities within 2,000 feet of seasonal wetlands during a limited period when wetlands are dry. California tiger salamanders are least active during the dry season. All activities within 2,000 feet of suitable California tiger salamander habitat will require the presence of a biological monitor.

Additional measures to minimize impacts to the species are identified in Section 2.13 Applicant Proposed Measures. Loss of habitat is not expected as PG&E has committed to spanning the seasonal wetlands so that no poles will be placed within 100 feet of seasonal wetlands. PG&E is in the process of consulting with the USFWS and CDFG on impacts to the California tiger salamander. PG&E will comply with all conditions and conservation measures recommended by CDFG and the USFWS to minimize impacts to CTS. There is no designated critical habitat within the project area. The nearest critical habitat for the California tiger salamander is located approximately three miles north of the project area.

San Joaquin Kit Fox

The project area occurs along the eastern edge of the SJKF historical distribution. Extensive research has not been conducted on the current distribution. According to the USFWS 1998 Recovery Plan for Upland Species of the San Joaquin Valley, there are three core populations currently in existence. Two core populations, the Carrizo Plain Natural Area (San Luis Obispo County) and the natural lands of western Kern County (i.e., Elk Hills, Buena Vista Hill, Buena Vista Valley and Lokern Natural Area), are far removed from the project area. The third core population is in the Ciervo-Panoche Natural Area, which is located along the Fresno and San Benito County borders. Although this population occurs within Fresno County, it is located more than 50 miles west of the project area. The potential for the SJKF to occur within the project area is extremely low. There are no CNDDDB records of the SJKF within five miles of the project area. No dens or kit fox were observed among the project area. The proposed substation could result in the loss of approximately 4.9 acres of potential kit fox migration and foraging habitat. The power line will not result in a noticeable loss of habitat. The proposed project is not likely to result in any impacts to the SJKF because they are not likely to occur in the project area; therefore, protective measures are not required.

Migratory Bird Treaty Act Bird Species

The project will have the potential to impact bird species protected under the Migratory Bird Treaty Act. Biological field reviews identified no nests or occupied burrows in areas

impacted by the project. However, new nests could be built prior to construction. PG&E will conduct a preconstruction survey for migratory nesting birds, if construction occurs during the avian nesting period. If active bird nests are observed, appropriate buffers will be established surrounding nests to minimize impacts to birds resulting from elevated noise and activity levels.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFG or USFWS?

Less than significant impact. There are no riparian or sensitive natural communities located at the proposed substation site. Two seasonal wetlands were identified along the power line interconnection alignment. Pole placement and overland travel could have the potential to impact seasonal wetlands. However, PG&E has committed to avoid the seasonal wetlands. No poles or other facilities will be placed within 100 feet of the wetlands. All other habitat types that occur within the project area are common. Incorporation of APMs will ensure that impacts are less than significant.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less than significant impact. Impacts to seasonal wetlands will be avoided. Seasonal wetlands were identified along the power line alignment, but PG&E will not construct poles within 100 feet of wetlands. Incorporation of APMs will ensure that impacts are less than significant.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than significant impact. The project area is not known to be a migratory route for wildlife species. Additionally, construction and operation of the substation and power line are not likely to cause a barrier to wildlife movement as areas surrounding the substation will remain permeable and power lines do not create barriers to movement.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No impact. There are no local policies or ordinances that will conflict with the proposed project.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No impact. There are no known Habitat Conservation Plans, Natural Community Conservation Plans or other plans that will be impacted by the project.

3.4.4 References

- Barry, S.J., and HOB. Shaffer. 1994. The status of the California tiger salamander (*Ambystoma californiense*) at Lagunita: a 50 year update. In *Journal of Herpetology* 28:246-255.
- Bell, H.M. 1994. Analysis of Habitat Characteristics of the San Joaquin Kit Fox in its Northern Range. M.A. thesis. California State University Hayward. 90 pp.
- Calflora. 2009. Information on California Plants for Education, Research and Conservation. Berkeley, California. Located online at: <http://www.calflora.org>. Accessed October 2009.
- California Department of Fish and Game. 2009. *California Natural Diversity Database*. Natural Heritage Division. Sacramento, California. Accessed October 2009.
- California Native Plant Society. 2009. Inventory of Rare and Endangered Plants (online edition, v7-10a). California Native Plant Society. Sacramento. Located online at: <http://www.cnps.org/inventory>. Accessed October 2009.
- Cook, D.G., P.C. Trenham, and P.T. Northern. 2006. Demography and Breeding Phenology of the California Tiger Salamander (*Ambystoma californiense*) in an Urban Landscape. In *Northwestern Naturalist*. 87:215-224.
- Grinnell, J., J.S. Dixon, and J.M. Linsdale. 1937. *Fur-bearing Mammals of California*. Volume 2. University of California Press. Berkeley, California.
- Keeley, J. E. 1998. C4 Photosynthetic Modifications in the Evolutionary Transition from Land to Water in Aquatic Grasses. In *Oecologia* 116:85-97.
- NatureServe 2008. NatureServe Explorer: An Online Encyclopedia of Life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Located online at: <http://www.natureserve.org/explorer>. Accessed October 2009.
- Scott-Graham, E. 1994. American Farmland Trust: a Proposal for Habitat Driven Creation and Enhancement on Farmlands in the San Joaquin Valley under the Federal Endangered Species Act. Draft Rep. Visalia, California. 34 pp.
- U.S. Fish and Wildlife Service. 1998. *Recovery Plan for Upland Species of the San Joaquin Valley, California*. Region 1, Portland, Oregon. 319 pp.
- _____. 2005. *Recovery Plan for Vernal Pool Ecosystems of California and Oregon*. Portland, Oregon. 606 pages.
- U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office 2010a. *Species Account Fleshy Owl's Clover (*Castilleja campestris* ssp. *succulenta*)*. Located online at: http://www.fws.gov/sacramento/es/plant_spp_accts/acctplant.htm. Accessed May 2010.
- _____. 2010b. *Species Account San Joaquin Valley Orcutt Grass (*Orcuttia inaequalis*)*. Located online at: http://www.fws.gov/sacramento/es/plant_spp_accts/acctplant.htm. Accessed May 2010.
- _____. 2010c. *Species Account Hairy Orcutt Grass (*Orcuttia pilosa*)*. Located online at: http://www.fws.gov/sacramento/es/plant_spp_accts/acctplant.htm. Accessed May 2010.

3.5 CULTURAL RESOURCES

This section describes the cultural resources of the project area and examines the potential impact on these resources. With implementation of the APMs, impacts to cultural resources will be less than significant. Paleontological resources are discussed in Section 3.6: Geology and Soils.

TABLE 3.5-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
CULTURAL RESOURCES				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?			X	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?			X	
c) Disturb any human remains, including those interred outside of formal cemeteries?			X	

3.5.1 Methodology

Information on the character and location of cultural resources in the vicinity of the project was compiled from published literature, database queries, maps, and consultation with local Native American groups and individuals. The background research was supplemented by an intensive survey of the project site by a qualified archaeologist.

A records search was conducted for the project area and a 0.5 mile radius buffer, to ascertain the presence of prior surveys and cultural resources potentially present within the project site and vicinity. Records were searched at the Southern San Joaquin Valley Archaeological Information Center, housed at California State University, Bakersfield. Other, specialized listings that were consulted include the most recent updates of the National Register of Historic Places (NRHP), California Historical Landmarks, and California Points of Historical Interest, as well as evaluations of properties reviewed by the State of California Office of Historic Preservation. The *California Inventory of Historic Resources* was also reviewed, as were local inventories, lists, and historic maps. The cultural resources inventory (Bassett 2010), which includes the project area and additional route alternatives for the power line that have since been dropped, has been produced as a separate document. The cultural resources inventory report will be provided separately to CPUC staff. The records search results are provided in the cultural resources inventory report. The results are summarized and discussed in this section.

The Native American Heritage Commission (NAHC) was consulted for a review of the Sacred Lands Inventory for the project area. In the response letter, the NAHC noted that no Native American cultural resources were listed in their files for the project site or immediate vicinity. Transcon subsequently contacted the 12 Native American individuals from 11 organizations listed by the NAHC who may have knowledge of cultural resources in the project area. Contact was initiated with letters and a map of the project area was provided; no replies were received. Correspondence

associated with the consultation effort is provided in Appendix E. Individuals were contacted from the following organizations:

- Big Sandy Rancheria of Mono Indians
- Cold Springs Rancheria of Mono Indians
- North Fork Mono Tribe
- Table Mountain Rancheria
- Dumma Wo-Wah Tribal Government
- Traditional Choinumni Tribe
- Choinumni Tribe; Choinumi/Mono
- Kings River Choinumni Farm Tribe
- Dumma Tribal Government
- The Choinumni Tribe of Yokuts
- Sierra Nevada Native American Coalition

An archaeological field inventory of the project area was undertaken by an archaeologist meeting the professional qualification standards for archaeology, established by the Secretary of the Interior. The project area was surveyed in accordance with standard archaeological practices for central California and utilized transect intervals of 10 meters. A 100 foot buffer area around the proposed substation and power line were also surveyed. A map delineating the pedestrian survey coverage is provided in the cultural resources inventory report.

3.5.2 Existing Conditions

3.5.2.1 Regulatory Background

Federal

Since no federal lands or monies are involved, no federal regulations are applicable.

State

CEQA requires the assessment of a proposed project's effects on cultural resources. Pursuant to CEQA, a "historical resource" is a resource listed in, or eligible for listing in, the California Register of Historical Resources (CRHR). Section 5024.1 of the Public Resource Code defines eligibility requirements for the CRHR and states that a resource may be eligible for inclusion in the register if it:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, resources included in a local register of historic resources or identified as significant in a local survey conducted in accordance with state guidelines are also considered historic resources under CEQA, unless a preponderance of the facts demonstrates otherwise. CEQA applies to archaeological resources when 1) the archaeological resource satisfies the definition of a historic resource, or 2) the archaeological resource satisfies the definition of a "unique archaeological

resource.” A unique archaeological resource is an archaeological artifact, object, or site that has a high probability of meeting any of the following criteria:

- A. The archaeological resource contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- B. The archaeological resource has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- C. The archaeological resource is directly associated with a scientifically recognized important prehistoric or historic event or person.

CEQA recognizes three separate categories of resources: CRHR, California Historical Landmarks, and California Points of Historical Interest. Additional state regulations applicable to cultural resources on private property are:

- Native American Heritage Commission. Section 5097.91 of the California Public Resource Code established the NAHC, whose duties include the inventory of places of significance to Native Americans, including known grave sites on private lands. Section 5097.98 defines the protocol to be followed upon notification from a county coroner of a discovery of Native American human remains.
- California Public Records Act. Two sections of this act were enacted to protect cultural resources from vandalism and unauthorized excavation. Section 6254(R) authorizes public agencies to withhold information from the public that relates to “Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission.” Section 6254.10 allows the withholding of records held by State agencies that relate to archaeological site information and reports.
- Health and Safety Code, Sections 7050 and 7052. Section 7050.5 declares that if human remains are discovered outside of a dedicated cemetery, ground disturbance must cease and the county coroner notified. Section 7052 establishes it as a felony for anyone but relatives to mutilate, disinter, or otherwise disturb human remains.
- California Penal Code, Section 622.5. Section 622.5 provides misdemeanor penalties for injuring or destroying objects of historic or archaeological interest located on public lands or on private lands, but specifically excluding the landowner.

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations. In any event, no local regulations address cultural resources.

3.5.2.2 Environmental Setting

Culture History

Overviews of the prehistory of the western San Joaquin Valley have been provided by Schiffman and Garfinkel (1981), Moratto (1984), and more recently by Riddell (2002). Human occupation of the area likely has its origins in the late Pleistocene, dating from as early as 12,000 years ago. The Tranquility and Witt sites may be the earliest known examples of human activity within the Central Valley (Hewes 1946). Sizable populations first appeared in the region with the Western Pluvial Lake Tradition, especially around Tulare and Buena Vista lakes, dating from between 11,000 and 7,000 before present (BP).

Subsequent occupation of the region is typically divided into the Early (8,000-4,000 BP.), Middle (4,000-1,500 BP), and Late (1,500 BP-historic) horizons; these horizons are mainly differentiated on the basis of technology, trade items, and burial patterns. These populations were oriented to an acorn gathering and hunting way of life. Trade relationships were maintained with peoples of the Delta, Sierra Nevada, as well as the central and southern coasts. During the later horizon, structures included very large, circular ceremonial houses and small dwellings.

Prehistoric archaeological resources in the region tend to be located on benches, terraced areas, areas of exposed bedrock or lithic sources, and near water sources. Lack of these within the project area, as well as intensive past and current cultivation, diminish the potential presence of resources. Riddle (2002) has suggested that up to 90 percent of all archaeological sites in the region have been largely destroyed. Known prehistoric sites near to the project area are primarily extensive midden deposits near watercourses or multiple bedrock milling features. Two sites, the Sharer Site (CA-FRE-1154) and the Harlan Site (CA-FRE-1155) are located six miles to the east of the project area. Both have deep areas of midden and were interpreted as seasonal procurement campsites. Numerous small processing stations have been developed in the surrounding foothills.

The project area passes through the region of the ethnohistoric Southern Valley Yokuts (Latta 1977). The project area lies within the area occupied by the Gashowu, a tribelet of the Kings River Group of the Foothill Division. Their two major settlements, *Pohoniu* and *Yokau* are located in the foothills well to the east of the project (Kroeber 1976). At these locations, along waterways, tule roots often substituted for acorns and provided reeds to construct watercraft. During the early 19th century, the Yokuts became increasingly under the control of the Spanish mission system and later, Spanish and Mexican ranching operations.

The San Joaquin Valley was explored sporadically by the Spanish in the late 18th and early 19th centuries in the course of looking for a shorter route from Sonora, Mexico to Monterey, searching for fugitive Indians who fled coastal missions, and scouting new mission sites. The first Americans entered the area in the 1820s and 1830s. In 1846 the Mexican government granted General José Castro the 48,800 acre Rancho Rio del San Joaquin. At the beginning of the American period a number of ferry stations were established to service the gold mining area to the east, particularly the Coarsegold area. By the early 1850s many of the mines had played out and agricultural pursuits, especially cattle raising, became more common in the valley. Farms were also established during the 1850s to support regional mining booms with cotton and potatoes being important early crops. In later years, alfalfa and orchard crops were planted.

The pace of development of the region greatly accelerated with the coming of the Southern Pacific Railroad in the early 1870s. Fresno, a station on the railroad was made the county seat in 1874. Clovis was established in 1891 as a stop on the San Joaquin Valley Railroad. The Fresno Flume and Irrigation Company made Clovis their headquarters and ran a large lumber mill there between 1894 and 1914. Agriculture in the region was fueled by the construction of canals heading off of the Kings River. The first was the Fresno Canal (1872) followed by the Gould and Enterprise canals dug in the late 1870s and early 1880s. The immediate project area was known as the Big Dry Creek or Mississippi District and was watered by the Enterprise Canal. It was originally used for the winter grazing of sheep; later homesteaders, including many Italians, raised wheat and other grain crops, grapes, fruit, and nuts. Today the project area is a mix of agricultural uses and residential areas.

Records Search Results

The records search results indicated that eight previous cultural resources studies have been conducted within the study area. These surveys are P-000107, P-000293, P-000534, P-001084, P-001870, P-001890, and P-002203 (including seven separate parcels), and P-002289. Two of these studies (P-000534 and P-001084) overlap with and cover approximately three-quarter miles of the power line survey; the substation site had not been previously surveyed.

One previous study (P-002289) (Nettles and Baloian 2006) of the project vicinity had identified seven “potential archaeological locations” within the study area, mostly places where historic plats or aerial photos had suggested that historic structures had been present. Field truthing of these locations by Nettles and Baloian (2006) identified four structures remaining. These are: A-7, a circa 1937 Mission-style residence, A-9, a circa 1930s Tudor-style residence, A-11, a vernacular-style bungalow, and A-12, a circa 1940s vernacular structure.

Other cultural resources identified within the Shepherd Substation study area by Nettles and Baloian (2006) are the circa 1880 Enterprise Canal, including three bridges spanning the canal, and the circa 1912 West Branch of the Helm Colonial Ditch, recorded as site CA-FRE-3344H. All cultural resources previously identified are on the more developed western edge of the study area, well away from the proposed substation and power line.

Archaeological Survey Results

Survey conditions were acceptable with generally good surface visibility. However, most of the surveyed land had been modified through road and irrigation ditch construction, cultivation, past development and demolition activities, and residential landscaping. No archaeological sites, isolated artifacts or features, or elements of the historic built-environment were identified during the survey. As such, no historical resources will be affected by project implementation.

3.5.3 Impacts

3.5.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts to cultural resources may be considered significant if the project will:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the CEQA guidelines;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA guidelines; and/or
- Disturb any human remains, including those interred outside of formal cemeteries.

3.5.3.2 Environmental Impacts

The following section discusses significance criteria for impacts to cultural resources derived from the CEQA Checklist.

