# Section 4 Environmental Assessment

## 4.1 INTRODUCTION

The following sections address the Project's potential impacts on the range of resources identified in Appendix G of the California Environmental Quality Act (CEQA) Guidelines:

- 4.2 Aesthetics
- 4.3 Air Quality
- 4.4 Biological Resources
- 4.5 Cultural Resources
- 4.6 Geology, Soils, and Paleontology
- 4.7 Hazards and Hazardous Materials
- 4.8 Hydrology and Water Quality
- 4.9 Land Use, Planning, and Agriculture
- 4.10 Mineral Resources
- 4.11 Noise
- 4.12 Population and Housing
- 4.13 Public Services / Utilities and Service Systems / Recreation
- 4.14 Transportation and Traffic
- 4.15 Cumulative Impacts

Each section includes a discussion of the existing environmental setting specific to the resource or issue area; relevant regulatory requirements; significance criteria upon which the impact determinations are based; and a discussion of Project-specific impacts. Project design features, construction methods, management practices, and other measures proposed by the Applicants to avoid or reduce potential impacts are described, and additional mitigation measures are identified (if appropriate) that would further reduce potentially significant impacts to less than significant after consideration of the measures that are already proposed by the Applicants.

Where no impacts would occur or where the CEQA-based significance criteria are not applicable, this is noted in the section containing the criteria. The remaining impact discussions are organized according to the resource-specific significance criteria, and each potentially significant or less than significant impact is coded and numbered.

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# 4.2 AESTHETICS

This section addresses the potential for the Project to affect the visual quality or characteristics of the Project area or its scenic resources. This section also considers potential impacts from light and glare.

## 4.2.1 Environmental Setting

The description of the environmental setting is based on site visits conducted on January 17 and February 12, 2008.

### Overview

The Project is located in a rural area, characterized primarily by agricultural uses including row crops, vineyards, orchards, and limited grazing. Residential and commercial uses are very limited in the Project area. These uses consist of several isolated residences along the pipeline route; a cluster of homes near the entrance to the Storage Field, several homes along the south side of State Route (SR) 180; and commercial uses (a restaurant and boat rental business) at Fresno Slough. Agricultural processing facilities include the Spreckels Sugar Plant on the north side of I-180; cotton gins; and various other active and inactive agriculture-related industrial uses. Natural features include the Mendota Wildlife Management Area, Alkali Sink Ecological Reserve, San Joaquin River, and Fresno Slough. The concrete-lined California Aqueduct is located near the western end of the pipeline, and the Chowchilla Canal is located along a portion of the electric power line route, west of the Storage Field. The level topography throughout the Project area is typical of the Central Valley.

SR 198 is the closest state scenic highway, located approximately 28 miles south of the Project area (Caltrans 2008). The closest scenic highway designated by Fresno or Madera County is Interstate 5, located approximately 3 miles west of the westernmost extent of the Project (Fresno General Plan 2000). Due to the level terrain and distance involved, the Project is not visible from these highways.

### Gill Ranch Storage Field

The approximately 5,020-acre Storage Field is in active agricultural production (row crops, orchard, and vineyard). Numerous existing gas wells and related surface facilities, including piping, tanks, compression facilities, are interspersed with the agricultural operations. Agricultural storage yards are also interspersed within the Storage Field. Many of the wells have been plugged and abandoned; two remain in use today. Electrical power lines are present in the proposed electric power line route at Avenue 3, and at Road 16 near the proposed central compressor site**.** Photos of the compressor station site, power line corridor, and existing uses within the Storage Field are provided in Section 3.1 Project Location.

The San Joaquin River passes through the southeast corner of the Storage Field. The River is bordered by approximately 10-foot levees on both sides, and riparian vegetation is present along the river banks.

The proposed 10-acre central compression station will be centrally located within the Storage Field, along Avenue 3, approximately 0.25 mile east of the intersection with Road 16, and will be visible from agricultural roads within the Storage Field. The compressor station site is presently cultivated with irrigated row crops. The nearest major roads are I-180, located approximately 4 miles south in Fresno County, and Avenue 7, located 4 miles north, in Madera County. The proposed Storage Field facility locations are not visible from these roadways due to the level terrain, distance, and intervening agricultural crops. The intervening river levees and riparian vegetation along the San Joaquin River further shield the Storage Field from I-180.

A cluster of residences is located on Road 16 near the entrance to the Storage Field, and approximately 1 mile north of the proposed central compressor station site. These residences are within approximately 1 mile of the nearest proposed injection/withdrawal well sites. An abandoned cotton gin and agricultural storage yard is located across Road 16 near these residences. The central compressor station site and well pad sites are not visible from any other residences or from any commercial or recreational uses.

### Gas Transmission Pipeline Alignment and Pipeline Surface Facilities

The pipeline will be located underground, primarily along public and private roads. The surrounding area is primarily in agricultural use. Exceptions include a few isolated residences along the western portion of the pipeline route (i.e., along Lincoln Avenue, SR 33 and immediately west of Fresno Slough); numerous residences and storage units along the south side of I-180 between Fresno Slough and San Mateo Avenue; the Spreckels Sugar Plant on the north side of I-180 at San Mateo Avenue (comprising multi-story office buildings and silos, large parking lots, multiple industrial enclosures, and rail spurs); and various other active and inactive agriculture-related industrial uses. A restaurant and commercial recreation facility are located on the east bank of the Fresno Slough. The recreational facility provides boat rental, fishing platforms, picnic areas and shade structures.

The concrete-lined California Aqueduct is located near the western end of the pipeline. Natural features include the Mendota Wildlife Management Area, Alkali Sink Ecological Reserve, San Joaquin River, and Fresno Slough. The Mendota Wildlife Management Area is seasonally open for public recreational use, with an information kiosk and public entrance area along I-180, just east of the Fresno Slough.

The pipeline corridor, but not the pipeline, will be visible from public roadways including, from west to east, SR 33, West Panoche Road, and I-180. The proposed mainline valve sites are located in open level agricultural fields. One site is located along the west side of SR 33, and the other site is located near the intersection of San Mateo Avenue and I-180.

The proposed PG&E Line 401 interconnection facility is located on Lincoln Avenue, a private agricultural road. The site is surrounded by mature orchard trees and is not visible from public roads.

### Electrical Power Line Route

The power line will be located along public roadways including Avenue 7½, Avenue 7, and Chowchilla Canal Road. Avenue 7½ and Avenue 7 are heavily traveled public roads between the Cities of Fresno and Madera to the east, and Firebaugh and other cities to the west and north. There are existing power lines along these roadways except for an approximately 1-mile section along Avenue 7.

Chowchilla Canal Road is primarily used by local agricultural operators and has existing power lines along its entire length between Avenue 7 and Avenue 3. Avenue 3 from the Chowhilla Canal to the central compressor location is a private agricultural road with existing power lines. The surrounding area contains field crops and agricultural storage facilities. Several existing gas well facilities are visible within the Storage Field along Avenue 3.

There are no residences, commercial uses, or recreational uses located along the power line route.

### Staging Areas

The Mendota Railyard in Mendota will be used for off-loading pipe and other heavy loads that arrive via rail. Trucks will be used to transport materials from the Mendota Railyard and from other locations to the designated construction staging areas. Two staging sites will be located on agricultural land adjacent to the Spreckels Sugar Plant at the intersection of I-180 and San Mateo Avenue (Figure 3.7-1 in Section 3 Project Description). For construction activity in Madera County, staging will take place at an idle cotton gin and storage yard at the entrance to the Storage Field along Road 16; and in the agricultural field immediately adjacent to the proposed central compressor station site (Figures 3.1-2 and 3.7-1 in Section 3 Project Description).

The Mendota railyard is an existing industrial facility with several storage yards, located in the City of Mendota and surrounded by residential and commercial uses. The Spreckels Sugar Plant sites are open agricultural fields adjacent to the existing industrial facilities. The site adjacent to I-180 is presently used for grazing, and is visible from I-180 and San Mateo Avenue. The other site is located along the rail spur near the rear of the facility and is not visible from public roads. The cotton gin site is an existing agricultural facility located near the existing residences on Road 16. The central compressor station site is located in an agricultural field, and is not visible from public roads or residences.

## 4.2.2 Regulatory Setting

### 4.2.2.1 Federal

No federal laws or regulations applicable to aesthetics are relevant to this Project.

### 4.2.2.2 State

No state laws or regulations applicable to aesthetics are relevant to this Project.

### 4.2.2.3 Local

#### County of Fresno General Plan

The County of Fresno General Plan (2000) contains policies intended to protect the visual resources of the County. These policies require that development be planned and designed to maintain the scenic open space character of rangelands including view corridors of highways. New development shall utilize natural landforms and vegetation in the least visually disruptive way possible. The General Plan also requires the County to 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 visual impacts on existing and future residents.

#### County of Madera General Plan

The County of Madera General Plan (1995) contains policies intended to protect the County's visual resources. These policies require new development in scenic rural areas to avoid highly-visible locations, except when necessary to avoid hazards; or when the proposed construction will incorporate design and screening measures to minimize the visibility of structures and graded areas. The County also requires that new development incorporate soil conservation practices and minimize land alterations. Gas and electric projects also should minimize visual impacts on existing and future residents.

## 4.2.3 Impact Assessment

Impacts were determined by considering the visual sensitivity of the affected area, the degree of contrast between the Project components and the surrounding area, the potential for Project components to be located in areas that are visible from public viewpoints, and the duration of impact.

### 4.2.3.1 Significance Criteria

Appendix G of the California Environment Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on aesthetics if the project would:

- Have a substantial adverse effect on a scenic vista;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

The following additional criterion is included in Appendix G but is not relevant to this Project:

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

No scenic highways or historic buildings are present in the Project area, and the Project will not damage scenic resources. The pipeline and power line will follow existing roadways in agricultural areas, and the Storage Field and mainline valves are located in agricultural areas, primarily planted with row crops. Thus the Project will not damage scenic resources such as trees and rock outcroppings.

### 4.2.3.2 Impacts and Mitigation Measures

#### Have a substantial adverse effect on a scenic vista

**IMPACT AES-1: During construction, the Project would create temporary aesthetic impacts near scenic vistas**. The Project area primarily consists of agricultural uses, such as row crops, orchards, and vineyards on level terrain; these areas are not scenic vistas. Expansive views of the Mendota Wildlife Management Area and Alkali Sink Ecological Reserve are available from I-180 looking south. These areas may be considered scenic vistas due to their relatively undeveloped natural features, including channels of water and native vegetation. Pipeline construction will occur on the north side of I-180, across from these natural areas. Therefore views toward these natural areas will not be obstructed. Any impacts from construction to scenic vistas will be temporary and less than significant. The pipeline will be buried and revegetated, and no permanent impacts to scenic vistas will occur.

The Storage Field is remote from public roadways, and there are no scenic vistas in this portion of the Project area. There are no scenic vistas along the electric power line corridor. No impacts to scenic vistas will occur as a result of proposed construction in the Storage Field or along the power line corridor.

### Substantially degrade the existing visual character or quality of the site and its surroundings

**IMPACT AES-2: The Project would cause both temporary and long-term visual changes, but would not substantially degrade the existing visual character or quality in the Project area.** Impacts of each major Project component are discussed individually below.

### Central Compressor Station

The compressor facility and related gas and water handling equipment will be located on a 10-acre site near the center of the Storage Field. Profile views and an isometric view of the compressor station are provided in Appendix A. The visual elements of this facility will include the compressor building; other smaller buildings for the control room and various enclosed equipment; open piping and industrial equipment surrounding the buildings; the electric substation; internal roads and graveled ground surfacing; and perimeter chain link fencing topped by additional security wires.

Structure heights and dimensions are listed in Table A-1 and shown on site plans and elevation views in Appendix A. Based on these preliminary design dimensions, the most prominent feature will be the compressor building, which will measure 170 feet long, 75 feet wide, and 36 feet high. Other buildings will not be as large or as tall as the compressor building. However the combined buildings will have a massing effect within the central portion of the facility. Other facilities within the fenceline, including the electrical substation, which will have the overall tallest features (including two 75 foot tall power poles on the north side of Avenue 3, and two 60-ft tall steel poles inside the fenceline), will contribute to the industrial character of the facility but will not add to the overall mass of the facility.

Based on the preliminary design drawings provided in Appendix A, visual simulations of the facility were developed from two vantage points, as shown on Figures 4.2-1 and 4.2-2. Figure4.2-1 shows a before and after view of the compressor station as viewed from the adjacent private agricultural road (Avenue 3), looking toward the northeastern corner of the facility. Views from this perspective will be limited to the agricultural operations within the Storage Field; however, this perspective provides a general view of the facility at close range. Based on the visual simulation in Figure 4.2-1, the proposed facility will contrast with the surrounding level agricultural terrain and will be noticeably larger than the existing industrial or agricultural infrastructure. However, due to the lack of sensitive receptors at this close range, this visual contrast is not considered significant.





FIGURE 4.2-1 | COMPRESSOR STATION PHOTO SIMULATION AT CLOSE RANGE


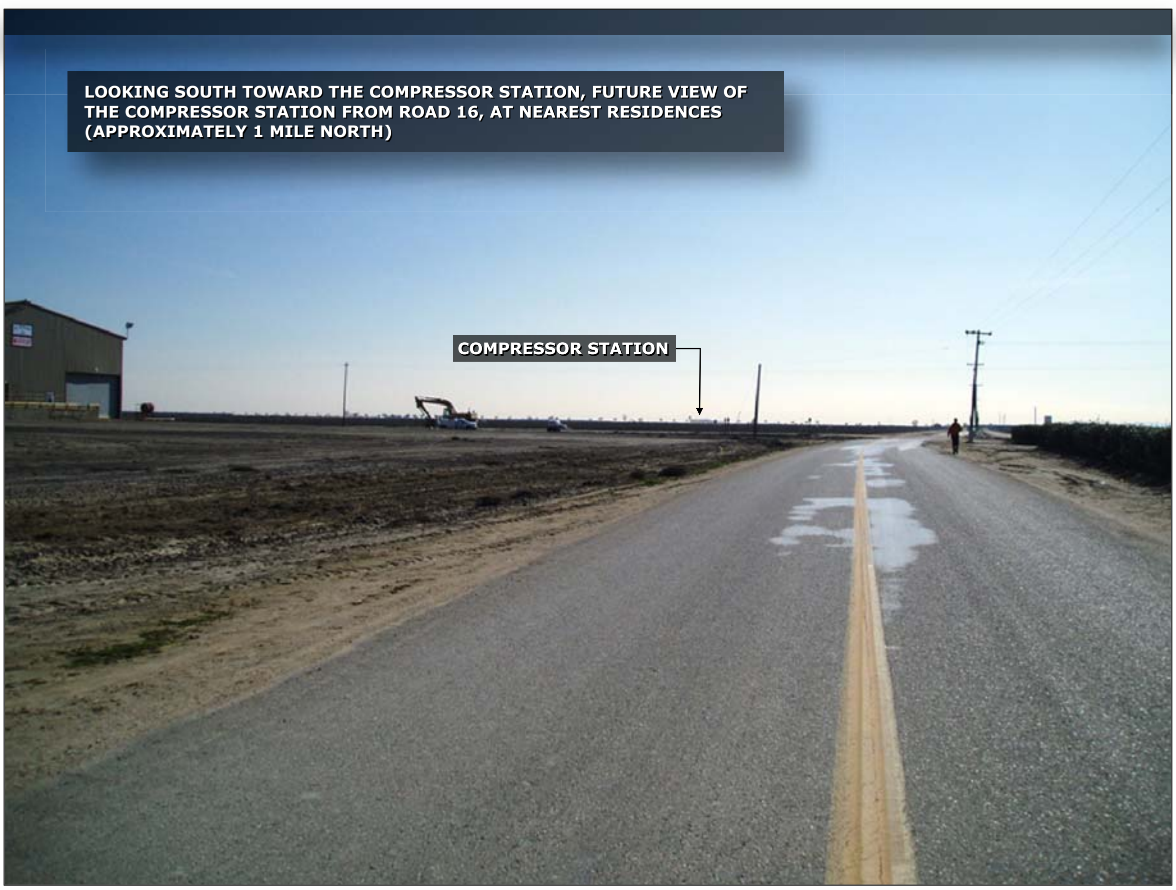




FIGURE 4.2-2 | COMPRESSOR STATION PHOTO SIMULATION FROM NEAREST RESIDENCES

Figure 4.2-2 shows before and after views of the compressor station as viewed from the residences along Road 16, approximately 1.1 mile north of the facility site. As shown in Figure 4.2-2, the existing view from Road 16 near the existing residences is characterized by level agricultural fields, except for agricultural storage facilities related to the cotton gin facility and associated equipment storage area located immediately east and south of these residences. When the compressor facility is superimposed on this view, the resulting view shows that the compressor station will be visible in the distance but the facility will not be a dominant feature against the horizon. Given the distance between the compressor site and the residences, and the presence of other agricultural buildings in the area, views of the compressor station do not differ substantially from ancillary farm structures present throughout the area. Therefore, impacts to visual resources from this location will not be substantially degraded.

The compressor station will be located in an area that is not accessible to or visible by the general public because of the distance to Avenue 7 and I-180, which are both approximately 4 miles away. In addition, the intervening agricultural vegetation, as well as the levees and riparian vegetation along the San Joaquin River, will visually obscure the site from travelers on these roads.

In summary, the compressor facility will increase the industrial character of the immediate surroundings. However, due to the distance from sensitive receptors and presence of other agricultural vegetation and structures, the facility will not substantially degrade the overall visual setting of the Project area. Therefore, any impacts to visual resources from the compressor station will be less than significant and no mitigation is required.

### Well Pad Facilities

The injection/withdrawal wells and observation wells will occupy several well pads interspersed throughout the Storage Field. During the temporary drilling and construction phase, a drill rig will occupy each well pad in sequence, and will be present at each site for 24 hours a day over an approximately two-week period. The entire drilling program for all new wells, including new well drilling and completion, and reworking and completion of existing wells, is anticipated to last approximately seven months (Figure 3.7-3). During this period, the approximately 150 foot tall rig mast will be visible from surrounding areas. The nearest sensitive receptors to the well pads are the residences along Road 16, approximately 1 mile northeast of the nearest proposed well pad (Figure 3.1-2). Other well pads will be more distant from these residences. The rig will likely be visible from Avenue 7 located 4 miles north of the Storage Field, and possibly from I-180, located 4 miles south of the Storage Field.

The temporary presence of drill rigs in the Storage Field is commonplace. Based on the distance to receptor sites, the short duration of drilling, and the relatively common occurrence of drilling rigs in the Project area, the temporary presence of a drilling rig will not substantially degrade the visual character of the Project area.

Following completion of drilling, the long-term visual elements within each well pad facility will include the approximately 0.7 acre earthen and gravel well pad and access road; up to four wellheads; associated aboveground piping; a small control building; communications equipment; and perimeter security fencing. The wellheads and other structures will measure up to ten feet in height and will be consolidated within a small area within the wellpad. These facilities will generally be located where there are existing gas wells, and the existing well pads will be slightly expanded from the existing well pads. The proposed well pads are surrounded by existing agricultural operations. Based on the distance to the nearest residences and public roads (as discussed above), the relatively low profile of these structures; and existing occurrence of numerous similar well pads and facilities, the proposed well pad facilities will not result in a substantial change in the visual character of the existing landscape. Any impacts to aesthetic resources will be less than significant and no mitigation is required.

### Pipeline

The pipelines will be constructed underground along public and private roadways. During construction, the existing landscape will be altered to install the pipelines. However, visual changes to the area will be temporary, and the corridor will be returned as near as possible to its original condition after construction was completed.

The Applicants propose to implement an Agricultural Impact Mitigation Plan. This plan includes site restoration measures that will be developed in coordination with the individual landowners. In general, the areas that are presently in agriculture will be returned to agriculture, and the pipeline alignment will not be visible from public viewing locations. In natural, non-agricultural areas, the Applicants propose to implement additional restoration measures, including revegetation of the pipeline corridor. These measures will ensure that the pipeline corridor does not stand out as a visible feature. Long-term pipeline inspections and maintenance will be conducted via existing roads. No permanent new access roads will be constructed for the purpose of pipeline inspection.

In accordance with Caltrans standards, permanent pipeline markers will be installed at regular intervals along the alignment. These structures are designed to be seen by the public. The placement and relative small size of the markers will not degrade the existing visual character because they will be unobtrusive and generally located in or near existing roadway utility corridors where various signs and markers are commonplace. Potential impacts to visual resources from the pipeline will be less than significant and no mitigation is required.

### PG&E Interconnection Facility and Mainline Valve Sites

The PG&E interconnection facility will consist of piping and valve equipment surrounded by a security fence. This site is surrounded by mature orchards and will not be visible from public roadways or residences. Two mainline valve facilities will be located adjacent to public roadways. Valve equipment will project approximately 3 feet above the ground surface and will be surrounded by security fencing. Piping and equipment related to these facilities will not substantially alter the visual character of the area because of their small size and their location along existing utility corridors. Any impacts to visual resources from these facilities will be less than significant and no mitigation is required.

### Construction Staging Areas

The Mendota railyard is an existing industrial facility. Temporary construction-related activities at this off-loading site will be typical of the site's existing activities and will not change the visual character of this area. The construction staging areas near the Spreckels Sugar Plant will be located in level agricultural fields that are currently used for grazing. The staging area nearest to I-180 will be visible from I-180 and from certain nearby residences. However, this area is not visually sensitive due to the presence of the sugar plant. Therefore the temporary use of staging areas near the Spreckels facility will not cause a substantial change in the visual character of the existing landscape.

The staging area at the existing cotton gin site near the Storage Field is located in an existing developed area. Temporary use of this area for equipment staging and worker parking will be visible from the existing residences along Road 16. However, this use will not change the visual character of the area due to the present use of the site for agricultural storage and processing. Equipment staging adjacent to the proposed central compressor site will not be visible from public roads or residences. In summary the temporary use of proposed staging areas for construction equipment staging and worker parking will not cause a substantial change in the visual character of the existing landscape. Potential impacts to visual resources will be less than significant and no mitigation is required.

### Electric Power Line

Power lines are common in agricultural areas and along roadways. There are no residences, commercial uses, or recreational uses located along the proposed power line route. Segments of the power line that will be located along Avenue 7½ and Avenue 7 will be visible from these roadways. There are existing power lines along these roadways except for an approximately 1-mile section along Avenue 7. The new power line would be built with larger wood poles that would replace all existing electric distribution wood poles that are within the proposed alignment. The new wood poles will be approximately 70 feet tall, as compared to the approximately 50-foot height of the existing poles in this area. An example of the proposed pole design is shown as an inset to Figure 3.1-3, in Section 3 Project Description. Although the taller wood poles will be slightly more prominent than the existing wood poles, the wood poles of the new power line are typical of wood poles on other power lines in the Project area and will not be out of character with the existing landscape features.

Two tubular steel poles will be installed on either side of Chowchilla Canal Road near Avenue 3 in order to allow the power line to span the canal. These steel poles will be as tall as 120 feet and will potentially stand out on the landscape in contrast to other landscape features. However, these poles will be located in a remote agricultural area 4 miles south of Avenue 7 and will be equally distant from any residences. Although the poles could be visible from Avenue 7, they would not be prominent from this distance, and other intervening landscape features such as the Chowchilla Canal levee, trees along the San Joaquin River, and power poles would further diminish the prominence of the new steel poles. The wooden poles to be installed along Avenue 3 will not be visible from public roads or residences due to the distance from these receptors.

In summary, the proposed power lines will generally replace existing poles and the power line route will avoid creating visual impacts to residences. Although the new wood poles will be taller than the existing wood poles, the wood pole design will not be substantially different in character from the existing poles used throughout PG&E's service territory. The two steel poles will be distant from public viewing locations and will not create a prominent visual feature from public viewing locations. Therefore the proposed power poles and lines will not substantially change the visual character of the existing landscape. Impacts to visual resources related to the proposed wood poles and power lines will be less than significant, and no mitigation is required.

### Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area

**IMPACT AES-3: The Project would add a potential source of light and glare in a rural agricultural setting.** Project construction would occur generally between 7 am to 7 pm. The use of construction equipment after daylight hours may necessitate the use of construction lighting, such as at HDD drilling locations. Although night construction is not normally necessary at HDD locations, there are potential situations in which continuous drilling is advantageous to maintain the integrity of the drill bore. In such cases, there could be 24-hour HDD operations that would require lighting for a period of approximately 1 week or less. The only area in which nighttime HDD construction will be visible to residents is in the vicinity of the proposed Fresno Slough HDD exit location. This work site is located on the north side of I-180, across form several residences between the Fresno Slough and San Mateo Avenue. To minimize potential construction related impacts to residents of this area, the Applicants will require that night lighting, if required, be shielded and directed away from residential areas, and lights would be turned out in areas where they are no longer needed. Given the implementation of these measures, any construction-phase impacts from lighting and glare will be less than significant and no mitigation is required.

As discussed in Impact AES-2, drilling activities will require 24-hour operations for a period of up to six months in order to the complete the drilling program for the various proposed wells. Night time drilling will require the use of lighting on the drill rig. This lighting will likely be visible from residences at Road 16, and potentially from public roadways, including Avenue 7 and I-180. The Applicants' preliminary drilling plan specifies that drilling contractors minimize the use of lighting to only that required to safely illuminate the work area, and that lights shall be shielded and directed inward on the work area. Based on the short-term nature of drilling, and with the incorporation of these measures, potential short-term impacts from lighting and glare during drilling will be less than significant and no mitigation is required

During the operations phase, the well pads will be remotely monitored and will not require substantial night lighting. Routine inspections will occur during daylight hours, and night-time maintenance and construction (e.g., well workovers or major equipment replacement) will be infrequent. During these events, any lighting visible to adjacent uses will be shielded and directed toward the work area. These work sites are distant from residential areas (at least one mile or more from the nearest residence), and work will be intermittent and temporary. Based on these factors, any impacts from light and glare at the well pad sites will be less than significant and no mitigation is required.

During operations phase, the central compressor station will be a potential source of offsite light and glare. The central compressor station facilities will be staffed during normal business hours and continuously monitored 24 hours per day. Night time lighting during normal operations will be limited to perimeter security lighting and ancillary access way and equipment lighting throughout the facility to allow for security and routine inspections. Most lighting will be near ground level. Additional lighting will be used during occasional nighttime maintenance activities. In all cases the light fixtures will be directed to the facility and offsite light and glare will be shielded. Due to relative scale of the proposed facility as compared to the surrounding agricultural landscape, this new source of light could be discernable from distant roadways and residences. However, based on the limited use of lighting, the distance to sensitive receptors, and intervening landscape features between the facility and public roads, the new source of lighting will be dissipated and will not substantially change the nighttime visual setting or introduce a significant source of light and glare to these receptors. Similarly, the addition of occasional maintenance lighting at the compressor station will not result in a significant change in the ambient night-time lighting at the Storage Field site. Given the Project location and these measures, any impacts from facility lighting will be less than significant, and no mitigation is required.

The Project's visible structures will be treated to limit the amount of reflective surfaces, such as by using mat painting techniques to reduce or eliminate potential glare. Reflective surfaces such as windows will also be limited, and any potential glare from reflective surfaces will not be seen from sensitive receptors. No impacts from glare will occur and no mitigation is required.