Would the project:

- a) **Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?**

Less than Significant. Construction of the substation and power line will result in ground disturbance. No known cultural resources are present within the areas subject to ground disturbance. If potential historic resources are discovered during the construction period,

- construction will cease at that location and a PG&E Cultural Resource Specialist will be contacted immediately to examine and evaluate the find in accordance with standard protocols. Implementation of APMs Cult-1 through Cult-4 (Table 2.13-1) will ensure that impacts will be less than significant.
- b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?**
Less than Significant. Construction of the substation and power line will result in ground disturbance. No known archaeological resources are present within the areas to be disturbed. If archaeological resources are discovered during the construction period, construction will cease at that location and a PG&E Cultural Resources Specialist will be contacted to examine and evaluate the find in accordance with standard protocols. Implementation of APMs Cult-1 through Cult-4 (Table 2.13-1) will ensure that impacts will be less than significant.
- c) Disturb any human remains, including those interred outside of formal cemeteries?**
Less than Significant. Construction of the substation and power line will result in some ground disturbance. No cemeteries or burials are known to exist within the areas to be disturbed. If suspected human remains are discovered during the construction period, construction will cease at that location and a PG&E Cultural Resources Specialist will be contacted to examine and evaluate the find in accordance with standard protocols for human remains. Implementation of APMs Cult-3 and Cult-4 (Table 2.13-1) will ensure that impacts will be less than significant.

3.5.4 References

- Bassett, Everett J. 2010. *Draft Cultural Resources Inventory Report, Shepherd Substation Project, Fresno County, California*. Prepared by Transcon Environmental for submittal to the California Public Utilities Commission.
- Hewes, Gordon W. 1946. Early Man in California and the Tranquility Site. In *American Antiquity*, Vol. 11, pp. 209-215.
- Kroeber, Alfred. 1976. *Handbook of the Indians of California Reprinted*. Dover Publications, New York. Originally Published 1925, Bureau of American Ethnology Bulletin 78, Smithsonian Institute, Washington, D.C.
- Latta, F.F. 1977. *Handbook of Yokuts Indians*. Santa Cruz: Bear State Books.
- Moratto, M.J. 1984. *California Archaeology*. New York: Academic Press.
- Nettles, Wendy M., and Randy Baloian. 2006. *Reconnaissance Survey of the City of Clovis, Northwest Urban Center Specific Plan Area "FR2289"*. Applied EarthWorks, Inc. Report on file Southern San Joaquin Valley Information Center, Bakersfield.
- Riddell, F.A. 2002. The Status of San Joaquin Valley Archaeology. In *Essay in California Archaeology: A Memorial to Franklin Fenenga* edited by William J. Wallace and Francis A. Riddell, pp. 55-61. University of California Archaeological Research Facility, Contribution Number 60. Berkeley.
- Schiffman, Robert A., and A.P. Garfinkel. 1981. *Prehistory of Kern County: An Overview*. Bakersfield College Publications in Archaeology, Number 1.

3.6 GEOLOGY AND SOILS

This section describes the geology, mineralogy, soils, and paleontology of the project area and examines the project's potential impact on these resources. The analysis concludes that implementation of the APMs will ensure that impacts to geology, mineralogy, soils and paleontology will be less than significant.

TABLE 3.6-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
GEOLOGY AND SOILS				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
MINERAL RESOURCES				
Would the project:				
f) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X

TABLE 3.6-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
g) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X
PALEONTOLOGICAL RESOURCES Would the project:				
h) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X	

Potential seismic risks have been identified and will not result in added exposure of people or structures to rupture of a known earthquake fault, ground shaking or failure, or landslides. APMs will also ensure that the potential for erosion, siltation, and topsoil loss is less-than-significant. Mineral and paleontological resources will not be affected.

3.6.1 Methodology

Information on geology, mineralogy, soils and paleontology was compiled from published literature, maps, and online tools. Seismic information was obtained from maps published by the California Division of Mines and Geology as well as by reviewing the Fresno County General Plan. Soils data was collected from the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey 2.0, an online tool (NRCS 2010). Paleontology records were reviewed using the University of California Museum of Paleontology database of known paleontological sites in Fresno County (California Geological Survey 1997).

3.6.2 Existing Conditions

3.6.2.1 Regulatory Background

Federal

No federal regulations are applicable to geology, minerals, or paleontology within the project area.

State

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 was drafted to avoid or reduce damage to structures from earthquakes. It prohibits development within 50 feet of an active fault zone. However, the project is not located in an Alquist-Priolo Earthquake Fault zone.

Mineral resource zones are designated by the California Geological Survey where access to important mineral resources may be threatened, according to provisions of the California Surface Mining and Reclamation Act of 1975. No mineral resource zones are located near to the project.

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations.

3.6.2.2 Environmental Setting

The project area is within the San Joaquin Valley, a subunit of the Central Valley, which is 430 miles long and 75 miles wide. The soils of the valley floor are comprised of thousands of feet of sediments. During the Jurassic period, marine sediments accumulated here, but with the retreat of the sea that covered the valley millions of years ago and the coinciding rise of the Coastal Ranges, deposition and accumulation of sediments transitioned to deposits washed into the valley from the surrounding mountains. The primary soils were developed by weathering of the underlying granitic parent material. The secondary soils were formed by a combination of aeolian and alluvial forces transporting a variety of granitic and assorted metamorphic and metavolcanic materials from mountain streams. Quaternary and recent alluvium covers most of the valley basin.

Seismicity

There are no known active faults or Alquist-Priolo earthquake fault zones within the project area. However, the Fresno region is a seismically active area. Major active faults include the San Andreas, located over 70 miles to the west, and Nunez faults. The Nunez fault is located approximately 50 miles southwest of the project area in the Alcalde Hills (California Division of Mines and Geology 2000). Ground shaking is the primary concern within the Fresno municipal area and this could result from any of the faults in the region; however, this risk is only moderate due the project's distance from major fault lines.

Subsidence

Groundwater levels beneath the Fresno area have been dropping (City of Fresno 2010). If groundwater levels continue to drop within the Fresno area, subsidence is possible; however, subsidence is currently not a significant hazard (City of Fresno 2008). The project will have no impact on subsidence as there is no proposed groundwater pumping or oil and gas removal associated with the project.

Soils

Soil within the substation site consists entirely of Atwater sandy, loam (NRCS 2010). Other soil units consisting of Cometa sandy loams and Los Robles loams occur along the power line interconnection and have similar properties as the Atwater sandy, loam. A summary of the Atwater sandy, loam soil's properties is included in Table 3.6-2.

TABLE 3.6-2 Atwater Sandy, Loam Soil Properties	
Category	Rating
Gravel Source	Poor
Sand Source	Fair
Prime or Unique Farmland	Prime if irrigated
Erosion Factor	Moderate (K-factor = 0.28)*
Slope	0 to 3 percent
Shrink/Swell Potential	No limitations on construction
* K-factor indicates the susceptibility of a soil to sheet and rill erosion by water and values range from 0.02 to 0.69 with the higher value being more susceptible to erosion. Source: NRCS 2010.	

There are no limitations on construction of structures imposed by the soil's shrink/swell potential. PG&E will prepare the substation site for construction in a manner consistent with common engineering practices, such as conformance with building codes and American Society for Testing and Materials (ASTM) standards. Such practices will include the compaction of engineered fills.

The project area is flat, and although minor grading will be required, there will be no significant changes to the area's topography. Construction of the substation and power line interconnection will disturb soils, which may be subject to erosion during construction activities. However, because the site is flat and erosivity of the soil is moderate, erosion is not anticipated to be a problem.

Mineral Resources

There are no known oil, gas, or aggregate sources in the project area and the project will not interfere with any mineral resource extraction process. Widely available non-renewable resources will be utilized in the construction of the project, including aggregates, iron, steel, mineral oil, and oil and gas that will be used in the operation of vehicles and equipment.

Paleontological Resources

The project is located on alluvial fan and fluvial deposits of Pleistocene age (2 million to 11,000 years old) (Smith 1964). The University of California Museum of Paleontology database of known paleontological sites in Fresno County was reviewed to identify Pleistocene formations and to determine the likelihood of paleontological resources being present. One hundred and fifty-one Pleistocene fossils, including birds, and reptiles have been identified, mainly from an agricultural site located approximately seven miles from the project area.

3.6.3 Impacts

3.6.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts to geology, mineralogy, soils, and paleontology may be considered significant if the following applies.

Geology

Impacts to geology may be considered significant if they were to:

- Result in severe damage or destruction to one or more project components as a direct consequence of a geologic event;
- Result in exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:
 - Rupture of a known earthquake fault,
 - Strong seismic ground shaking,
 - Seismic-related ground failure, including liquefaction, or
 - Landslides; or
- Are located on a geologic unit that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landsliding, lateral spreading, subsidence, liquefaction, or collapse.

Soils

Impacts to soils may be considered significant if they were to:

- Result in a substantial soil erosion or loss of topsoil;
- Are located on a soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landsliding, lateral spreading, subsidence, liquefaction, or collapse; or
- Create a substantial risk to life or property due to the presence of expansive soils.

CEQA also includes the potential for consideration of significant impacts due to the presence of soils incapable of supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available; however, this consideration is not applicable to the project because no sanitary wastewater will be produced.

Mineral Resources

Impacts to mineral resources may be considered significant if they were to:

- Result in the loss of availability of a known mineral resource classified MRZ-2 by the State Geologist and of value to the region and residents of the state, or
- Result in the loss of availability of a locally important mineral resource recovery site.

Paleontological Resources

Impacts to paleontological resources may be considered significant if they:

- Result in physical changes to the landscape, directly affecting or changing the context within which a paleontological resource or unique geologic feature exists.

3.6.3.2 Environmental Impacts

This section discusses significance criteria for geology, soils, and paleontology impacts derived from the CEQA Checklist.

Would the project:

Geology and Soils

- a) **Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:**

- i) **Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.**

No impact. There are no known Alquist-Priolo earthquake fault zones or active faults in the project area, so potential surface-fault rupture is not expected.

- ii) **Strong seismic ground shaking?**

Less than significant. Faults in surrounding areas could result in ground shaking within the project area. The area has a moderate risk of an earthquake. The substation will not be manned. Thus, impacts to human life are not expected unless workers were present for maintenance during seismic activity. The project facilities will be engineered to withstand predicted ground shaking and will meet or exceed the relevant seismic requirements. Impacts to the power line resulting from ground shaking are not likely. The power line will be constructed with sufficient conductor length, sag, and span between conductors per industry standards. Generally, power line support structures can withstand groundshaking.

iii) Seismic-related ground failure, including liquefaction?

Less than significant. Liquefaction is generally a concern when the groundwater table is within 50-feet of the surface and the soils are unconsolidated and granular. Groundwater depth is estimated at approximately 120 feet in the Fresno municipal area (City of Fresno 2008). Impacts to the substation and power line interconnection resulting from liquefaction are not expected. The depth to groundwater within the project area reduces the likelihood of liquefaction.

iv) Landslides?

No impact. Landslides pose risks in steep terrain with unstable subsurface conditions. Landslides are not likely due to the gently sloping (0 to 5 percent) topography and distance from hills, mountains, or slopes. No slopes exist among the area where landslides will be anticipated.

b) Result in substantial soil erosion or the loss of topsoil?

Less than significant. Soil erosion or loss of topsoil could result from excavation or grading activities during construction. However, the implementation of APM Geo-1 (Table 2.13-1) will ensure that soil erosion and the loss of topsoil will be less than significant.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less than significant. The project is not located on unstable soil units, is generally flat, and limited surface disturbance will occur. Thus, impacts to soil stability will be less than significant.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

No impact. Expansive soil, which may cause differential and cyclical foundation movements, is not expected to have an effect on project components. The soils contain limited amounts of clay and are not expected to be expansive. Engineering level geotechnical studies will be conducted to identify soil characteristics and the results will be considered in the design of facilities. No impact is expected.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No impact. The project does not include a waste disposal system.

*Mineral Resources***f) Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state?**

No impact. The project will not result in the loss of availability of a known mineral resource.

g) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land-use plan?

No impact. The project will not result in the loss of availability of a locally important mineral recovery site; therefore, no impact will occur.

*Paleontological Resources***h) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?**

Less than significant. Construction of the proposed substation is not likely to have significant impacts to paleontological resources, as surface and subsurface disturbance associated with the project is limited. Significant impacts could occur if construction practices were likely to impact rare fossils important to stratigraphic or paleoenvironmental interpretation or fossils important to the paleobiology or evolutionary history of plants and animals. Generally, rare fossils are those of vertebrates.

Although vertebrate fossils have been found in similar formations, the fossils were largely recovered from asphalt pits. Given the low likelihood of encountering an asphalt pit, lack of a known paleontological resource, and the limited disturbance associated with the project, the likelihood of encountering rare fossils is low. If paleontological remains are discovered during construction, APM Pal-1 (Table 2.13-1) will be implemented to ensure that impacts are less than significant.

3.6.4 References

- California Division of Mines and Geology. 2000. Digital Images of Official Alquist-Priolo Earthquake Fault Zones Maps of California, Central Coast Region. CD-ROM.
- California Geological Survey. 1997. Guidelines for Evaluating Seismic Hazards in California, Special Publication 117. Located online at <http://www.consrv.ca.gov/cgs/shzp/webdocs/sp117.pdf>.
- City of Fresno. 2008. City of Fresno Housing Element: 2008-2013. Located online at <http://www.fresno.gov/NR/rdonlyres/E236698F-3690-4898-B081-0556A4A31862/0/HETableofContents.pdf>. Accessed November 2010.
2010. Water Division of the City of Fresno. Historical Water Level. Located online at <http://www.fresno.gov/Government/DepartmentDirectory/PublicUtilities/Watermanagement/WaterInformation/HistoricalOverviewandFacts/HistoricalWaterLevel.htm>. Accessed November 2010.
- Natural Resource Conservation Service. 2010. *Web Soil Survey - Soil Survey of Fresno County, California, Northwestern Part*. Located online at <http://websoilsurvey.nrcs.usda.gov>. Accessed May 2010.
- Smith, A. R. 1964. Geologic Map of California: Bakersfield Sheet. 1:250,000. California Division of Mines and Geology.
- University of California Museum of Paleontology. 2009. Online Exhibits; the Paleontology Portal. Online: <http://www.ucmp.berkeley.edu/exhibits/index.php>. Site visited February 2009.

3.7 HAZARDS AND HAZARDOUS MATERIALS

This section presents potential impacts from hazards and hazardous materials posed by the project. The section provides the environmental and regulatory settings and includes a discussion of project impacts. Hazardous materials are defined by federal and state agencies to help protect public health and the environment. Implementation of the APMs will ensure that impacts to hazards and hazardous materials will be less than significant.

TABLE 3.7-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
HYDROLOGY AND WATER QUALITY				
Would the project:				
a) Violate any water quality standards or waste discharge requirements?			X	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			X	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			X	
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise substantially degrade water quality?			X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?			X	

TABLE 3.7-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

No impacts are anticipated to health and human safety as a result of implementation of the project. Construction and continued operation of this project are not anticipated to increase the risk of wildfires. Use of fuels and fluids for project construction equipment will not impact the human environment. These materials will be handled and controlled in such a manner as to avoid impact to the environment. Spill clean-up kits will be available onsite to clean up any accidental spills. Preconstruction environmental and construction safety training will be conducted prior to construction to educate workers on potential safety issues. The operation of the substation will be in accordance with the Spill Prevention Control Countermeasure (SPCC) Guidelines and is not likely to result in any significant impacts to health and safety.

3.7.1 Methodology

Potential impacts to the environment and public health from hazards and hazardous materials were evaluated on the basis of the existing conditions of the project site and adjacent properties, historical uses, and known contamination as reported in EPA and California Department of Toxic Substance Control databases to determine the likelihood of encountering hazardous materials.

3.7.2 Existing Conditions

3.7.2.1 Regulatory Background

Federal

Hazardous materials and waste are regulated at the federal level by the EPA through numerous laws. The following are the primary laws potentially applicable within the project area:

- Resource Conservation and Recovery Act-40 Code of Federal Regulations (CFR) Parts 240-299.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- National Oil and Hazardous Substances Pollution Contingency Plan.
- Clean Water Act.
- Spill Prevention, Control, and Countermeasures Plan – 40 CFR Part 112.
- Superfund Amendments and Reauthorization Act.
- Occupational Safety and Health Standards (Title 29 CFR Parts 1910 and 1926).

In addition, the Federal Aviation Administration (FAA) regulates aviation at regional, public, private, and military airports. Regulation 49 CFR Part 77.13 stipulates the height of structures near airports. The U.S. and California Departments of Transportation also require the proponent to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration when:

- Construction or alteration exceeds 200 feet above ground level.
- Construction or alteration is:
 - Within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet.
 - Within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet.
 - Within 5,000 feet of a public use heliport which exceeds a 25:1 surface.
- Requested by the FAA.
- Construction or alteration is located on a public use airport or heliport regardless of height or location.

State

The California Environmental Protection Agency (Cal/EPA) and the Department of Toxic Substances Control (DTSC) manage hazardous materials and waste within the State of California. The DTSC regulates hazardous waste, cleans existing contamination, and looks for ways to reduce hazardous waste produced in California. The Hazardous Waste and Control Law (HCLW), which is generally more stringent than its federal counterpart (i.e., the Resource Conservation and Recovery Act), is administered by Cal/EPA. The HCLW lists materials that may be hazardous and identifies criteria for proper handling and control of hazardous materials. Additional authority is given to the DTSC by the California Health and Safety Code. The DTSC is the agency that regulates, as well as cleans up, hazardous waste.

The California Occupational Safety and Health Administration (Cal/OSHA) is the primary state overseer of worker safety.

3.7.2.2 Environmental Setting

Hazardous materials are defined by the California Code of Regulations as:

A substance or combination of substances, which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or otherwise managed.

There are no known contaminated sites in the vicinity of the project area (California DTSC 2009). The substation site is currently being used for agricultural purposes. Soils in agricultural areas may be contaminated with residual herbicides, pesticides, and/or fumigants.

Electric and Magnetic Fields

Recognizing that there is public interest and concern regarding potential health effects from exposure to electric and magnetic fields (EMF) from power lines, this document provides some general background information regarding EMF associated with electric utility facilities in Appendix F.