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# 4.3 AIR QUALITY

The Project will utilize an existing depleted gas field, the Gill Ranch Gas Field, in central California for gas storage purposes. The proposed Storage Field is located approximately 20 miles west of Fresno, near the town of Mendota, California.

The Storage Field is comprised of approximately 5,020 acres of primarily agricultural use lands. The Storage Field lies generally along the northern bank of the San Joaquin River, and is located primarily in Madera County.

The Project will develop up to 15 injection/withdrawal (IW) wells; up to seven (7) reservoir observation/monitoring (OM) wells; and a centralized compressor facility to provide up to 45,000 HP of compression. The IW wells will be clustered on four well pads with up to four wells per pad. OM wells will be located on individual well pads. The compressors will be driven by electric motors. As a result, the air emissions associated with the Project are significantly lower than a comparable project utilizing gas-fired compressor motors.

A single 30-inch diameter natural gas pipeline will be constructed from the outlet of the central compression facility to an interconnect with PG&E's high-pressure backbone system near the I-5 corridor, located approximately 25 miles west of the field.

This section describes existing air quality conditions, maximum potential impacts from the Project, and Project design measures that keep these impacts below thresholds of significance.

This section also presents the methodology and results of the air quality analyses performed to assess potential impacts associated with air emissions from the Project. Potential public health risks posed by emissions of non-criteria pollutants are also addressed in Section 4.3.5.8 Screening Health Risk Assessment.

## 4.3.1 Air Quality Setting

### 4.3.1.1 Geography and Topography

The Project site will be approximately 23 miles west- northwest of the city of Fresno and 6 miles east- northeast of the City of Mendota. The Project site is nearly level, at an elevation ranging from approximately 163 to 187 feet above mean sea level. Essentially flat terrain extends for many miles on all sides of the Project site. The Project site is located in the San Joaquin Valley Air Pollution Control District (SJVAPCD).

### 4.3.1.2 Climate and Meteorology

The climate of the San Joaquin Valley is characterized by hot summers, mild winters, and small amounts of precipitation. The major climatic controls in the Valley are the mountains on three sides and the semipermanent Pacific High pressure system over the eastern Pacific

Ocean. The Great Basin High pressure system to the east also affects the Valley, primarily during the winter months. These synoptic scale influences result in distinct seasonal weather characteristics, as discussed below.

The Pacific High is a semipermanent subtropical high pressure system located off the Pacific Coast. It is centered between the 140°W and 150°W meridians, and oscillates in a north-south direction seasonally. During the summer, it moves northward and dominates the regional climate, producing persistent temperature inversions and a predominantly southwesterly wind field. Clear skies, high temperatures, and low humidity characterize this season. Very little precipitation occurs during summer months, because migrating storm systems are blocked by the Pacific High. Occasionally, however, tropical air moves into the area and thunderstorms may occur over the adjacent mountains.

In the fall, the Pacific High weakens and shifts southwestward toward Hawaii, and its dominance is diminished in the San Joaquin Valley. During the transition period, the storm belt and zone of strong westerly winds also moves southward into California. The prevailing weather patterns during this time of year include storm periods with rain and gusty winds, clear weather that can occur after a storm or because of the Great Basin High pressure area, or persistent fog caused by temperature inversion.

Precipitation, temperature, wind speed, and wind direction data have been recorded at the meteorological monitoring station located in Madera, approximately 12 miles east-northeast of the Project site. In summer (June, July, and August), daily high and low temperatures at the Project area average 95.3 and 59.8 °F (degrees Fahrenheit), respectively. In winter (December, January, and February), daily high and low temperatures are about 56.6 and 36.7 °F, respectively.[1] The average annual rainfall at the Project site is about 11.3 inches, of which about 80% occurs between November and March. Between rainstorms, skies are fair, winds are light, and temperatures are moderate.

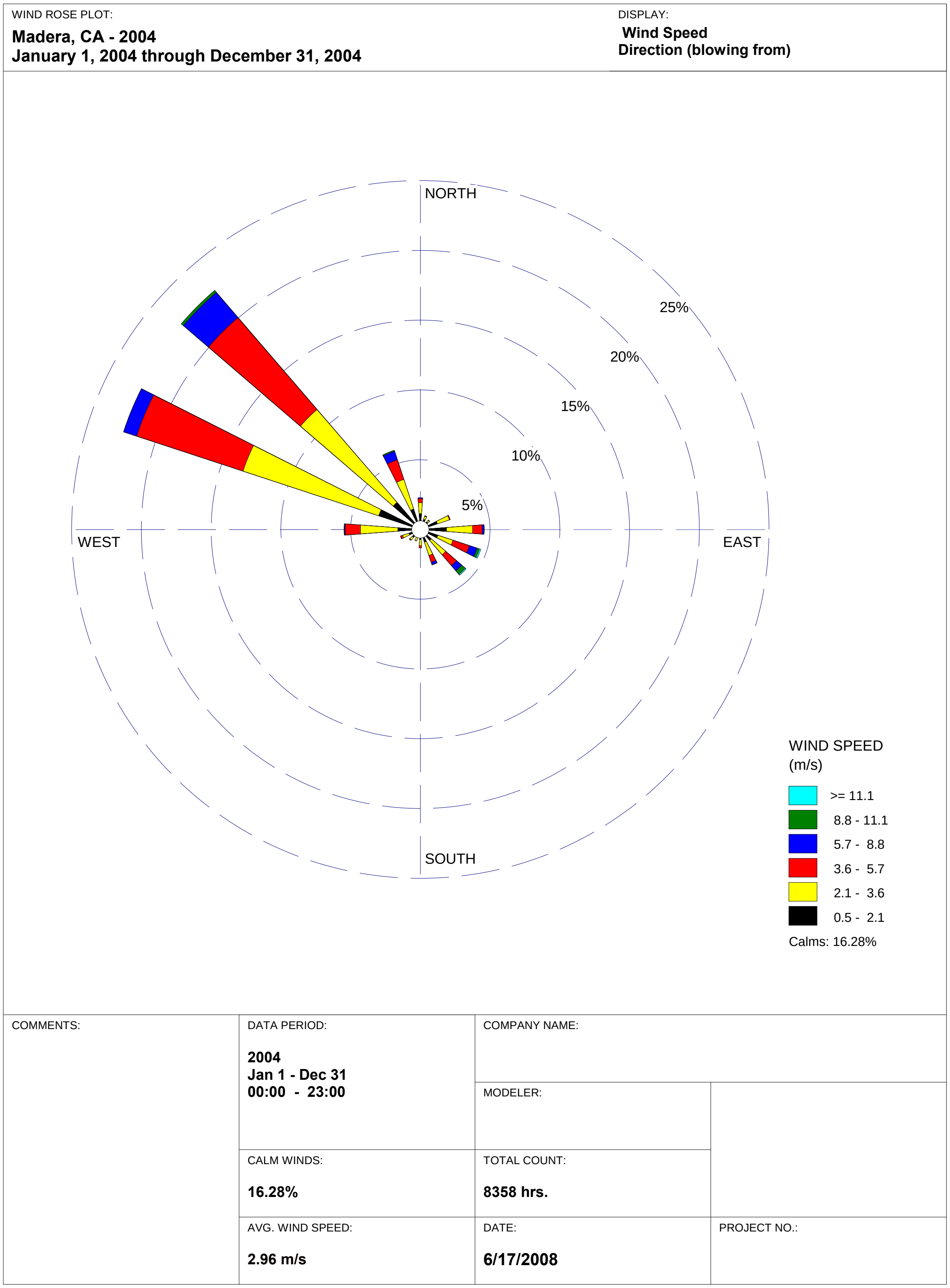
Air quality is determined primarily by the type and amount of pollutants emitted into the atmosphere, the topography of the air basin, and local meteorological conditions. In the Project area, stable atmospheric conditions and light winds can provide conditions for pollutants to accumulate in the air basin when emissions are produced. The predominant winds in the Project area are shown in Figure 4.3-1.

A marine climate influences mixing heights. Often, the base of the inversion is found at the top of a layer of marine air, because of the cooler nature of the marine environment. Inland areas, however, where the marine influence is absent, often experience strong ground-based inversions that inhibit mixing and can result in high pollutant concentrations. Low mixing heights are observed during the winter in the San Joaquin Valley. Mixing height measurements have been made at Fresno, the nearest upper-level meteorological station (located approximately 23 miles east-southeast of the Project site). At Fresno, the 50th

[1] Desert Research Institute, Western Regional Climate Center. 2008. Western U.S. Climate Historical Summaries, Site Accessed May 2008. URL: http://www.wrcc.dri.edu/Climsum.html

percentile morning mixing heights for the period 1979–80 were 115-150 meters (approximately 375-495 feet) in the fall and winter, 230 meters (755 feet) in the spring, and 175 meters (575 feet) in the summer. Such low mixing heights trap pollutants. The 50th percentile afternoon mixing heights, however, were unlimited in spring and summer, 1,135 meters (3,725 feet) in the fall, and 630 meters (2,065 feet) in the winter.[2] Such mixing heights provide generally favorable conditions for the dispersion of pollutants.

[2] Smith, T. B., W. D. Sanders, and D. M. Takeuchi. 1984. Application of Climatological Analysis to Minimize Air Pollution Impacts in California, Final Report on ARB Agreement A2-119-32. August.




WRPLOT View - Lakes Environmental Software

**Figure 4.3-1: 2004 Annual Wind Rose, Madera, CA**

## 4.3.2 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (USEPA) has established national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide ($NO_2$), carbon monoxide (CO), sulfur dioxide ($SO_2$), particulate matter with aerodynamic diameter less than or equal to 10 microns ($PM_{10}$), particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and airborne lead. Areas with air pollution levels above these standards are considered "nonattainment areas" subject to planning and pollution control requirements that are more stringent than standard requirements.

In addition, the California Air Resources Board (CARB) has established standards for ozone, CO, $NO_2$, $SO_2$, sulfates, $PM_{10}$, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (one hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). For some pollutants there is more than one air quality standard, reflecting both short-term and long-term effects. Table 4.3-1 presents the NAAQS and California ambient air quality standards for selected pollutants. The California standards are generally set at concentrations much lower than the federal standards and in some cases have shorter averaging periods.

Table 4.3-1: **Ambient Air Quality Standards**

| Pollutant | Averaging Time | California | National |
|---|---|---|---|
| Ozone | 1 hour | 0.09 ppm (180 µg/m$^3$) | |
| | 8 hours | 0.070 ppm (137 µg/m$^3$) | 0.075 ppm (147 µg/m$^3$) (3-year average of annual 4th-highest daily maximum) |
| Carbon Monoxide | 8 hours | 9.0 ppm (10,000 µg/m$^3$) | 9 ppm (10,000 µg/m$^3$) |
| | 1 hour | 20 ppm (23,000 µg/m$^3$) | 35 ppm (40,000 µg/m$^3$) |
| Nitrogen Dioxide | Annual Average | 0.030 (57 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$) |
| | 1 hour | 0.18 ppm (339 µg/m$^3$) | – |
| Sulfur Dioxide | Annual Average | – | 0.03 ppm (80 µg/m$^3$) |
| | 24 hours | 0.04 ppm (105 µg/m$^3$) | 0.14 ppm (365 µg/m$^3$) |
| | 3 hours [a] | – | 0.5 ppm (1300 µg/m$^3$) |
| | 1 hour | 0.25 ppm (655 µg/m$^3$) | – |
| Suspended Particulate Matter (10 Micron) | Annual Arithmetic Mean | 20 µg/m$^3$ | – |
| | 24 hours | 50 µg/m$^3$ | 150 µg/m$^3$ |
| Suspended Particulate Matter (2.5 Micron) | Annual Arithmetic Mean | 12 µg/m$^3$ | 15 µg/m$^3$ (3-year average) |
| | 24 hours | – | 35 µg/m$^3$ (3-year average of 98th percentiles) |
| Sulfates | 24 hours | 25 µg/m$^3$ | – |
| Lead | 30 days | 1.5 µg/m$^3$ | – |
| | Calendar Quarter | – | 1.5 µg/m$^3$ |
| Hydrogen Sulfide | 1-hour | 0.03 ppm (42 µg/m$^3$) | – |
| Vinyl Chloride | 24-hour | 0.010 ppm (26 µg/m$^3$) | – |
| Visibility Reducing Particles | 8-hour (10am to 6pm PST) | In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. | – |

Notes:
[a] This is a national secondary standard, which is designed to protect public welfare.

## 4.3.3 Existing Air Quality

Data from several ambient air monitoring stations were used to characterize air quality at the Project site. They were chosen because of their proximity to the site and because they record area-wide ambient conditions rather than the localized impacts of any particular facility. All ambient air quality data presented in this section were taken from CARB publications and data sources or USEPA air quality data tables. Ambient concentrations of ozone and nitrogen dioxide ($NO_2$) are recorded at the Madera-Pump Yard monitoring station in Madera, about 12 miles from the Project site. Monitoring of lead ended in 2003 at Madera-Pump Yard. Respirable particulate matter ($PM_{10}$) and fine particulate matter ($PM_{2.5}$) are recorded at the Fresno-First Street in Fresno, about 25 miles from the Project site. The nearest monitoring station for sulfur dioxide ($SO_2$) is at Bethel Island, about 112 miles from the Project site (a new $SO_2$ monitor has been established at Fresno-First Street, but the only available data are from 2007). The nearest carbon monoxide (CO) monitor is Fresno-Skypark in Fresno and the nearest sulfates monitor is in Bakersfield. The Madera-Pump Yard and Fresno-First Street station are operated by the California Air Resources Board and the Fresno-Skypark station is operated by San Joaquin Valley APCD (SJVAPCD). The Bethel Island station is operated by the Bay Area Air Quality Management District (BAAQMD).

### 4.3.3.1 Ozone

Ozone is an end product of complex reactions between volatile organic compounds (VOC) and oxides of nitrogen (NOx) in the presence of intense ultraviolet radiation. VOC and NOx emissions from millions of vehicles and stationary sources, in combination with daytime wind flow patterns, mountain barriers, a persistent temperature inversion, and intense sunlight result in high ozone concentrations. For purposes of state and federal air quality planning, the San Joaquin Valley Air Basin is a nonattainment area for ozone.

Maximum ozone concentrations at the Madera-Pump Yard monitoring station are usually recorded during the summer months. Table 4.3-2 shows the annual maximum one-hour and eight-hour ozone levels recorded at this station in Madera during the period from 1998–2007, as well as the number of days in which the state and federal standards were exceeded. The data show that the state ozone air quality standard was frequently exceeded during the period from 1998-2003 but rarely exceeded during 2004-2007. The federal 8-hour standard was also frequently exceeded during the period 1998 to 2003, but there have been no violations during 2004 -2007 except one violation in 2006.

The long-term trends of maximum one-hour ozone readings are shown in Figure 4.3-2 for the Madera-Pump Yard station in Madera. The data show that compliance with the state ozone air quality standards has not been achieved in the area in the past 10 years since 1998. Trends of maximum and 3-year averages of the 4th highest daily concentrations of eight-hour average ozone readings at the Madera-Pump Yard stations are shown in Figure 4.3-3. These levels are above the new 2008 federal 8-hour average standard (0.075$\mu g/m^3$) during the 11 years shown (1997-2007).

**Table 4.3-2: Ozone Levels at Madera-Pump Yard , Madera, 1998-2007, (parts per million - ppm)**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Highest 1-Hour Average | 0.127 | 0.118 | 0.104 | 0.115 | 0.141 | 0.12 | 0.097 | 0.095 | 0.113 | 0.091 |
| Highest 8-Hour Average | 0.116 | 0.095 | 0.096 | 0.093 | 0.110 | 0.102 | 0.084 | 0.081 | 0.095 | 0.083 |
| Number of Exceeding: | | | | | | | | | | |
| State Standard | | | | | | | | | | |
| (0.09 ppm, 1-hour) | 15 | 12 | 8 | 15 | 21 | 15 | 3 | 1 | 4 | 0 |
| (0.07 ppm, 8-hour) | 45 | 46 | 50 | 53 | 66 | 67 | 25 | 19 | 35 | 12 |
| Federal Standard[a] (0.08 ppm, 8-hour) | 12 | 10 | 9 | 13 | 18 | 14 | 0 | 0 | 1 | 0 |

Source: California Air Quality Data, Annual Summary, California Air Resources Board

The 1997 federal ozone standard has been replaced by the new 2008 standard of 0.075 ppm. A USEPA final rule on the ozone standard became effective May 27, 2008. The data shown here are the number of days exceeding the old standard.

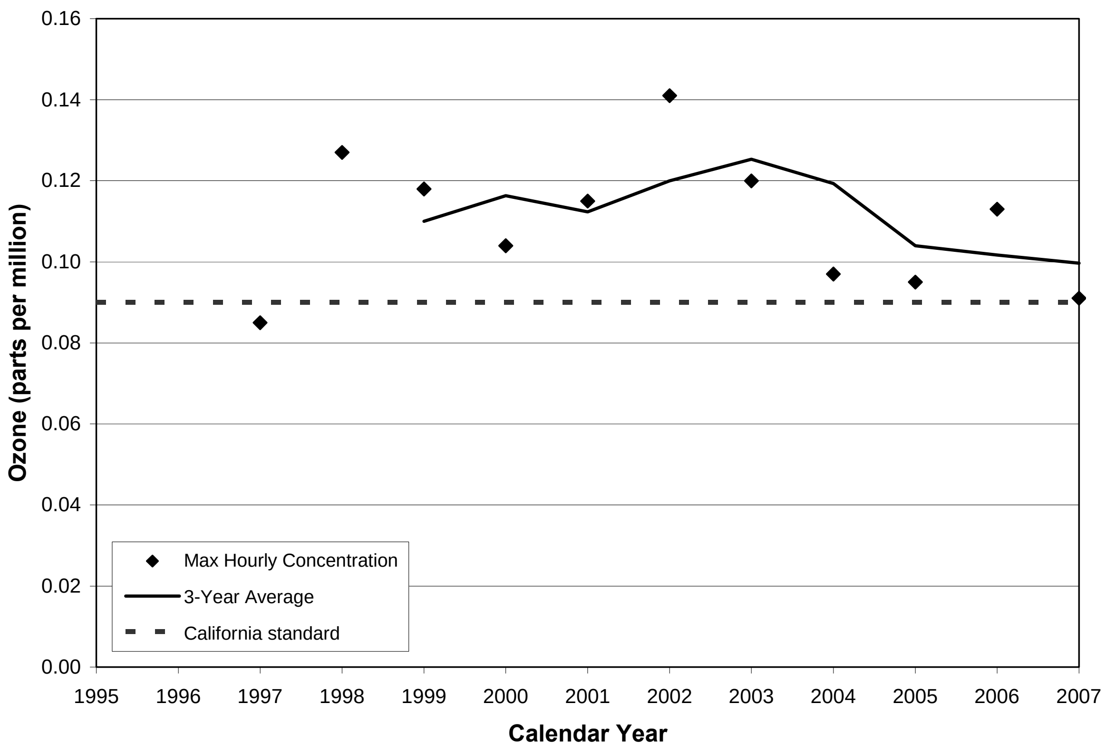



**Figure 4.3-2: Maximum 1-hour Ozone Level: Madera-Pump Yard: 1997-2007**

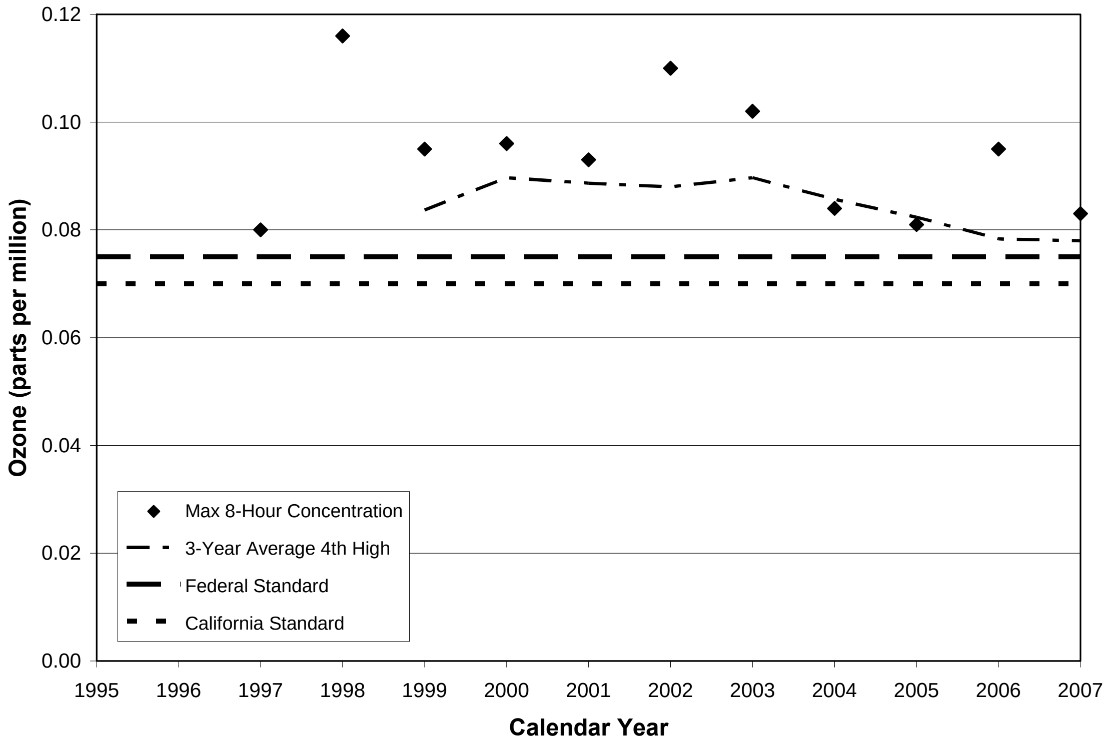



**Figure 4.3-3: Maximum 8-hour Ozone Level: Madera-Pump Yard: 1997-2007**

### 4.3.3.2 Nitrogen Dioxide

Atmospheric $NO_2$ is formed primarily from reactions between nitric oxide (NO) and oxygen or ozone. NO is formed during high temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is much less harmful than $NO_2$, it can be converted to $NO_2$ in the atmosphere within a matter of hours, or even minutes, under certain conditions. For purposes of state and federal air quality planning, the San Joaquin Valley Air Basin is in attainment for $NO_2$.

Table 4.3-3 shows the annual maximum one-hour $NO_2$ levels recorded at the Madera-Pump Yard monitoring station in Madera from 1998 through 2007, as well as the annual average level for each of those years. During this period, there have been no violations of either the state 1-hour standard (0.18 ppm), the state annual average (0.030 ppm), or the federal annual average standard (0.053 ppm). Figure 4.3-4 shows the trend from 1998 through 2007 of maximum 1-hour $NO_2$ levels at Madera Pump Yard. These have been well below the state standard for many years.

**Table 4.3-3: Nitrogen Dioxide Levels at Madera-Pump Yard , Madera, 1998-2007 (parts per million - ppm)**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Highest 1-hour Average | 0.060 | 0.084 | 0.060 | 0.060 | 0.058 | 0.054 | 0.053 | 0.057 | 0.051 | 0.047 |
| Annual Average (0.030 ppm, state) (0.053 ppm, federal) | 0.011 | 0.014 | 0.013 | 0.011 | 0.012 | 0.010 | 0.010 | 0.010 | 0.011 | 0.010 |
| Number of Exceeding: | | | | | | | | | | |
| State Standard (days) (0.18 ppm, 1-hour) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: California Air Quality Data, Annual Summary, California Air Resources Board, and AIRData, USEPA

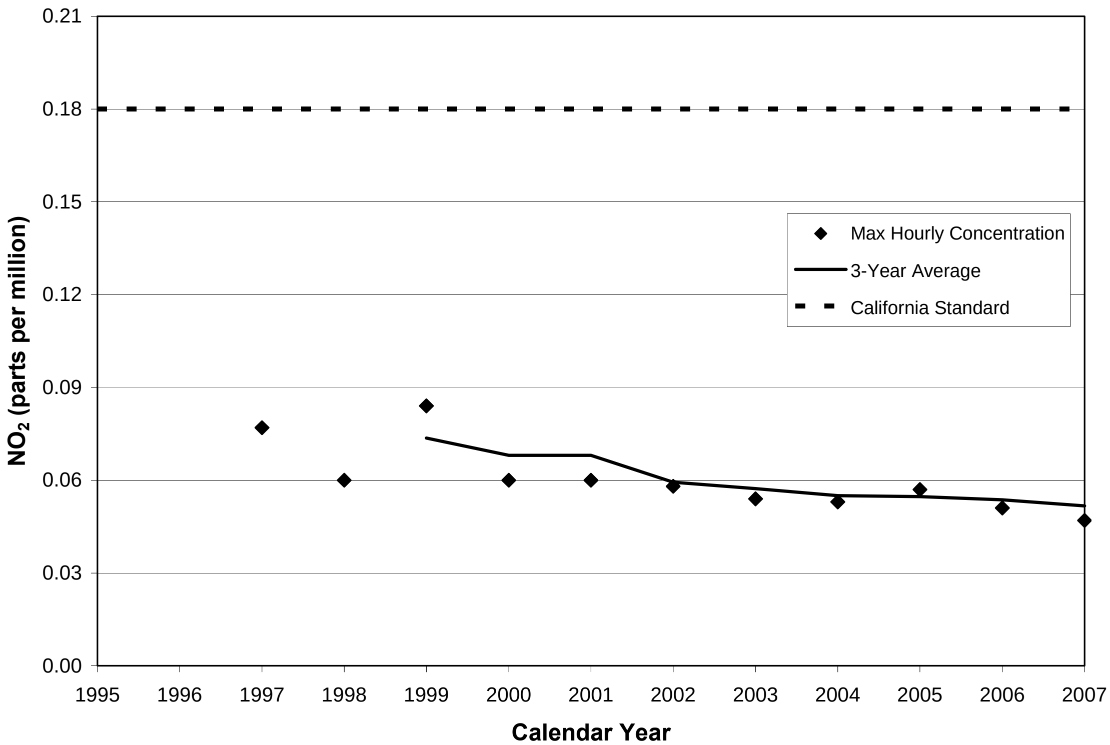



**Figure 4.3-4: Maximum 1-Hour $NO_2$ Level: Madera-Pump Yard: 1997-2007**

### 4.3.3.3 Carbon Monoxide

CO is a product of incomplete combustion, principally from automobiles and other mobile sources of pollution. In many areas of California, CO emissions from wood-burning stoves and fireplaces can also be measurable contributors to high ambient levels of CO. Industrial sources typically contribute less than 10 percent of ambient CO levels. Peak CO levels occur typically during winter months, due to a combination of higher emission rates and stagnant weather conditions. For purposes of state and federal air quality planning, the San Joaquin Valley Air Basin is classified as being in attainment for CO.

Table 4.3-4 shows the California and federal air quality standards for CO, and the maximum 1-hour and 8-hour average levels recorded at the Fresno-Skypark monitoring station in Fresno during the period 1998–2007.

Trends of maximum 8-hour and 1-hour average CO, shown in Figures 4.3-5 and 4.3-6, respectively, demonstrate that maximum ambient CO levels at Fresno have been below the state and federal standards since 1995.

**Table 4.3-4: Carbon Monoxide Levels at Fresno-Skypark , Fresno, 1998-2007, (parts per million - ppm)**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Highest 8-hour average | 2.6 | 2.3 | 2.2 | 1.8 | 1.9 | 1.7 | 2.2 | 1.2 | 2.1 | 1.4 |
| Highest 1-hour average | 3.8 | 3.5 | 3.9 | 4.1 | 2.7 | 2.7 | 3.2 | 2.5 | 3.8 | 2.6 |
| Number of days exceeding: | | | | | | | | | | |
| State Standard (20 ppm, 1-hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| State Standard (9.0 ppm, 8-hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal Standard (35 ppm, 1-hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal Standard (9 ppm, 8-hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: California Air Quality Data, Annual Summary, California Air Resources Board, and AIRData, USEPA

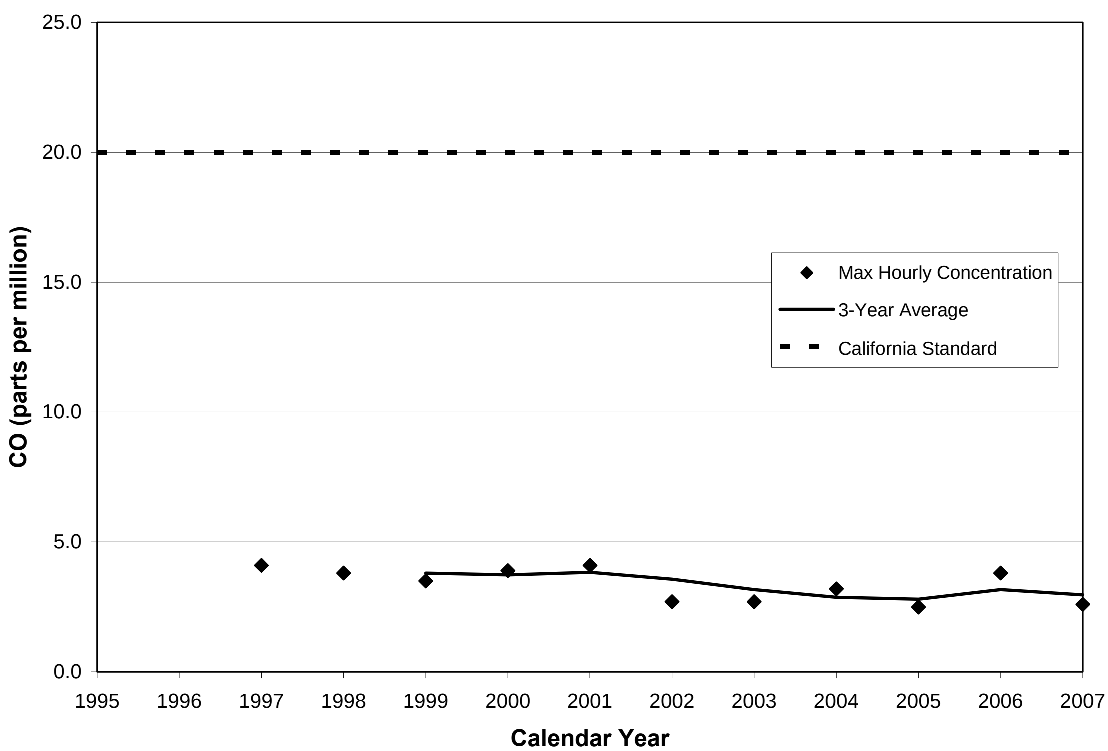



**Figure 4.3-5: Maximum 1-Hour Average CO Level: Fresno-Skypark: 1997-2007**

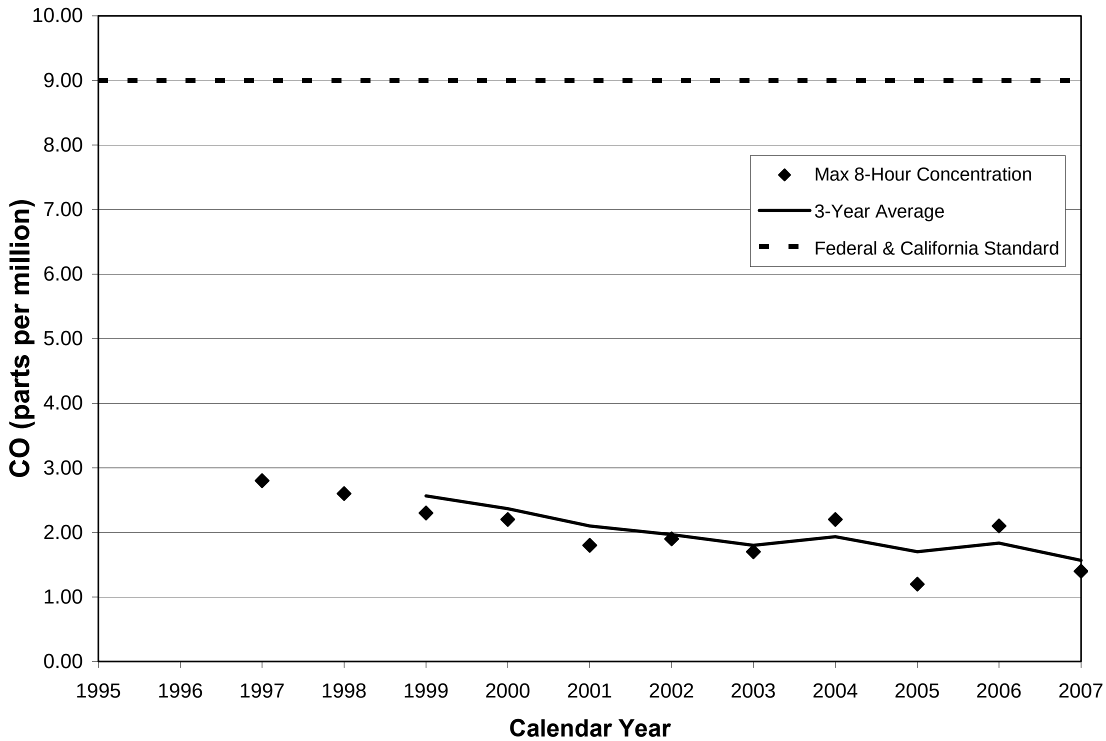



**Figure 4.3-6: Maximum 8-Hour Average CO Level: Fresno-Skypark: 1997-2007**

#### 4.3.3.4 Sulfur Dioxide

$SO_2$ is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains negligible sulfur, while fuel oils contain much larger amounts. Because of the complexity of the chemical reactions that convert $SO_2$ to other compounds (such as sulfates), peak concentrations of $SO_2$ occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The San Joaquin Valley Air Basin is considered to be in attainment for $SO_2$ for purposes of state and federal air quality planning.

Table 4.3-5 presents the state and federal air quality standards for $SO_2$ and the maximum levels recorded at Bethel Island Road (the nearest $SO_2$ monitoring station) from 1998 through 2007. Maximum 1-hour average and 24-hour average readings have been an order of magnitude below the state standard. The federal annual average standard is 0.03 ppm; during most of the period shown, annual average $SO_2$ levels at this site have been less than one-tenth of the federal standard. Figure 4.3-7 shows that for several years the maximum $SO_2$ levels generally have been less than one-fourth of the state standard.

**Table 4.3-5: Sulfur Dioxide Levels at Bethel Island , 1998–2007 (parts per million - ppm)**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Highest 1-Hour Average | 0.028 | 0.029 | 0.018 | 0.015 | 0.029 | 0.016 | 0.015 | 0.017 | 0.017 | 0.018 |
| Highest 24-hour Average | 0.009 | 0.008 | 0.007 | 0.007 | 0.009 | 0.006 | 0.006 | 0.006 | 0.007 | 0.005 |
| Annual Average (0.03 ppm, federal) | 0.002 | 0.002 | 0.002 | 0.002 | 0.003 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |
| Number of Exceedances: | | | | | | | | | | |
| State Standard | | | | | | | | | | |
| (0.25 ppm, 1-hour) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (0.04 ppm, 24-hour) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Federal Standard (0.14 ppm, 24-hour) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: AIRData, USEPA

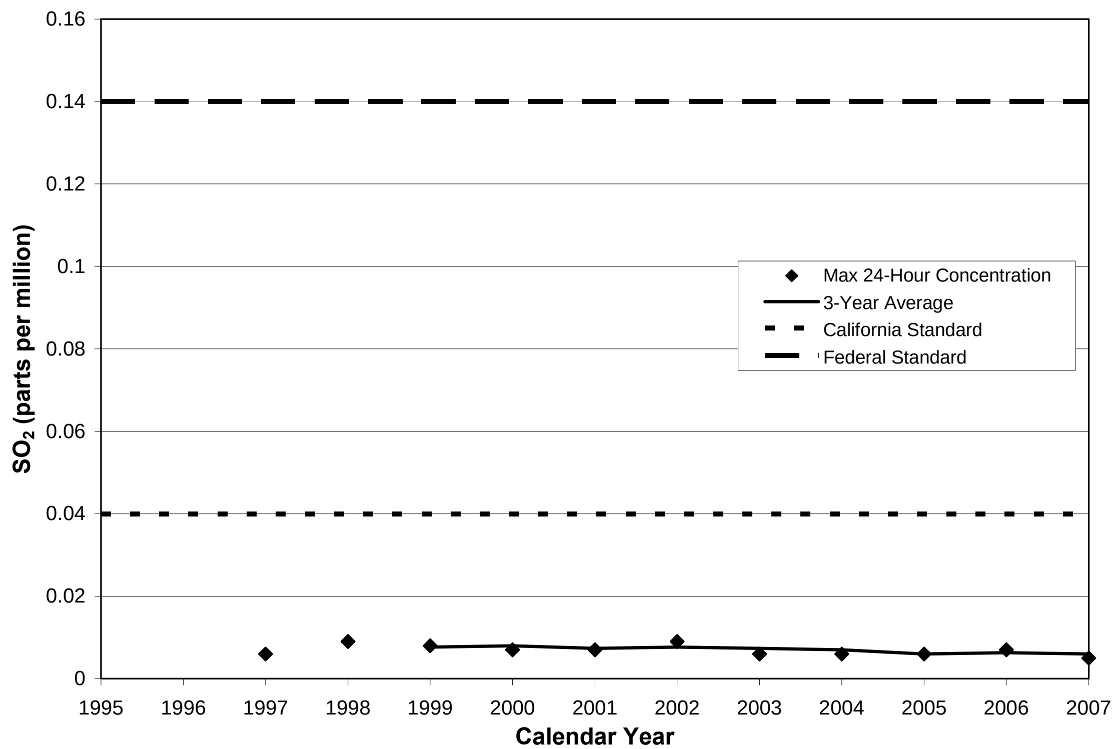



**Figure 4.3-7: Maximum 24-Hour Average $SO_2$ Level: Bethel Island Road: 1995-2007**

### 4.3.3.5 Particulate Sulfates

Particulate sulfates are the product of further oxidation of $SO_2$. The San Joaquin Valley Air Basin is in attainment of the state standard for sulfates (24-hour average < 25ug/m$^3$). There is no federal standard for sulfates.

Due to extremely low ambient levels, sulfates have not been monitored in San Joaquin County at least since 1990. Table 4.3-6 presents maximum 24-hour average sulfate levels recorded in Bakersfield, the monitoring station closest to the Project site, for the period 1995–2002, after which sulfate monitoring ceased at that station. During the period 1995-2002, sulfate levels in Bakersfield have been only about 17 percent of the state standard.

**Table 4.3-6: Particulate Sulfate Levels in Bakersfield, 1995–2002 (micrograms per cubic meter - µg/m3)**

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|---|---|---|
| Highest 24-hour Average | 4.3 | 3.5 | 3.5 | 3.5 | 3.7 | 3.7 | 3.6 | 3.9 |
| Number of Days Exceeding State Standard (25 µg/m3, 24-hour) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: California Air Quality Data, Annual Summary, California Air Resources Board

### 4.3.3.6 Particulates, Respirable and Fine ($PM_{10}$ and $PM_{2.5}$)

Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources (usually carbon particles); and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides. For air quality planning purposes, the San Joaquin Valley Air Basin is considered to be in nonattainment of both federal and state $PM_{10}$ standards.

Table 4.3-7 shows the federal and state air quality standards for $PM_{10}$, maximum levels, and arithmetic annual averages recorded at Fresno-First Street in Fresno from 1998 through 2007. Maximum 24-hour $PM_{10}$ levels from this site frequently exceed the state standards, but have not exceeded the federal standard except 6 violations in 2001. Annual average $PM_{10}$ levels are above the state standard during the monitoring period.

The trend of maximum 24-hour average $PM_{10}$ levels is plotted in Figure 4.3-8, and the trend of estimated violations of the state 24-hour standard of 50 µg/m$^3$ is plotted in Figure 4.3-9. Note that since $PM_{10}$ is generally measured only once every six days, estimated exceedance days are usually about six times the number of measured exceedances. The trends of annual average $PM_{10}$ readings and the California and federal standards are shown in Figure 4.3-10. Annual average $PM_{10}$ concentrations have been above the state standard of 20µg/m$^3$.

**Table 4.3-7: PM10 Levels at Fresno-First Street, Fresno, 1998-2007 (micrograms per cubic meter - µg/m3)**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Highest 24-hour Average | | | | | | | | | | |
| State | 141 | 154 | 138 | 193 | 96 | 74 | 54 | 106 | 117 | 107 |
| Federal | 149 | 162 | 139 | 204 | 100 | 74 | 58 | 109 | 122 | 102 |
| Annual Arithmetic Mean (State Standard = 20 µg /m$^3$) | 34.3 | 44.9 | 41 | 43.3 | 39.7 | 35 | 31.3 | 32.9 | 38.2 | 32.5 |
| Number of Days Exceeding: | | | | | | | | | | |
| State Standard (50 µg/m$^3$, 24-hour) | 77.2 | 110 | 72.3 | 97.6 | 90.4 | 79.6 | 30.2 | 58.1 | 79.6 | 54 |
| Federal Standard (150 µg/m$^3$, 24-hour) | 0 | 0 | 0 | 6.0 | 0 | 0 | 0 | 0 | 0 | 0 |

Source: California Air Quality Data, Annual Summary, California Air Resources Board

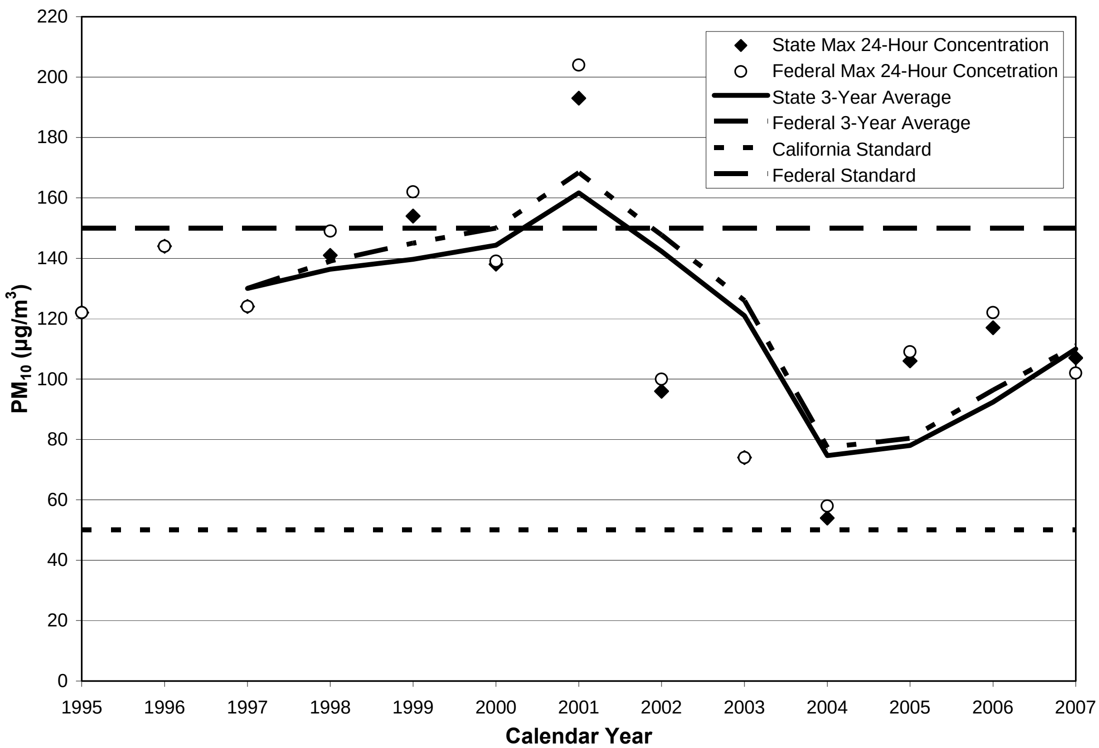



**Figure 4.3-8: Maximum 24-Hour Average $PM_{10}$ Level: Fresno-First Street: 1995-2007**

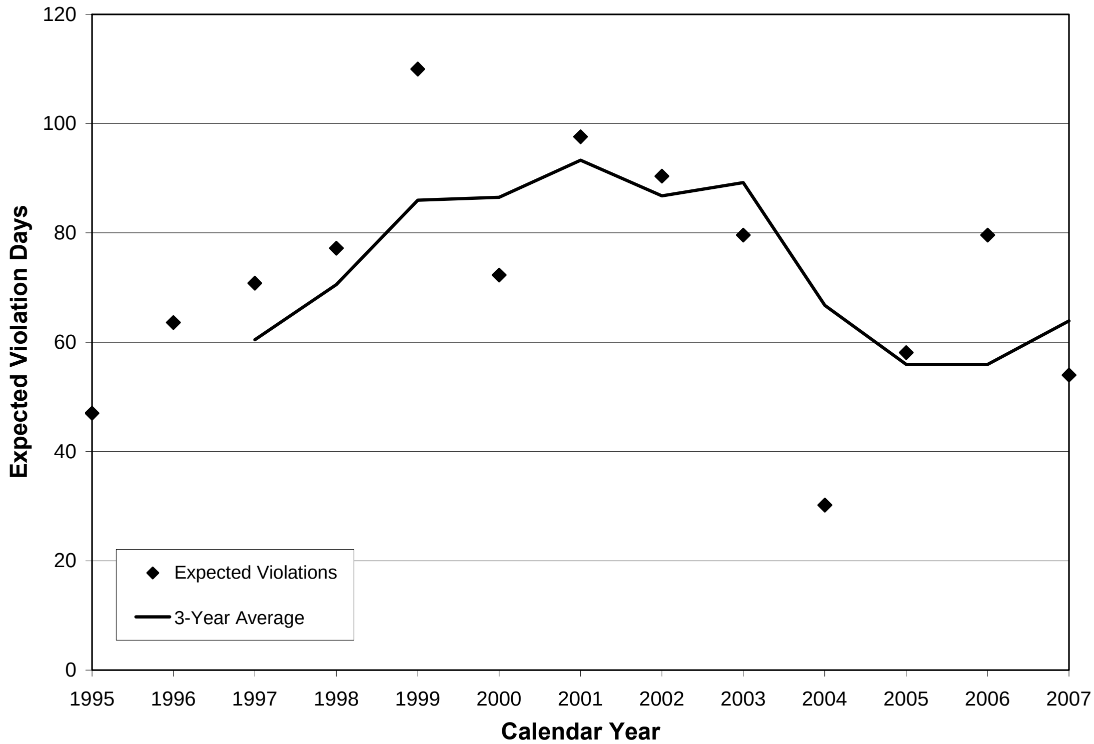



**Figure 4.3-9: Estimated Violations of the California 24-Hour $PM_{10}$ Standard: Fresno-First Street: 1995-2007**

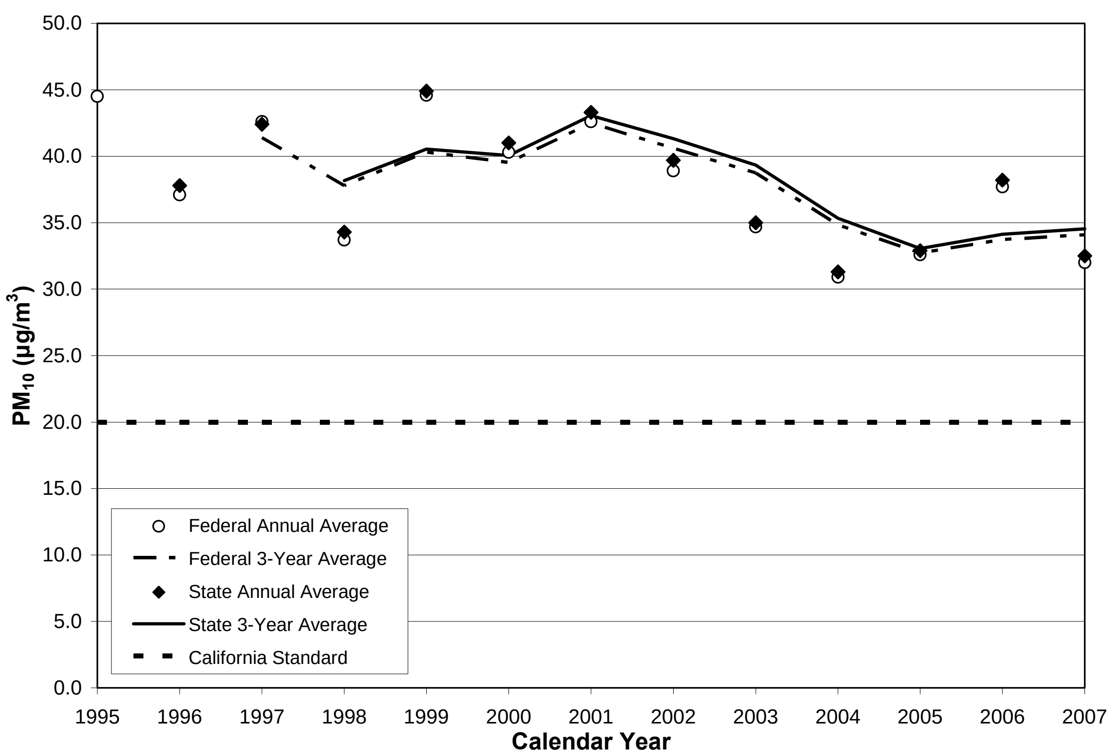



**Figure 4.3-10: Annual Average $PM_{10}$ Level: Fresno-First Street: 1995-2007**

$PM_{2.5}$ is also measured at the Fresno-First Street monitoring station. Maximum 24-hour average readings have met USEPA's federal standard (35 µg/m$^3$) that is applied to the 3-year average 98th percentile reading, since 1994.

Table 4.3-8 shows the federal air quality standards for $PM_{2.5}$, maximum levels recorded at the Fresno-First street monitoring station in Fresno during 1998-2007, and 3-year averages for the same period. The 24-hour average concentrations have exceeded the federal standard occasionally throughout the monitoring period except 2003. Annual average $PM_{2.5}$ levels have exceeded the state and federal standard during monitoring years. As for $PM_{10}$, $PM_{2.5}$ is measured only once every 6 days, so estimated exceedances are six times the number of measured exceedances. The San Joaquin Valley Air Basin is considered a nonattainment area for the state $PM_{2.5}$ standard but the attainment status for the federal $PM_{2.5}$ standard has not yet been determined.

The trend of federal annual average $PM_{2.5}$ levels is plotted in Figure 4.3-11, and the trend of maximum 24-hour average levels is plotted in Figure 4.3-12.

**Table 4.3-8: PM2.5 Levels Fresno-First Street, Fresno, 1998-2007 (micrograms per cubic meter - µg/m3)**

| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|
| Highest 24-Hour Average | 136 | 160 | 110 | 84 | 63 | 71 | 86 | 71 | 104 |
| 3-yr Average, 98$^{th}$ Percentile (Fed Std =35 µg/m$^3$) | | | 101.0 | 86.0 | 68.7 | 61 | 59.7 | 58 | 63 |
| Annual Arithmetic Mean (State Std = 12 µg/m$^3$) | 27.6 | * | 19.8 | 21.5 | 17.8 | 16.3 | 16.7 | 16.8 | 18.8 |
| 3-yr Annual Average (Federal Std = 15 µg/m$^3$) | | | | | 19.7 | 18.5 | 16.9 | 16.6 | 17.4 |
| Number of Days Exceeding: | | | | | | | | | |
| Federal Standard (35 µg/m$^3$, 24-hour) | * | * | 12.2 | 15.1 | 0 | 2.4 | 10.1 | 1.0 | 11.3 |

Source: California Air Quality Data, Annual Summary, California Air Resources Board
* There were insufficient (or no) data available to determine the value.