However, EMF is not addressed here as an environmental impact under CEQA. The CPUC has repeatedly recognized that EMF is not an environmental impact to be analyzed in the context of CEQA because 1) there is no agreement among scientists that EMF does create a potential health risk, and 2) there are no defined or adopted CEQA standards for defining health risks from EMF. (See e.g., CPUC Decision No. 04-07-027 [Jul. 16, 2004]; Delta DPA Capacity Increase Substation Project Final MND and Supporting Initial Study [November 2006], A.05-06-022, section B.1.14.1, page B-31, adopted in D.07-03-009 [March 1, 2007].)

3.7.3 Impacts

3.7.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts from hazards and hazardous materials may be considered significant if the project will:

- Create a hazard to public health or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous materials within 0.25 mile of a school;
- Are located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, will create a hazard to the public or the environment;
- Are located within two miles of a public or private airport and will result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response or evacuation plan; and/or
- Expose people or structures to a risk of loss, injury, or death involving wild land fires.

3.7.3.2 Environmental Impacts

The criteria used to determine the significance of impacts from hazards and hazardous materials are based on Appendix G of the CEQA Guidelines.

Would the project:

- a) **Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous material?**

Less than significant. Use of small volumes of fuels and fluids, primarily petroleum hydrocarbons and their derivatives (e.g., fuels, lubricants, oils, and solvents), standard in the operation of construction equipment, including support vehicles, will be properly handled, cleaned-up, and disposed of in the case of an accidental spill. Spill clean-up kits will be available as outlined in APM Haz-1 (Table 2.13-1). A SWPPP will be prepared and implemented for project construction.

The substation includes three 45 megavolt ampere transformers and each transformer contains approximately 12,200 gallons of mineral oil for cooling. The mineral oil will not contain Polycarbonated Biphenyls (PCBs) and is non-toxic. The operation of the substation will be in accordance with the SPCC Guidelines and will include the construction of a spill retention basin as outlined in APM Haz-2 (Table 2.13-1). When insulators are taken out of

service, the mineral oil must be disposed of as hazardous waste. The limited use of hazardous materials in the construction and operation of the proposed project as well as the proposed measures to reduce risks from accidental spills of hazardous materials pose a less than significant risk.

- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?**

Less than significant. The implementation of APMs Haz-1 and Haz-2 (Table 2.13-1) will ensure that impacts due to the release of a hazardous material will be less than significant.

- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**

No impact. There will be no impact as there are no schools within one-quarter mile of the project.

- d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

Less than significant. There are no known contaminated sites in the vicinity of the project area (DTSC 2009). The project site and surrounding areas are currently being used for agricultural purposes. Disturbing soils in these areas could result in a significant impact from residual herbicides, pesticides, or fumigant contaminated soils, which may be present. Implementation of APM Haz-4 (Table 2.13-1) will ensure that any potential hazard will be less than significant.

- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport, result in a safety hazard for people residing or working in the project area?**

No impact. There are no airports located within two miles of the project area; therefore, there will be no impact.

- f) For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area?**

No impact. The nearest private airstrip, the Arnold Ranch Airport, is located over four miles northwest of the nearest point of the project area (Airnav 2009).

- g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

Less than significant impact. Construction of the power line interconnection may require brief periods where traffic is controlled along Copper Avenue. Traffic impacts are analyzed in Section 3.11. In the event an emergency response vehicle needed access or evacuation was necessary during these brief periods, PG&E will cease those work activities leading to road impairments. The potential for the project to impair an adopted emergency response plan or emergency evacuation plan is less than significant.

- h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fire, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

Less than significant. The project is not located in a wildland area. To prevent the spread of a wildfire in areas where there is a potential (e.g., the substation site and where the power line interconnection passes through undeveloped lands), APM Haz-3 (Table 2.13-1) will be implemented.

3.7.4 References

Airnav. 2009. Airports in the Vicinity of Clovis, California. Located online at <http://www.airnav.com>. Accessed March 2009.

California Department of Toxic Substances Control. 2009. EnviroStor query. Located online at <http://www.envirostor.dtsc.ca.gov/public/>. Accessed March 2009.

3.8 HYDROLOGY AND WATER QUALITY

This section presents information regarding hydrological and water quality resources for the project. It documents an analysis of likely impacts on hydrology and water quality. Implementation of the APMs will ensure that impacts to hydrology and water quality will be less than significant.

TABLE 3.8-1				
CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
HYDROLOGY AND WATER QUALITY				
Would the project:				
a) Violate any water quality standards or waste discharge requirements?			X	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			X	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			X	
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise substantially degrade water quality?			X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?			X	

TABLE 3.8-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

3.8.1 Methodology

This section analyzes impacts on hydrology and water quality from the implementation of the project based on changes to the environmental setting. Surface, floodplains, waters and wetlands in the project area were identified by reviewing USGS topographic maps, USGS Wetland Inventory Maps, FEMA panels, Fresno County floodplain maps, aerial photography, and by conducting a field investigation.

3.8.2 Existing Conditions

3.8.2.1 Regulatory Background

Federal

The Clean Water Act (CWA) is intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 CFR 1251). The regulations implementing the CWA protect waters of the U.S. including streams and wetlands (33 CFR 328.3). The CWA requires states to set standards to protect, maintain, and restore water quality by regulating point source and some non-point source discharges. Under Section 402 of the CWA, the National Pollutant Discharge Elimination System (NPDES) permit process was established to regulate these discharges. Construction projects that involve ground disturbance of acre or more are required to comply with the NPDES permit process. Project proponents must develop a SWPPP, which outlines Best Management Practices for controlling stormwater runoff from construction sites.

The National Flood Insurance Act (1968) makes available federally subsidized flood insurance to owners of flood-prone properties. To facilitate identifying areas with flood potential, Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps that can be used for planning purposes.

State

In California, NPDES permitting authority was turned over to the Regional Water Quality Control Board. California has nine regional boards. The project is located within the jurisdiction of the Central Valley Regional Water Quality Control Board.

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations.

3.8.2.2 Environmental Setting

The major regional waterways in the area are the Kings and San Joaquin rivers, which drain the area of the Sierra Nevada Mountains to the east. The Kings River is located approximately 15 miles southeast of the project area and the San Joaquin River is located approximately five miles to the west. The project area lies within a portion of the San Joaquin River watershed that is drained by Dry Creek. The floodplain associated with the project area is probably the residual of a tributary that emerged after the land was modified for agricultural uses.

Other water development facilities present in the project area include the Enterprise Canal and two ponds connected by a small irrigation ditch. The Enterprise Canal is a concrete-lined irrigation channel located in the southwestern portion of the project area. The man-made freshwater ponds are located between Behymer and Copper Avenues. A small irrigation ditch connects the two ponds. The irrigation ditch is a small, two foot wide unlined canal approximately 0.75 miles long. Both ponds have a surface area of approximately five acres. Two seasonal wetlands were identified during field reviews. The first seasonal wetland is located just south of the ponds and the second is located immediately north of the ponds. The first wetland is located in an area that appears to be disced for agricultural purposes. Maps of these seasonal wetlands are located in the Biological Resources section 3.4.

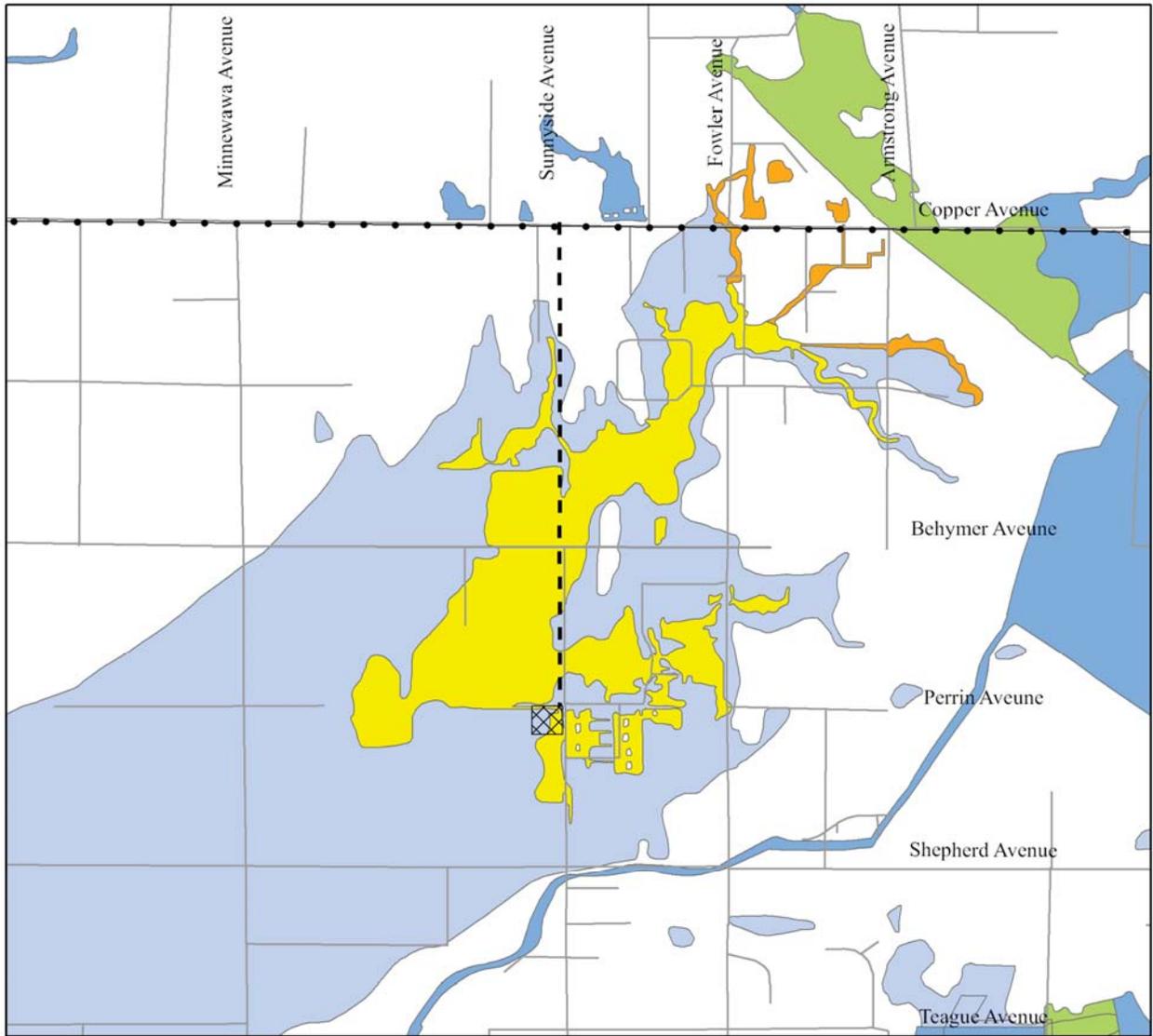
FEMA and Fresno County floodplain maps were reviewed to determine if the project area falls within any designated 100-year floodplain (FEMA 2009). Flood Insurance Rate Maps (FIRM) panels 06019C-1040H and -1580H identify a jurisdictional Zone AH floodplain within the project area (FEMA 2009). Zone AH is a special flood hazard area with a one percent chance of flooding in any given year to depths of one to three feet (Figure 3.8-1). Groundwater for the area is estimated at approximately 120 feet below the surface (City of Fresno 2010).

3.8.3 Impacts

3.8.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts to hydrology and water quality may be considered significant if the project will:

- Violates any water quality standards or waste discharge requirements;
- Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that will result in substantial erosion or siltation on- or off-site;
- Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increases the rate or amount of surface runoff in a manner that will result in flooding on or off site;
- Creates or contributes runoff water that will exceed the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff;
- Otherwise substantially degrades water quality;
- Places housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map;
- Places within a 100-year flood hazard area structures that will impede or redirect flood flows;
- Exposes people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; and/or
- Causes inundation by seiche, tsunami, or mudflow.

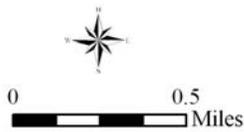


Legend

- Power Line Interconnection
- Proposed Substation
- Existing 115kV Power Line

Flood Hazard Zones

- Zone X - Annual Chance of Flooding 0.2%
- 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 Ponded
- Zone AO - Flood Depths of 1-3 Feet, Usually Sheet Flow on Sloping Terrain



Flood Hazard Map
Shepherd Substation Project

FIGURE 3.8-1

Source: Fresno County 2007



3.8.3.2 Environmental Impacts

The following section discusses significance criteria for hydrology and water quality impacts derived from the CEQA Checklist.

Would the project:

a) Violate any water quality standards or waste discharge requirements?

Less than significant. The project will not result in the discharge of waste into a waterway. Construction-related discharges could occur; however, these will be minimized through the implementation of APMs WQ-1 and WQ-2 (Table 2.13-1). Operation-related discharges are not anticipated; however, they could occur through accidental spills from substation equipment. Potential impacts from spills will be avoided through the installation of an onsite retention basin, which will contain any onsite spills.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

No impact. Construction and operation of the project will require no groundwater pumping. Water required during construction will be brought in via water trucks, and no water will be required for operational activities. Groundwater for the area is estimated at approximately 120 feet below the surface (City of Fresno 2008). Project construction activities will occur to a maximum depth of 40 feet, resulting in no interference to groundwater.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Less than significant. No stream or river courses will be altered as a result of the project. Agricultural fields surrounding the project are routinely flooded during irrigation. The project will be constructed at a slightly higher elevation than the surrounding areas to prevent flooding from local irrigation. The project will utilize an infiltration basin to prevent storm water runoff from leaving the site. The basin combined with the small footprint of the substation will ensure that the project will not result in substantial soil erosion or siltation on- or off-site. Additionally, the substation will consist of a crushed gravel surface in areas not occupied by roads or equipment and will not be entirely impervious.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less than significant. The project will not substantially alter the existing drainage pattern. See discussion under question c above.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Less than significant. Construction of the project will include the creation of compacted and impervious surfaces throughout the substation site, which could create a small increase in runoff due to decreased ground percolation throughout the substation site. During significant

- storm events, an increase in runoff from the site may occur. This increase will be less than significant, due to the small size of the project (approximately five acres), relative to the watershed.
- f) Otherwise substantially degrade water quality?**
Less than significant. The project will not substantially degrade water quality. Further, the implementation of a SWPPP and APM WQ-1 (Table 2.13-1) will prevent substantial degradation of water quality.
- g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?**
No impact. The project will not place housing within a 100-year flood hazard area.
- h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?**
Less than significant. The project will place structures within a 100-year flood hazard area. Approximately 40 percent of the substation site and 3,000 feet of power line are located in a FEMA-designated Zone AH floodplain. Substation design will incorporate a permanent stormwater management basin to minimize on-site and off-site flooding that might otherwise be produced by the new, altered drainage pattern or increased impervious surface. Along Sunnyside and Copper Avenues, power pole foundations will be placed to avoid increased flooding onto adjacent roadways.
- i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?**
No impact. The project is not located in a dam failure flood area.
- j) Inundation by seiche, tsunami, or mudflow?**
No impact. The project area is not subject to inundation by seiche, tsunami or mudflow.

3.8.4 References

- City of Fresno. 2010. Water Division of the City of Fresno. Historical Water Level. Located online at <http://www.fresno.gov/Government/DepartmentDirectory/PublicUtilities/Watermanagement/WaterInformation/HistoricalOverviewandFacts/HistoricalWaterLevel.htm>. Accessed November 2010.
- Federal Emergency Management Agency. 2009. FEMA Map Service Center, Map Search – Quick Order. <http://msc.fema.gov/webapp/wcs/stores/servlet/CategoryDisplay>. Accessed March 2009.

3.9 NOISE

This section describes potential impacts from noise resulting from the construction and operation of the project. Implementation of the APMs described in this section will ensure that impacts from noise will be less than significant.

TABLE 3.9-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
NOISE Would the project:				
a) Expose persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Expose persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c) Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

3.9.1 Methodology

Existing Fresno County and City of Clovis noise standards were reviewed. Sensitive noise receptors were identified and impacts were evaluated based upon estimated construction and operation noise levels. Sensitive noise receptors within 1,000 feet of the project have been identified in Figures 2.2-3 to 2.2-5 in Chapter 2. Sensitive noise receptors are generally defined as residences, schools, religious facilities, hospitals, and parks. Table 3.9-2 displays land use compatibility for various noise levels.

TABLE 3.9-2 Land Use Compatibility for Community Noise Environments								
Land Use Category	Community Noise Exposure (Outdoor) Day-Night Average Sound Level (Ldn) or Community Noise Equivalent Level (CNEL), decibels (dB)							
	50	55	60	65	70	75	80	85
Residential: Low-Density Single Family, Duplex, Mobile Homes								
Residential: Multiple Family								
Transient Lodging: Motels, Hotels								
Schools, Libraries, Churches, Hospitals, Nursing Homes								
Auditoriums, Concert Halls, Amphitheatres								
Sports Arena, Outdoor Spectator Sports								
Playgrounds, Neighborhood Parks								
Golf Courses, Riding Stables, Water Recreation, Cemeteries								
Office Buildings, Business Commercial and Professional								
Industrial, Manufacturing, Utilities, Agriculture								
	NORMALLY ACCEPTABLE	Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.						
	CONDITIONALLY ACCEPTABLE	New construction of development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.						
	GENERALLY UNACCEPTABLE	New construction of development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.						
	LAND USE DISCOURAGED	New construction or development should generally not be undertaken.						

Source: Fresno County General Plan 2000

3.9.2 Existing Conditions

3.9.2.1 Regulatory Background

Federal

The EPA has published guidelines for noise so as to protect human health and welfare (EPA 1974), but noise regulation is generally the responsibility of local governments.

State

The State of California Governor's Office of Planning and Research (OPR) General Plan Guidelines maintains recommendations for noise for local governments to establish noise regulations (California Governor's OPR 2003).

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations. The following analysis of local regulations relating to noise is provided for informational purposes and to assist with CEQA review.

Fresno County General Plan Noise Element

The Fresno County General Plan (2000) noise policies are listed below. It should be noted that construction-related activities are exempt (Section 8.40.060C of Fresno County Code), provided such activities do not take place before 6:00 a.m. or after 9:00 p.m. on any day except Saturday and Sunday, or before 7:00 a.m. or after 5:00 p.m. on Saturday and Sunday.

- Policy HS-G.1: The County shall require that all proposed development incorporate design elements necessary to minimize adverse noise impacts on surrounding land uses.
- Policy HS-G.5: Where noise mitigation measures are required to achieve acceptable levels according to land use compatibility or the Noise Control Ordinance, the County shall place emphasis of such measures upon site planning and project design. These measures may include, but are not limited to, building orientation, setbacks, earthen berms, and building construction practices. The County shall consider the use of noise barriers, such as soundwalls, as a means of achieving the noise standards after other design-related noise mitigation measures have been evaluated or integrated into the project.
- Policy HS-G.6: The County shall regulate construction-related noise to reduce impacts on adjacent uses in accordance with the County's Noise Control Ordinance.

Fresno County Noise Ordinance (Fresno County Code Chapter 8.40)

Fresno County Code 8.40.040 sets forth outdoor noise standards (Table 3.9-3). A special exception has been made for electrical substations in Section 8.40.090, stating that "Notwithstanding the provisions of Section 8.40.040, noise sources associated with the operation of electrical substations shall not exceed 50 decibels A-weighted (dBA) when measured as provided in Section 8.40.030."

Receiving Land Use	Noise Level Standard Descriptor	Daytime Standard (7 a.m. – 10 p.m.) (dB)	Nighttime Standard (10 p.m. – 7 a.m.) (dB)
Residential	Hourly Average (L_{eq})	50	45
Residential	Maximum Level (L_{max})	70	65

The Noise Ordinance further states that the following activities shall be exempt:

- Noise sources associated with construction provided such activities do not take place before 6:00 a.m. or after 9:00 p.m. on any day except Saturday or Sunday, or before 7:00 a.m. or after 5:00 p.m. on Saturday or Sunday (8.40.060 C).
- Noise sources associated with work performed by private or public utilities in the maintenance or modification of its facilities (8.40.060 G).

3.9.2.2 Environmental Setting

Existing noise levels are typical of low and medium-density residential areas. A typical noise level for such areas is between 50 and 60 dBA. Noises are generated primarily from vehicular traffic along roadways.

Sensitive noise receptors are limited to residences located east of the substation site and scattered along the power line alignment. The nearest sensitive noise receptor to the substation is a home located approximately 260 feet east of the proposed substation fence. The nearest sensitive noise receptor to the power line is a newly constructed home located just south of the power line terminus at Copper Avenue, which will be approximately 50 feet from the power line.

3.9.3 Impacts

3.9.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts from noise may be considered significant if the project will:

- Expose persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels;
- Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary increase or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

3.9.3.2 Environmental Impacts

The following section discusses significance criteria for noise impacts derived from the CEQA Checklist.

Would the project:

- a) **Expose Persons to or Generate Noise Levels in Excess of Standards Established in the Local General Plan or Noise Ordinance, or Other Applicable Standards?**

Less than significant. During construction, noise will be generated from the use of construction equipment identified in Tables 2.7.1 and 2.7.2, and from vehicles used to transport crews and materials to the project area. Noise levels for typical construction equipment at a distance of 50 feet from the equipment are displayed in Table 3.9-4.

Equipment use will be temporary. The maximum noise levels will range between 80 and 85 dBA at 50 feet from construction equipment. As a general rule of thumb, noise levels drop six dB every time the distance from a point source is doubled. Sensitive noise receptors are limited to residences located east of the substation site and scattered along the power line alignment. The nearest sensitive noise receptor to the substation is a home located approximately 260 feet east of the substation fence. The nearest sensitive noise receptor to the power line is a newly constructed home located just south of the power line terminus at Copper Avenue, which will be approximately 50 feet from the power line. Figures 2.2-3 to 2.2-5 display sensitive receptors within 1,000 feet of the project.

As described in APM Noise-1 (Table 2.13-1), construction of the proposed project will comply with the standards set forth in the Fresno County Noise Ordinance. Construction activities will not take place before 6:00 a.m. or after 9:00 p.m. on any day except Saturday or Sunday, or before 7:00 a.m. or after 5:00 p.m. on Saturday or Sunday, except as necessary for safety reasons or to perform certain construction activities when electrical clearances are available. Specifically, cut-over activities are typically performed at night when electricity loads are at their lowest levels. PG&E will employ APMs Noise-1 through Noise-7 (Table 2.13-1) to further minimize construction noise impacts. Impacts during construction will be less than significant.

Long-term noise impacts are discussed under criterion “c” below.

Equipment	Typical Maximum Noise Levels (dBA at 50 feet)
Front loader	80
Backhoe, excavator	80
Tractor, dozer	85
Grader, scraper	85
Dump truck	84
Pick-up truck	55
Concrete mixer truck	85
Crane (movable)	85
Pump	77
Generator	82
Compressor (air)	80
Pneumatic tools	85
Paver	85
Compactor (ground)	80
Auger drill rig	85

Source: U.S. Department of Transportation 2006.

b) Expose Persons to or Generate Excessive Groundborne Vibration or Groundborne Noise Levels?

Less than significant. Vibration from construction may result from heavy equipment driving on uneven surfaces, tamping the ground surface, and rock drilling. The level of vibration depends upon the distance to the receptor, the type of soil, and the intensity of the equipment creating the vibration. Generally, construction related groundborne vibration is not expected to extend beyond 25 feet from the generating source. No sensitive receptors are located within 25 feet of areas of construction. Thus, impacts will be less than significant.

Vibration from operation of the substation and power line is not expected and, therefore, there will be no impact.

c) Cause a Substantial Permanent Increase in Ambient Noise Levels in the Project Vicinity above Levels Existing without the Project?

Less than significant. The permanent noises generated by an electrical substation are limited to transformer operation and equipment and vehicles used by workers performing periodic maintenance.

Transformer noise generally contains a pure-tone or “hum” component, as well as noise associated with cooling fans and oil pumps that operate periodically. As shown in Figure 2.6.1, the transformers will be located near the eastern boundary of the substation. The nearest sensitive noise receptor is approximately 370 feet from the noise source. The approximate maximum noise level at this distance created from the operation of the three 45-MVA, 115/21 kV transformers will be approximately 46 dBA equivalent continuous sound level (L_{eq}). This estimated maximum noise level is below the typical ambient noise level of 50-60 dBA, and below the 50 dBA L_{eq} acceptable noise level average for electrical substations contained in the Fresno County Noise Ordinance. Less-than-significant noise levels will be further reduced by a planned eight-foot high prefabricated concrete wall along the eastern side of the substation perimeter. The noise impacts from operation of the substation will be less than significant.

Operation of the electrical power lines will not generate noise. Corona, a phenomenon that can cause a tiny electric discharge that can ionize air close to the conductors, creating a noise, is usually not a design issue for power lines rated at 230 kV and lower voltages.

Noise associated with routine inspection and maintenance of the project will be periodic, infrequent, and isolated, and will be less than significant.

d) Result in a Substantial Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity above Existing Levels?

Less than significant. Construction of the proposed project will result in increased temporary noise levels in the area of construction. Noise levels could reach levels close to 85 dB at the nearest sensitive noise receptors, depending upon the equipment in use. Implementation of APM Noise-1 through Noise-7 (Table 2.13-1) will reduce this impact. The majority of the work will be conducted in compliance with the local codes and ordinances, which restricts noise generating activities to daylight hours. However, it is possible that minimal construction activity will be required during nighttime hours. Specifically, cut-over activities

are generally conducted at night when electricity loads are at their lowest levels. Should work outside daylight hours be necessary, PG&E will notify neighbors and take appropriate measures to minimize disturbance. Impacts will be less than significant.

Operation of the substation and power line will not result in an increase in noise levels above allowable thresholds.

- e) **For a Project Located within an Airport Land Use Plan or, Where Such a Plan has not been Adopted within Two Miles of a Public Airport or Public Use Airport, Would the Project Expose People Residing or Working in the Project Area to Excessive Noise Levels?**

No impact. The project is not located within an airport land use plan or within two miles of a public use airport.

- f) **If Within the Vicinity of a Private Airstrip, would the Project Expose People Residing or Working within the Project Area to Excessive Noise Levels?**

No impact. The project is not located in the vicinity of a private airstrip.

3.9.4 References

California Governor's Office of Planning and Research. 2003. *General Plan Guidelines, Appendix C, Guidelines for the Preparation and Content of the Noise Element of the General Plan.*

Environmental Protection Agency. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March.

Fresno County. 2000. *Fresno County General Plan.* Located online at <http://www.co.fresno.ca.us/departmentspage.aspx?id=19705>.

U.S. Department of Transportation. 2006. *Construction Noise Handbook.* Final Report August 2006. FHWA-HEP-06-015 DOT-VNTSC-FHWA-06-02. NTIS No. PB2006-109102.

3.10 POPULATION, HOUSING, PUBLIC SERVICES, AND UTILITIES

This section describes the existing population and housing conditions, public services, and utility systems within the project area, and evaluates the potential impacts associated with project construction and operation. Impacts to population, housing, public services, and utilities will be less than significant and no APMs are required.

TABLE 3.10-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
POPULATION AND HOUSING				
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X	
c) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
b)				
i) Fire protection?			X	
ii) Police protection?			X	
iii) Schools?				X
iv) Parks?				X
v) Other public facilities?				X

TABLE 3.10-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
UTILITIES AND SERVICE SYSTEMS				
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X	
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X

Construction personnel will be employed during an estimated twelve month construction phase and no permanent positions will be created by the project. The workers are likely to be hired from the immediate area where they will commute from their residences, or may be lodged in hotels if traveling from a further distance.

3.10.1 Methodology

Population, housing, and employment statistics for Fresno County and the City of Clovis were reviewed. Local data were compiled from the U.S. Census Bureau, California Economic Development Department, and the Fresno County Planning Department.

3.10.2 Existing Conditions

3.10.2.1 Regulatory Background

Federal

There are no federal public services and utilities regulations, policies, or guidelines relative to the project area.

State

The California Integrated Waste Management Board, under the umbrella of the California Environmental Protection Agency, is the state agency designated to oversee, manage, and track California's solid waste generated each year. The Board develops laws and regulations to control and manage waste, working jointly with local governments to implement regulations and fund programs.

Wastewater is regulated by several state/regional agencies, including the State Water Resources Control Board, the California Department of Health Services, the California Department of Pesticide Regulation, the California Department of Toxic Substances, the California Department of Water Resources, and the Central Valley Regional Water Quality Control Board.

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations.

3.10.2.2 Environmental Setting

Population and Housing

The estimated population of Clovis in 2007 was 86,000 (California Department of Finance 2007). By 2010, the city's population is projected to reach 96,971, and by 2015, the expected population will be 413,200 (City of Clovis 2006).

Within the City of Clovis, educational services, healthcare, and the social assistance sector employ the largest percentage of the labor force, followed by the retail trade and manufacturing industries (US Census Bureau). Table 3.10-2 displays unemployment and income data for Clovis, Fresno County, and the State of California as of 2007.

TABLE 3.10-2			
Employment and Income Data for Fresno County and California			
Category	Clovis	Fresno County	California
Unemployment Rate*	8.9%	8.9%	6.6%
Median Household Income	\$59,825	\$47,298	\$59,948
*These estimates are from a period of time before the recent economic downturn. Current estimates (dated May 18, 2010) for unemployment are higher (California = 13.0%, Fresno County = 18.7%) Source: U.S. Census Bureau 2007, 2009; California Economic Development Department 2009			

Public Services

Fire protection services for the project area are provided by the County of Fresno North Clovis Fire Station #85, located at 1392 E. Nees Avenue, approximately two miles south of the project. The Fresno County Fire Department estimates that the response time to the project area is between four and eight minutes. Police patrol coverage is provided by the Fresno County Sheriff's Office, Area 2. The hospital nearest to the project area is the Community Medical Center, located approximately three miles south on Herndon Drive.

There are no schools located within one mile of the substation site. No existing parks are located within the project area, although two recreational paths, the Enterprise and the Dry Creek trails, are within the study area. Both of the trails are located south of Shepherd Avenue.

Utilities and Service Systems

PG&E provides electricity and natural gas to the immediate area. No potable water or garbage services will be provided to the substation.

3.10.3 Impacts

3.10.3.1 Significance Criteria

Population and Housing

Impacts to population, housing, and employment may be considered significant if they:

- Induce substantial population growth in the project area either directly (by proposing new homes and businesses) or indirectly (through extension of roads or other infrastructure);
- Displace a large number of existing residences, requiring replacement housing to be constructed elsewhere; or
- Displace a substantial number of people, necessitating the construction of replacement housing elsewhere.

Public Services

Impacts to public services may be considered significant if they:

- Result in the need for new or altered government services, such as fire and police protection, schools, parks, or other public facilities.

Utilities and Service Systems

Impacts to utilities and service systems may be considered significant if they:

- Exceed wastewater treatment requirements of the Regional Water Quality Control Board;
- Result in the need for new or altered water or wastewater treatment facilities or drainage facilities,
- Result in the need for construction of new stormwater drainage facilities;
- Result in the need for a new or expanded water supply;
- Result in the extension of a sewer trunk line with capacity to serve new development;
- Result in inadequate access to a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Cause a breach of published national, state, or local standards relating to solid waste.

3.10.3.2 Environmental Impacts

The following section discusses significance criteria for population, housing, public services, and utilities derived from the CEQA Checklist.

Would the project:

Population and Housing

- a) **Induce substantial population growth in an area, whether directly (by proposing new homes or businesses) or indirectly (through the extension of infrastructure)?**

Less than significant. Construction activities will be short-term and temporary. During peak construction, no more than 25 construction workers will be required. Construction workers will be drawn from existing PG&E staff from within Fresno County or adjacent areas and will not permanently increase the local population or affect available housing.

Operation of the substation and power line will be automated and will not require additional employees or induce population growth in the area.

The purpose of the project is to improve service reliability and meet projected future energy demands to accommodate the projected growth within the PG&E service area. PG&E is required by federal and CPUC rules to provide adequate energy to customers. As such, the project is responsive to future energy loads and will not indirectly cause substantial population growth.

- b) **Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?**

No impact. The substation is located in an agricultural area, and no existing housing will be displaced as a result of the project. Several residences are located adjacent to the power line corridor; none of these residences will be displaced by construction activities.

- c) **Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

No impact. As stated above, the substation and power line will not displace people or necessitate the construction of housing elsewhere.

Public Services

- a) **Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:**

- i) **Fire protection?**

Less than significant. Fire protection services for the project area are provided by the County of Fresno North Clovis Fire Station #85. Construction activities are not expected to increase the demand for fire protection services in a manner that will require the need for more facilities. Operation of the substation and power line will not be expected to increase the demand for fire protection services. Fire risk will be comparable to other existing electrical infrastructure in the vicinity of the project and will not create the need to increase local fire protection services. Additionally, the project is not expected to interfere with fire protection response times.

ii) Police protection?

Less than significant. The project is not expected to generate an increased need for police protection and will not interfere with current police protection services. Construction of the project will be temporary and will not result in a need for increased police protection. Project operation will include the operation of an automated substation and power line.

iii) Schools?

No impact. The project will not generate an increased need for schools and will not interfere with existing schools. Construction will be temporary and will not increase the demand for schools. Operation of the project will be automated.

iv) Parks?

No impact. The project will have no impact on parks as there will be no permanent increase in the population of the area.

v) Other public facilities?

No impact. The project will have no effect on other public facilities.

*Utilities and Service Systems***a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

No impact. Wastewater from the project will be self contained. During construction, wastewater will be contained within portable toilet facilities removed by an authorized waste disposal company, and disposed of at an approved site with adequate capacity to handle project related waste water. Operation of facilities will be automated, so no permanent waste facilities are needed.

b) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No impact. A stormwater detention basin will be constructed within the substation. It will be engineered to acceptable industry standards as well as the Fresno County basin capacity criteria and design standards. No expansion of existing stormwater facilities will be required. Substation stormwater drainage facilities are not expected to cause a significant environmental impact.

c) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

No impact. Water and wastewater at the project will be self-contained. During construction, water will be brought to the project site via water trucks and portable toilets will contain waste generated on site. No water or wastewater facilities are needed for the operation of the facility, so no treatment facilities will be required.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less than significant. Water use will be primarily for dust control during construction. Water supplies required for the project will be minimal and supplied via water trucks. This

use is temporary and the existing water supplies are adequate to support this use. During project operation, water use will be limited to irrigation of substation vegetation. This use will be adequately supported by existing water supplies.

- e) **Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

No impact. As discussed above the project will result in a limited generation of wastewater and existing facilities are adequately suited to handle the limited wastewater generated.

- f) **Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?**

Less than significant impact. Trash and debris generated during construction will be disposed of at a proper landfill site with adequate capacity to handle such material. The bulk of the material will result from the clearing of almond trees during construction of the substation. There will be no long term generation of trash or debris as a result of the project.