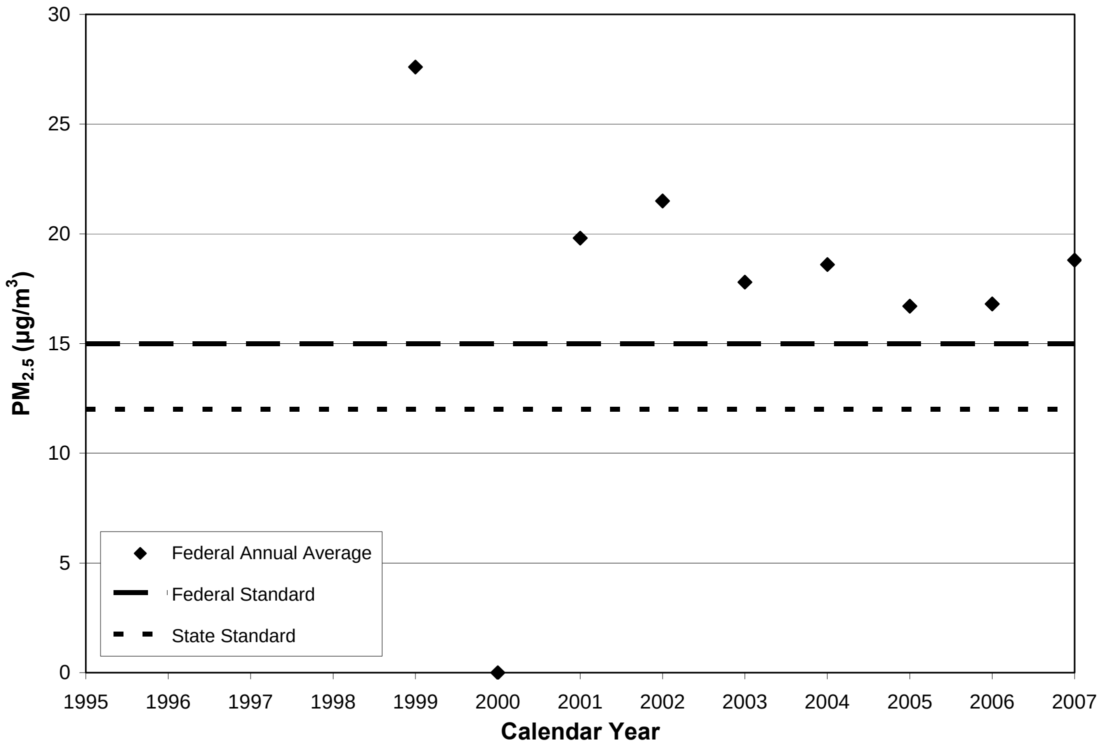



**Figure 4.3-11: Federal Annual Average $PM_{2.5}$ Level: Madera-Pump Yard: 1995-2007**

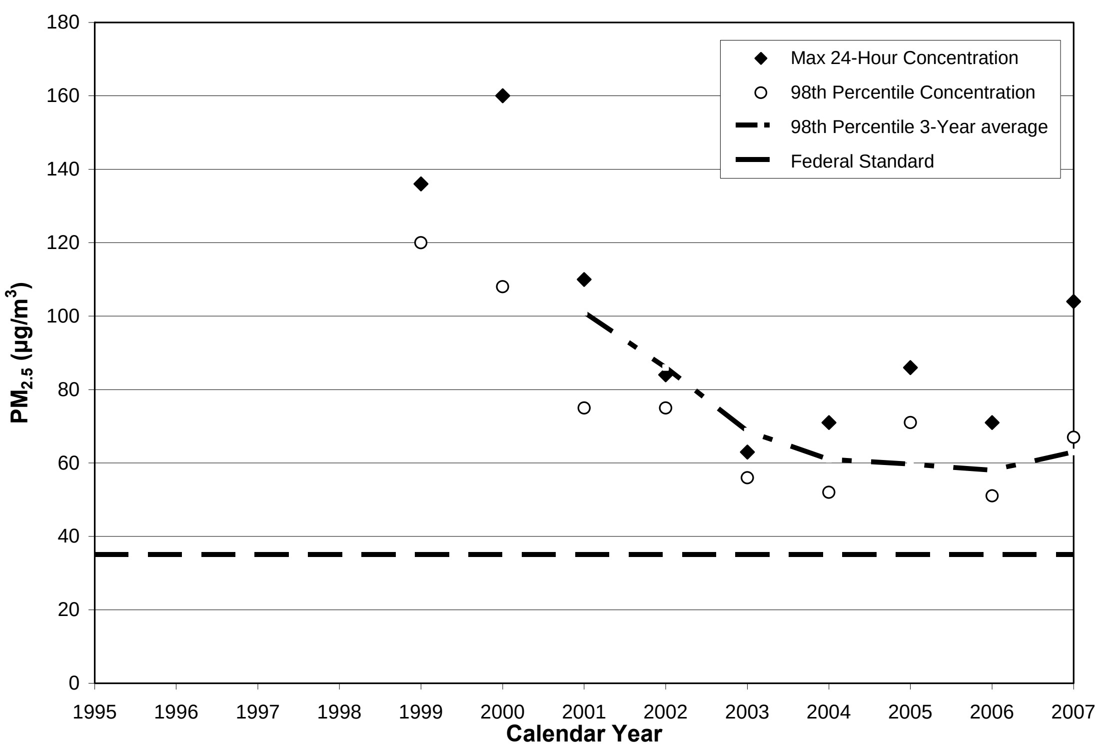



**Figure 4.3-12: Maximum 24-Hour $PM_{2.5}$ Level: Madera-Pump Yard: 1995-2007**

### 4.3.3.7 Airborne Lead

The majority of lead in the air results from the combustion of fuels that contain lead. Until 30 years ago, motor gasolines contained relatively large amounts of lead compounds used as octane-rating improvers, with the result that ambient lead levels were relatively high. Beginning with the 1975 model year, however, manufacturers began to equip new automobiles with exhaust catalysts, which are poisoned by the exhaust products of leaded gasoline. Thus, unleaded gasoline became the required fuel for an increasing fraction of new vehicles, and the phase out of leaded gasoline began. As a result, ambient lead levels decreased dramatically, and for several years California air basins, including the San Joaquin Valley Air Basin, have been in attainment of state and federal airborne lead standards for air quality planning purposes. Table 4.3-9 lists the state air quality standard for airborne lead and the levels recorded in the Madera-Pump Yard station between 1998 and 2003. Table 4.3-9 indicates that airborne lead levels have been well below the ambient air quality standard of 1.5 µg/m$^3$ for the period 1998 through 2003.

**Table 4.3-9: Airborne Lead at Madera-Pump Yard, Madera, 1998-2003 (µg/m3)**

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|---|---|---|---|---|---|---|
| Highest Daily Average | 0.02 | 0.02 | 0.03 | 0.02 | 0.02 | 0.02 |
| Number of Day Exceeding Federal Standard (1.5 µg/m$^3$) | 0 | 0 | 0 | 0 | 0 | 0 |

Source: AIRData, USEPA

## 4.3.4 Regulatory Setting

The USEPA has responsibility for enforcing, on a national basis, the requirements of many of the country's environmental and hazardous waste laws. California is under the jurisdiction of USEPA Region IX, which has its offices in San Francisco. Region IX is responsible for the local administration of USEPA programs for California, Arizona, Nevada, Hawaii, and certain Pacific trust territories. USEPA's activities relative to the California air pollution control program focus principally on reviewing California's submittals for the State Implementation Plan (SIP). The SIP is required by the federal Clean Air Act to demonstrate how all areas of the state will meet the national ambient air quality standards within the federally specified deadlines (42 USC §7409, 7411).

The California Air Resources Board was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update as necessary the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the federal ambient air quality standards (California Health & Safety Code (H&SC) §39500 et seq.).

When the state's air pollution statutes were reorganized in the mid-1960s, local air pollution control districts (APCDs) were required to be established in each county of the state (H&SC §4000 et seq.). There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California, (H&SC §40200 et seq.).

Air pollution control districts and air quality management districts in California have principal responsibility for:

- Developing plans for meeting the state and federal ambient air quality standard;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution; and
- Enforcing air pollution statutes and regulations governing non-vehicular sources; and for developing employer-based trip reduction programs.

Each level of government has adopted specific regulations that limit emissions from stationary combustion sources, several of which are applicable to this Project.

### 4.3.4.1 Applicable Regulations and Standards

#### 4.3.4.1.1 Federal

The USEPA implements and enforces the requirements of many of the federal environmental laws. The federal Clean Air Act, as most recently amended in 1990, provides USEPA with the legal authority to regulate air pollution from stationary sources such as the Project. USEPA has promulgated the following stationary source regulatory programs to implement the requirements of the 1990 Clean Air Act:

- Standards of Performance for New Stationary Sources (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAPS);
- Prevention of Significant Deterioration (PSD);
- New Source Review (NSR); and

- Title V: Operating Permits.

*National Standards of Performance for New Stationary Sources*

**Authority:** Clean Air Act §111, 42 USC §7411; 40 CFR Part 60, Subpart KKK

**Purpose:** Establishes standards of performance to limit the emission of criteria pollutants (air pollutants for which USEPA has established national ambient air quality standards (NAAQS)) from new or modified facilities in specific source categories. The applicability of these regulations depends on the equipment size; process rate; and date of construction, modification, or reconstruction of the affected facility. The proposed Project was reviewed for applicability of the following NSPS:

- Subpart KKK—Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants (constructed after January 20, 1984) is applicable to any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both. Because this is a storage facility for processed gas, the facility is not subject to Subpart KKK.

These standards are implemented at the local level with federal and state oversight.

**Administering Agency:** SJVAPCD, with USEPA Region 9 and CARB oversight.

*National Emission Standards for Hazardous Air Pollutants*

**Authority:** Clean Air Act § 112, 42 USC §7412; 40 CFR Part 63

**Purpose:** Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by USEPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific source categories.[3] These standards are implemented at the local level with federal oversight.

Generally, NESHAPS are not applicable unless the facility is a major source of HAPs (i.e., 10 tpy of one HAP or 25 tpy of all HAPs). The Project is not a major source of HAPs. However, USEPA also regulates smaller sources of HAPs as area sources. 40 CFR 63 Subpart HH, NESHAP for Source Categories from Oil and Natural Gas Production Facilities includes requirements for Triethylene Glycol (TEG) dehydrators. A TEG dehydrator is exempt from the NESHAP if facility-wide emissions of benzene are less than 1 TPY. As discussed below, benzene emissions from the facility will be below this threshold. Therefore, NESHAPS does not apply to the Project.

**Administering Agency:** SJVAPCD, with USEPA Region 9 oversight.

[3] A major source of HAPs is one that emits more than 10 tons per year (tpy) of any individual HAP, or more than 25 tpy of all HAPs combined.

### *Prevention of Significant Deterioration Program*

**Authority:** Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52

**Purpose:** Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies to pollutants for which ambient concentrations do not exceed the corresponding NAAQS (i.e., attainment pollutants—$NO_2$. $SO_2$ and CO). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

The PSD requirements apply, on a pollutant-specific basis, to any project that is a new major stationary source or a major modification to an existing major stationary source. A major source is a listed facility (one of 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 tpy, or any other facility that emits at least 250 tpy. As shown in Table 4.3-19, emissions of NOx, $SO_2$, and CO are all below 100 TPY. Therefore, the facility is not a major stationary source, and is not subject to PSD.

The PSD program contains the following elements:

- Air quality monitoring;
- BACT;
- Air quality impact analysis;
- Protection of Class I areas; and
- Growth, visibility, soils, and vegetation impacts.

As the SJVAPCD does not have delegation for the PSD program, a separate PSD application would need to be filed with the USEPA if the Project were determined to be subject to PSD requirements.

***Air Quality Monitoring***

At its discretion, USEPA Region 9 may require pre-construction and/or post-construction ambient air quality monitoring for PSD sources if representative monitoring data are not already available. Pre-construction monitoring data must be gathered over a one-year period to characterize local ambient air quality. Post-construction air quality monitoring data must be collected as deemed necessary by USEPA Region 9 to characterize the impacts of proposed project emissions on ambient air quality.

### Best Available Control Technology

BACT must be applied to any new or modified major source to minimize the emissions increase of those pollutants exceeding the PSD emission thresholds. USEPA defines BACT as an emissions limitation—called the Lowest Achievable Emission Rate (LAER)—based on the maximum degree of reduction for each subject pollutant, considering energy, environmental, and economic impacts, that is achievable through the application of available methods, systems, and techniques. BACT/LAER must be as stringent as any emission limit required by an applicable NSPS or NESHAP. BACT/LAER is defined below in the discussion of the SJVAPCD NSR regulatory requirements.

### Air Quality Impact Analysis

An air quality dispersion analysis must be conducted to evaluate impacts of significant emission increases from new or modified facilities on ambient air quality. PSD source emissions must not cause an exceedance of any ambient air quality standard, and the increase in ambient air concentrations must not exceed the allowable increments shown in Table 4.3-10.

**Table 4.3-10: PSD Class II Increments**

| Pollutant | Averaging Period | Allowable Increment ($\mu g/m^3$) |
|---|---|---|
| $NO_2$ | Annual | 25[a] |
| $PM_{10}$ | Annual<br>24-Hour | 17[a]<br>30[b] |
| $SO_2$ | Annual<br>24-Hour<br>3-Hour | 20[a]<br>91[b]<br>512[b] |

Notes:
[a] Not to be exceeded
[b] Not to be exceeded more than once per year.

### Protection of Class I Areas

The potential increase in ambient air quality concentrations for attainment pollutants (i.e., $NO_2$, $PM_{10}$, or $SO_2$) within Class I areas closer than approximately 100 km may need to be quantified if the new or modified PSD source were to have a sufficiently large emission increase as evaluated by the Class I area Federal Land Managers. In such a case, a Class I visibility impact analysis would also be performed.

### Growth, Visibility, Soils, and Vegetation Impacts

Impairment to visibility, soils, and vegetation resulting from PSD source emissions as well as associated commercial, residential, industrial, and other growth must be analyzed. This analysis includes cumulative impacts to local ambient air quality.

**Administering Agency:** USEPA, Region 9.

### *Nonattainment New Source Review*

**Authority:** Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52

**Purpose:** Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of ambient quality standards. This program is implemented at the local level with USEPA oversight.

The NSR requirements apply, on a pollutant-specific basis, to any project that is a new major stationary source or a major modification to an existing major stationary source. A major source is a listed facility (one of 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 tpy, or any other facility that emits at least 250 tpy. As shown in Table 4.3-19, emissions of NOx, VOC, $PM_{10}$, and $PM_{2.5}$ are all below 100 TPY. Therefore, the facility is not a major stationary source, and is not subject to PSD.

**Administering Agency:** SJVAPCD, with USEPA Region 9 oversight.

### *Title V – Operating Permits Program*

**Authority:** Clean Air Act § 501 (Title V), 42 USC §7661; 40 CFR Part 70

**Purpose:** Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by USEPA as requiring a Title V permit. These requirements are implemented at the local level with federal oversight.

A major facility is a facility with a potential to emit any pollutant above the major facility thresholds. Table 4.3-11 shows the major facility thresholds contained in SJVAPCD Rule 3.24:

**Table 4.3-11: District Major Facility Thresholds**

| Pollutant | Threshold |
|---|---|
| $PM_{10}$ | 140,000 lb/yr |
| NOx | 50,000 lb/yr |
| $SO_2$ | 140,000 lb/yr |
| VOC | 50,000 lb/yr |
| CO | 200,000 lb/yr |

Project emissions are shown in Table 4.3-19. All emissions are below major facility thresholds. Therefore the Project is not subject to Title V.

**Administering Agency:** SJVAPCD, with USEPA Region 9 oversight.

#### 4.3.4.1.2 State

The California Air Resources Board was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the federal ambient air quality standards. CARB has implemented the following state or federal stationary source regulatory programs in accordance with the requirements of the federal Clean Air Act and California Health & Safety Code (H&SC):

- State Implementation Plan;
- California Clean Air Act;
- Toxic Air Contaminant Program;
- Nuisance Regulation;
- Air Toxics "Hot Spots" Act;
- CEC and CARB Memorandum of Understanding; and
- California Climate Change Regulatory Program.

*State Implementation Plan*

**Authority:** Health & Safety Code (H&SC) §39500 et seq.

**Purpose:** Required by the federal Clean Air Act, the SIP must demonstrate the means by which all areas of the state will attain and maintain NAAQS within the federally mandated deadlines. CARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules (and/or revise existing rules) and demonstrate that the resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in the attainment of NAAQS. The relevant SJVAPCD Rules and Regulations that have also been incorporated into the SIP are discussed with the local LORS.

**Administering Agency:** SJVAPCD, with CARB and USEPA Region 9 oversight.

### *California Clean Air Act*

**Authority:** H&SC §40910 - 40930

**Purpose:** Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air quality standards will be attained and maintained. The SJVAPCD Air Quality Plan is discussed with the local LORS.

**Administering Agency:** SJVAPCD, with CARB oversight.

### *Toxic Air Contaminant Program*

**Authority:** H&SC §39650 - 39675

**Purpose:** Established in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants and control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants. CARB also assesses the potential for human exposure to a substance, while the Office of Environmental Health Hazard Assessment (OEHHA) evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report, which concludes whether a substance poses a significant health risk and should be identified as a toxic air contaminant. In 1993, the Legislature amended the program to identify the 187 federal hazardous air pollutants[4] as toxic air contaminants. CARB reviews the emission sources of an identified toxic air contaminant and, if necessary, develops air toxics control measures to reduce the emissions. No Air Toxic Control Measures are applicable to the Project.

### *Nuisance Statute*

**Authority:** CA Health & Safety Code §41700

**Purpose:** Provides that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property." Compliance with the District's nuisance regulation will assure compliance with the State nuisance statute.

**Administering Agency:** SJVAPCD and CARB

[4] The USEPA increased the original list of 188 HAPs to 189, and then removed caprolactam (61FR30816, June 18, 1996) and methyl ethyl ketone on December 19, 2005, reducing the list to 187.

### *Air Toxic "Hot Spots" Act*

**Authority:** CA Health & Safety Code § 44300-44384; 17 CCR §93300-93347

**Purpose:** Established in 1987, the Air Toxics "Hot Spots" Information and Assessment Act[5] supplements the toxic air contaminant program, by requiring the development of a statewide inventory of air toxics emissions from stationary sources. The program requires affected facilities to prepare (1) an emissions inventory plan that identifies relevant air toxics and sources of air toxics emissions; (2) an emissions inventory report quantifying air toxics emissions; and (3) a health risk assessment, if necessary, to characterize the health risks to the exposed public. Facilities whose air toxics emissions are deemed to pose a significant health risk must issue notices to the exposed population. In 1992, the Legislature amended the program to further require facilities whose air toxics emissions are deemed to pose a significant health risk to implement risk management plans to reduce the associated health risks. This program is implemented at the local level with state oversight.

The Project is subject to the reporting requirements of AB 2588 because benzene emissions are above the reporting thresholds.

**Administering Agency:** SJVAPCD, with CARB oversight.

### *California Climate Change Regulatory Program*

**Authority:** Stats. 2006, Ch. 488 and CA Health & Safety Code § 38500-38599

**Purpose:** The State of California adopted the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) on September 27, 2006, which requires sources within the state to reduce carbon emissions by approximately 25% by the year 2020. The California Climate Action Registry has published protocols for voluntary reporting of GHG emissions from a number of sectors of the economy,[6] and CARB has proposed draft regulations to limit GHG emissions from electric power plants and other specific source categories.[7] In addition, CARB has issued draft guidance with recommended emission factors for calculating GHG emissions.[8]

AB 32 also sets the following milestone dates for CARB to take specific actions:

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[5] Commonly known as AB 2588.

[6] California Climate Action Registry. Appendix to the General Reporting Protocol: Power/Utility Reporting Protocol – Reporting Entity-Wide Greenhouse Gas Emissions Produced by Electric Power Generators and Electric Utilities, Version 1.0, April 2005 (http://www.climateregistry.org/Default.aspx?refreshed=true).

[7] CARB. Staff Report: Initial Statement of Reasons for Rulemaking, Public Hearing to Consider Mandatory Reporting of Greenhouse Gas Emissions Pursuant to the California Global Warming Solutions Act of 2006 (Assembly Bill 32), October19, 2007, http://www.arb.ca.gov/regact/2007/ghg2007/ghg2007.htm.

[8] CARB. Attachments C to F, Supplemental Materials Document for Staff Report: Initial Statement of Reasons for Rulemaking, Public Hearing to Consider Mandatory Reporting of Greenhouse Gas Emissions Pursuant to the California Global Warming Solutions Act of 2006 (Assembly Bill 32), October19, 2007, http://www.arb.ca.gov/regact/2007/ghg2007/ghg2007.htm.

- June 30, 2007: Identify a list of discrete early action GHG emission reduction measures (first report published April 20, 2007, with additional measures adopted on October 25, 2007).

- January 1, 2008: Establish a statewide GHG emission cap for 2020 that is equivalent to 1990 emissions.

- January 1, 2008: Adopt mandatory reporting rules for significant sources of GHGs.

- January 1, 2009: Adopt a scoping plan that will indicate how GHG emission reductions will be achieved from significant GHG sources through regulations, market-based compliance mechanisms, and other actions, including recommendation of a *de minimis* threshold for GHG emissions, below which sources would be exempt from reduction requirements.

- January 1, 2011: Adopt regulations to achieve maximum technologically feasible and cost-effective GHG emission reductions, including provisions for both market-based and alternative compliance mechanisms.

- January 1, 2012: Regulations adopted prior to January 1, 2010, become effective.

Senate Bill (SB) 97, adopted August 21, 2007, requires the California Office of Planning and Research (OPR) to develop CEQA guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" by July 1, 2009. SB 97 further requires the Resources Agency Secretary to adopt these CEQA guidelines by January 1, 2010. Finally, SB 97 removes GHG emissions as a cause of action under CEQA for specified state-financed infrastructure projects until January 1, 2010.

The facility's emissions fall below the thresholds for which mandatory reporting is required. CARB has not yet adopted control requirements applicable to this facility. As a result, the Project is currently not subject to any requirements under this program.

**Administering Agency:** CARB.

#### 4.3.4.1.3 Local

##### *District Regulations and Policies*

When the state's air pollution statutes were reorganized in the mid-1960s, local districts were required to be established in each county of the state. There are three different types of districts: county, regional, and unified (including the SJVAPCD). Local districts have principal responsibility for developing plans for meeting the NAAQS and California ambient air quality standards; for developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards; for implementing permit programs established for the construction, modification, and operation of sources of air pollution; for enforcing air pollution statutes and regulations governing non-vehicular sources; and for developing programs to reduce emissions from indirect sources.

### *San Joaquin Valley Unified Air Pollution Control District Attainment Demonstration Plans*

**Authority:** H&SC §40914

**Purpose:** The SJVAPCD plans define the proposed strategies, including stationary source and transportation control measures and new source review rules, which will be implemented to attain and maintain the state ambient air quality standards. The relevant stationary source control measures and new source review requirements are discussed with individual SJVAPCD Rules and Regulations.

**Administering Agency:** SJVAPCD, with CARB oversight.

### *San Joaquin Valley Air Pollution Control District Rules and Regulations*

**Authority:** H&SC §4000 et seq., H&SC §40200 et seq., indicated SJVAPCD Rules

**Purpose:** Establishes procedures and standards for issuing permits; establishes standards and limitations on a source-specific basis.

**Administering Agency:** SJVAPCD with USEPA Region 9 and CARB oversight.

Rule 2010 (Permits Required) specifies that any facility installing nonexempt equipment that causes or controls the emission of air pollutants must first obtain an Authority to Construct from the SJVAPCD.

Rule 2201 (New and Modified Stationary Source Review Rule) implements the federal NSR program, as well as the new source review requirements of the California Clean Air Act. The rule contains the following elements:

- Best available control technology (BACT);
- Emission offsets; and
- Air quality impact analysis (AQIA).

#### ***Best Available Control Technology***

Best Available Control Technology (BACT) must be applied to any new or modified source resulting in an emissions increase exceeding any SJVAPCD BACT threshold shown in Table 4.3-12.

**Table 4.3-12: District BACT Emission Thresholds**

| Pollutant | Threshold |
|---|---|
| PM | 2 lb/day |
| NOx | 2 lb/day |
| $SO_2$ | 2 lb/day |
| VOC | 2 lb/day |
| CO | 100 tpy |

The SJVAPCD defines BACT as the most stringent emission limitation or control technique that:

- Has been achieved in practice for such emissions unit and class of source; or
- Is contained in any SIP approved by the USEPA for such emissions unit category and class of source. A specific limitation or control technique shall not apply if the owner or operator of the proposed emissions unit demonstrates to the satisfaction of the Air Pollution Control Officer (APCO) that such limitation or control technique is not presently achievable; or
- Is any other emission limitation or control technique, including process and equipment changes of basic and control equipment, found by the APCO to be technologically feasible for such class or category of sources or for a specific source, and cost-effective as determined by the APCO.

Emissions of some pollutants from some equipment exceed BACT thresholds. BACT requirements apply to the Project.

***Emission Offsets***

A new or modified facility with a stationary source NSR balance exceeding the SJVAPCD offset thresholds shown in Table 4.3-13 must offset all emissions increases at a ratio that varies according to the distance between the facility and the source of the offsets.

**Table 4.3-13: District Offset Emission Thresholds**

| Pollutant | Threshold, lb/yr |
|---|---|
| NOx | 20,000 |
| $SO_2$ | 54,730 |
| CO | 200,000 [a] |
| VOC | 20,000 |
| PM | 29,200 |

[a] Applies in CO attainment areas, including the Project Site. CO emissions in nonattainment areas are subject to a 30,000 lb/yr offset threshold.

As discussed below, the Project's emissions fall below District offset thresholds.

***Air Quality Impact Analysis***

Emissions from a new or modified Stationary Source shall not cause or make worse the violation of an Ambient Air Quality Standard. An air quality impact analysis must be conducted to evaluate impacts of emission increases from new or modified facilities on ambient air quality, unless the APCO waives the requirement.

***Toxic Risk Management***

The SJVAPCD's Risk Management Review Policy for Permitting New and Modified Sources provides a mechanism for evaluating potential impacts of air emissions of toxic substances from new, modified, and relocated sources in the SJVAPCD. The policy requires a demonstration that the source will not adversely impact the health and welfare of the public.

Rule 2520 (Federally Mandated Operating Permits) requires new major facilities and Phase II acid rain facilities to obtain an operating permit containing the federally enforceable requirements mandated by Title V of the 1990 Clean Air Act Amendments. The application must present a process description, all new stationary sources at the facility, applicable regulations, estimated emissions, associated operating conditions, alternative operating scenarios, a facility compliance plan, and a compliance certification. Because the Project will not be a major facility, this Rule does not apply.

*SJVAPCD Prohibitory Rules*

The general prohibitory rules of the SJVAPCD applicable to the Project include the following:

Rule 4001 (New Source Performance Standards): Requires compliance with applicable federal standards of performance for new or modified stationary sources. Because the Project is not subject to any federal new source performance standards, Rule 4001 does not apply.

Rule 4002 – National Emissions Standards for Hazardous Air Pollutants: This rule implements the federal NESHAPS regulations discussed above in Section 4.3.4.1.1. NESHAPs are not applicable to the Project because the facility will not be a major source of HAPs (i.e., 10 tpy of one HAP or 25 tpy of all HAPs).

Rule 4101 – Visible Emissions: Prohibits visible emissions as dark as or darker than Ringelmann No. 1 for periods greater than three minutes in any hour.

Rule 4102 – Nuisance: Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property.

Rule 4201 – Particulate Matter Emission Standards: Prohibits PM emissions in excess of 0.1 grains per dry standard cubic foot (gr/dscf).

Rule 4301 – Fuel Burning Equipment: For "any furnace, boiler, apparatus, stack, and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer," combustion contaminant (defined in Rule 1020 (Definition 3.12) as particulate matter from burning carbon-containing material) emissions are limited to the following:

- 0.1 grain of combustion contaminants per dry standard cubic foot @ 12% $CO_2$;
- 10 pounds of combustion contaminants per hour;
- Sulfur compounds as $SO_2$ to 200 pounds per hour; and
- NOx as $NO_2$ to 140 pounds per hour.

These limits do not apply to emergency standby generator and fire water pump engines.

Rule 4305 – Boilers, Steam Generators, and Process Heaters—Phase 2: Limits NOx emissions from specified combustion devices to 30 ppmv at 3% oxygen. Limits CO emissions to 400 ppmv.

Rule 4306 – Boilers, Steam Generators, and Process Heaters—Phase 3: Limits NOx emissions from specified combustion devices to specified levels.

Rule 4309 – Dryers, Dehydrators, and Ovens: Requires dehydrators to be fueled with PUC-quality natural gas and imposes operating, maintenance, recordkeeping and reporting requirements for dehydrators. A dehydrator is a device that drives free water from products like fruits, vegetables, and nuts, at an accelerated rate without damage to the product. The rule does not apply to the equipment used to remove water from natural gas.

Rule 4351 – Boilers, Steam Generators, and Process Heaters—Phase 1: Limits NOx and CO emissions from combustion devices at major facilities. Because potential NOx emissions from the facility do not exceed 50 TPY, this is not a major facility, and the rule does not apply.

Rule 4408 – Glycol Dehydration Systems: Requires that the dehydrator be vented to a control system.

Rule 4499 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities: Limits VOC emissions from leaking components at light crude oil production facilities, natural gas production facilities, and natural gas processing facilities. Includes inspection, maintenance, recordkeeping and reporting requirements for valves and flanges. Does not apply to this facility because gas storage facilities are not subject to the Rule.

Rule 4801 – Sulfur Compounds: Prohibits sulfur compound emissions, calculated as $SO_2$, in excess of 0.2% (2,000 ppmv) from any source.