- g) **Comply with federal, state, and local statutes and regulations related to solid waste?**

No impact. The project will comply with all solid waste statutes and regulations.

3.10.4 References

_____ 2006. General Plan Map. City of Clovis, Department of Planning and Development Services Clovis, California.

California Department of Finance. 2007. E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change - January 1, 2006 and 2007. Sacramento, May 2007.

California Economic Development Department. 2009. Located online at <http://www.edd.ca.gov>. Accessed March 2009.

U.S. Census Bureau. 2007. *American Community Survey*. <http://www.census.gov/acs/www>. Accessed March 2009.

_____ 2009. <http://www.census.gov>. Accessed March 2009.

3.11 TRANSPORTATION AND TRAFFIC

This section presents potential impacts on local transportation and traffic conditions for the proposed project. Implementation of the APMs will ensure that impacts to transportation and traffic will be less than significant. During project construction, local roads will likely experience small increases in traffic. Once installed, the facilities will require monthly inspection and occasional maintenance. Traffic from operations and maintenance activities will not have a measurable impact on local roads.

TABLE 3.11-1 CEQA Initial Study Checklist				
Description	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporation	Less Than Significant Impact	No Impact
TRANSPORTATION/TRAFFIC				
Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X	
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			X	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?			X	
f) Result in inadequate parking capacity?				X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

3.11.1 Methodology

Reports and published plans from the City of Clovis, Fresno County, and California Department of Transportation (Caltrans) were reviewed and used to analyze the project's potential impacts on transportation.

3.11.2 Existing Conditions

3.11.2.1 Regulatory Background

Federal

No Federal regulations regarding transportation or traffic apply to the project, since there are no federally-maintained roads located within the project area.

State

If transportation involving oversize or excessive loads is required, PG&E will obtain a ministerial Caltrans transportation permit for oversize and excessive loads. PG&E will follow all terms of that permit.

Local

Because the CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary land-use regulations. If transportation involving oversize or excessive loads is required, PG&E will obtain a ministerial Fresno County transportation permit for oversize and excessive loads.

3.11.2.2 Environmental Setting

In Fresno County, State Route (SR) 99, SR 180, SR 41, and SR 168 are all major State-maintained roadways providing local access to the Clovis area. These routes are all located three or more miles from the project area. In the vicinity of the project study area, two-lane surface streets are present. Nees Avenue borders the project study area on the south and Copper Avenue borders the project's proposed power line interconnection on the north. These are both major east/west roads. Nees Avenue is a three-lane divided roadway at Minnewawa Avenue, and becomes a two-lane undivided road east of Clovis Avenue. Copper Avenue is a two-lane undivided road.

Minnewawa Avenue borders the project study area on the west and Armstrong Avenue, a dirt road, runs along the east side. Both are two-lane, undivided roads; however, Minnewawa Avenue becomes a four-lane divided roadway south of Shepherd Avenue, and Armstrong Avenue is a dirt road alignment between Behymer and Shepherd Avenues. Smaller residential roads within the project area include Perrin Road, Sunnyside Avenue, and Behymer Avenue. Access along all of these roads is unrestricted.

Shepherd Substation will be located on the southwestern corner of the intersection of Perrin and Sunnyside avenues. The proposed power line interconnection will travel from Copper Avenue directly south through orchards, agricultural fields, and along Sunnyside Avenue to the proposed substation. Sunnyside Avenue extends north along the east side of the substation but ends approximately 0.1 miles north of the substation. It is mainly used only by local landowners. The power line interconnection will cross Behymer Avenue at its intersection with Sunnyside Avenue.

It is anticipated that construction personnel will commute from surrounding areas. The main travel corridor will be along SR 99, after which construction personnel will use secondary surface streets to access the project area. During operation, the substation will not require permanent onsite personnel. Temporary and periodic visits to the substation will be required for operation and maintenance.

Alternative Transportation

There are several existing and proposed Class I (trails) and Class II (on-street/bicycle lanes) bicycle facilities located within the vicinity of the project; however, there are currently no existing facilities located within one mile of the proposed substation. Future on-street bicycle lane improvements are proposed along Shepherd Avenue and there are plans to extend bicycle trails along the Enterprise Canal, north of Shepherd Avenue, as seen in the Clovis Bicycle Transportation Plan (2003, 2009a,b). Fresno County is also in the process of developing a Bicycle Transportation Master Plan.

No commuter or freight rails are located near the project area. The closest commercial airport, Fresno Yosemite International Airport, is located approximately seven miles south of the project site. There are also several small, regional and privately owned airports and heliports located within ten miles of the project.

Levels of Service

A review of existing traffic conditions includes an analysis of intersection operation and road segment traffic flow. The results of the analysis are expressed in terms of level of service (LOS). LOS is the term used to describe the degree of traffic congestion. The various LOS range from A to F with “A” the best operating conditions and “F” the worst operating conditions.

The Fresno County General Plan reflects that current conditions are at LOS “C” for all roadways within the County’s rural areas and at LOS “D” within the spheres of influence of the cities of Fresno and Clovis. The City of Clovis has also established LOS “D” as its target standard and attained this level. Per the City’s General Plan, LOS “D” is a commonly used standard for cities throughout California, except when roadway construction or improvements make this threshold impractical, and lower levels of service are anticipated or experienced.

Caltrans has established LOS thresholds for the State Routes it maintains, including SR 99, SR 180, and SR 168. LOS data is not available for SR 41. Table 3.11-2 provides LOS thresholds for segments along these roadways that will be used to access the project vicinity.

Roadway	Segment	LOS
SR 99 ¹	Clovis Avenue to South Junction Route 99/41 Separation	C
SR 99 ¹	South Junction Route 99/41 Separation to North Junction Route 99/41 Separation	D
SR 99 ¹	North Junction Route 99/41 Separation to Ashlan Avenue	C
SR 99 ¹	Ashlan Avenue to Madera County Line	B
SR 180 ²	Brawley Avenue to SR 99	N/A
SR 180 ²	SR 99 to SR 41	B
SR 180 ²	SR 41 to SR 168	D
SR 180 ²	SR 168 to Chestnut Avenue	B
SR 180 ²	Chestnut Avenue to Temperance Avenue	N/A

TABLE 3.11-2 Levels of Service Standards for State Routes Used to Access the Project Vicinity		
Roadway	Segment	LOS
SR 180 ²	Temperance Avenue to Academy Avenue	D
SR 168 ³	SR 180 to Shaw Avenue	C
SR 168 ³	Shaw Avenue to Shepherd Avenue	B
SR 168 ³	Shepherd Avenue to Sample Road	D
¹ 2003 Data; ² 2004 Data; ³ 2005 Data Source: California Department of Transportation 2010, Transportation Concept Reports		

3.11.3 Impacts

3.11.3.1 Significance Criteria

According to Appendix G of the CEQA Guidelines, impacts on transportation may be considered significant if the project:

- Results in an impact to existing traffic flows, including a substantial increase in traffic;
- Prevents area roadways from meeting Caltrans, County, or City established LOS standards;
- Causes a change in air traffic patterns;
- Results in a substantial increase in hazards due to design features or incompatible uses;
- Results in inadequate emergency access;
- Results in inadequate parking capacity, or
- Conflicts with adopted policies, plans, or programs supporting alternative transportation.

3.11.3.2 Environmental Impacts

This section discusses significance criteria for impacts on transportation derived from the CEQA Checklist.

Would the project:

- a) **Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?**

Less than significant impact. The immediate project area is expected to experience a slight increase in the traffic load during project construction. To minimize traffic impacts, APM Tran-1 (Table 2.13-1) will be implemented. On average, approximately six to ten construction personnel will commute daily to the project area from surrounding areas during construction. During the peak of construction, no more than 25 workers are expected to commute to the project area. Impacts will be temporary and are not likely to result in congestion.

Within the project area, Sunnyside and Copper avenues may need to be temporarily reduced to one lane during construction. Sunnyside Avenue, however, provides access to a small residential area with very light traffic. As a result, the temporary closures will cause insignificant traffic delays and congestion within the project area. As Copper Avenue will only be impacted temporarily while the interconnection line is tied into the existing power line, any delays will be temporary. During substation and power line operation, only periodic maintenance visits will be necessary.

- b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?**
Less than significant impact. SR 99, SR 41, SR 180, and SR 168 are all major State Routes that will provide access to the project area. Local access will be via surface streets, such as Shepherd, Copper, Sunnyside, Behymer, Minnewawa, Herndon, and Nees avenues. The State Routes and local streets are expected to be able to handle the increased travel during construction, operation, and maintenance of the project without modification or constraints, due to the project's relatively short timeframe for construction and minimal number of personnel and equipment needed daily during construction, operation, and maintenance. The project is not likely to exceed an established LOS standard.
- c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?**
No impact. Project construction, operation, and maintenance will not affect air traffic patterns or impact an FAA-designated air safety zone around an existing airport. The project is not within a FAA-designated air safety zone.
- d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**
No impact. The project will not create any new driving hazards or incompatible uses during either construction or operation and maintenance.
- e) Result in inadequate emergency access?**
Less than significant impact. PG&E will notify emergency services and transit/bus authorities concerning the project and possible intersection closures or detours. Any closures will be temporary and limited to brief periods of localized construction. Operation and maintenance activities will not create any closures or detours resulting in inadequate emergency access.
- f) Result in inadequate parking capacity?**
No impact. The project will not affect any existing parking lots. Construction and operation and maintenance personnel will park at the substation site and will not create an increased need for parking.
- g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?**
No impact. No bike paths, sidewalks, commuter rails, freight rails, or airports will be affected by the project. Construction and operation and maintenance of the project will not conflict with any alternative transportation policies, plans or programs.

3.11.4 References

California Department of Transportation. 2010. Located online at:

<http://www.dot.ca.gov/dist6/planning/tcrs/index.htm#sr14>. Accessed May 26, 2010.

City of Clovis. 2003. *Clovis Bicycle Transportation Plan*. Located online at:

<http://www.ci.clovis.ca.us/ServicesAndDepartments/Planning/Pages/BicycleTransportationPlan.aspx>. Accessed May 2010.

_____. 2009a. Municipal Code. http://nt5.scbbs.com/cgi-bin/om_isapi.dll?clientID=374125399&depth=2&infobase=clovis.nfo&record={1099}&softpage=PL_frame. Accessed November 2009.

_____. 2009b. Trails of Clovis. <http://www.ci.clovis.ca.us/SiteCollectionDocuments/PublicUtilities/Parks/ClovisTrailsMap.pdf>. Accessed November 2009.

4.0 CUMULATIVE ANALYSIS

4.1 GROWTH-INDUCING IMPACTS

4.1.1 Significance Criteria

Per the CEQA Guidelines, the following criteria were used to evaluate whether the project will result in potentially individual or cumulative growth-inducing impacts:

- Will the project, either directly or indirectly, foster economic or population growth, or remove obstacles to growth in the area?
- Will the project provide new employment?
- Will the project provide access to previously inaccessible areas or extend public services to previously unserved areas?
- Will the project burden existing community services?
- Will the project cause development elsewhere?

4.1.2 Analysis of Growth-Inducing Impacts

4.1.2.1 Economic or Population Growth

The project is being implemented to increase the reliability of the existing electrical system. The project is not being implemented to promote growth but, rather, in response to growth. The purpose of the project is to improve reliability and meet projected future energy loads, specifically for peak demands, based on energy demand forecasts. PG&E is required by federal and CPUC rules to provide adequate energy to customers. The project is being proposed to meet the needs of projected future energy loads and, as such, is responsive to future energy loads and will not be growth-inducing.

4.1.2.2 New Employment

Construction activities will be short-term and temporary. During the peak of construction activities, no more than 25 construction personnel will be required. Construction personnel will come from within Fresno County or adjacent areas and will not permanently increase the local population or affect available housing. Operation of the substation and power line will be automated and will not require additional employees. The automated features for operation of this project will not result in long-term growth in this area.

4.1.2.3 Extended Access, Extended Public Services

PG&E currently provides service to the project area. The project is proposed to meet future growth demands. The project will not provide access to previously inaccessible areas, or extend public services to areas not currently served.

4.1.2.4 Existing Community Services

The project will not burden community services. The substation will not require wastewater, or solid waste services. Water will be required for irrigation of landscaping, but the amount will be negligible. The impacts on police and fire protection services are expected to be negligible.

4.1.2.5 New Development

The project will not promote new development. The project is designed to meet the future projected demand for electricity in response to growth approved and projected by local planning agencies.

4.2 CUMULATIVE IMPACTS

4.2.1 Significance Criteria

CEQA defines a cumulative impact as an effect that is created as a result of the combination of the proposed project together with other projects (past, present, or future) causing related impacts. Cumulative impacts of a project need to be evaluated when the project's incremental effect is cumulatively considerable and, therefore, potentially significant.

4.2.1.1 Analysis of Cumulative Impacts

Future projects that may act cumulatively were identified by reviewing the Fresno County and the City of Clovis general plans. The City and County planning department staff were contacted to determine the status of approved or proposed projects. A summary of projects identified near the project is provided below.

New Park and Enterprise Trail Extension

The City of Clovis is proposing a park extending to the north and south of Shepherd Avenue at the intersection of Shepherd and Sunnyside avenues, approximately 0.25 miles south of the substation site. In addition, Fresno County has an extension of the Enterprise Trail planned from the proposed park, trending north along the Enterprise Canal. This trail will also be located approximately 0.25 miles south of the substation site.

New Church

A church facility is proposed for the northwest corner of Teague and Fowler Avenues, approximately 0.5 miles southeast of the substation site. The conditional use permit for the church was approved by the Fresno County Planning Commission in September 2008.

As discussed in Chapter 4, the majority of the potential impacts resulting from the project will be short term, occurring during project construction, with negligible impacts resulting from project operation. Because construction impacts are of a short duration and localized, they will have to occur concurrently and in proximity of other future projects in order to have a cumulative impact. Construction impacts, which are primarily related to air quality, biological resources, noise, and traffic, are not likely to act cumulatively with the two identified future projects in a manner that will result in significant impacts, as these projects are located too far away to act cumulatively. Additionally, short-term construction-related impacts are not typically considered significant under CEQA.

Long-term impacts associated with operation of the proposed project will be limited to aesthetics, biological resources, and noise. With regards to aesthetics, the substation and power line are new elements added to the visual landscape in the project area. Other past and present projects have also changed the visual landscape in the project area, and future projects are expected to continue to change the visual landscape. The substation and power line are located at a sufficient distance from other future projects so as not to create a cumulative visual impact.

Operation of the project will not result in the loss of sensitive biological habitats. The substation will be located within an existing almond orchard and the power line will avoid sensitive habitats. As such, when combined cumulatively with other projects, the proposed project will not result in impacts to biological resources that are cumulatively considerable.

As discussed in section 3.9, noise impacts from project operation will be insignificant and localized to the area immediately surrounding the substation site. There are no projects that have been identified within proximity of the substation site that will contribute to noise pollution. The nearest project with the potential to act cumulatively is over 0.25 miles from the substation site, too far away to be cumulatively considerable with any noise generated by the substation.

APPENDIX A

KEY OBSERVATIONAL POINTS VISUAL SIMULATIONS



Photo



Simulation



East Copper Avenue - This simulation depicts the proposed power line connecting to the existing 115kV power line parallel to East Copper Avenue. The view is east from the intersection of Sunnyside Avenue and East Copper Avenue.

Shepherd Substation Project

KOP 1



Photo



Copper Avenue - This photo depicts the existing 115 kV power line that parallels East Copper Avenue on the south side of the road. In addition, the power lines located on the north side of the road are also visible. The photo is a view south and west along the proposed power line. The existing line would tie into the proposed power line near the end of the driveway of the new residence. The new residence was built within the last year.

Shepherd Substation Project

Simulation



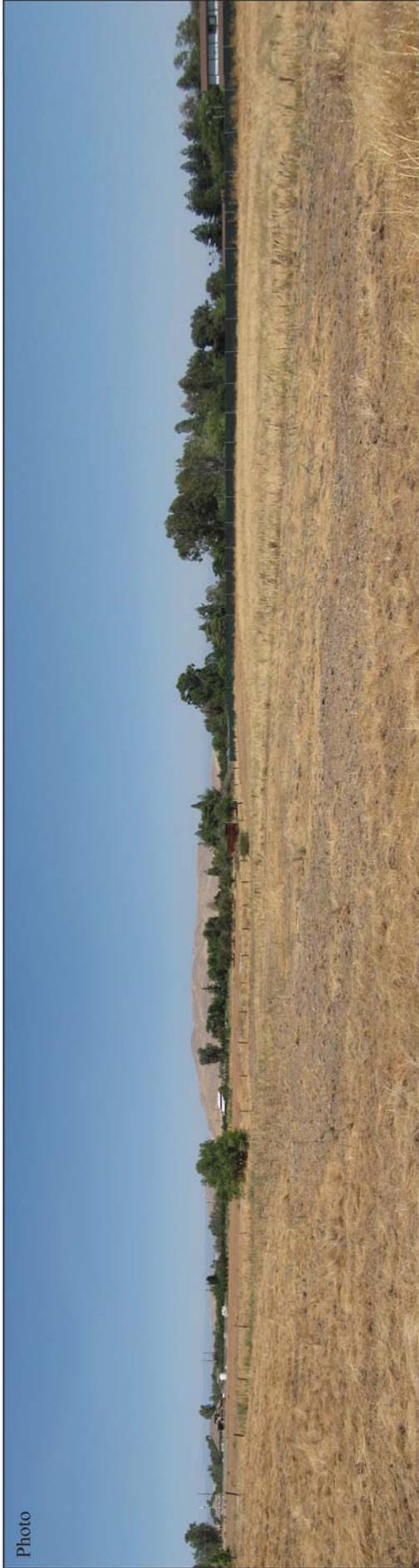
Copper Avenue - This simulation depicts the power line connecting to the existing 115 kV power line that parallels East Copper Avenue. The view looks south and west along the proposed power line.

Shepherd Substation Project

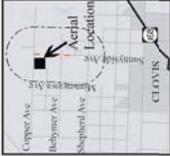
KOP 2 After



Photo



Simulation



Pasture between Copper Avenue and Behymer Avenue -
 This simulation depicts a view to the north and east from the area near a residence west of the proposed power line.

Shepherd Substation Project

KOP 3



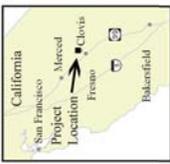


Photo



Simulation

Proposed substation

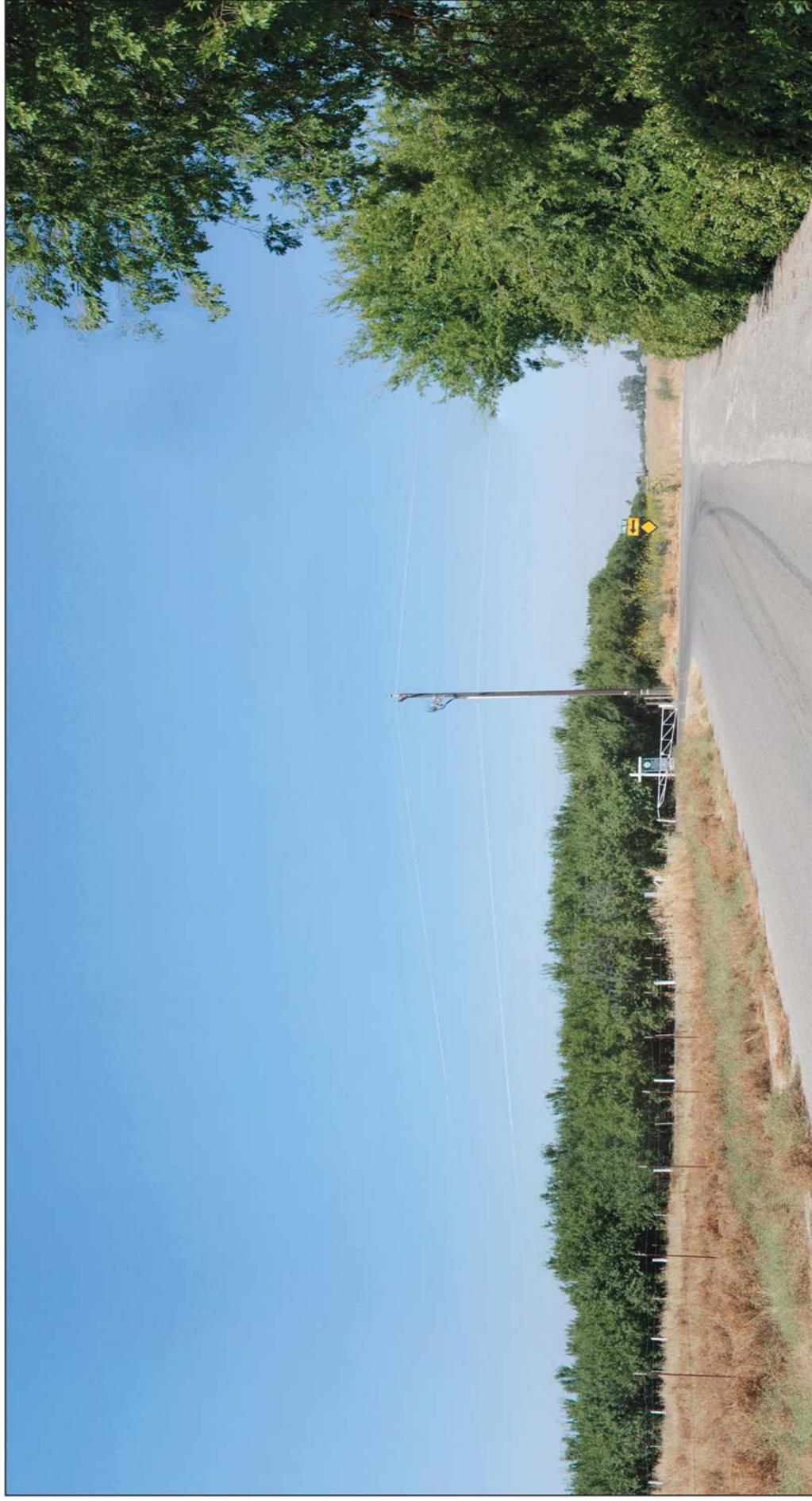


Intersection of Behymer Avenue and the power line - This simulation depicts a view to the south looking along the proposed power line with the proposed substation in the distance. The open area on the right side of the simulation is where the pasture and flood retention areas are located.

Shepherd Substation Project

KOP 4





East of Sunnyside Avenue along Perrin Avenue - This view is to the west toward the proposed substation. This is a primary entrance point and intersection from Sunnyside Avenue for the surrounding residences.

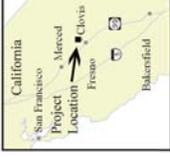
Shepherd Substation Project



KOP 5 Before



Simulation



East of Sunnyside Avenue along Perrin Avenue - 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.

Shepherd Substation Project

KOP 5 After



Photo



Simulation



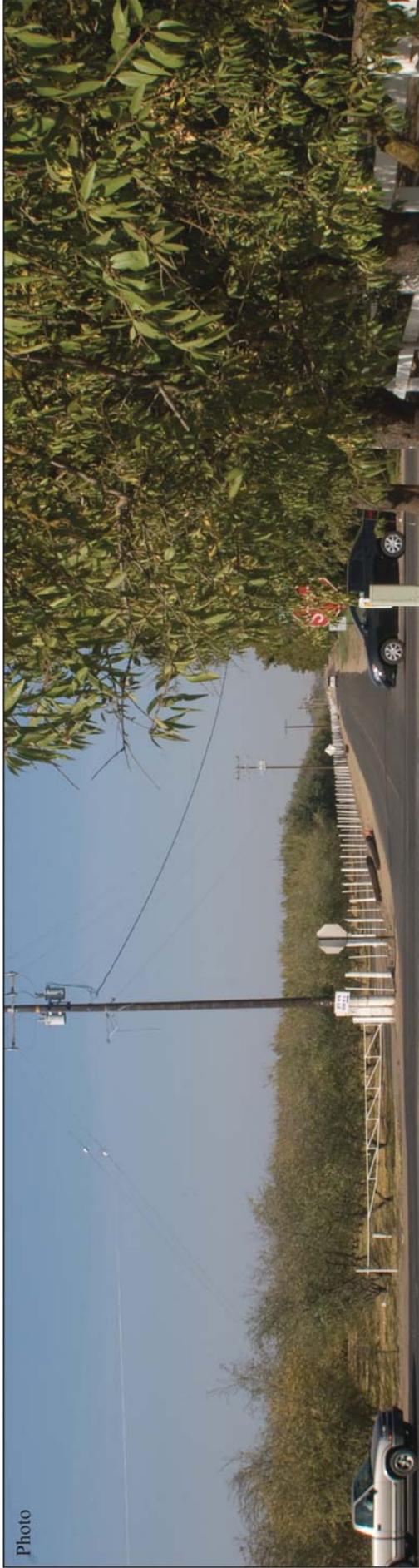
South of Sunnyside Avenue and Perrin Avenue - This viewpoint is located at the edge of the nearest residence located directly across the street from the proposed substation. The view looks north and west along Sunnyside Avenue. The substation wall and entry gates are visible through the almond orchard, which will remain as depicted.

Shepherd Substation Project

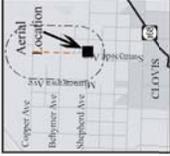
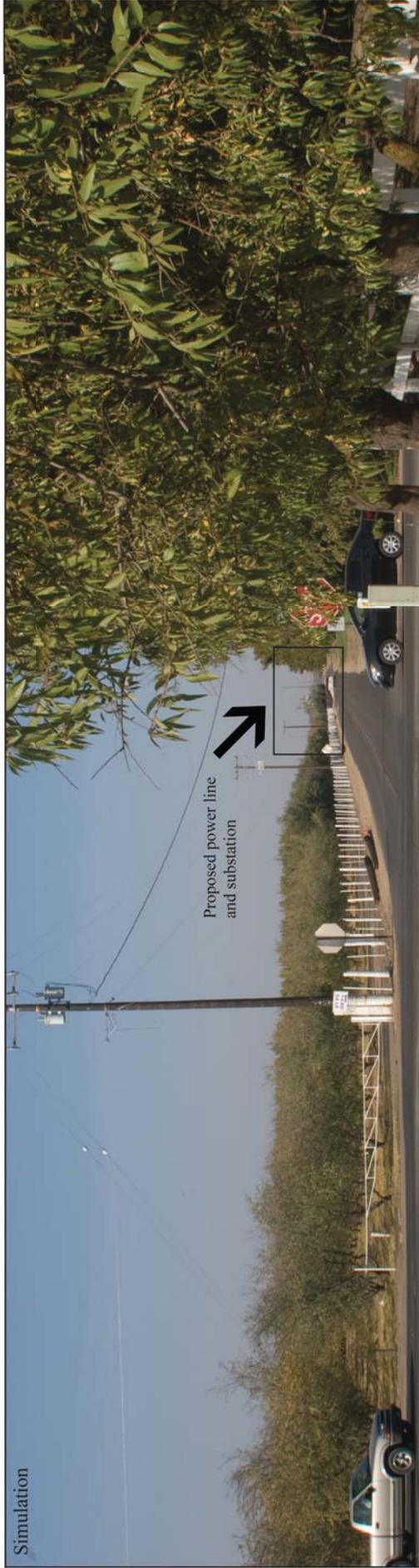
KOP 6



Photo



Simulation



Intersection of Sunnyside Ave. and Shepherd Ave. - This is the primary entrance point for the project area and adjacent to nearest designated recreation feature which is an existing recreational trail and proposed park. The proposed Shepherd Substation and 115 kV power line are located approximately 1/2 mile north of the viewpoint, along the west side of Sunnyside Ave and is barely visible. Sunnyside Ave is the road extending from the bottom to the top of the photo.

Shepherd Substation Project

APPENDIX B
PROPERTY OWNER LIST

APPENDIX B PROPERTY OWNER LIST

PROPERTY OWNER LIST	
Property Address	Mailing Address
Not Found	5469 E. Olive Ave., Fresno 93727
9485 Sunnyside Ave., Clovis 93619	10173 N. Spanish Bay Dr., Fresno, 93720
4648 E. Shepherd Ave., Clovis 93619	2917 E. Shepherd Ave., Clovis 93612
5025 E. Behymer Ave., Clovis 93619	Same
5065 E. Behymer Ave., Clovis 93619	Same
9864 N. Sunnyside Ave., Clovis 93619	Same
9724 N. Sunnyside Ave., Clovis 93619	Same
9798 N. Sunnyside Ave., Clovis 93619	Same
9494 N. Sunnyside Ave., Clovis 93619	Same
5070 Perrin Rd., Clovis 93619	Same
9580 N. Sunnyside Ave., Clovis 93619	Same
Not Found	597 Goshen Ave., Clovis 93611
5037 Perrin Rd., Clovis 93619	14732 Encendido, San Diego 92127-3808
9422 Sunnyside Ave., Clovis 93619	Same
9364 Sunnyside Ave., Clovis 93619	Same
4890 E. Copper Ave., Clovis 93619	2054 E. Sawgrass Ave., Fresno 93619
Not Found	10939 N. Renn Ave., Clovis 93611
4715 Copper Ave., Clovis CA 93611	Same
4825 E. Copper Ave., Clovis 93619	Same
Not Found	2917 E. Shepherd Ave., Clovis 93611
5018 E. Copper Ave., Clovis 93619	Same
5040 E. Copper Ave., Clovis 93619	Same
10791 N. Purdue Ave., Clovis, 93619	Same
10825 N. Purdue Ave., Clovis, 93619	1295 E. Valley Forge Dr., Fresno 93720
10847 N. Purdue Ave., Clovis 93619	Same

PROPERTY OWNER LIST	
Property Address	Mailing Address
10881 N. Purdue Ave., Clovis 93619	Same
10737 N. Purdue Ave., Clovis 93619	Same
10769 N. Purdue Ave., Clovis 93619	Same
5039 E. Copper Ave. Clovis 93619	PO Box 1472, Clovis 93613
5098 Horseshoe Bend Ave., Clovis 93619	Same
5106 Horseshoe Bend Ave., Clovis 93619	Same
5114 Horseshoe Bend Ave., Clovis 93619	Same
5120 Horseshoe Bend Ave., Clovis 93619	Same
5109 E. International Ave., Clovis 93619	Same
5092 Horseshoe Bend Ave., Clovis 93619	11158 E. Belmont Ave., Sanger 93657
5104 E. Behymer Ave., Clovis 93619	634 Cromwell Ave., Clovis 93611
5110 E. Behymer Ave., Clovis 93619	Same
10361 N. Fowler Ave., Clovis 93619	Same
Not Found	634 Cromwell Ave., Clovis 93611
5105 E. International Ave., Clovis 93619	Same

APPENDIX C
LETTERS OF SUPPORT

APPENDIX B LETTERS OF SUPPORT**C.1 County of Fresno Letter**

County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
ALAN WEAVER, DIRECTOR

June 25, 2010

Pacific Gas & Electric Co.
ATTN: Greg Parker
650 "O" Street, Bag 23
Fresno, CA 93760-0001

Re. Shepherd Substation and 115kv Extension Project in Fresno County

Dear Mr. Parker:

Thank you for meeting with me on April 12th, 2010. I appreciated learning about the proposed Shepherd Substation and the 1.5 mile 115 KV Power line extensions. I understand the proposed project is to improve system reliability and meet future needs of Fresno County, and the residents of the City of Clovis.

I understand that PG&E will be seeking a Permit to Construct (PTC) from the California Public Utility Commission (CPUC). The Department is supportive of your application and appreciates that PG&E is investing in upgrading of the infrastructure in the County. The County has requested PG&E to submit a Non-Discretionary Site Plan Review for the Substation. Once PG&E has received its PTC, there will be no permits necessary from the County to perform this work as described.

I look forward to working with you as you work through the permit process.

Sincerely,

Lynn Gorman, ACIP
Deputy Director of Planning

c. Bernard Jimenez, Development Services Division Manager

C.2 City of Clovis Letter

City of Clovis
Department of Planning and Development Services
CITY HALL · 1033 FIFTH STREET · CLOVIS, CA 93612

May 6, 2010

Greg Parker
Principal Land Planner
1455 E. Shaw
Fresno, Ca 93711

**SUBJECT: Shepherd Substation and 115kv Extension
Project in Fresno County**

Dear Mr. Parker:

Thank you for meeting with me and Deputy City Planner David Fey on April 13th, 2010. We appreciated the update about the proposed Shepherd Substation and the 1.5 mile 115 KV Power line extensions. I understand the proposed project will improve system reliability and meet the future needs of Fresno County and the residents of the City of Clovis.

I also understand that PG&E will be seeking a Permit to Construct (PTC) from the California Public Utility Commission (CPUC). The Department is supportive of your application and appreciates that PG&E is making needed investments to upgrade the metropolitan area's infrastructure. Once PG&E has received its PTC, there will be no permits necessary from the City to perform this work as described.

I look forward to continuing to work with you through the permit process.

Sincerely,

Dwight Kroll, AICP
Director of Planning
and Development Services

J:\GPU\ShepherdSub050310.DOC

APPENDIX D
AIR EMISSIONS CALCULATIONS

APPENDIX D AIR EMISSIONS CALCULATIONS

9/7/2010 3:33:49 PM

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

ROG NOx CO SO2 PM10 PM2.5 CO2

TOTALS (tons/year, unmitigated)

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

ROG NOx CO SO2 PM10 PM2.5 CO2

TOTALS (tons/year, unmitigated)

0.00 0.00 0.00 0.00 0.00 0.00 0.00

Summary Report for Summer Emissions (Pounds/Day)

File Name: P:\U03-56\Urbemis\090710 updates.urb924

Project Name: Shepard Substation

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	4.13	75.32	26.80	0.00	25.01	2.29	27.29	5.22	2.14	7.36	9,797.14
2010 TOTALS (lbs/day mitigated)	4.13	75.32	26.80	0.00	25.01	2.29	27.29	5.22	2.14	7.36	9,797.14
2011 TOTALS (lbs/day unmitigated)	7.98	143.88	36.27	0.00	5.01	3.84	7.95	1.05	3.57	3.81	18,836.19
2011 TOTALS (lbs/day mitigated)	7.98	143.88	36.27	0.00	5.01	3.84	7.95	1.05	3.57	3.81	18,836.19

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)							

Summary Report for Annual Emissions (Tons/Year)

File Name: P:\U03-56\Urbemis\090710 updates.urb924

Project Name: Shepard Substation

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	0.07	1.36	0.43	0.00	0.00	0.04	0.04	0.00	0.04	0.04	178.10
2011 TOTALS (tons/year unmitigated)	0.17	3.06	0.87	0.00	0.00	0.09	0.09	0.00	0.08	0.08	397.14

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)							

Summary Report for Summer Emissions (Pounds/Day)

File Name: P:\U03-56\Urbemis\090710 updates.urb924

Project Name: Shepard Substation

Project Location: San Joaquin Valley APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	4.37	79.88	28.28	0.00	0.01	2.42	2.43	0.00	2.26	2.27	10,382.95
2011 TOTALS (lbs/day unmitigated)	8.49	153.09	38.44	0.00	0.01	4.09	4.09	0.00	3.80	3.80	20,038.91

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)							

APPENDIX E

TRIBAL CONSULTATION CORRESPONDENCE

APPENDIX E TRIBAL CONSULTATION CORRESPONDENCE**E.1 Sample Tribal Consultation Letter**

January 7, 2009

Tribe/Nation
Address

Re: Pacific Gas and Electric Company's Shepherd Substation Project, Fresno County, California

Dear _____:

The purpose of this letter is to request any information or comments that you might have regarding cultural resources or areas of concern to Native American communities within or near PG&E's proposed Shepherd Substation Project (see enclosed maps). The Area of Potential Effect (APE) is located on private land. The California Public Utilities Commission is acting as the lead agency for California Environmental Quality Act (CEQA) review. For this reason, tribal scoping is being conducted.