Rule 8011 – Fugitive $PM_{10}$ Prohibitions, General Requirements: Sets forth definitions, applicability and administrative requirements for anthropogenic sources of $PM_{10}$.

Rule 8021 – Fugitive $PM_{10}$ Prohibitions, Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities: Limits fugitive dust emissions from construction, demolition, excavation, and related activities.

Rule 8041 – Carryout and Trackout (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from construction carryout and trackout.

Rule 8051 – Open Areas (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from open areas larger than 3.0 acres containing more than 1,000 square feet of disturbed surface.

Rule 8061 – Paved and Unpaved Roads (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from constructed paved and unpaved roads on the Project site.

Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from unpaved vehicle/equipment traffic areas experiencing more than 50 annual average daily trips.

### 4.3.4.2 Conformance of Facility

As addressed in this section, the Project is designed, and will be constructed and operated, in accordance with all relevant federal, state, and local requirements and policies concerning protection of air quality.

#### 4.3.4.2.1 Federal

*National Standards of Performance for New Stationary Sources*

No NSPS standards are applicable to this facility.

*National Emission Standards for Hazardous Air Pollutants*

NESHAPS does not apply to this facility.

*Prevention of Significant Deterioration Program*

PSD review does not apply to the Project.

*Nonattainment New Source Review*

NSR review does not apply to the Project.

*Title V—Operating Permits*

This facility will not require a Title V permit.

#### 4.3.4.2.2 State

*State Implementation Plan*

Compliance with SIP elements is assured by compliance with relevant SJVAPCD Rules and Regulations.

*California Clean Air Act*

AB 2595, the California Clean Air Act (Act), was enacted by the California Legislature and became law in January 1989. The Act requires the local air pollution control districts to attain and maintain both the federal and state ambient air quality standards at the "earliest practicable date." The Act contains several milestones for local districts and the California Air Resources Board. In compliance with the CCAA, the San Joaquin Valley APCD adopted the 2007 Ozone Plan to address the nonattainment status for Ozone.

Air quality plans must demonstrate attainment of the state ambient air quality standards and must result in a five percent annual reduction in emissions of nonattainment pollutants (ozone, CO, NOx, $SO_2$, and their precursors) in a given district (H&SC §40914). A local district may adopt additional stationary source control measures or transportation control measures, revise existing source-specific or new source review rules, or expand its vehicle inspection and maintenance program (H&SC §40918) as part of the plan. District air quality plans specify the development and adoption of more stringent regulations to achieve the requirements of the Act. The applicable regulations that will apply to the Project, and the relevant compliance demonstration, are included in the discussion of SJVAPCD prohibitory rules below.

*Toxic Air Contaminant Program*

No CARB ATCMs are applicable to this facility.

*Nuisance Statute*

Compliance with the District's nuisance regulation will assure compliance with the State nuisance statute.

*Air Toxic "Hot Spots" Act*

The facility will comply with the reporting requirements of this act, and will conduct risk assessments as required by the District.

#### 4.3.4.2.3 SJVAPCD New Source Review Requirements

SJVAPCD Rule 2201, New and Modified Stationary Source Review, requires that a pre-construction review be conducted for all proposed new or modified sources of air pollution. New Source Review contains three principal elements:

- Best available control technology (BACT);
- Emissions offsets; and
- Air quality impact analysis.

BACT is required for any source for each emissions increase of an affected pollutant for which the source's potential to emit exceeds specified levels. The specified levels are 2.0 lb/day for each pollutant except CO.

The regulation further requires that the applicant provide emission offsets for pollutants that exceed 20,000 lb/year (volatile organic compounds and nitrogen oxides), 54,750 lb/year (sulfur oxides), 29,200 lb/year ($PM_{10}$), or 200,000 lb/year (carbon monoxide).

*California Climate Change Regulatory Program*

The Project is currently not subject to any requirements under this program.

#### 4.3.4.2.4 Local

*San Joaquin Valley Unified Air Pollution Control District Permit Requirements*

Rule 2010 (Permits Required): Specifies that any facility installing nonexempt equipment that causes or controls the emission of air pollutants must first obtain an Authority to Construct from the SJVAPCD. An application will be submitted to the District seeking appropriate permits.

Rule 2201 (New and Modified Stationary Source Review Rule): Implements the federal NSR program, as well as the new source review requirements of the California Clean Air Act. The Project's compliance with BACT requirements is discussed below in Section 4.3.6.3. The Project is not subject to District offset requirements. The Project is subject to District Air Quality Impact Analysis requirements; however, it is expected that the District will not require modeling of the modest operating emissions from this facility.

### *San Joaquin Valley Unified Air Pollution Control District Attainment Demonstration Plans*

As required by the federal Clean Air Act and the California Clean Air Act, plans that demonstrate attainment must be developed for those areas that have not attained the national and state air quality standards (42 USC §7401; H&SC §40912). As part of its plan, the District has developed regulations limiting emissions from specific sources. These regulations are collectively known as "prohibitory rules," because they prohibit the construction or operation of a source of pollution that would violate specific emission limits.

The general prohibitory rules of the District applicable to the Project are as follows.

<u>Rule 4001 (New Source Performance Standards)</u>: Requires compliance with applicable federal standards of performance for new or modified stationary sources. As discussed above, there are no NSPS applicable to this facility.

<u>Rule 4002 – National Emissions Standards for Hazardous Air Pollutants</u>: This rule implements the federal NESHAPS regulations discussed above in Section 4.3.4.1.1. NESHAPs are not applicable to the Project because the facility will not be a major source of HAPs (i.e., 10 tpy of one HAP or 25 tpy of all HAPs). The area source NESHAP Oil and Natural Gas Production Facilities does not apply if facility-wide emissions of benzene are less than 1 TPY.

<u>Rule 4101 – Visible Emissions</u>: Prohibits visible emissions as dark as, or darker than, Ringelmann No. 1 for periods greater than three minutes in any hour. All combustion sources will use clean natural gas, which should result in compliance with this requirement.

<u>Rule 4102 – Nuisance</u>: Prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property. Operation of this facility is not expected to result in emissions of odorous substances or dust that might create a nuisance.

<u>Rule 4201 – Particulate Matter Emission Standards</u>: Prohibits PM emissions in excess of 0.1 grains per dry standard cubic foot (gr/dscf). All combustion sources will use clean natural gas, which should result in compliance with this requirement.

<u>Rule 4301 – Fuel Burning Equipment</u>: All combustion sources will use clean natural gas, which should result in compliance with this rule's limits on sulfur dioxide and particulate emissions.

<u>Rule 4305 – Boilers, Steam Generators, and Process Heaters—Phase 2</u>: Limits NOx emissions from specified combustion devices to 30 ppmv at 3% oxygen. Also limits CO emissions to 400 ppmv. As shown in Table 4.3-16, the process gas heaters will comply with this regulation.

<u>Rule 4306 – Boilers, Steam Generators, and Process Heaters—Phase 3</u>: Limits NOx emissions from specified combustion devices to specified levels. The section applicable to

the process gas heaters is 5.11H (Units limited by a Permit to Operate to an annual heat input of 9 billion Btu/year to 30 billion Btu/year). The applicable limits are 30 ppmv NOx and 400 PPMV CO. As shown in Table 4.3-16, the process gas heaters will comply with this regulation.

Rule 4309 – Dryers, Dehydrators, and Ovens: This rule does not apply to the facility.

Rule 4351 – Boilers, Steam Generators, and Process Heaters—Phase 1: This rule does not apply to the facility.

Rule 4408 – Glycol Dehydration Systems: Requires that the dehydrator be vented to a control system. Hydrocarbon from the dehydrator will be controlled by a thermal oxidizer.

Rule 4499 – Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities: This rule does not apply to the facility.

Rule 4801 – Sulfur Compounds: Prohibits sulfur compound emissions, calculated as $SO_2$, in excess of 0.2% (2,000 ppmv) from any source. The use of PUC quality natural gas in all combustion devices will ensure compliance with this standard.

Rule 8011 – Fugitive $PM_{10}$ Prohibitions, General Requirements: Sets forth definitions, applicability and administrative requirements for anthropogenic sources of $PM_{10}$.

- Limits the types of chemicals that may be used for dust suppression.
- Provides criteria for use of a Fugitive $PM_{10}$ Limitation Plan in lieu of compliance with Rules 8061 and 8071.

The Project will comply with all restrictions contained in this rule.

Rule 8021 – Fugitive $PM_{10}$ Prohibitions, Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities: Limits fugitive dust emissions from construction, demolition, excavation, and related activities.

- Requires specific measures before, during, and after earthmoving.
- Imposes 15 mph speed limit on unpaved roads on construction sites.
- Requires outdoor construction activities to stop whenever visible dust emissions exceed 20%.

The Project will comply with all restrictions contained in this rule.

Rule 8041 – Carryout and Trackout (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from construction carryout and trackout.

The Project will comply with all restrictions contained in this rule.

Rule 8051 – Open Areas (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from open areas larger than 3.0 acres containing more than 1,000 square feet of disturbed surface.

- Control fugitive dust from open areas by either applying water or dust suppressants, planting vegetation, or paving or graveling.

The Project will comply with all restrictions contained in this rule.

Rule 8061 – Paved and Unpaved Roads (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from constructed paved and unpaved roads on the Project site.

- Requires unpaved roads with more than 26 Annual Average Daily Trips (AADT) to limit speed to 25 mph, and to stabilize the road to prevent excessive dust. This rule will apply during the construction phase, but will not apply during operation.

The Project will comply with all restrictions contained in this rule.

Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas (Fugitive $PM_{10}$ Prohibitions): Requires application of specific measures to minimize fugitive dust emissions from unpaved vehicle/equipment traffic areas experiencing more than 50 annual average daily trips.

- Requires stabilization of unpaved traffic areas.

The Project will comply with all restrictions contained in this rule.

Applicable regulations are summarized in Table 4.3-14.

**Table 4.3-14: Regulations and Permits for Protection of Air Quality**

| Regulation | Purpose | Regulating Agency | Permit or Approval | Schedule and Status of Permit | Conformance (Section) |
|---|---|---|---|---|---|
| *Federal* | | | | | |
| Clean Air Act (CAA) §160-169A and implementing regulations, Title 42 United States Code (USC) §7470-7491 (42 USC 7470-7491), Title 40 Code of Federal Regulations (CFR) Parts 51 & 52 (40 CFR 51 & 52) (Prevention of Significant Deterioration Program ) | Requires prevention of significant deterioration (PSD) review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies to pollutants for which ambient concentrations are lower than NAAQS. | USEPA | After project review, issues PSD permit with conditions limiting emissions. | Project not subject to federal air programs or permit requirements. | 4.3.6.1, 4.3.4.2.1 |
| *State* | | | | | |
| California Health & Safety Code (H&SC) §41700 (Nuisance Statute) | Outlaws discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance. | SJVAPCD with CARB oversight | After project review, issues Authority to Construct (ATC) with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.4.1.2 |
| H&SC §44300-44384; California Code of Regulations (CCR) §93300-93347 (Toxic "Hot Spots" Act) | Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments. | SJVAPCD with CARB oversight | After project review, issues ATC with conditions limiting emissions. | Project emissions below levels triggering HRA. | 4.3.5.4, 4.3.4.1.2 |
| *Local* | | | | | |
| Rule 2010 (Permits Required) | Requires operators of new or modified equipment to secure an authority to construct the source | SJVAPCD with CARB oversight | After project review, issues ATC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 2201 (New and Modified Stationary Source Review Rule) | NSR and PSD: Requires that preconstruction review be conducted for all proposed new or modified sources of air pollution, including BACT, emissions offsets, and air quality impact analysis. | SJVAPCD with CARB oversight | After project review, issues ATC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.5.1, 4.3.5.2, 4.3.5.3, 4.3.5.4, 4.3.6.3, 4.3.4.2.6 |
| Rule 4101 – Visible Emissions | Prohibits visible emissions as dark or darker than Ringelmann No. 1 for periods greater than three minutes in any hour | SJVAPCD with CARB oversight | After project review, issues ATC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | |
| Rule 4102 – Nuisance | Prohibits emissions in quantities that adversely affect public health, other businesses, or property. | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 4201 – Particulate Matter Emission Standards | Limits emissions of particulate matter to 0.3 grains per dry standard cubic foot | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 4301 – Fuel Burning Equipment | Limits emissions of particulates to 0.1 gr.dscf and 10 lb.hr; $SO_2$ to 200 lb/hr; NOx to 140 lb/hr. | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |

**Table 4.3-14: Regulations and Permits for Protection of Air Quality**

| Regulation | Purpose | Regulating Agency | Permit or Approval | Schedule and Status of Permit | Conformance (Section) |
|---|---|---|---|---|---|
| Rule 4305 – Boilers, Steam Generators, and Process Heaters—Phase 2 | Limits emissions of NOx to 30 ppmv; CO to 400 ppmv. | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 4306 – Boilers, Steam Generators, and Process Heaters—Phase 3 | Limits emissions of NOx to 30 ppmv; CO to 400 ppmv. | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 4408– Glycol Dehydration Systems | Requires control of dehydrator vent | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 4801 – Sulfur Compounds | Limits $SO_2$ emissions to <0.2 percent | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 8011 – Fugitive $PM_{10}$ Prohibitions, General Requirements | Limits chemicals used for dust suppression | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 8021 – Fugitive $PM_{10}$ Prohibitions, Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities | Specifies dust control measures during earth moving activities | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 8041 – Carryout and Trackout (Fugitive $PM_{10}$ Prohibitions) | Controls fugitive dust from vehicle carryout | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 8051 – Open Areas (Fugitive $PM_{10}$ Prohibitions) | Requires dust suppression for open areas | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 8061 – Paved and Unpaved Roads (Fugitive $PM_{10}$ Prohibitions) | Requires dust suppression for unpaved roads | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |
| Rule 8071 – Unpaved Vehicle/Equipment Traffic Areas (Fugitive $PM_{10}$ Prohibitions) | Requires dust suppression for construction traffic areas | SJVAPCD with CARB oversight | After project review, issues DOC with conditions limiting emissions. | Agency approval to be obtained before start of construction. | 4.3.6.3, 4.3.4.2.8 |

## 4.3.5 Impact Assessment

### 4.3.5.1 Significance Criteria

The criteria for evaluating the significance of impacts are based on quantitative thresholds established by the SJVAPCD. Additional general thresholds for air quality impact assessment are contained in Appendix G of the California Environmental Quality Act Guidelines. The following sections describe the methods used to estimate Project-related air quality impacts, and the results of the assessment in the context of the SJVAPCD's thresholds. Section 4.3.5.9 lists the CEQA Appendix G air quality thresholds and summarizes the potential impacts in the context of the CEQA Appendix G criteria. Section 4.3.5.9 also summarizes the Project design features and practices that will be implemented to reduce potential impacts to less than significant levels.

### 4.3.5.2 Overview of the Analytical Approach to Estimating Facility Impacts

The new emissions sources at the facility include fugitive emissions from the natural gas storage system (compressors, pumps, valves, and fittings); combustion emissions from various small sources (gas heaters and a dehydrator regeneration unit); and evaporative losses from storage of corrosion inhibitor/methanol.

As discussed below, operating emissions of all pollutants are well below regulatory levels requiring dispersion modeling. As a result, no dispersion modeling was conducted for operating emissions. Because construction activities often have relatively high dust emissions over relatively short periods, dispersion modeling has been performed to estimate impacts of construction activities.

#### 4.3.5.2.1 New Equipment

The following equipment is expected to require permits from SJVAPCD:

- Natural Gas Storage Facility – A facility-wide permit which includes all components from which fugitive emissions may occur: compressors, pumps, valves, and flanges. It will also include emissions from equipment too small to be subject to individual permit requirements.

- Withdrawal Heaters (6) – Small (8.6 MMBtu capacity each) heaters will be used to heat natural gas when it is withdrawn from the storage facility.

- Skid-mounted Dehydration Regeneration Units (2), with reboiler; each controlled by thermal oxidation unit.

- Organic liquid storage tanks: Methanol (4), 6,500 gallon horizontal cylinder ; corrosion inhibitor (4) 620 gallon horizontal cylinder.

#### 4.3.5.2.2 Facility Operations

*Natural Gas Storage Facility—Fugitive Emissions*

There are no intentional releases from the natural gas storage facility itself. However, fugitive emissions are expected from the fittings, as well as small incidental releases associated with injection of corrosion inhibitors.

Fugitive emissions from fitting leaks are calculated using USEPA emission factors. Fugitive emissions from operation of the corrosion inhibitor injection pump are calculated based on the gas displacement during the pumping cycle.

*Gas Heaters*

Six 8.6 MMBtu/hr heaters will be used to heat natural gas being withdrawn from the storage facility. Although it is anticipated that process gas heaters will be required for approximately 11 days during each withdrawal cycle of the storage facility, emissions have been calculated assuming that the heaters are used at capacity for 6 months.

*Natural Gas Dehydrators/Regeneration*

Two Triethylene Glycol (TEG) dehydration units will be included in the Project. Each unit has a capacity of 715 MMSCFD.

Natural gas is composed of a number of hydrocarbons, primarily methane, and is normally saturated with water when it is moved out of underground storage. Some of the hydrocarbons are VOC or HAPs. Before the gas can be moved into the delivery pipeline, it must be treated to remove water to prevent hydrate formation in the pipeline. Treatment involves methanol injection to depress the dew-point of the water, followed by the TEG (triethylene glycol) unit where the water is removed from the gas.

TEG dehydration involves contacting the natural gas with TEG, which absorbs water and some of the methanol and other hydrocarbons from the gas. The dry natural gas is put back into the pipeline. The water is removed from the TEG in a regenerator, which heats the TEG to drive out the water and other contaminants.

The TEG unit has two emission points. The first is the reflux stack, where the water and hydrocarbons (removed from the gas) are emitted. Emissions from this stack are controlled using a thermal oxidizer. The second is the reboiler, which is fired by natural gas to provide the heat needed to dry the TEG. Emissions from the reboiler consist of natural gas combustion byproducts.

*Methanol/Corrosion Inhibitor Storage*

Methanol is a volatile organic compound. Emissions from VOC storage occur when the tank is filled (working losses) and from diurnal temperature variations (standing losses).

### 4.3.5.3 Emissions Assessment: Criteria Pollutants

The combustion sources also will emit trace levels of toxic air contaminants (TACs). This section also presents the maximum TAC emissions from the proposed combustion sources. Tables containing the detailed TAC emission calculations are included in Appendix 4.3A.

#### 4.3.5.3.1 Criteria Pollutant Emissions: Fugitive Emissions

Fittings (pumps, compressors, valves) in hydrocarbon surface components can leak. USEPA has developed correlation factors for emissions from such leaks.[9] The natural gas being stored in the storage facility is mostly methane, but it also contains small amounts of other VOCs.

Based upon Project fitting counts and the factors developed by USEPA, the VOC emissions from equipment leaks are estimated to be 9.6 lb/day of methane and 1.0 lb/day VOC.

Additionally, during withdrawal operation only, corrosion inhibitor and methanol will be injected with the small pneumatic driven (power gas) pumps located at each well. Because the pumps are pneumatically driven, they will exhaust small amounts of natural gas with each stroke. Maximum emissions from these pumps are estimated to be 185 lb/day of methane, 19 lb/day VOC.

VOC emissions from storage facility are subject to Best Available Control Technology (BACT) requirements. BACT for fugitive emissions from fitting leaks is a Leak Detection and Repair (LDAR) program. Fittings will be inspected for leaks following District guidance for leak detection and repair programs at natural gas processing facilities.

#### 4.3.5.3.2 Criteria Pollutant Emissions: Combustion Sources

Criteria pollutants emitted from the combustion sources include NOx, sulfur oxides (SOx), CO, VOCs, and fine particulate matter ($PM_{10}$).[10]

Proposed maximum emissions from the combustion sources were estimated on an hourly, daily, and annual basis based on expected maximum operation and proposed annual operating limitations. Nominal composition of natural gas is shown in Table 4.3-15. Combustion source emission rates are shown in Tables 4.3-16 and 4.3-17.

Some equipment only operates during the withdrawal of natural gas from storage. This includes the injection of corrosion inhibitors and the dehydrator (which remove water and heavier hydrocarbons from the gas before it is put into the pipeline). For the purpose of emission calculations, gas withdrawal is assumed to occur for 4,320 hours (i.e., 180 24-hour days) per year.

[9] USEPA, "Protocol for Equipment Leak Emissions Estimates," EPA-453/R-95-017 (1995)

**Table 4.3-15: Nominal Fuel Properties—Natural Gas**

| Component Analysis | | Chemical Analysis | |
|---|---|---|---|
| Component | Average Concentration, Volume | Constituent | Percent by Weight |
| $CH_4$ | 93.1% | C | 72.35 % |
| $C_2H_6$ | 3.4% | H | 23.32 % |
| $C_3H_8$ | 0.7% | N | 2.02 % |
| $C_4H_{10}$ | 0.1% | O | 2.30 % |
| $C_5H_{12}$ | 0.1% | S | <0.25 gr/100 scf |
| $N_2$ | 1.25% | Higher Heating Value | 1033 Btu/scf<br>22,480 Btu/lb |
| $CO_2$ | 1.25% | | |
| S | <0.00% | | |

**Table 4.3-16: Maximum Emission Rates—Heaters (each)**

| Pollutant | ppmv @ 3% $O_2$ | lb/MMBtu | lb/hr |
|---|---|---|---|
| NOx | 9 | 0.0108 | 0.09 |
| $SO_2$[a] | 0.84 | 0.0028 | 0.02 |
| CO | 50 | 0.0366 | 0.31 |
| VOC | 25 | 0.0108 | 0.09 |
| $PM_{10}$ | n/a | 0.007 | 0.02 |
| $PM_{2.5}$ | n/a | 0.007 | 0.02 |

Notes:
[a] Based on maximum natural gas sulfur content of 1.0 gr/100 scf.

[10] All of the particulate matter emitted from combustion sources is assumed to be less than 2.5 microns in diameter. All references to $PM_{10}$ include $PM_{2.5}$ as well.

**Table 4.3-17: Maximum Emission Rates—Dehydrator Reboilers (each)**

| Pollutant | ppmv @ 3% $O_2$ | lb/MMBtu | lb/hr |
|---|---|---|---|
| NOx | 9 | 0.0108 | 0.05 |
| $SO_2$[a] | 0.84 | 0.0014 | 0.01 |
| CO | 100 | 0.0732 | 0.33 |
| VOC | 30 | 0.0130 | 0.05 |
| $PM_{10}$ | n/a | 0.007 | 0.01 |
| $PM_{2.5}$ | n/a | 0.007 | 0.01 |

Notes:
[a] Based on maximum natural gas sulfur content of 1.0 gr/100 scf.f.

All of the combustion sources (process heaters, dehydrator reboilers, and dehydrator thermal oxidizers) are subject to BACT for NOx and VOC. BACT for NOx is 9ppm at 3% oxygen. BACT for VOC is good combustion control for combustion emissions, and 98% destruction efficiency for the thermal oxidizer.

#### 4.3.5.3.3 Criteria Pollutants: Methanol and Corrosion Inhibitor Storage

Emissions from VOC storage occur when the tank is filled (working losses) and from diurnal temperature variations (standing losses). The USEPA program TANKS was used to calculate these emissions. Tank design parameters are shown in Table 4.3-18.

**Table 4.3-18: Storage Tank Specifications**

| Contents: | Methanol | Corrosion Inhibitor |
|---|---|---|
| Diameter | 96 inches | 48 inches |
| Length | 16 feet | 6 feet |
| Temperature | ambient | ambient |
| Throughput, max hourly | 5.9 gallon | 0.5 gallon |
| Throughput, annual | 12,690 | 2,160 |

#### 4.3.5.2.4 Criteria Pollutants: Organic Emissions from Thermal Oxidizer

The reflux stack from the dehydrator is where the water and hydrocarbons (removed from the gas) are emitted. Emissions from this stack are controlled using a thermal oxidizer.

Emissions from the thermal oxidizer have two components: combustion emissions from the natural gas used to fuel the oxidizer, and VOC that is not completely combusted by the oxidizer.

Thermal oxidizer emissions presented in Table 4.3-19 are based on a similar installation documented in the Oklahoma Department of Environmental Quality Title V permit for the ONEOK gas storage facility in Logan County, Oklahoma (Permit 2006-191-TVR).

**Table 4.3-19: Maximum Emission Rates—Dehydrator Thermal Oxidizers (each)**

| Pollutant | lb/MMSCF | lb/hr |
|---|---|---|
| NOx | 0.0135 | 0.20 |
| $SO_2$[a] | 0.0888 | 1.32 |
| CO | 0.0507 | 0.75 |
| VOC | 0.0033 | 0.05 |
| $PM_{10}$ | 0.0023 | 0.03 |
| $PM_{2.5}$ | 0.0023 | 0.03 |

Notes:

[a] Based on maximum natural gas sulfur content of 1.0 gr/100 scf.
[b] VOC from fuel combustion.
[c] Based on 98% control of VOCs introduced into oxidizer.

#### 4.3.5.3.5 Criteria Pollutant Emissions Summary

The worst case emissions for each time period (hourly, daily, and annual) are presented in Table 4.3-20.

**Table 4.3-20: Emissions from Project Equipment**

| Emissions/Equipment | NOx | $SO_2$ | CO | VOC | $PM_{10}$ |
|---|---|---|---|---|---|
| *Maximum Hourly Emissions* | | | | | |
| Natural Gas Storage Facility | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 |
| Heaters (6) | 0.56 | 0.14 | 1.89 | 0.56 | 0.39 |
| Dehydration Units (reboiler plus thermal oxidizer) (2) | 0.50 | 0.05 | 3.31 | 1.62 | 0.14 |
| VOC Storage (8) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total, pounds per hour** | **1.06** | **0.19** | **5.20** | **2.24** | **0.52** |
| *Maximum Daily Emissions* | | | | | |
| Natural Gas Storage Facility | 0.00 | 0.00 | 0.00 | 1.57 | 0.00 |
| Heaters (6) | 13.37 | 3.43 | 45.33 | 13.37 | 9.29 |
| Dehydration Units (reboiler plus thermal oxidizer) (2) | 12.00 | 1.19 | 79.39 | 38.81 | 3.24 |
| VOC Storage (8) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total, pounds per day** | **25.37** | **4.62** | **124.72** | **53.76** | **12.53** |
| *Maximum Annual Emissions, tpy* | | | | | |
| Natural Gas Storage Facility | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 |
| Heaters (6) | 1.20 | 0.31 | 4.08 | 1.20 | 0.84 |
| Dehydration Units (reboiler plus thermal oxidizer) (2) | 1.08 | 0.11 | 7.15 | 3.49 | 0.29 |
| VOC Storage (8) | 0.00 | 0.00 | 0.00 | 0.34 | 0.00 |
| **Total, tons per year** | **2.28** | **0.42** | **11.22** | **5.21** | **1.13** |

### 4.3.5.4 Emissions Assessment: Toxic Air Contaminants

#### 4.3.5.4.1 Toxic Air Contaminant Emissions: Combustion Sources

Maximum hourly and annual TAC emissions were estimated for the proposed facility. Maximum proposed TAC emissions from combustion sources were calculated from the heat input rate (in MMBtu/hr and MMBtu/yr), emission factors (in lb/mmcf), and the nominal higher heating value of 1033 Btu/scf. Other emission factors were obtained from AP-42 (Table 3.1-3, 4/00, and Table 3.4-1 of the Background Document for Section 3.1). TAC emissions are summarized in Table 4.3-21.