The proposed substation would be constructed on approximately five acres of almond orchard. There are several transmission line alternatives which would connect the substation to the existing electrical supply grid. All transmission line alternatives are less than four miles in length. The project is located within sections 17 and 20, Township 12 South, Range 21 East, Clovis 7.5-minute USGS topographic quadrangle map (Mount Diablo Baseline and Meridian). PG&E has retained Transcon Environmental, Inc. to conduct the evaluation and to do an archaeological survey of the APE.

Coordination with the Native American Heritage Commission (NAHC) has been conducted and no information on the project area was available. NAHC has recommended that you be contacted. Please let us know if you have any concerns with the project. Any other information that you can provide for this project area would also be helpful. If you have any questions or comments, please feel free to contact me at (480) 807-0095.

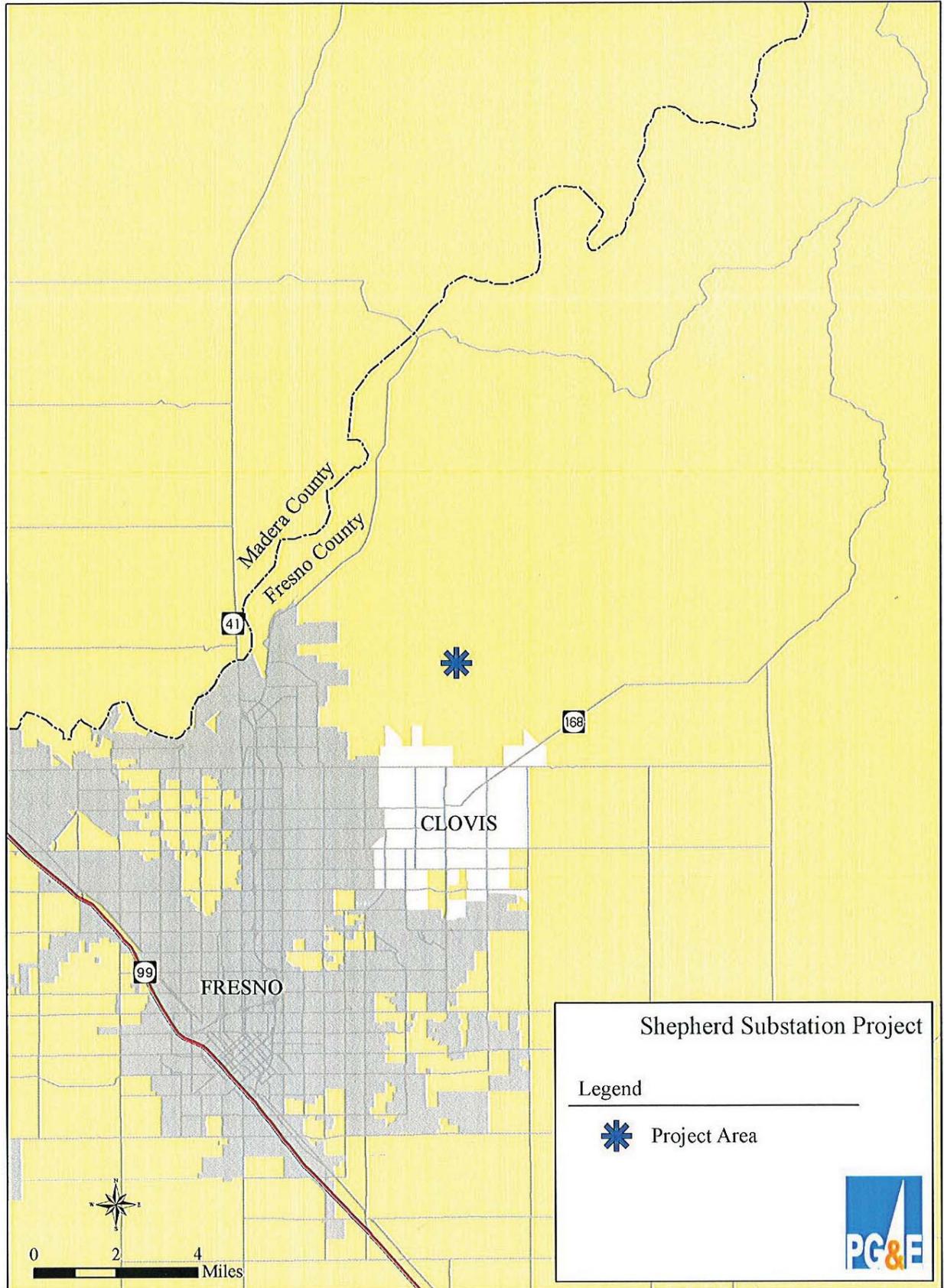
Sincerely,

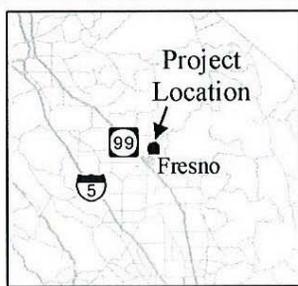
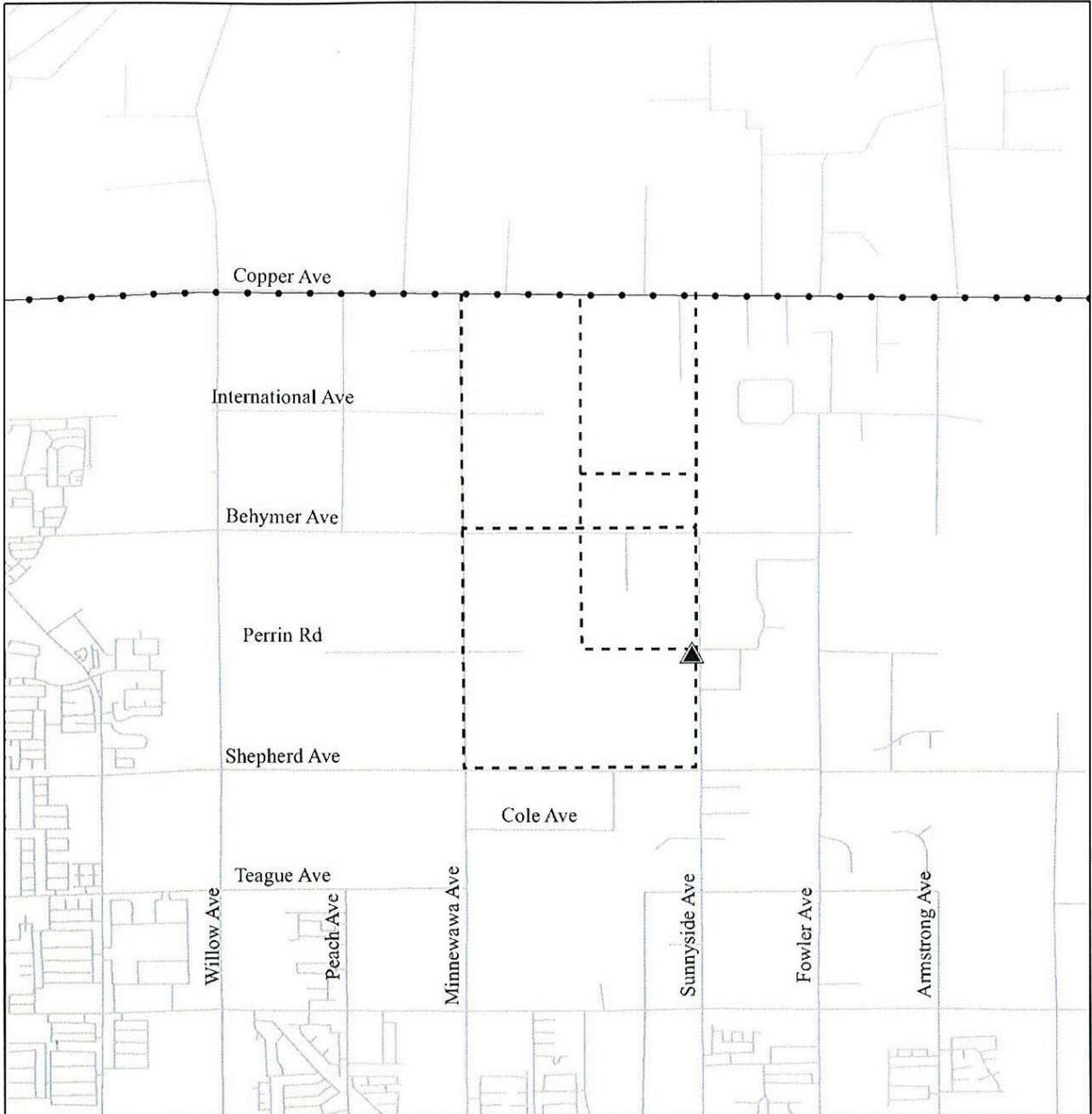
Transcon Environmental

A handwritten signature in black ink, appearing to read "Everett Bassett".

Everett Bassett
Cultural Resources Director

encl.

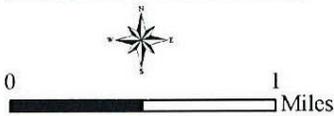




Legend

-  Proposed Shepherd Substation
-  Transmission Line Alternatives
-  Existing 115kV Transmission Line

Shepherd Substation Project
Pacific Gas and Electric Company



E.2 Native American Heritage Commission Letter

STATE OF CALIFORNIA **Arnold Schwarzenegger, GOVERNOR**

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 864
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5890
Web Site www.nahc.ca.gov
na_nahc@pacbell.net



December 22, 2008

Mr. Everett Bassett
TRANSCON ENVIRONMENTAL
3740 E. Southern Avenue, Suite 218
Mesa, Arizona 85206

Sent by FAX to 480-807-0068
No. Pages: 3

Re: Request for a Sacred Lands File records search for Shepherd Substation Project located north of Clovis and southeast of Friant in Fresno County, California

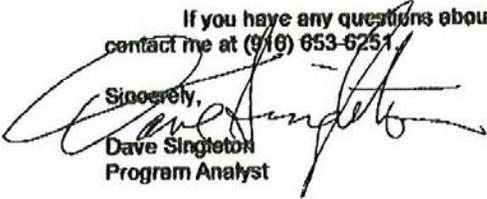
Dear Mr. Bassett:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE). The SLF search failed to indicate the presence of numerous Native American cultural resources in the project area (APE or 'area of potential effect).. The absence of an archaeological or historical resource does not indicate that it does not exist. Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. A Native American tribe or individual may be the only source of a cultural resource.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes that may have knowledge of cultural resources in the project area. We recommend that you contact the other persons on the attached list of Native American contacts. They may have specific knowledge as to whether or not the known cultural resources identified may be at-risk by the proposed project

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5007.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List

**Native American Contacts
Fresno County
December 22, 2008**

Big Sandy Rancheria of Mono Indians
Connie Lewis, Chairperson
 P.O. Box 337 / 7302 Rancheria Western Mono
 Auberry , CA 93602
 cl@bigsandyrancheria.com
 (559) 855-4003
 (559) 855-4129 Fax

Dumna Wo-Wah Tribal Government
Keith F. Turner, Tribal Contact
 P.O. Box 306
 Auberry , CA 93602
 Dumna/Foothill
 Mono
 (559) 855-3128 Home
 (559) 696-0191 (Cell)

Gold Springs Rancheria of Mono Indians
Travis Coleman, Chairperson
 P.O. Box 209 Mono
 Tollhouse , CA 93667
 tcoleman@ca.ihs.gov
 (559) 855-5043
 559-855-4445 - FAX

Traditional Choinumni Tribe
Angie Osborne
 2787 N Piedra Road Choinumni/Foothill
 Sanger , CA 93657
 (559) 787-3336

North Fork Mono Tribe
Ron Goode, Chairperson
 13396 Tollhouse Road Mono
 Clovis , CA 93619
 eagleye@cuip.net
 (559) 299-3729 Home

Sierra Nevada Native American Coalition
Lawrence Bill, Interim Chairperson
 P.O. 125 Mono
 Dunlap , CA 93621 Foothill Yokuts
 (559) 338-2354

Table Mountain Rancheria
Lee Ann Walker Grant, Chairperson
 P.O. Box 410 Yokuts
 Friant , CA 93626-0177
 (559) 822-2587
 (559) 822-2693 FAX

Choinumni Tribe; Choinumni/Mono
Lorrie Planas
 2736 Palo Alto Choinumni
 Clovis , CA 93611 Mono

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Pacific Gas and Electric Company's Shepherd Substation Project located north of Clovis and southeast of Friant in Fresno County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Native American Contacts
Fresno County
December 22, 2008

Kings River Choinumni Farm Tribe
John Davis, Chairman
1064 Oxford Avenue Foothill Yokuts
Clovis , CA 93612-2211 Choinumni
559-324-9908

Dumna Tribal Government
Jim Redmoon - Cultural Resources Representative
1305 E. Sussex Way Dumna/Foothill
Fresno , CA 93704 Choinumni
559-241-0226

Kings River Choinumni Farm Tribe
Stan Alec
2248 Vartikian Foothill Yokuts
Clovis , CA 93611 Choinumni
559-297-1787
559-647-3227 - cell

The Choinumni Tribe of Yokuts
Rosemary Smith, Chairperson
1505 Barstow Choinumni
Clovis , CA 96311 Foothill YoKut
monoclovis@yahoo.com
559-862-5757

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Pacific Gas and Electric Company's Shepherd Substation Project located north of Clovis and southeast of Friant in Fresno County, California for which a Sacred Lands File search and Native American Contacts list were requested.

APPENDIX F

ELECTRIC AND MAGNETIC FIELDS

APPENDIX F ELECTRIC AND MAGNETIC FIELDS

The California Public Utilities Commission (CPUC) and the California Department of Health Services (CDHS) have not concluded that exposure to magnetic fields from utility electric facilities is a health hazard. Many reports have concluded that the potential for health effects associated with electric and magnetic field (EMF) exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures.

EMF is a term used to describe electric and magnetic fields that are created by electric voltage (electric field) and electric current (magnetic field). Power frequency EMF is a natural consequence of electrical circuits, and can be either directly measured using the appropriate measuring instruments or calculated using appropriate information.

F.1 Electric Fields

Electric fields are present whenever voltage exists on a wire, and are not dependent on current. The magnitude of the electric field is primarily a function of the configuration and operating voltage of the line, and decreases with the distance from the source (line). The electric field can be shielded (i.e., the strength can be reduced) by any conducting surface, such as trees, fences, walls, buildings, and most types of towers. The strength of an electric field is measured in volts per meter (V/m) or kilovolts per meter (kV/m).

F.2 Magnetic Fields

Magnetic fields are present whenever current flows in a conductor, and are not dependent on the voltage present on the conductor. The strength of these fields also decreases with distance from the source. However, unlike electric fields, most common materials have little shielding effect on magnetic fields.

The magnetic field strength is a function of both the current on the conductor and the design of the system. Magnetic fields are measured in units called Gauss. However, for the low levels normally encountered near power systems, the field strength is expressed in a much smaller unit, the milligauss (mG), which is one thousandth of a Gauss.

Power frequency EMF is present where electricity is used. It is present around not only utility transmission lines, distribution lines, and substations, but the building wiring in homes, offices, and schools, and in the appliances and machinery used in these locations. Typical magnetic fields from these sources can range from below 1 mG to above 1,000 mG (1 Gauss).

Magnetic field strengths diminish with distance. Fields from compact sources (i.e., those containing coils such as small appliances and transformers) decrease in inverse proportion to the distance from the source cubed. For three-phase transmission lines with balanced currents, the magnetic field strength drops off inversely proportional to the distance from the line squared. Fields from unbalanced currents, which flow in paths such as neutral or ground conductors, fall off inversely proportional to the distance from the source. Conductor spacing and configuration also affect the rate at which the magnetic field strength decreases.

The magnetic field levels of Pacific Gas and Electric Company's overhead and underground transmission lines would vary depending upon customer power usage. Magnetic field strengths for typical Pacific Gas and Electric Company transmission line loadings at the edge of rights-of-way are approximately 10–90 mG. Under peak load conditions, the magnetic fields at the edge of the right-

of-way would not likely exceed 150 mG. There are no long-term, health-based State or Federal government EMF exposure standards. State regulations for magnetic fields have been developed in New York and Florida (150 mG and 200 mG at the edge of the right-of-way). However, these are based on limiting exposure from new facilities to levels no greater than existing facilities.

The strongest magnetic fields around the outside of a substation come from the transmission lines entering and leaving the station. The strength of the magnetic fields from transformers and other equipment decreases quickly with distance. Beyond the substation fence, the magnetic fields produced by the equipment within the station are typically indistinguishable from background levels.

F.3 Possible Health Effects

The possible effects of EMF on human health have come under scientific scrutiny. Concern about EMF originally focused on electric fields; however, much of the recent research has focused on magnetic fields. Uncertainty exists as to what characteristics of magnetic field exposure need to be considered to assess human exposure effects. Among the characteristics considered are field intensity, transients, harmonics, and changes in intensity over time. These characteristics may vary from transmission lines to appliances to home wiring, and this may create different types of exposures. The exposure most often considered is intensity or magnitude of the field.

There is a consensus among the medical and scientific communities that there is insufficient evidence to conclude that EMF causes adverse health effects. Neither the medical nor scientific communities have been able to provide any foundation upon which regulatory bodies could establish a standard or level of exposure that is known to be either safe or harmful. Laboratory experiments have shown that magnetic fields can cause biologic changes in living cells, but scientists are not sure whether any risk to human health can be associated with them. Some studies have suggested an association between surrogate measures of magnetic fields and certain cancers while others have not.

F.4 California Public Utilities Commission Decision Summary

On January 15, 1991, the CPUC initiated an investigation to consider its role in mitigating the health effects, if any, of electric and magnetic fields from utility facilities and lines. A working group of interested parties, called the California EMF Consensus Group, was created by the CPUC to advise it on this issue. It consisted of seventeen stakeholders representing citizens groups, consumer groups, environmental groups, State agencies, unions, and utilities. The Consensus Group's fact-finding process was open to the public, and its report incorporated concerns expressed by the public. Its recommendations were filed with the Commission in March 1992.

In August 2004, the CPUC began a proceeding known as a “rulemaking” (R.04-08-020) to explore whether changes should be made to existing CPUC policies and rules concerning EMF from electric transmission lines and other utility facilities.

Through a series of hearings and conferences, the Commission evaluated the results of its existing EMF mitigation policies and addressed possible improvements in implementation of these policies. The CPUC also explored whether new policies are warranted in light of recent scientific findings on the possible health effects of EMF exposure.

The CPUC completed the EMF rulemaking in January 2006 and presented these conclusions in Decision D.06-01-042:

- The CPUC affirmed its existing policy of requiring no-cost and low-cost mitigation measures to reduce EMF levels from new utility transmission lines and substation projects.

- The CPUC adopted rules and policies to improve utility design guidelines for reducing EMF, and provides for a utility workshop to implement these policies and standardize design guidelines.
- Despite numerous studies, including one ordered by the Commission and conducted by the CDHS, the CPUC stated “we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences.”
- The CPUC said it would “remain vigilant” regarding new scientific studies on EMF, and if these studies indicate negative EMF health impacts, the Commission would reconsider its EMF policies and open a new rulemaking if necessary.

In response to a situation of scientific uncertainty and public concern, the decision specifically requires Pacific Gas and Electric Company to consider “no-cost” and “low-cost” measures, where feasible, to reduce exposure from new or upgraded utility facilities. It directs that no-cost mitigation measures be undertaken, and that low-cost options, when they meet certain guidelines for field reduction and cost, be adopted through the project certification process. Pacific Gas and Electric Company was directed to develop, submit and follow EMF guidelines to implement the CPUC decision. Four percent of total project budgeted cost is the benchmark in implementing EMF mitigation, and mitigation measures should achieve incremental magnetic field reductions of at least 15 percent.

F.5 Reviews of EMF Studies

Hundreds of EMF studies have been conducted over the last 20 years in the areas of epidemiology, animal research, cellular studies, and exposure assessment. A number of nationally recognized multi-discipline panels have performed comprehensive reviews of the body of scientific knowledge on EMF. These panels’ ability to bring experts from a variety of disciplines together to review the research gives their reports recognized credibility. It is standard practice in risk assessment and policymaking to rely on the findings and consensus opinions of these distinguished panels. None of these groups have concluded that EMF causes adverse health effects or that the development of standards was appropriate or would have a scientific basis.

Reports by the National Research Council/National Academy of Sciences, American Medical Association, American Cancer Society, National Institute of Environmental Health Sciences, World Health Organization, International Agency for Research on Cancer, and CDHS conclude that insufficient scientific evidence exists to warrant the adoption of specific health-based EMF mitigation measures. The potential for adverse health effects associated with EMF exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures.

F.6 National Institute of Environmental Health Sciences

In June of 1999, the federal government completed a \$60-million EMF research program managed by the National Institute of Environmental Health Sciences (NIEHS) and the U.S. Department of Energy known as the EMF RAPID (Research and Public Information Dissemination) Program. In their report to the U.S. Congress, the NIEHS concluded that:

The NIEHS believes that the probability that extremely low frequency (ELF)-EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal, scientific support that exposure to this agent is causing any degree of harm.

The NIEHS report also included the following conclusions:

1. The National Toxicology Program routinely examines environmental exposures to determine the degree to which they constitute a human cancer risk and produces the ‘Report on Carcinogens’ listing agents that are ‘known human carcinogens’ or ‘reasonably anticipated to be human carcinogens.’ It is our opinion that based on evidence to date, ELF-EMF exposure would not be listed in the ‘Report on Carcinogens’ as an agent ‘reasonably anticipated to be a human carcinogen.’ This is based on the limited epidemiological evidence and the findings from the EMF-RAPID Program that did not indicate an effect of ELF-EMF exposure in experimental animals or a mechanistic basis for carcinogenicity.
2. The NIEHS agrees that the associations reported for childhood leukemia and adult chronic lymphocytic leukemia cannot be dismissed easily as random or negative findings. The lack of positive findings in animals or in mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but cannot completely discount the finding. The NIEHS also agrees with the conclusion that no other cancers or non-cancer health outcomes provide sufficient evidence of a risk to warrant concern.
3. Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiological findings.
4. The NIEHS suggests that the level and strength of evidence supporting ELF-EMF exposure as a human health hazard are insufficient to warrant aggressive regulatory actions; thus, we do not recommend actions such as stringent standards on electric appliances and a national program to bury all transmission and distribution lines. Instead, the evidence suggests passive measures such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. NIEHS suggests that the power industry continue its current practice of siting transmission lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. We also encourage technologies that lower exposures from neighborhood distribution lines, provided that they do not increase other risks, such as those from accidental electrocution or fire.

F.7 U.S. National Research Council/National Academy of Sciences

In May 1999, the National Research Council/National Academy of Sciences, an independent scientific agency responsible for advising the federal government on science, technology, and medicine, released its evaluation of the scientific and technical content of research projects conducted under the U.S. EMF RAPID Program, concluding that:

The results of the EMF-RAPID program do not support the contention that the use of electricity poses a major unrecognized public-health danger. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue, but a special research-funding effort is not required. Investigators should compete for funding through traditional research-funding mechanisms. If future research on this subject is funded through such mechanisms, it should be limited to tests of well-defined mechanistic hypotheses or replications of reported positive effects. If carefully performed, such experiments would have value even if their results

are negative. Special efforts should be made to communicate the conclusions of this effort to the general public effectively.

The following specific recommendations are made by the committee:

The committee recommends that no further special research program focused on possible health effects of power-frequency magnetic fields be funded. Basic research on the effects of power-frequency magnetic fields on cells and animals should continue, but investigators should compete for funding through traditional research funding mechanisms. If, however, Congress determines that another time-limited, focused research program on the health effects of power-frequency magnetic fields is warranted, the committee recommends that emphasis be placed on replications of studies that have yielded scientifically promising claims of effects, and that have been reported in peer-reviewed journals. Such a program would benefit from the use of a contract-funding mechanism with a requirement for complete reports and/or peer-reviewed publications at program's end. The engineering studies were initiated without the guidance of a clearly established biologic effect. The committee recommends that no further engineering studies be funded unless a biologic effect that can be used to plan the engineering studies has been determined. Much of the information from the EMF-RAPID biology program has not been published in peer-reviewed journals. NIEHS should collect all future peer-reviewed information resulting from the EMF-RAPID biology projects and publish a summary report of such information periodically on the NIEHS Web site. The communication effort initiated by EMF-RAPID is reasonable. The two booklets and the telephone information line are useful, as is the EMF-RAPID Internet site. There are two limitations to the effort. First, it is largely passive, responding to inquiries and providing information, rather than being active. Second, much of the information produced is in a scientific format not readily understandable by the public. The committee recommends that further material produced to disseminate information on power-frequency magnetic fields be written for the general public in a clear fashion. The Web site should be made more user friendly. The booklet Questions and Answers about EMF should be updated periodically and made available to the public.

F.8 World Health Organization

The World Health Organization (WHO) established the International EMF Project in 1996 to investigate potential health risks associated with exposure to electric and magnetic fields (EMF). A WHO Task Group recently concluded a review of the health implications of extremely low frequency (ELF) EMF.

A Task Group of scientific experts was convened in 2005 to assess any risks to health that might exist from exposure to ELF EMFs. Previously in 2002, the International Agency for Research on Cancer examined the evidence regarding cancer; this Task Group reviewed evidence for a number of health effects, and updated the evidence regarding cancer. The conclusions and recommendations of the Task Group are presented in a World Health Organization report titled “Extremely Low Frequency Fields Environmental Health Criteria Monograph No.238” and Factsheet No 322:

- “New human, animal and in vitro studies, published since the 2002 International Agency for Research on Cancer monograph, do not change the overall classification of ELF magnetic fields as a possible human carcinogen.”
- “A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between extremely low frequency magnetic fields and any of these diseases is much weaker than for childhood

- leukemia, and in some cases (e.g., for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease.”
- “The epidemiological evidence is weakened by methodological problems, such as potential selection bias. In addition, there are no accepted biophysical mechanisms that would suggest that low-level exposures are involved in cancer development. Thus, if there were any effects from exposures to these low-level fields, it would have to be through a biological mechanism that is as yet unknown. Additionally, animal studies have been largely negative. Thus, on balance, the evidence related to childhood leukemia is not strong enough to be considered causal.”
 - “Policy-makers should establish an ELF-EMF protection programme that includes measurements of fields from all sources to ensure that the exposure limits are not exceeded either for the general public or workers.”
 - “Government and industry should monitor science and promote research programmes to further reduce the uncertainty of the scientific evidence on the health effects of ELF field exposure.”
 - “Policy-makers, community planners and manufacturers should implement very low-cost measures when constructing new facilities and designing new equipment including appliances.”
 - “Changes to engineering practice to reduce ELF exposure from equipment or devices should be considered, provided that they yield other additional benefits, such as greater safety, or little or no cost.”
 - “When changes to existing ELF sources are contemplated, ELF field reduction should be considered alongside safety, reliability and economic aspects.”

F.9 International Agency for Research on Cancer

In June of 2001, the International Agency for Research on Cancer, a branch of the World Health Organization, evaluated the carcinogenic risk to humans of static and extremely low-frequency EMF. In October of 2001, the World Health Organization published a Fact Sheet that summarized the International Agency for Research on Cancer findings. Below is an excerpt from the fact sheet:

- In June 2001, an expert scientific working group of International Agency for Research on Cancer reviewed studies related to the carcinogenicity of static and ELF electric and magnetic fields. Using the standard International Agency for Research on Cancer classification that weighs human, animal and laboratory evidence, ELF magnetic fields were classified as possibly carcinogenic to humans based on epidemiological studies of childhood leukemia. Evidence for all other cancers in children and adults, as well as other types of exposures (i.e., static fields and ELF electric fields) was considered not classifiable either due to insufficient or inconsistent scientific information.
- “Possibly carcinogenic to humans” is a classification used to denote an agent for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals.
- This classification is the weakest of three categories (“is carcinogenic to humans”, “probably carcinogenic to humans” and “possibly carcinogenic to humans”) used by International Agency for Research on Cancer to classify potential carcinogens based on published scientific evidence. Some examples of well-known agents that have been classified by International Agency for Research on Cancer are listed below:

Classifications	Examples of Agents
“Carcinogenic to humans” (usually based on strong evidence of carcinogenicity in humans)	<ul style="list-style-type: none"> • Asbestos • Mustard gas • Tobacco (smoked and smokeless) • Gamma radiation
“Probably carcinogenic to humans” (usually based on strong evidence of carcinogenicity in animals)	<ul style="list-style-type: none"> • Diesel engine exhaust • Sun lamps • UV radiation • Formaldehyde
“Possibly carcinogenic to humans” (usually based on evidence in humans which is considered credible, but for which other explanations could not be ruled out)	<ul style="list-style-type: none"> • Coffee • Styrene • Gasoline engine exhaust • Pickled Vegetables • ELF magnetic fields

Do ELF Fields Cause Cancer?

ELF fields are known to interact with tissues by inducing electric fields and currents in them. This is the only established mechanism of action of these fields. However, the electric currents induced by ELF fields commonly found in our environment are normally much lower than the strongest electric currents naturally occurring in the body, such as those that control the beating of the heart.

Since 1979 when epidemiological studies first raised a concern about exposures to transmission line frequency magnetic fields and childhood cancer, a large number of studies have been conducted to determine if measured ELF exposure can influence cancer development, especially leukemia in children.

There is no consistent evidence that exposure to ELF fields experienced in our living environment causes direct damage to biological molecules, including DNA. Since it seems unlikely that ELF fields could initiate cancer, a large number of investigations have been conducted to determine if ELF exposure can influence cancer promotion or co-promotion. Results from animal studies conducted so far suggest that ELF fields do not initiate or promote cancer.

Pooled analyses of epidemiological studies provide insight into the epidemiological evidence that played a pivotal role in the International Agency for Research on Cancer evaluation. These studies suggest that, in a population exposed to average magnetic fields in excess of 0.3 to 0.4 μT , twice as many children might develop leukemia compared to a population with lower exposures. In spite of the large number database, some uncertainty remains as to whether magnetic field exposure or some other factor(s) might have accounted for the increased leukemia incidence.

Childhood leukemia is a rare disease with 4 out of 100,000 children under the age of 14 diagnosed every year. Also, average magnetic field exposures above 0.3 or 0.4 μT in residences are rare. It can be estimated from the epidemiological study results that less than 1% of populations using 240-volt power supplies are exposed to these levels, although this may be higher in countries using 120-volt supplies.

The International Agency for Research on Cancer review addresses the issue of whether it is feasible that ELF-EMF pose a cancer risk. The next step in the process is to estimate the likelihood of cancers in the general population from the usual exposures and to evaluate evidence for other (non-cancer) diseases. This part of the risk assessment should be finished by World Health Organization in the next 18 months.

F.10 American Cancer Society

In the journal *A Cancer Journal for Clinicians*, the American Cancer Society (ACS) reviewed EMF residential and occupational epidemiologic research in an article written by Dr. Clark W. Heath, Jr., ACS's vice president of epidemiology and surveillance research. Dr. Heath reviews thirteen residential epidemiologic studies of adult and childhood cancer. Dr. Heath wrote:

Evidence suggesting that exposure to EMF may or may not promote human carcinogenesis is mostly based on...epidemiologic observations.... While those observations may suggest such a relationship for leukemia and brain cancer in particular, the findings are weak, inconsistent, and inconclusive.... The weakness and inconsistent nature of epidemiologic data, combined with the continued dearth of coherent and reproducible findings from experimental laboratory research, leave one uncertain and rather doubtful that any real biologic link exists between EMF exposure and carcinogenicity.

F.11 American Medical Association

The American Medical Association adopted recommendations of its Council on Scientific Affairs regarding EMF health effects. The report was prepared as a result of a resolution passed by American Medical Association's membership at its 1993 annual meeting. The following recommendations are based on the Council on Scientific Affairs' review of EMF epidemiologic and laboratory studies to date, as well as on several major literature reviews:

1. Although no scientifically documented health risk has been associated with the usually occurring levels of electromagnetic fields, the American Medical Association should continue to monitor developments and issues related to the subject.
2. The American Medical Association should encourage research efforts sponsored by agencies such as the National Institutes of Health, the U.S. Department of Energy, and the National Science Foundation. Continuing research should include study of exposures to EMF and its effects, average public exposures, occupational exposures, and the effects of field surges and harmonics.
3. The American Medical Association should support the meeting of an authoritative, multidisciplinary committee under the auspices of the National Academy of Sciences or the National Council on Radiation Protection and Measurements to make recommendations about exposure levels of the public and workers to EMF and radiation.

References

- American Cancer Society. 1996. "Electromagnetic Field Exposure and Cancer: a Review of Epidemiologic Evidence." In *A Cancer Journal for Clinicians*. American Cancer Society. January/February.
- American Medical Association. 1994. *Effects of Electric and Magnetic Fields*. Report of the Council on Scientific Affairs to the American Medical Association. December.
- California Public Utilities Commission. 1993. Order instituting investigation on the Commission's own motion to develop policies and procedures for addressing the potential health effects of electric and magnetic fields of utility facilities. Decision 93-11-013. November 2.
- _____ 2006. Order Instituting Rulemaking to update the Commission's policies and procedures related to electromagnetic fields emanating from regulated utility facilities. Decision 06-01-042 January 26, 2006.
- National Institute of Environmental Health Sciences, National Institutes of Health .1999. *NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. Prepared in Response to the 1992 Energy Policy Act*. June.
- National Research Council/National Academy of Sciences. 1999. Research on Power-Frequency Fields Completed Under the Energy Policy Act of 1992 [Final Report, 1999]. May.
- Pacific Gas and Electric Company. 2006. EMF Design Guidelines for Electrical Facilities.
- World Health Organization International EMF Project 2001. Fact Sheet No. 263, Electromagnetic Fields and Public Health Extremely Low Frequency Fields and Cancer. October.
- World Health Organization. 2007a. Extremely low frequency (ELF) fields. Environmental Health Criteria, Vol. 238.
- _____ 2007b. Electromagnetic Fields and Public Health: Exposure to Extremely Low Frequency Fields. Fact Sheet Number 322.