**Table 4.3-21: Maximum Proposed TAC Emissions**

| Compound | Maximum Proposed Emissions, 6 heaters, 2 dehydrators | |
|---|---|---|
| | (lb/hr) | (TPY) |
| Benzene | 8.07E-02 | 1.74E-01 |
| Ethylbenzene | 7.17E-02 | 1.55E-01 |
| Formaldehyde | 4.40E-03 | 9.50E-03 |
| Hexane | 1.25E-01 | 2.73E-01 |
| Methanol | 6.00E-01 | 1.38E+00 |
| Naphthalene | 3.58E-05 | 7.73E-05 |
| PAHs | 5.87E-06 | 1.27E-05 |
| Toluene | 2.96E-01 | 6.39E-01 |
| Xylene | 4.48E-01 | 9.67E-01 |
| *TOTAL HAPs* | *1.62* | *3.60* |

Notes:
[a] Obtained from AP-42 See text.
[c] Carcinogenic PAHs only; naphthalene considered separately.

### 4.3.5.4.2 Toxic Air Contaminant Emissions: Dehydrator Thermal Oxidizer

Maximum hourly and annual TAC emissions were estimated for the proposed facility. Maximum proposed TAC emissions from combustion sources were calculated from the heat input rate (in MMBtu/hr and MMBtu/yr), emission factors (in lb/mmcf), and the nominal higher heating value of 1033 Btu/scf. Other emission factors were obtained from AP-42 (Table 3.1-3, 4/00, and Table 3.4-1 of the Background Document for Section 3.1). TAC emissions are summarized in Table 4.3-20.

Methanol emissions from methanol storage were calculated using AP-42 equations for VOC storage vessels.

Toxic air contaminant emissions from the thermal oxidizers were based on emission factors developed for a similar installation documented in the Oklahoma Department of Environmental Quality Title V permit for the ONEOK gas storage facility in Logan County, Oklahoma (Permit 2006-191-TVR). The Oklahoma permit did not include methanol emissions. The emission factor for methanol assumes that all of the VOC unaccounted for by the other HAPs is methanol.

### 4.3.5.5 Emissions Assessment: Construction

Construction of industrial facilities requires coordination of numerous equipment and personnel. The concentrated on-site activities result in short term, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Measures designed to reduce criteria air pollutant emissions from construction activities will also reduce greenhouse gas emissions.

The following practices will be utilized to control exhaust emissions from the Diesel heavy equipment used during construction of the Project:

- Operational measures, such as limiting time spent with the engine idling by shutting down equipment when not in use;
- Regular preventive maintenance to prevent emission increases due to engine problems;
- Use of low sulfur and low aromatic fuel meeting California standards for motor vehicle Diesel fuel; and
- Use of low-emitting Diesel engines meeting federal emissions standards for construction equipment.

The following practices will be used to control fugitive dust emissions during construction of the Project:

- Use either water application or chemical dust suppressant application to control dust emissions from unpaved road travel and unpaved parking areas;
- Use vacuum sweeping and/or water flushing of paved road surface to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas;
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard;
- Limit traffic speeds on unpaved roads to 15 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to roadways;
- Replant vegetation in disturbed areas as quickly as possible;
- Use wheel washers or wash off tires of all trucks exiting construction site that carry track-out dirt from unpaved roads; and
- Minimize fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant.

### 4.3.5.6 Emissions Assessment: Greenhouse Gases

Combustion sources produce air emissions known as greenhouse gases in addition to the "criteria air pollutants" that have been traditionally regulated under the federal and state

Clean Air Acts. Greenhouse gas emissions contribute to the warming of the earth's atmosphere, leading to climate change. For combustion sources, these include primarily carbon dioxide, with much smaller amounts of nitrous oxide (N2O, not NO or NO2, which are commonly known as NOx or oxides of nitrogen), and methane (CH4 - unburned natural gas). Also included are sulfur hexafluoride (SF6) from high voltage equipment, and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment.

Because this Project uses electric motors instead of internal combustion engines to drive the compressors, GHG emissions from the Project are very low. CO2 is emitted from the combustion of carbon-based fuels in the small process heaters, dehydrator reboilers, and thermal oxidizers. There will also be fugitive emissions of methane from fittings and injection of corrosion inhibitors during gas withdrawal. (Methane is a high global-warming-potential gas. One pound of methane emissions has the same global warming potential as 21 pounds of CO2.)

#### 4.3.5.6.1 Operations

Two types of greenhouse gas emissions will result from operation of the Project: combustion emissions (predominantly CO2) and fugitive emissions (methane from fittings, pumps, and compressors). Total GHG emissions from facility operations are 18,215 metric tons CO2eq per year. This facility will not be subject to the current CARB mandatory GHG emission reporting regulation. For comparison, CARB has used 25,000 metric tons CO2eq per year as the reporting threshold for combustion sources.

#### 4.3.5.6.2 Construction

Emission of greenhouse gases from combustion of fuel by construction equipment is estimated using procedures in the CARB AB-32 reporting regulation. CARB indicates that the emission factor for CA Low Sulfur Diesel is 9.96 kg CO2/gallon. The estimated fuel consumption by construction equipment is 136,027 gallons. Therefore the estimated CO2 emissions from construction equipment are 1,355 MT CO2eq.

### 4.3.5.7 Air Quality Impact Analysis

The following ambient air quality impact analyses were conducted for CEQA review, and those analyses are presented in this section.

#### 4.3.5.7.1 Air Quality Modeling Methodology

An assessment of impacts from construction activities on ambient air quality has been conducted using USEPA-approved air quality dispersion models. These models are based on various mathematical descriptions of atmospheric diffusion and dispersion processes in which a pollutant source impact can be calculated over a given area.

The impact analysis was used to determine the worst-case ground-level impacts of construction activities, including dust generated by workers driving to and from the site. The results were compared with established state and federal ambient air quality standards and PSD significance levels. In accordance with the air quality impact analysis guidelines developed by USEPA (40 CFR Part 51, Appendix W: Guideline on Air Quality Models), the ground-level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain;
- Aerodynamic effects (downwash) due to nearby building(s) and structures;
- Impacts from inversion breakup (fumigation); and
- Impacts from shoreline fumigation conditions.

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise. Plume impaction on elevated terrain, such as on the slope of a nearby hill, can cause high ground-level concentrations, especially under stable atmospheric conditions. Another dispersion condition that can cause high ground-level pollutant concentrations is caused by building downwash. Building downwash can occur when wind speeds are high and a building or structure is in close proximity to the emission stack. This can result in building wake effects where the plume is drawn down toward the ground by the lower pressure region that exists in the lee side (downwind) of the building or structure.

Because construction emissions are fugitive (not emitted from a stack), downwash is not a consideration.

Fumigation conditions occur when the plume is emitted into a low-lying layer of stable air (inversion) that then becomes unstable, resulting in a rapid mixing of pollutants towards the ground. The low mixing height that results from this condition allows little diffusion of the stack plume before it is carried downwind to the ground. Although fumigation conditions rarely last as long as an hour, relatively high ground-level concentrations may be reached during that period. Fumigation tends to occur under clear skies and light winds, and is more prevalent in the summer. Because land surfaces tend to both heat and cool more rapidly than water, shoreline fumigation tends to occur on sunny days when the denser cooler air over water displaces the warmer, lighter air over land. During an inland sea breeze, the unstable air over land gradually increases in depth with inland distance. The boundary between the stable air over the water and the unstable air over the land and the wind speed determine if the plume will loop down before much dispersion of the pollutants has occurred.

The basic model equation used in this analysis assumes that the concentrations of emissions within a plume can be characterized by a Gaussian distribution about the centerline of the plume. Concentrations at any location downwind of a point source such as a stack can be determined from the following equation:

$$C(x,y,z,H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2\left(y/\sigma_y\right)^2}\right) * \left[\left\{e^{-1/2\left(z-H/\sigma_z\right)^2}\right\} + \left\{e^{-1/2\left(z+H/\sigma_z\right)^2}\right\}\right]$$

where

C = the concentration in the air of the substance or pollutant in question

Q = the pollutant emission rate

σyσz = the horizontal and vertical dispersion coefficients, respectively, at downwind distance x

u = the wind speed at the height of the plume center

x,y,z = the variables that define the 3-dimensional Cartesian coordinate system used; the downwind, crosswind, and vertical distances from the base of the stack

H = the height of the plume above the stack base (the sum of the height of the stack and the vertical distance that the plume rises due to the momentum and/or buoyancy of the plume)

Gaussian dispersion models are approved by USEPA for regulatory use and are based on conservative assumptions (i.e., the models tend to overpredict actual impacts by assuming steady-state conditions, no pollutant loss through conservation of mass, no chemical reactions, etc.). The USEPA models were used to determine if ambient air quality standards would be exceeded, and whether a more accurate and sophisticated modeling procedure would be warranted to make the impact determination. The following sections describe results of the ambient air quality modeling analyses.

The air quality impact analyses were performed using AERMOD Version 07026. The air quality modeling analysis followed the January 2008 USEPA AERMOD Implementation Guide and USEPA's "Guideline on Air Quality Models" (USEPA, 2005). USEPA default options were used.

AERMOD is a Gaussian dispersion model capable of assessing impacts from a variety of source types in areas of simple, intermediate, and complex terrain. The model can account for settling and dry deposition of particulates; area, line, and volume source types; downwash effects; and gradual plume rise as a function of downwind distance. The model is capable of estimating concentrations for a wide range of averaging times (from one hour to one year).

Inputs required by the AERMOD model include the following:

- Model options;
- Meteorological data;
- Source data; and
- Receptor data.

Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Examples of model options include use of site-specific vertical profiles of wind speed and temperature; consideration of stack and building wake effects; and time-dependent exponential decay of pollutants. The model supplies recommended default options for the user. Except where explicitly stated, such as for building downwash, as described in more detail below, default values were used. A number of these default values are required for USEPA and local District approval of model results and are listed below.

- Urban dispersion coefficients (see discussion below)
- Gradual plume rise
- Stack tip downwash
- Buoyancy induced dispersion
- Calm processing
- Default urban wind profile exponents
- Default vertical temperature gradients = 0.02, 0.035
- 10 meter anemometer height

AERMOD uses hourly meteorological data to characterize plume dispersion. The representativeness of the data is dependent on the proximity of the meteorological monitoring site to the area under consideration, the complexity of the terrain, the exposure of the meteorological monitoring site, and the period of time during which the data are collected. The meteorological data used in this analysis were collected at the Fresno station located 25 miles east of the site. This data set was selected to be representative of meteorological conditions at the Project site and to meet the requirements of the USEPA "On-Site Meteorological Program Guidance for Regulatory Model Applications" (EPA-450/4-87-013, August 1995). The analysis used meteorological data collected during 2000-2004.

The required emission source data inputs to AERMOD include source locations, source elevations, stack heights, stack diameters, stack exit temperatures and velocities, and emission rates. The source locations are specified for a Cartesian (x,y) coordinate system where x and y are distances east and north in meters, respectively. The Cartesian coordinate system used is the Universal Transverse Mercator Projection (UTM).

#### 4.3.5.8 Screening Health Risk Assessment

The screening health risk assessment (SHRA) was conducted to determine expected impacts on public health of the noncriteria pollutant emissions from the facility. The SHRA was conducted in accordance with the CAPCOA Air Toxics "Hot Spots" Program Risk Assessment Guidelines (October 1993). The SHRA estimated the offsite cancer risk to the maximally exposed individual (MEI), as well as indicated any adverse effects of non-carcinogenic compound emissions. CARB/OEHHA Health Risk Assessment computer program was used to evaluate multipathway exposure to toxic substances. Because of the conservatism (overprediction) built into the established risk analysis methodology, the actual risks will be lower than those estimated.

A health risk assessment requires the following information:

- Unit risk factors (or carcinogenic potency values) for any carcinogenic substances that may be emitted;
- Noncancer Reference Exposure levels (RELs) for determining non-carcinogenic health impacts;
- One-hour and annual average emission rates for each substance of concern; and
- The modeled maximum offsite concentration of each of the pollutants emitted.

Pollutant-specific unit risk factors are the estimated probability of a person contracting cancer as a result of constant exposure to an ambient concentration of 1 $\mu g/m^3$ over a 70-year lifetime. The SHRA uses unit risk factors specified by the OEHHA. The cancer risk for each pollutant emitted is the product of the unit risk factor and the modeled concentration. All of the pollutant cancer risks are assumed to be additive.

An evaluation of the potential noncancer health effects from long-term (chronic) and short-term (acute) exposures has also been included in the SHRA. Many of the carcinogenic compounds are also associated with noncancer health effects and are therefore included in the determination of both cancer and noncancer effects. RELs are used as indicators of potential adverse health effects. RELs are generally based on the most sensitive adverse health effect reported and are designed to protect the most sensitive individuals. However, exceeding the REL does not automatically indicate a health impact. The OEHHA reference exposure levels were used to determine any adverse health effects from noncarcinogenic compounds. A hazard index for each noncancer pollutant is then determined by the ratio of the pollutant annual average concentration to its respective REL for a chronic evaluation. The individual indices are summed to determine the overall hazard index for the Project. Because noncancer compounds do not target the same system or organ, this sum is considered conservative. The same procedure is used for the acute evaluation.

The Project SHRA results are compared with the established risk management procedures for the determination of acceptability. The established risk management criteria include those listed below.

- If the potential increased cancer risk is less than one in a million, the facility risk is considered not significant.
- If the potential increased cancer risk is greater than one in a million but less than ten in a million and Toxics-Best Available Control Technology (TBACT) has been applied to reduce risks, the facility risk is considered acceptable.
- If the potential increased cancer risk is greater than ten in a million and there are mitigating circumstances that, in the judgment of a regulatory agency, outweigh the risk, the risk is considered acceptable.
- For noncancer effects, total hazard indices of one or less are considered not significant.
- For a hazard index greater than one, OEHHA and the reviewing agency conduct a more refined review of the analysis and determine whether the impact is acceptable.

The SHRA includes the noncriteria pollutants listed in Table 4.3-20. The receptor grid described earlier for criteria pollutant modeling was used for the SHRA. The SHRA results for the Project are presented in Table 4.3-22, and the detailed calculations are provided in Appendix 4.3B.

**Table 4.3-22: Screening Health Risk Assessment Results**

| | |
|---|---|
| Cancer Risk to Maximally Exposed Individual: | 0.3 in one million |
| Acute Inhalation Hazard Index: | 0.002 |
| Chronic Inhalation Hazard Index: | 0.0004 |

Notes: [a] REL=Reference Exposure Level.

The screening HRA results indicate that the acute and chronic hazard indices are well below 1.0, so are not significant. In addition, the maximum chronic noninhalation exposure is well below the REL so is also considered insignificant. The cancer risk to a maximally exposed individual is 0.3 in one million, well below the one in one million level. The screening HRA results indicate that, overall, the Project will not pose a significant health risk at any location.

#### 4.3.5.9 Construction Impacts Analysis

Emissions during the construction phase of the Project have been estimated, including an assessment of emissions from vehicle and equipment exhaust and the fugitive dust generated from material handling. A dispersion modeling analysis was conducted based on these emissions. A detailed analysis of the emissions and ambient impacts is included in Appendix 4.3C. The results of the analysis indicate that the maximum construction impacts will be below the state and federal standards for all the criteria pollutants emitted. The best available emission control techniques will be used. The Project construction impacts are not unusual in comparison to most construction sites; construction sites that use good dust suppression techniques and low-emitting vehicles typically do not cause violations.

The Applicants will work with the SJVAPCD to develop operating restrictions and equipment specifications that will provide a comparable air quality impact to that presented by the assumptions used in this analysis.

#### 4.3.5.10 CEQA Impacts and Mitigation

##### 4.3.5.10.1 CEQA Appendix G Guidelines

Appendix G of the California Environment Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on air quality if the project would:

- 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 standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)
- Expose sensitive receptors to substantial pollutant concentrations
- Create objectionable odors affecting substantial numbers of people.

Each of these criteria is discussed below.

### Conflict with or obstruct implementation of the applicable air quality plan

**IMPACT AQ-1. Project construction and operations emissions would not Conflict with or obstruct implementation of the applicable air quality plan.** Because the air emissions from the proposed Project are far below thresholds of significance, and because of the relatively remote location of the Project, it is anticipated that the Project will not conflict with or obstruct implementation of any applicable air quality plan. Project design features include the use of electric-driven compressors and implementation of BACT, as required under District regulations. Construction emissions will be minimized through the use of all feasible construction dust control measures, as specified in the SJVAPCD "Guide for Assessing and Mitigating Air Quality Impacts." With the implementation of these Project design features and practices, impacts to air quality will be less than significant, and no mitigations are required.

### Violate any air quality standard or contribute substantially to an existing or projected air quality violation

**IMPACT AQ-2. Project construction and operations emissions will not violate any air quality standard or contribute substantially to an existing or projected air quality violation.** Because the air emissions from the proposed Project are far below thresholds of significance, and because of the relatively remote location of the Project, it is anticipated that the Project will not violate any air quality standard or contribute substantially to an existing or projected air quality violation. With the implementation of Project design measures and practices noted above, impacts to air quality will be less than significant, and no mitigations are required.

### 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)

**IMPACT AQ-3. Project construction and operations emissions will not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment.** Because the air emissions from the proposed Project are far below thresholds of significance, and because of the relatively remote location of the Project, it is anticipated that the Project will not contribute to a considerable net increase of any criteria pollutants for which the Project region is non-attainment. With the implementation of Project design measures and practices noted above, impacts to air quality will be less than significant, and no mitigations are required.

### Expose sensitive receptors to substantial pollutant concentrations

**IMPACT AQ-4. Project construction and operations emissions will expose sensitive receptors to substantial pollutant concentrations.** Because the air emissions from the proposed Project are far below thresholds of significance, and because of the relatively remote location of the Project, it is anticipated that the Project will not conflict with or obstruct implementation of any applicable air quality plan. With the implementation of Project design measures and practices noted above, impacts to air quality will be less than significant, and no mitigations are required.

#### Create objectionable odors affecting substantial numbers of people

**IMPACT AQ-5. Project construction and operations create objectionable odors affecting substantial numbers of people.** SJVAPCD Rule 4102 – Nuisance, prohibits the discharge from a facility of air pollutants that cause injury, detriment, nuisance, or annoyance to the public, or that damage business or property. Operation of the proposed Project is not expected to result in emissions of odorous substances or dust that might create a nuisance. With the implementation of Project design measures and practices noted above, impacts related to odor will be less than significant, and no mitigations are required.

### 4.3.5.10.2 San Joaquin Valley Air Pollution Control District Guidelines

The District has published a set of recommended thresholds of significant impact for projects being evaluated under CEQA. Under District guidance, projects with emissions above the recommended thresholds are considered to have significant air quality impacts.

With regard to construction emissions, the District has identified a number of activities that could result in significant PM10 impacts. These include excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle exhaust. These emissions have been quantified and modeled as part of this assessment.

The District recognizes that construction equipment also emits carbon monoxide and ozone precursor emissions. However, the SJVAPCD has determined that these emissions may cause a significant air quality impact only in the cases of very large or very intense construction projects.

The District's recommended thresholds are shown in Table 4.3-23.

**Table 4.3-23: SJVAPCD Recommended Thresholds of Significant Impact**

| Emission | Threshold[a] | Project Level |
|---|---|---|
| Ozone Precursor (ROG) | 10 TPY | 2.28 TPY |
| Ozone Precursor (NOx) | 10 TPY | 5.21 TPY |
| $PM_{10}$ | Complying with SJVAPCD Regulation VIII reduces to less than significant | Project will comply |
| CO | Project causes or contributes to an exceedance of state or federal ambient CO standard | Project will not cause or contribute |
| Hazardous Air Pollutant | 10 in one million cancer risk | 0.2 in one million |
| Hazardous Air Pollutant | Acute hazard index of 1 | 0.002 |
| Hazardous Air Pollutant | Chronic hazard index of 1 | 0.0004 |
| Odor impacts | Based on distance of odor source from people | No odor source at Project |
| Construction impacts | Same thresholds as above, but apply only during construction | ROG emissions= 1.7 TPY<br>NOx emissions= 35.7 TPY |

Notes:

[a] http://www.valleyair.org/transportation/ceqaanalysislevels.htm#small.

Emissions of NOx from construction activities exceed the District's threshold for potential significance. Almost all of these emissions come from operation of the drilling rigs. Excluding the drilling rigs, NOx emissions are well below the threshold. Because emissions themselves are not an impact, exceeding the threshold requires that the actual impacts be assessed to determine whether the emissions will result in a significant impact. This assessment was accomplished by modeling.

As described in Section 4.3.5.9, the emissions from construction activities (including operation of the drill rigs) were modeled. Modeling results presented in Appendix B.1, Table 4.3C-3, demonstrate that the Project will not cause or contribute to a violation of any ambient air quality standard.

## 4.3.6 Consistency with Applicable Regulations

### 4.3.6.1 Consistency with Federal Requirements

The San Joaquin Valley APCD (District) has been delegated authority by the USEPA to implement and enforce most federal requirements that may be applicable to the Project, including the new source performance standards and new source review for nonattainment pollutants. Compliance with the District regulations ensures compliance and consistency with the corresponding federal requirements as well.

#### 4.3.6.2 Consistency with State Requirements

State law sets up local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. As discussed above, the Project is under the local jurisdiction of the District, and compliance with District regulations will ensure compliance with state air quality requirements.

#### 4.3.6.3 Consistency with Local Requirements: San Joaquin Valley Air Pollution Control District (District)

The District has been delegated responsibility for implementing local, state, and federal air quality regulations in the county where the Project is located. The Project is subject to District regulations that apply to new sources of emissions, to the prohibitory regulations that specify emission standards for individual equipment categories, and to the requirements for evaluation of impacts from toxic air pollutants.

Under the regulations that govern new sources of emissions, the Project is required to secure a preconstruction Determination of Compliance from the District (Rule 2010), as well as demonstrate continued compliance with regulatory limits when the facility becomes operational. The preconstruction review includes demonstrating that sources will use best available control technology (BACT) and will provide any necessary emission offsets.

Applicable BACT trigger levels are shown in Table 4.3-23, along with anticipated potential emission unit emissions. BACT is required for any source for each emissions increase of an affected pollutant for which the source's potential to emit exceeds specified levels. The Project is exempt from BACT for CO because the potential to emit CO is less than 200,000 lb/year.

As shown in Table 4.3-24, BACT is required for the natural gas storage facility (VOC); the process heaters (VOC, NOx) ; and the dehydrators (VOC and NOx).

**Table 4.3-24: Facility Best Available Control Technology Requirements**

| Pollutant | Applicability Level | Natural Gas Storage | Process Heaters (each) | Dehydrators (each) | Methanol and Corrosion Inhibitor Storage (each) |
|---|---|---|---|---|---|
| *District Rule 2201 Section 4.1* | | | | | |
| VOC | 2 lbs/day | **2.3** | **2.2** | 19.7 | 0.0 |
| NOx | 2 lbs/day | 0 | **2.2** | 6.0 | 0 |
| $SO_2$ | 2 lbs/day | 0 | 0.3 | 0.4 | 0 |
| $PM_{10}$ | 2 lbs/day | 0 | 1.5 | 1.6 | 0 |

BACT for the applicable pollutants was determined by reviewing the District BACT Clearinghouse, the Bay Area Air Quality Management District BACT Guidelines Manual, the South Coast Air Quality Management District BACT Guidelines Manual, and the CARB BACT Clearinghouse. A summary of the review is provided in Appendix 4.3D. The District considers BACT to be the most stringent level of demonstrated emission control that is feasible. The Project will use the BACT measures discussed above.

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# 4.4 BIOLOGICAL RESOURCES

## 4.4.1 Environmental Setting

### 4.4.1.1 Study Area

The study area for biological resources includes the Project area, which comprises the approximately 5,020-acre Gill Ranch Storage Field, an 85-foot-wide pipeline right-of-way (ROW), a 40-foot-wide power line ROW, ancillary facilities, and temporary use and staging areas. An overview of the Project area is shown on Figure 3.1-1 and Figure 3.1-2 and described in Section 3.1 Project Location. The study area also includes the Project vicinity, an area that extends up to 5 miles from the Project area components.

### 4.4.1.2 Methods

Biological resources within the study area were assessed based on literature reviews, database queries, consultation with agency biologists and experts, reconnaissance-level surveys of the Project area, and focused field surveys for biological resources of particular interest. The area covered by focused field surveys varied by resource and species.

#### Literature Review and Database Queries

The assessment of biological resources included literature review and database queries. Sources of relevant information included the following:

- Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986)
- National Wetlands Inventory (U.S. Fish and Wildlife Service [USFWS] 2008b)
- California Natural Diversity Database (CNDDB) (CDFG 2008a)
- California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants (CNPS 2008)
- California Wildlife Habitat Relationships (CWHR) (CDFG 2005)
- Recovery Plan for Upland Species of the San Joaquin Valley (USFWS 1998)
- California Department of Fish and Game (CDFG) and USFWS websites and listing packages (CDFG 2008b, CDFG 2008c, CDFG 2008d, USFWS 2008a)
- Other biological studies completed in the Project vicinity

Relevant information from these sources is incorporated into this document and referenced as appropriate. The CNDDB and CNPS Online Inventory database queries were first performed in

2007 of 12 7.5-minute quadrangles: Hammonds Ranch, Broadview Farms, Firebaugh, Mendota Dam, Gravelly Ford, Chounet Ranch, Chaney Ranch, Coit Ranch, Tranquility, Jamesan, Biola, and Kerman. The CNDDB was queried again in June 2008, using a 5-mile buffer around the Project area and all alternative routes.

### Agency Consultations

CDFG and USFWS staff biologists were consulted to obtain concurrence on species and habitats that needed to be addressed. CDFG provided species lists and special-status species survey results for the CDFG Alkali Sink Ecological Reserve. Meetings were held with CDFG on March 3, 2008, and with the U.S. Army Corps of Engineers (USACE), USFWS, and the U.S. Environmental Protection Agency (USEPA) on March 6, 2008. USFWS staff visited the Project area on April 2, 2008. Following is a summary of agency correspondence through June 2008.

#### *CDFG Meeting — March 3, 2008*

CDFG participants in the meeting included Julie Vance (Senior Environmental Scientist), Justin Sloan (Environmental Scientist), Steve Brueggemann (Associate Wildlife Biologist, Mendota Wildlife Area Manager), Michelle Selmon (Associate Wildlife Biologist, Conservation Planning). During this meeting results of preliminary literature reviews (As provided in Appendix B.2, Table B.2-1 and B.2-2) were presented to the group and this list was reviewed for completeness. CDFG commented on special-status species of particular interest to the agency (as discussed later in this section) and also provided excerpts from CDFG Annual Reports of Vertebrate Monitoring Activities in the Project vicinity (M. Selmon, CDFG, Pers. Com. 2008). CDFG indicated that they would evaluate the Project under CEQA and that this PEA would provide information necessary to support this effort.

#### *USACE/USFWS/USEPA Meeting — March 6, 2008*

Agency participants in this meeting included Zachary Simmons (USACE Biologist, Project Manager), Leah Fisher (USACE Legal Staff), Maryann Owens (USFWS Biologist), Shelley Buranek (USFWS Biologist), and Valentina Cabrera (USEPA Wetlands Division). During this meeting, USACE staff confirmed that federal jurisdiction under Section 404 of the Clean Water Act is triggered by the Project's pipeline alignment across the San Joaquin River crossing, and that USACE would serve as the lead federal agency for purposes of compliance with applicable federal regulations (including Rivers and Harbors Act Section 10, Clean Water Act Section 404, and Endangered Species Act). Information was exchanged regarding federally listed species of concern with the potential to occur in the Project area; and the scope and methodology for wetland delineation studies and special-status species surveys.

#### *USFWS Site Visit — April 2, 2008*

USFWS participants at this visit to the Project area were staff biologists Maryann Owens and Shelley Buranek. This visit included reviews of the proposed central compressor station site, well sites, San Joaquin River crossing, gas pipeline alignment with particular focus on the properties across from the Alkali Sink Ecological Reserve, and the pipeline terminus and tie-in point with PG&E's gas transmission system. Following this visit, ENTRIX, Inc., as the agent for the Applicant, submitted a letter, dated April 25, 2008 to Mr. Kenneth Sanchez, Acting Field

Supervisor, USFWS Sacramento District Office (Appendix B.2). The purpose of this letter was to clarify discussions held during the April 2, 2008, site visit and to request concurrence on scope and survey methodologies for various special-status species of particular interest to USFWS. No written response had been received at the time of this application.

## Field Surveys

Biological surveys were performed in winter, spring, and summer of 2008. These surveys included vegetation community mapping, wildlife habitat assessment, special-status species surveys, and a wetland resource assessment.

### *Vegetation Mapping and Wildlife Habitat Assessment*

Biologists mapped and characterized plant communities and wildlife habitats in the Project area during January, February, and April, 2008. Mapping of plant communities and habitats was based on aerial photographs and direct field observations. Plant communities were mapped within 1,000 feet of the Project area.

Plant community descriptions are based on the CDFG's Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986). Additional plant community descriptions are based on descriptions from Sawyer and Keeler-Wolf (1995), and other sources as indicated. The plant community information was incorporated into a Geographical Information System (GIS) database and was used to develop a series of maps depicting vegetation community types. These maps are provided in Appendix B.2.

Assessment of habitat distribution and suitability for common and special-status wildlife species was based on the vegetation community maps and field evaluations. Initial reconnaissance-level wildlife habitat evaluations were conducted in the Project area on February 19-20, and April 17-18, 2008. During these surveys, vegetation type, special habitat features (e.g., wetlands, riparian), and direct observations of wildlife or diagnostic sign (i.e., track, scat, feather, carcass, etc.) were recorded. Natural features that could be used by birds for nesting and roosting were noted along with potential corridors for animal movement. The locations of elderberry shrubs (*Sambucus mexicana*), obligate host plant for the federally listed threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), were mapped. Representative photographs were taken of each habitat type and incidental observations of all species were recorded. Wildlife habitat data were compared to the habitat requirements for each of the special-status species listed in Appendix B.2, Tables B.2-1 and B.2-2. Predictions of potential wildlife species occurrence for habitats in the Project area were made using the California Wildlife Habitat Relationships (CWHR) (CDFG 2005).

### *Wetlands and Other Waters of the United States*

A general assessment of the Project area was conducted in order to identify areas with surface water or shallow groundwater that 1) could be considered jurisdictional under the Clean Water Act, 2) could present challenges during construction, and 3) could provide special habitat for sensitive plants or wildlife (i.e., vernal pools, alkali areas, and riparian corridors). Hydrologic features were identified with a combination of literature search (NWI Inventory) and field surveys of the Project area. Each hydrologic feature was described in terms of its physical characteristics including vegetation, hydrology and soils as well as its potential habitat value for wildlife and sensitive species. The hydrological source and discharge point for each feature was also investigated through an analysis of aerial photos and field reconnaissance.

A formal delineation of potential jurisdictional wetlands was conducted April 28 through May 2, 2008. The delineation area included the proposed pipeline route and surface facility areas. The proposed power line alignment, as well as MP 20.6 to 21.6 of the pipeline ROW was excluded from the survey area due to lack of landowner access. Alternative pipeline routes and power line routes were not included in the formal delineation, but these areas were surveyed and described during the reconnaissance-level vegetation community mapping and habitat assessment surveys. Results of the delineation are summarized in the following section. A full description of the methods and results of the delineation is provided in Gill Ranch Gas Storage Project Delineation of Other Waters of the United States Including Wetlands (ENTRIX in. prep.).

### *Special-status Species*

For the purposes of this PEA, special-status designations for plants and wildlife include those established under federal and state laws and regulations (e.g., Federal and California Endangered Species Acts, California Fish and Game Code), and plant species recognized by the California Native Plant Society (CNPS).

**Special-status Plants.** A reconnaissance-level survey of the Project area was conducted in order to identify areas capable of supporting special-status plant species, and protocol surveys were conducted in all potential habitat. Floristic surveys were conducted in accordance with the Guidelines for Assessing Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (CDFG 2000) and General Rare Plant Survey Guidelines (USFWS 2002). Protocol special-status plant surveys were conducted during the blooming period for target species. Early season field surveys were performed on April 15, 16 and 17 and May 2, and will be repeated in August 2008 to survey for late-blooming species. Reference populations of palmate-bracted bird's beak (*Cordylanthus palmatus*) in the Alkali Sink Ecological Reserve were monitored on June 24 with CDFG botanist Ellen Cypher in preparation for late season surveys.

The survey area includes the 85-foot pipeline construction ROW, temporary use areas, staging areas and facility footprints. The pipeline corridor MP 20.5 to 21.5 of the pipeline ROW was excluded from the survey area due to lack of landowner access. Findings of the early season survey are summarized in Section 4.4.1.3, Results. The results of late season surveys will be presented in a supplemental document at the completion of these surveys. A full description of the methods and results of the survey is provided in the Gill Ranch Gas Storage Project Biological Resources Report (ENTRIX in. prep.).

**Special-status Wildlife.** A habitat-based approach was used to determine potential occurrence of special-status species combined with focused surveys for selected species of particular interest to CDFG and USFWS. The habitat-based approach assumes presence of a species if suitable habitat is present and appropriate mitigation is then proposed commensurate with anticipated impacts to that habitat. Species of particular interest to CDFG and USFWS, as determined from informal consultations, are valley elderberry longhorn beetle, blunt-nosed leopard lizard (*Gambelia sila*), giant garter snake (*Thamnophis gigas*), Swainson's hawk (*Buteo swainsoni*), burrowing owl (*Athene cunicularia*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), and San Joaquin kit fox (*Vulpes macrotis mutica*). Subsequent to informal agency consultations, several other federal- or state-listed species were determined to have potential to occur in the Project area. These include: vernal pool branchiopods (i.e., fairy shrimp and tadpole shrimp), California tiger salamander (*Ambystoma californiense*), and Nelson's antelope squirrel (*Ammospermophilus nelsoni*). The assessment approach varied for each of these species:

### *USFWS/CDFG Species of Particular Interest*

**Valley Elderberry Longhorn Beetle** — The Project area was surveyed for presence of elderberry, the host plant for the Valley elderberry longhorn beetle. The location of elderberry plants was documented using global positioning system (GPS). Any plants with a stem diameter of 1.0-inch or greater at ground level that are not completely avoided (including a 100-foot buffer) by the Project will be subject to full implementation of established conservation guidelines (USFWS 1999).

**Blunt-Nosed Leopard Lizard** – In consultation with CDFG biologists, key areas of interest for blunt-nosed leopard lizard were identified along the proposed pipeline route from Milepost (MP) 16.0 to MP 17.0 and from MP 19.5 to MP 21.6. Qualified surveyors from MH Wolfe & Associates performed reconnaissance level surveys on June 7, 8, and 17, 2008, to evaluate suitability of these key habitat areas as well as the entire Project area. Maps were evaluated for potential habitat and the Project, including the proposed pipeline route from origin to terminus, was surveyed by vehicle. During the reconnaissance survey, areas determined to be potential habitat were delineated for subsequent ground surveys. Among these, two areas of potential blunt-nosed leopard lizard (*Gambelia sila*) habitat along the proposed pipeline alignment were identified: 1) the segment north of and parallel to Highway 180 (Whitesbridge Avenue) from approximately MP 19.5 at San Mateo Avenue east to approximately MP 21.6; and 2) the segment from approximately MP 16.9 to MP 17.0 near the intersection of Highway 180 and West Panoche Road. The first segment crossed land currently covered by degraded valley sink scrub habitat and the second segment was dominated by Valley Saltbush Scrub. These areas excluding lands for which landowner permission for access had not been granted (approximately MP 20.5 to 21.6), were surveyed with meandering transects in substantial accordance with CDFG approved protocols for this species (CDFG 2004). Prior to ground surveys, potential habitat was searched by driving slowly along adjacent roads while looking for lizards and their sign with binoculars. Protocol ground surveys were performed from June 9 through July 15, 2008 (Adult Optimal Survey Period), with eight survey days in June and the remaining four survey days required by protocol being spread out as far as possible through July 15.

Surveys were performed by either two Level II Researchers or a Level II and Level I researcher. In the 80-foot-wide proposed pipeline corridor, sparse vegetation facilitated an effective search area approximately 400-foot-wide area centered on the corridor. Each surveyor walked meandering transects, covering approximately 50 feet on either side of the transect centerline. Air and soil temperatures were taken and recorded at the beginning and ending of each survey. Field notes recorded incidental species observations and special site conditions. Prior to beginning each transect, and at intervals, surveyors scanned far ahead with their binoculars to better detect species sensitive to movement. Particular attention was paid to any berms, the edges of open areas and small knolls, such as created by squirrel burrow aprons, road berms, topography or vegetation. The inside entrance of small mammal burrows also were inspected, with care to ensure that a surveyor's shadow did not cross the entrance prior to it being fully visible. Ground was also searched for large lizard scat that may be indicative of the presence of blunt-nosed leopard lizard.

Findings of these surveys are summarized in Section 4.4.1.3. Subsequent surveys during the Hatchling Optimal Survey Period (CDFG 2004) are planned and the results of these late season surveys will be presented in a supplemental document in fall of 2008.

**Giant Garter Snake** — An isolated agricultural pond referred to as the "Four-Mile Slough" (Appendix B.2, Map 9) was identified by USFWS as having potential to support giant garter snake. The Applicant proposes to avoid potential impacts on giant garter snake and its habitat by boring beneath this channel over a horizontal distance of approximately 600 feet. Use of this approach qualifies as a Level 1 impact as designated in Programmatic Consultation with the U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glen, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California, Sacramento Office Fish and Wildlife Service, November 13, 1997 (USFWS 1997). Because standard avoidance and minimization measures for Level 1 impacts, as specified in the Programmatic Consultation, will be implemented, no focused surveys for the species are required.

**Swainson's Hawk** — Swainson's hawks are known to occur and nest in the Project vicinity. Nesting surveys (Swainson's Hawk TAC 2000) were performed within 0.5 miles of the Project area on April 2, April 15-16, and June 10-12, 2008, to support siting of Project facilities and provide a basis for impact assessment. These surveys were supplemented with numerous incidental observations obtained during other visits to the Project area from summer 2007 to summer 2008. The results of these surveys are presented in Section 4.4.1.3 Results. However, because the results of these nesting surveys are only valid for the year when performed, additional protocol surveys are proposed for implementation prior to start of construction (refer to Section 4.4.4 for discussion of additional future surveys).

**Western Burrowing Owl** — In consultation with CDFG biologists, key areas of interest for burrowing owl were identified along the proposed pipeline route from MP 16.0 to MP 17.0 and from MP 19.5 to MP 21.6. Other areas offering potential nesting habitat were identified on levees and berms adjacent to major water crossings (e.g., San Joaquin River, San Luis Drain); however, these areas will be avoided using Horizontal Directional Drilling (HDD) and Conventional Boring techniques. Surveys for owls and suitable nesting burrows were performed throughout the Project area during all site visits and in conjunction with blunt-nosed leopard lizard surveys during June and July, 2008. Additional protocol (CDFG 1995) nesting surveys are proposed for implementation prior to start of construction (refer to Section 4.4.4).

**Fresno Kangaroo Rat** — In consultation with agency biologists, key areas of interest for Fresno kangaroo rat were identified along the proposed pipeline route from MP 19.5 to MP 21.6. In conjunction with the blunt-nosed leopard survey during June and July 2008, biologists searched the portion of this area where landowner permission to access had been granted (approximately MP 19.5 to MP 20.6) for evidence of kangaroo rats (e.g., burrows, tracks, and scat). Findings of these surveys are summarized in Section 4.4.1.3 Results. Trapping for kangaroo rats is proposed prior to construction on suitable habitat where permission to access is granted (refer to Section 4.4.4, Mitigation Measures).

**San Joaquin Kit Fox** – San Joaquin kit fox are known to occur in the Project vicinity (CNDDB 2008) and the species is assumed to be present in the Project area. Biologists looked for evidence of kit fox (e.g., burrows, tracks, and scat) during multiple visits to the Project area from summer 2007 through summer 2008. In addition, pre-construction searches for kit fox are proposed in suitable habitat where permission to access is granted as described in Section 4.4.4.

#### Incidental Observations

Incidental observations of plants, wildlife and animal sign (burrows, tracks, scat, prey remains, hair) were recorded when observed during all field visits and surveys. Locations of special-status species detections were documented using global positioning system (GPS) technology.

### 4.4.1.3 Results

#### Regional Setting

The Project area is located in the San Joaquin Valley, which is located in the southern portion of the Great Central Valley of California (Hickman 1993). This region is known as the Great Valley geomorphic province, which contains the alluvial plains of the Sacramento and San Joaquin valleys. The climate is characterized by hot, dry summers and mild winters. Elevation ranges from sea level to 2,000 feet in this ecological subregion. Mean annual precipitation ranges from 5 to 25 inches. Mean annual temperatures are between 56 to 62 degrees Fahrenheit (ºF) (USDA and USFS 1998).

The Project area is located within the San Joaquin River drainage system. Major surface waters within the Project area are the San Joaquin River and Fresno Slough. All surface waters discharging into the San Joaquin River eventually flow through the Sacramento-San Joaquin River Delta, San Francisco Bay, and then to the Pacific Ocean. Other minor water features include vernally wet areas and intermittently flowing agricultural ditches and ponds. A more detailed description of surface and ground water features is provided in Section 4.9, Hydrology and Water Quality.

## Vegetation Communities and Wildlife Habitat Assessment

Vegetation communities, differentiated by geographical distribution, species composition, and site conditions, are also referred to as habitat types, vegetation cover types and/or vegetation series depending on the context. General vegetation community types occurring within the Project vicinity include upland scrub and grassland communities, wetland, riparian and aquatic communities, as well as anthropogenic areas. Each of these general categories is subdivided into specific "cover types," or vegetation community "series." Vegetation community classification and nomenclature was adopted from Holland (1986), with additional descriptions from Holland and Kiel (1990) and Sawyer and Keeler-Wolf (1995).

A brief description of these communities and their location within the Project area is provided below. Additionally, each vegetation community is correlated with CWHR habitat types, allowing for an assessment of each community as wildlife habitat. Specific site data provided in the following discussion, including community distributions, species composition, and habitat quality is also presented. The distribution of plant communities throughout the Project area and alternative routes is shown in a series of maps (Appendix B.2). The acreage and percent of the Project area occupied by each plant community are summarized in Table 4.4-1.

### *Upland Scrub and Grassland Communities*

**Valley Saltbush Scrub.** The Valley Saltbush Scrub community is typically found on sandy to loamy soils without surface alkalinity in locations of low topographical relief such as alluvial fan formations and stream floodplain areas (Holland 1986). This scrub type is well distributed in the southern and southwestern San Joaquin Valley and the Carrizo Plains of San Luis Obispo County where the climate is characterized by long, hot, dry summers and short, damp winters often shrouded in tule fog for weeks at a time from December through February.

Valley Saltbush Scrub is characterized by open, gray or blue-green chenopod scrubs including spinescale saltbush (*Atriplex spinifera*) and/or allscale saltbush (*Atriplex polycarpa*). Shrub cover varies from 10 to 40 percent, and the understory includes species typically found in non-native grassland (Holland 1986). Sawyer and Keeler-Wolf (1995) describe this community under the Mixed Saltbush Series in the Manual of California Vegetation. In the Project area, saltbush scrub has been largely extirpated by agricultural conversion, flood control, and groundwater pumping. A few small remnant patches can be found along agricultural canals and roadsides from MP 17.0 to MP 17.5 and at MP 18.0. These areas are dominated by allscale saltbush with an understory of non-native grasses and forbs.

**Table 4.4-1: Vegetation Community Distribution within the Project Area**

| Vegetation Communities Along the Proposed Pipeline ROW Areas calculated with 85' buffer along the pipeline alignment) [1] | | | |
|---|---|---|---|
| **Vegetation Type** | **Vegetation Symbol** | **Acres** | **% cover within ROW** |
| Agricultural Canal | AGC | 1.28 | 0.46% |
| Coastal and Valley Freshwater Marsh | CVFM | 3.901 | 1.41% |
| Deciduous Orchards | DO | 24.93 | 9.01% |
| Developed Land | DL | 42.87 | 15.50% |
| Fallow Land | FL | 5.16 | 1.87% |
| Field and Row Crops | FR | 175.56 | 63.47% |
| Great Valley Riparian Forest and Scrub | GVRFS | 0.581 | 0.21% |
| Non-Native Grassland | NNGL | 1.391 | 0.50% |
| Open Water | OW | 1.661 | 0.60% |
| Saltbush Scrub | SBS | 4.45 | 1.61% |
| Seasonal Wetland Complex | SWC | 2.571 | 0.93% |
| Tree Row | TR | 1.83 | 0.66% |
| Valley Sink Scrub | VSS | 7.27 | 2.63% |
| Valley Sink Scrub/Non-Native Grassland | VSS/NNGL | 2.28 | 0.83% |
| Vineyard | V | 0.05 | 0.02% |
| Willow Cottonwood Scrub | **WCS** | **0.791** | **0.29%** |
| **Total Acres** | **276.58** | | |
| **Vegetation Communities within the Proposed Power Line ROW (Areas calculated with a 40-foot buffer along power line alignment)[2]** | | | |
| **Vegetation Type** | **Vegetation Symbol** | **Acres** | **% cover within ROW** |
| Agricultural Canal | AGC | 0.142 | 0.29% |
| Deciduous Orchards | DO | 3.062 | 6.47% |
| Developed Land | DL | 8.982 | 18.95% |
| Field and Row Crops | FR | 6.992 | 14.75% |
| Great Valley Riparian Forest and Scrub | GVRFS | 0.502 | 1.05% |
| Non-Native Grassland | NNGL | 20.772 | 43.85% |
| Non-Native Grassland/Open Water | NNGL/OW | 0.382 | 0.81% |
| Vineyard | V | 6.322 | 13.35% |
| Willow Cottonwood Scrub | WCS | 0.232 | 0.48% |
| **Total Acres** | **47.37** | | |
| **Vegetation Communities within the Storage Field (Areas calculated within 5,200-acre gas storage field)3** | | | |
| **Vegetation Type** | **Vegetation Symbol** | **Acres** | **% cover within GRS** |
| Agricultural Canal | AGC | 56.693 | 1.12% |
| Deciduous Orchards | DO | 1,315.703 | 26.01% |
| Developed Land | DL | 207.743 | 4.11% |
| Field and Row Crops | FR | 2,529.033 | 50.00% |
| Tree Row | TR | 12.993 | 0.26% |
| Vineyard | V | 682.403 | 13.49% |
| Willow Cottonwood Scrub | WCS | 253.683 | 5.02% |
| **Total Acres** | **5,058.21** | | |

**Table 4.4-1: Vegetation Community Distribution within the Project Area**

| Vegetation Communities within Temporary Use Areas (TUA's) (Areas calculated for TUA's located outside of pipeline and power line ROW's)4 | | | |
|---|---|---|---|
| **Vegetation Type** | **Vegetation Symbol** | **Acres** | **% cover within TUA's** |
| Developed Land | DL | 30.024 | 41.31% |
| Fallow Land | FL | 36.794 | 51.64% |
| Field and Row Crops | FR | 5.854 | 8.05% |
| **Total Acres** | | **72.66** | |

1Direct impacts to these communities will be avoided by implementation of HDD crossing methods.

2 Direct impacts to these communities will be limited to a small area in the immediate vicinity of each pole location.

3 Direct impacts to these communities will be limited to areas associated with injection/withdrawal wells and gathering lines.

4 Staging Areas and Temporary Use areas located outside of the pipeline and power line ROW included in this calculation are: the Mendota Rail yard, cotton facility, adjacent to compressor site, Spreckels sugar plant (at intersection of W. Whitebridge Ave and N San Mateo Ave), Spreckels sugar plant (across from ag. ponds).

This vegetation community is analogous to the CWHR habitat, Alkali Desert Scrub. Common wildlife species that utilize this habitat include black-tailed jackrabbit, coyote, several raptor species and many sparrows. Special-status wildlife that use Valley Saltbush Scrub, but not necessarily present in the Project vicinity, include western spadefoot (*Spea hammondii*), burrowing owl, Nelson's antelope squirrel, and Fresno kangaroo rat. A number of species are very dependent on this community. Le Conte's thrasher (*Toxostoma lecontei*), for example, was formerly found in Fresno County, but has presumably been extirpated due to the loss and fragmentation of this habitat type.

**Valley Sink Scrub.** Valley Sink Scrub is a low, open to dense succulent shrubland dominated by alkali-tolerant species in the Chenopodiaceae family, especially iodine bush (*Allenrolfea occidentalis*) or several Sueda (seablite) species. Understories usually are lacking, although sparse herbaceous cover dominated by red brome (*Bromus rubens*) develops occasionally. The annuals are most active from January to April, and the perennials from March to September. Sites host heavy, saline and/or alkaline clays typical of lakebeds or playas. High ground water supplies provide capillary water for the perennials. Soil surfaces often have a brilliant white salty crust over dark, sticky clay.

Valley Sink Scrub formerly surrounded all of the large San Joaquin Valley lakes (Kern, Buena Vista, Tulare, and Goose) and was distributed north along the trough of the San Joaquin Valley through Merced County to the Sacramento Valley. It is now extirpated throughout much of this area due to flood control, agricultural development, and ground water pumping (Holland 1986). Valley Sink Scrub remains extant at a few protected sites in the Project vicinity including the Alkali Sink Ecological Reserve, which is located on the south side of Highway 180 approximately between MP 20.0 and MP 21.6. Within the Project area, the community located between MP 19.5 and MP 21.6 is a very degraded form of Valley Sink Scrub. Historically, this piece of land was occupied by Valley Sink Scrub, and some remnant species (i.e., iodine bush, saltbush, and scanton grass) are competing with exotic grasses and forbs. Cattle grazing and modifications to the drainage patterns have altered the species composition to be dominated by common tarweed (*Hemizonia pungens* ssp. *pungens*) and Mediterranean barley (*Hordeum* *marinum* ssp. *gussoneanum*), and other forbs. This area is mapped as a transition community occupied by Non-native Grassland and Valley Sink Scrub. This area also hosts vernal (i.e., seasonal) pools that have the potential to support vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardi*). This vegetation community also hosts two CNPS List 1b species, heartscale (*Atriplex cordulata*) and Lost Hills crown scale (*Atriplex vallicola*).

Although the pure form of Valley Sink Scrub does not occur within the Project ROW, species occurring in this habitat have the potential to occupy adjacent habitat within the Project area. The species assemblage for Valley Sink Scrub is similar to that described above for Valley Saltbush Scrub. It was in this habitat, within the Alkali Sink Ecological Reserve, where the Fresno kangaroo rat was last documented in 1992 (CDFG 2008a).

**Non-native Grassland.** A heterogeneous mix of non-native grasses, annual forbs and wildflowers characterizes the non-native grassland community. Holland (1986) describes this community in his classification of Non-native Grassland and Wildflower Fields. At the onset of the late fall rains growth, flowering, and seed-set occur from winter through spring resulting in a dense cover of annual grasses and forbs reaching up to a meter in height. With a few late season exceptions, dominants are dead through the summer-fall dry season. This community is well distributed throughout the valleys and foothills of California (usually below 3,000 feet) with the exception of the north coastal and desert regions.

Areas dominated by this community generally support livestock grazing, and it is this disturbance that maintains an early successional stage dominated by exotic annual species and bare ground. In the absence of grazing or other disturbance events, many of these lands would eventually succeed into shrub land or woodland. Dominant plant species in the non-native grassland typically include introduced annual grasses, herbaceous forbs and wildflowers.

Within the Project area, dominant species include various species of barley (*Hordeum* spp.), brome (*Bromus* spp.), fescue (*Vulpia* spp.), fiddle neck (*Amsinckia* spp.), common goldfields (*Lasthenia californica*) shortpod mustard (*Hirschfeldia incana*), saltgrass (*Distichlis spicata*) common tarweed and filaree (*Erodium* spp).

Non-native Grassland was mapped in the central portion of the pipeline alignment from MP 17.0 to MP 18.0 and from MP 19.5 to MP 21.6. This area appears to be seasonally grazed by livestock; however no cattle were present at the time of the survey. Historically, this piece of land was occupied by Valley Sink Scrub, and some remnant species (i.e., iodine bush, saltbush and scanton grass) are competing with exotic grasses and forbs. The area between MP 19.5 and MP 21.6 is mapped as a transition community occupied by Non-native Grassland and Valley Sink Scrub.

This vegetation community is analogous to the CWHR Annual Grass habitat type. Non-native grasslands are used by a high diversity of wildlife, with species composition depending on precipitation, successional stages, grazing activities and other factors. Common species found in non-native grasslands include gopher snake (*Pituophis catenifer*), voles, ground-squirrels, geese, raptors, and songbirds. Special-status species that rely on these habitats include the blunt-nosed leopard lizard (*Gambelia sila*) California tiger salamander, cackling goose (*Branta hutchinsii leucopareia*), Swainson's hawk and American badger (*Taxidea taxus*).

#### *Riparian, Wetland and Aquatic Communities*

Vegetation in this cover type includes aquatic areas and adjacent riparian, floodplain and wetland communities. Aquatic areas include man-made and natural impoundments; agricultural impoundments and irrigation ditches are also described here. Riparian and floodplain communities are found associated with aquatic areas such as the Kings Slough, Fresno Slough and the San Joaquin River. Wetland communities including playas, meadows, and vernally wet areas are also described here.

**Great Valley Riparian Forest and Scrub and Willow Cottonwood Scrub.** Riparian areas within the Project area are primarily dominated by Fremont cottonwood (*Populus fremontii*) and various willow species (*Salix* spp.) with variable subdominants and understory species. These communities are typically found on floodplains and low-gradient depositional areas along the banks of rivers, seeps, and streams, where soils are intermittently flooded. Site conditions generally include fine-grained alluvial soils near perennial or nearly-perennial streams that provide subsurface irrigation even when the channel is dry (Holland 1986). Holland (1986) describes several Great Valley riparian forest communities including Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, and Great Valley Willow Scrub all of which are partially represented in the Project area as remnant stands. Dominant species in these communities may include: box elder (*Acer negundo var. californica*), California black walnut (*Juglans californica var. hindsii*), California sycamore (*Platanus racemosa*), Gooding's willow (*Salix gooddingii*), red willow (*Salix laevigata*), and shining willow (*Salix lucida*). Understories consist of shade-tolerant shrubs like button willow (*Cephalanthus occidentalis*) and Oregon ash (*Fraxinus latifolia*). Great Valley Willow Scrub generally occurs closer to the water in more flood prone areas and is characterized by an open to dense, broadleafed, winter-deciduous shrubby streamside thicket dominated by any of several willow species. Riparian forest and scrub was formerly extensive along the major low-gradient (depositional) streams throughout the Great Valley, but is now reduced to scattered, isolated remnants or young stands because of flood control, water diversion, agricultural development, and urban expansion.

Great Valley Riparian Forest and Scrub and Willow Cottonwood Scrub are found on the banks of the San Joaquin River (MP 25.1), intermittently around the Fresno Slough (MP 18.0), and along the Lone Willow Slough (power line MP 7). In general these areas were relatively poorly developed and had sparse overstories. Dominant overstory species included Fremont cottonwood and various willow species, with an understory of stinging nettle (*Urtica dioica*), button willow, and elderberry. Cottonwood and willow were also observed along some agricultural drainages and along the length of the Chowchilla Canal these occurrences were relatively isolated and scattered and were not large enough to warrant mapping as a defined riparian community. This community is analogous to the Fremont Cottonwood Series described by Sawyer and Keeler-Wolf (1994). The corresponding CWHR habitat type is Valley Foothill

Riparian. This community will be avoided during construction by utilizing HDD crossing methods at Fresno Slough and the San Joaquin River.

Riparian communities have a high value for wildlife. They provide nesting habitat for a large number of birds, including woodpeckers, flycatchers, vireos and warblers. Bats forage and roost in riparian areas. Other wildlife such as western skink (*Eumeces skiltonianus*), desert cottontail (*Sylvilagus audubonii*), mice, and gray fox (*Urocyon cinereoargenteus*) are found in riparian habitats as well.

**Coastal and Valley Freshwater Marsh.** This wetland community is typically dominated by perennial, emergent monocots including bulrush (*Scirpus* spp.) and cattail (*Typha* spp.) (Holland 1986). During the growing season, dominants often form completely closed canopies up to 4 to 5 meters (13 to 16 feet) tall. This community typically occurs in permanently flooded freshwater sites that lack a significant current. Prolonged saturation permits accumulation of deep, peaty soils. Within the region, this community is most extensive in the upper portion of the Sacramento-San Joaquin River Delta and is common in the Sacramento and San Joaquin valleys in river oxbows and other areas on the flood plain (Holland 1986). Coastal and Valley Freshwater Marsh corresponds with the Bulrush-Cattail Series described by Sawyer-Keeler Wolf (1995). Within the Project area, freshwater marsh was observed on the western bank of the Fresno Slough along the south side of Highway 180 (MP 17.5 to MP 18.0) as well as portions of the Mendota Wildlife Area.

This vegetation community is analogous to the CWHR habitat type, Fresh Emergent Wetland. Wetlands, along with riparian habitat, may have the biggest overall wildlife value of available habitats in the San Joaquin Valley for birds. Thousands of geese, cranes, ducks, herons, egrets, shorebirds and raptors depend on these habitats during winter and migration for both roosting and foraging. In the summer, they serve as nesting sites for ducks, rails, and blackbirds. Amphibians and reptiles such as giant garter snake, bullfrog (*Rana catesbeiana*) and western pond turtle (*Actinemys marmorata*) are dependent on wetland habitats as well.

**Seasonal Wetland Complex.** The following vegetation community is represented by several distinct Holland (1986) vegetation types, none of which were represented in pure form within the Project area. Vegetation within the Project area is best described as a combination of intergrading riparian woodland, marsh, vernal wetland, meadow, and grassland communities. These communities were present in very small units and did not warrant mapping as separate units, therefore, these areas are mapped as one unit under Modified Wetland Complex/Disturbed Wetland/Transitional Wetland. This community type is mapped within the Project area at MP 17.5 where it is dominated by exotic tamarisk (*Tamarix* sp.). Seasonal wetland complex is prevalent throughout the Mendota Wildlife Area located adjacent to the Project area, just south of Highway 180 near MP 18.0.

**Valley Wildrye Grassland.** This community is described as a dense sod prairie dominated by creeping wildrye (*Elymus triticoides*). It occurs on moist sites at low elevations, often adjacent to stands of riparian forest or freshwater marsh. Soils are frequently subalkaline and or seasonally overflowed. Characteristic species include *Artemisia douglasiana, Elymus triticoides,* and *Urtica* *holosericea*. This community is scattered widely through the Central Valley and surrounding foothills (Holland 1986). Large swaths of wildrye grass were observed adjacent to the east bank of the Fresno Slough, south of Whitesbridge Road.

**Alkali Meadow.** This community is dominated by sedges and perennial grasses including alkali sacaton (*Sporobolus airoidea*), varying from a dense to fairly open growth. Relatively few species are represented. The community is usually low growing, but occasionally has tufts to 1 meter high. Growing and flowering season extends from late spring to early fall. Site factors include relatively fine-textured, more or less permanently moist, alkaline soils. This community may intergrade with Non-native Grassland on drier, less alkaline soils of the Central Valley or with Alkali Marsh on permanently flooded sites. (Holland 1986). The corresponding CWHR habitat is Alkali Desert Scrub.

**Alkali Marsh.** Sites colonized with Alkali Marsh generally have standing water or saturated soil during most or all of the year. High evaporation and low input of fresh water render these marshes somewhat salty, especially during the summer. This community is similar to Coastal Brackish Marsh in quantitative range of saltiness, but is more alkaline and usually with salts other than sodium chloride. Marshes that become mostly dry during the summer are Vernal Marshes; those with a more constant input of fresh water are Coastal and Valley Freshwater Marshes; various types of chenopod scrub occur in areas with moist, highly alkaline soil that usually lack water at the surface. All of the above habitats may intergrade with Alkali Marshes. Alkali Marsh is typically found in lake beds and other areas on the flood plains of the Sacramento and San Joaquin rivers and in low-lying areas of Kings and Kern counties in the southwestern San Joaquin Valley at elevations below 1,000 feet (300 meters) (Holland 1986).

**Vernal Marsh.** Vernal Marsh is similar to Alkali Marsh and Coastal and Valley Freshwater Marsh, but has greater seasonal fluctuation. Vernal Marsh is also similar to Vernal Pools in species composition, with dominance by low growing annual herbs. Vernal Marsh intergrades with all of the above communities. The growing season varies with the water input, but is usually spring and early summer; often flowering behind the retreating water's edge as the marsh dries. Vernal Marsh sites generally have standing water following the winter rains, but have greatly reduced inundation or are completely dry by summer. These sites are often, but not necessarily alkaline, tending to become more alkaline late in the season. Vernal Marsh is widely scattered in the coastal and interior valleys, as well as low lying areas of the Sacramento and San Joaquin Valleys. This community is often found at the upland end of blind sloughs where it forms the transition between marshy slough vegetation and drier upland grassland (Holland 1986).

**Analogous CWHR habitats include Annual Grassland, Perennial Grassland, Fresh Emergent Wetland and Wet Meadow.** These wetland types, which often hold water ephemerally, provide habitat for wildlife species that use both grassland and wetland habitat types, depending on the prevailing conditions. For example, waterfowl and shorebirds may use the wetlands of vernal pools in the spring and sparrows and buntings may use the same area in the fall when it is dry. Many invertebrates are endemic to California vernal pools, including several species of tadpole and fairy shrimp, and amphibians such as California tiger salamander breed in these areas as well.

**Riverine and Lacustrine/Open Water.** Lacustrine habitats are inland lakes or dammed riverine channels containing standing water, including near-shore (limnetic) and deepwater (littoral) habitat. Permanently Flooded Lacustrine Habitat is distinguished from Intermittently-Flooded Lacustrine Habitat only by the typical duration of standing water (Cowardin et al. 1979). The inundated portions of the Chowchilla Bypass Canal, Fresno Slough and the San Joaquin River have been mapped as this cover type. Regulation of surface waters downstream at Mendota Pool determines water levels at the Fresno Slough. The Mendota Pool is drained each winter in order to conduct facility inspections at Mendota Dam, which reduces the Slough from a large still-water impoundment to a narrow stream of water (S. Brueggemann, Manager Pers. Comm. 2008). For the remainder of the year, the slough maintains about 10 feet of water depth in the vicinity of Whitesbridge Road (Highway 180) within the proposed pipeline corridor. The San Joaquin River is a perennial river. However, in the vicinity of the Project the river is a losing reach (i.e., surface water goes subsurface in this area), and only conveys water during flood flows. For a more detailed description of surface waters within the Project area refer to Section 4.9, Hydrology and Water Quality.

Riverine and Lacustrine areas support a wide variety of aquatic and terrestrial wildlife. Crappie, catfish, bluegill, carp and black and striped bass all can be found in Fresno Slough. Grebes, herons, egrets, ducks, muskrats, beavers and raccoons can all be found in these habitats as well.

### *Anthropogenic Areas*

Anthropogenic areas in the Project area include agricultural lands and limited commercial, industrial, and residential development. In general, agricultural lands dominate the Project area and include field and row crops, deciduous orchards, vineyards and fallow land. Corresponding CWHR habitats are Deciduous Orchard, Irrigated Row and Field Crop, Vineyard and Pasture, respectively. Built-up areas classified and mapped as developed lands, can be identified by the presence of structures, roads, fences and clustered vegetation. The analogous CWHR habitat is Urban. Additional discussion of agricultural land uses are provided in Section 4.10, Land Use, Planning, and Agricultural Resources.

**Agricultural Canal.** This vegetation community includes man-made impoundments (i.e., agricultural ponds) and linear canal features that may also seasonally support wetland vegetation. These water conveyance structures are man-made and range from a drainage swale a few feet wide to a 30-foot wide irrigation canal. Water levels fluctuate often, and are dependent on crop rotations and irrigation schedules. Some canals and ponds appear to hold water perennially, and may support wetland vegetation, fish or amphibians, while others remain relatively devoid of vegetation because of long-term inundation or dry periods. Vegetation in these areas is variable and depends on bank materials, season and recent management actions. Dominant species are dock (*Rumex* sp.), willow herb (*Epilobium* sp.), rabbitfoot grass (*Polypogon monspeliensis*) and other forb species. In areas with more permanent water cattails are often present. Vegetation is maintained through scraping, burning and/or herbicide treatment in order to increase storage capacity and water flow. Nonetheless these areas can provide some value to wildlife. These features are found intermittently throughout the Project area, and a summary of each feature is provided in Table 4.4-2.

**Agricultural Land: Field and Row Crops.** Agricultural land producing field and row crop types are the dominant land cover type in the Project area. Vegetation in this land-cover type includes a variety of sizes, shapes, and growing patterns. Most are grown in rows and require irrigation (Schultze 1994). The major row and field crops occurring within the Project area include cotton, cantaloupe and other melons, tomatoes, safflower, sugar beets, broccoli, and onions. Depending on the season and crop rotation, this type of agricultural land goes through various stages of disturbance including "in production", "recently tilled" and/or "with cover crop". Fields in production are generally maintained regularly, and may receive applications of pesticide, herbicide, fertilizer and regular irrigation. Production of these crops generally occurs from spring through fall. During the winter season, fields are generally planted with grass crops or alfalfa (*Medicago sativa*) utilized for its nitrogen fixing properties and ability to repair soil structure. At maturity, cover crops are generally harvested before being turned over for forage and grazed by sheep during their late winter lambing period. This particular phase of the rotation provides excellent foraging habitat for raptors and other birds of prey. Cover crops are tilled into the soil prior to planting.

Land covered by production crops is generally of little use to wildlife, due to monotypic vegetation, pesticide and herbicide application, and frequent human disturbance. If these areas have been tilled or have a cover crop, they can provide value to wildlife. Killdeer (*Charadrius vociferous*), American pipits (*Anthus rubescens*), and California horned lark (*Eremophila alpestris actia*) frequently can be found in these fields, and raptors will hunt for insects, small rodents and birds in these areas as well. Geese and cranes forage in these areas in winter. When irrigation practices create ponded conditions, migrant species such as the white-faced ibis (*Pelagadis chihi*) and the tricolored blackbird (*Agelaius tricolor*) often congregate. Some mammalian predators, such as fox and coyote (*Canis latrans*), will forage in this habitat.

**Agricultural Land: Deciduous Orchards.** Deciduous orchards producing various fruit and nut crops are common throughout the Project Area. All orchard crops grown within the Project area are deciduous in winter. Deciduous orchards in California are typically open, single species tree-dominated habitats, with an open understory (Schultze 1994). Typical orchards found within the Project area include pistachio and almond trees; pomegranates are less commonly grown. Orchards are typically even aged and range from very young sapling sized trees, to mature trees reaching up to 20 feet in height. Most are irrigated, usually with sprinklers or drip irrigation, although some may be flood irrigated. In one case, a small citrus orchard (an evergreen tree) was observed near MP 4.0 on the proposed pipeline route, and is mapped under this community.

**Table 4.4-2: Agricultural Canals, Ponds and Other Aquatic Areas**

| Site Number[1] | Name and Type of Feature | Location (Station in Feet/Mile Post) | Description (Bank materials, Vegetation, etc.)[1] | Hydrologic Characteristics (Source/Discharge, Flow) | Comments | National Wetland Inventory Classification | Proposed Crossing Method |
|---|---|---|---|---|---|---|---|
| A | agricultural pond | 2.5 | clay-loam banks, no vegetation, man made | water source unknown, agricultural pond; appears actively maintained | swallows using mud for nest building | NA | NA (can be avoided during construction) |
| B | California Aqueduct | 2.7 | concrete lined trapezoid channel, no vegetation | bounding reservoirs are San Luis Reservoir to the north and Pyramid Lake to the south; regulated; continuous flow | -- | R2UBKH (Riverine, lower perennial unconsolidated bottom, artificially flooded, permanently flooded) | HDD |
| C | agricultural pond | 4.1 | clay-loam banks, no perennial vegetation, man made | dry (April 2008) | -- | NA | NA (can be avoided during construction) |
| D | agricultural pond | 4.7 | clay-loam banks, no perennial vegetation, man made | dry (April 2008) | -- | NA | NA (can be avoided during construction) |
| E | agricultural pond | 6.2 | clay-loam banks, no perennial vegetation, man made | standing water | tadpoles | NA | NA (can be avoided during construction) |
| F | agricultural pond | 6.2 | clay-loam banks, cattails, man made | damp, but no standing water | -- | NA | NA (can be avoided during construction) |
| G | agricultural pond | 9.2 | very large 65'x 275' pond with clay soils, cattails and willow, man made | damp, but no standing water; likely in contact with shallow groundwater. Hydraulically connected to canal H. | pond appears un-maintained (trash is prevalent). | NA | NA (can be avoided during construction) |
| H | agricultural drain | 9.2 | loam banks, ruderal/herbaceous vegetation, man made | dry, no evidence of hydrology, hydraulically connected to G. | -- | NA | NA (can be avoided during construction) |
| I | agricultural drain | 10.3 | loam banks, ruderal/herbaceous vegetation, man made | dry, no evidence of hydrology | -- | NA | open trench |
| J | agricultural drain | 12.3-14.3 | loam banks, ruderal/herbaceous vegetation, tree rows along bank, man made | dry, no evidence of hydrology | -- | NA | NA (can be avoided during construction) |
| K | agricultural drain | 14.8 | loam banks, tamarisk along bank, man made | dry, no evidence of hydrology | small canal, appeared unused | NA | open trench |
| L | agricultural | 15.4 | clay-loam banks, no perennial | dry, no evidence of hydrology | small canal, relatively | NA | open trench |

**Table 4.4-2: Agricultural Canals, Ponds and Other Aquatic Areas**

| Site Number[1] | Name and Type of Feature | Location (Station in Feet/Mile Post) | Description (Bank materials, Vegetation, etc.)[1] | Hydrologic Characteristics (Source/Discharge, Flow) | Comments | National Wetland Inventory Classification | Proposed Crossing Method |
|---|---|---|---|---|---|---|---|
| | drain | | vegetation, man made | | insignificant | | |
| M | agricultural pond | 15.4 | clay-loam banks, ruderal/annual vegetation, no perennial vegetation, man made | isolated pond, no evidence of hydrology except for direct precipitation | pond appears un-maintained | NA | NA (can be avoided during construction) |
| N | agricultural drain | 15.9 | clay-loam banks, ruderal/annual vegetation, no perennial vegetation, man made | intermittent flow from irrigation | -- | NA | NA (can be avoided during construction) |
| O | agricultural drain | 16.4 | clay-loam banks, ruderal/annual vegetation, no perennial vegetation, man made | standing water (April); water levels likely fluctuate during | -- | NA | open trench |
| P | San Luis Drain (agricultural drain) | 16.9 | concrete lined v-ditch, no vegetation | S/D: source Mendota Pool, discharge point unknown<br>FLOW: regulated, intermittent | historical Selenium contamination | NA | conventional bore |
| Q | agricultural drain | 17.0 | vegetation unknown | regulated by agricultural use, intermittent flow, connectivity to adjacent drains | located on south side of 180 | NA | conventional bore |
| R | Fresno Slough Overflow (depression) | 17.5 | clay loam depression, ruderal/annual, vegetation tamarisk | Kings/Fresno Slough overflow fed by groundwater seepage, surface cracking evident | Bridge # 42-39 | PEMC - Freshwater Emergent Wetland (Palustrine, emergent, seasonally flooded)<br>PSSA - Freshwater Forested/Shrub Wetland (Palustrine, scrub-shrub, temporarily flooded) | open cut trench in dry season |
| S | Fresno Slough (Kings Slough) | 18.0 | natural banks with rip rap near bridge, ruderal vegetation and landscaping (lawn) with a few willow/cottonwood | source North Fork Kings River, Sierra Nevada (Inyo County), discharge point Mendota Pool, San Joaquin River. Perennial (standing) water observed | Bridge #42-41 | R2UBK (Riverine, lower perennial, unknown tidal designation, saturated, artificially flooded) | HDD |
| T | depression | 18.1 | clay-loam depression/degraded canal, annual vegetation, cottonwood, man made | direct precipitation or groundwater only | -- | NA | HDD (part of Fresno Slough/RR track HDD |

**Table 4.4-2: Agricultural Canals, Ponds and Other Aquatic Areas**

| Site Number[1] | Name and Type of Feature | Location (Station in Feet/Mile Post) | Description (Bank materials, Vegetation, etc.)[1] | Hydrologic Characteristics (Source/Discharge, Flow) | Comments | National Wetland Inventory Classification | Proposed Crossing Method |
|---|---|---|---|---|---|---|---|
| | | | | | | | span) |
| U | pond | 18.3 | clay-loam banks, with cattails, man made | standing water | use unknown | NA | HDD (part of Fresno Slough/RR track HDD span) |
| V | agricultural drain | 18.3 | clay-loam banks, ruderal/annual vegetation, no perennial vegetation, man made | isolated agricultural drain with possible groundwater connectivity to Kings/Fresno Slough. Standing water observed in January - April, agricultural use unknown | dog-leg channel near RR tracks | NA | HDD (part of Fresno Slough/RR track HDD span) |
| W | seasonally wet area | 19.5-21.6 | disturbed/grazed grassland, alkali soils | isolated seasonal pools fed by precipitation, shallow groundwater | directly across Hwy 180 from the Alkali Sink Ecological Area | PSSA - Freshwater Forested/Shrub Wetland (Palustrine, scrub-shrub, temporarily flooded) PUSA, other (Palustrine, unconsolidated shore, temporarily flooded) | open cut trench |
| X | Four-Mile Slough (agricultural pond) | 22.3 | clay-loam banks, some rip rap, ruderal/annual wetland vegetation, no perennial vegetation | isolated agricultural channel/pool, perennial (standing) water observed, regulated by agricultural operations | not contiguous with channel south of Hwy. 180, sinuous channel extends about 1-mile north and terminates in an agricultural field | NA | slick-bore |
| Y | San Joaquin River | 25.1 | natural banks (sand), flood control embankments on both banks | headwaters in the Sierra Nevada, outlet is Sacramento San Joaquin Delta. Flow is perennial, regulated at Friant Dam, loosing reach, receives mandated flow of 5 cfs at Gravelly Ford and flood flows | -- | PSSA (south bank) Freshwater Forested/Shrub Wetland (Palustrine, scrub-shrub, temporarily flooded) R2UBC (north bank) (Riverine, lower perennial, unconsolidated bottom, seasonally flooded) | HDD |
| Z | agricultural drain | 26.0 | clay-loam banks, ruderal/annual wetland | intermittent flow, regulated by agricultural operations, connects | standing water, actively used for | NA | open cut trench |

**Table 4.4-2: Agricultural Canals, Ponds and Other Aquatic Areas**

| Site Number[1] | Name and Type of Feature | Location (Station in Feet/Mile Post) | Description (Bank materials, Vegetation, etc.)[1] | Hydrologic Characteristics (Source/Discharge, Flow) | Comments | National Wetland Inventory Classification | Proposed Crossing Method |
|---|---|---|---|---|---|---|---|
| | | | vegetation cottonwood and willow trees lining the banks, wetland vegetation, man made | several localized agricultural drains | irrigation | | |
| AA | agricultural drain | GSF | clay-loam banks, ruderal/annual vegetation, no perennial vegetation, man made | standing water, actively used for irrigation, possible hydraulic connection with adjacent canals | | NA | NA (can be avoided during construction) |
| BB | agricultural drain | GSF | clay-loam banks, ruderal/annual vegetation, some willow, cattails and other wetland vegetation, man made | standing water, actively used for irrigation, possible hydraulic connection with adjacent canals | | NA | NA (can be avoided during construction) |
| CC | agricultural drain | GSF | clay-loam banks, very sparse ruderal/annual vegetation, no perennial vegetation, man made | standing water, actively used for irrigation, possible hydraulic connection with adjacent canals | | NA | NA (can be avoided during construction) |
| DD | agricultural drain | GSF | clay-loam banks, ruderal/annual vegetation, a few cattail patches, man made | standing water, actively used for irrigation, possible hydraulic connection with adjacent canals | | NA | NA (can be avoided during construction) |
| EE | agricultural drain | 3.7-7 (PW) | clay-loam banks, ruderal/annual vegetation, intermittent willows and other perennials, man made | intermittent water, irrigation use unknown, possible hydraulic connection with adjacent canals | | NA | NA (can be avoided during construction) |
| FF | Chowchilla Bypass Canal (flood control channel) | 7.0 (PW) | man made levees with sandy loam channel, ruderal/annual vegetation, very little perennial vegetation, man made | dry (April 2008), receives flow from San Joaquin River during flood conditions | | NA | NA (power line alignment) |
| GG | Lone Willow Slough (agricultural drain) | 7.1 | clay-loam banks, well developed willow scrub, man made | dry (April 2008), use for irrigation unknown | | NA | NA (power line alignment) |

Deciduous orchards do provide habitat for some wildlife species, primarily for foraging. Birds such as yellow-billed magpie (*Pica nuttalli*), American robin (*Turdus migratorius*), and other passerines can be found in orchards, usually outside of the breeding season. Some raptors may forage in orchards, particularly barn owls (*Tyto alba*). Small rodents and rabbits may use deciduous orchards, as well as some bats.

**Agricultural Land: Vineyards.** Vineyards are composed of single species planted in rows, usually supported on wood and wire trellises. Rows under the vines are usually sprayed with herbicides to prevent growth of herbaceous plants. Between rows of vines, grasses and other herbaceous plants may be planted or allowed to grow as a cover crop to control erosion. The vineyard type within the Project area is dominated by grapes. Vineyards are typically found on flat alluvial soils in valley floors, in rolling foothill areas, or on relatively steep slopes. All are irrigated, usually with sprinklers or drip irrigation, although some may be flood irrigated. Vineyards are most widespread in the Great Central Valley and to a lesser extent in coastal plains and valleys (Schultze 1994).

Vineyards are similar to deciduous orchards in the species assemblage that utilizes this habitat type. Vineyards may provide better habitat for reptiles and mammals, including western skink, broad-footed mole (*Scapanus latimanus*), pallid bat (*Antrozous pallidus*), long-eared myotis (*Myotis evotis*), and western spotted skunk (*Spilogale gracilis*).

**Agricultural Land: Fallow Land.** Agricultural lands that have been retired from production for an extended period of time (i.e., greater than one year) are considered fallow. These lands are similar to Non-native Grassland in plant species assemblage, but tend to be highly dominated by agricultural weeds and remnant row crop or cover crop species. Several fallow fields are found near the Spreckels Sugar Plant at MP 19.0 and along portions of Lincoln Avenue.

Pasture and fallow fields can provide quality habitat for a number of wildlife species. A wide variety of rodents may use these fields. Raptors such as red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk and prairie falcon (*Falco mexicanus*) forage on squirrels, mice, insects and a variety of birds in these fields. Coyotes and foxes hunt in these fields as well. Long-billed curlews (*Numenius americanus*), mountain plovers (*Charadrius montanus*), western meadowlark (*Sturnella neglecta*) and several sparrow species may use this habitat as well.

**Tree Rows.** This vegetation community is commonly associated with agricultural land and developed land. This community includes trees planted or retained for landscape values including shade, screening and aesthetics. In agricultural areas tree rows are generally linear communities primarily planted as a windbreak, visual screen, or landscape feature or can be a remnant of an abandoned orchard. In developed areas (i.e., commercial and residential properties) tree rows are generally mixed species and not grown in a linear fashion. Tree rows are generally composed of large exotic tree species such as eucalyptus (*Eucalyptus globulus*), poplar (*Populus* sp.), tamarisk (*Tamarix* sp.), pine (*Pinus* sp.), etc. Various species of palm are also quite common. These species were observed in the Project area and are distributed intermittently in agricultural and developed communities. Tree rows correspond to the Eucalyptus Series in Sawyer and Keeler-Wolf (1995) and CWHR. When mature, tree rows can provide roosting and nesting habitat for raptor species. Large rows may also provide habitat for wintering and migrant passerines, including white-crowned sparrow (*Zonotrichia leucophrys*), yellow-rumped warbler (*Dendroica coronata*), ruby-crowned kinglet (*Regulus calendula*), house wren (*Troglodytes aedon*), and house finch (*Carpodacus mexicanus*).

**Developed Land.** Developed land within the Project area includes low-density residential, industrial, and commercial development including houses, barns, equipment/tank storage, developed recreational areas, exotic plant landscaping, and limited industrial infrastructure. The Gill Ranch Storage Field includes several developed well pads. In the vicinity of the Fresno Slough, a commercial property is found on the north side of the proposed pipeline alignment, adjacent to the Fresno Slough from MP 18.0 to MP 19.5. Other developed areas include limited residential properties.

Rural home sites often host large mature trees which provide potential roosting and nesting sites for raptors such as great horned owl (*Bubo virginianus*) and barn owl. Urban areas may be used by a variety of wildlife that are opportunistic feeders such as raccoon (*Procyon lotor*) striped skunk (*Mephitis mephitis*), or other species that can tolerate human disturbance, such as mourning dove (*Zenaida macroura*), white-crowned sparrow, and brush rabbit (*Sylvilagus bachmani*). Bats may roost in manmade structures.

## Special-status Species and Sensitive Resource Areas

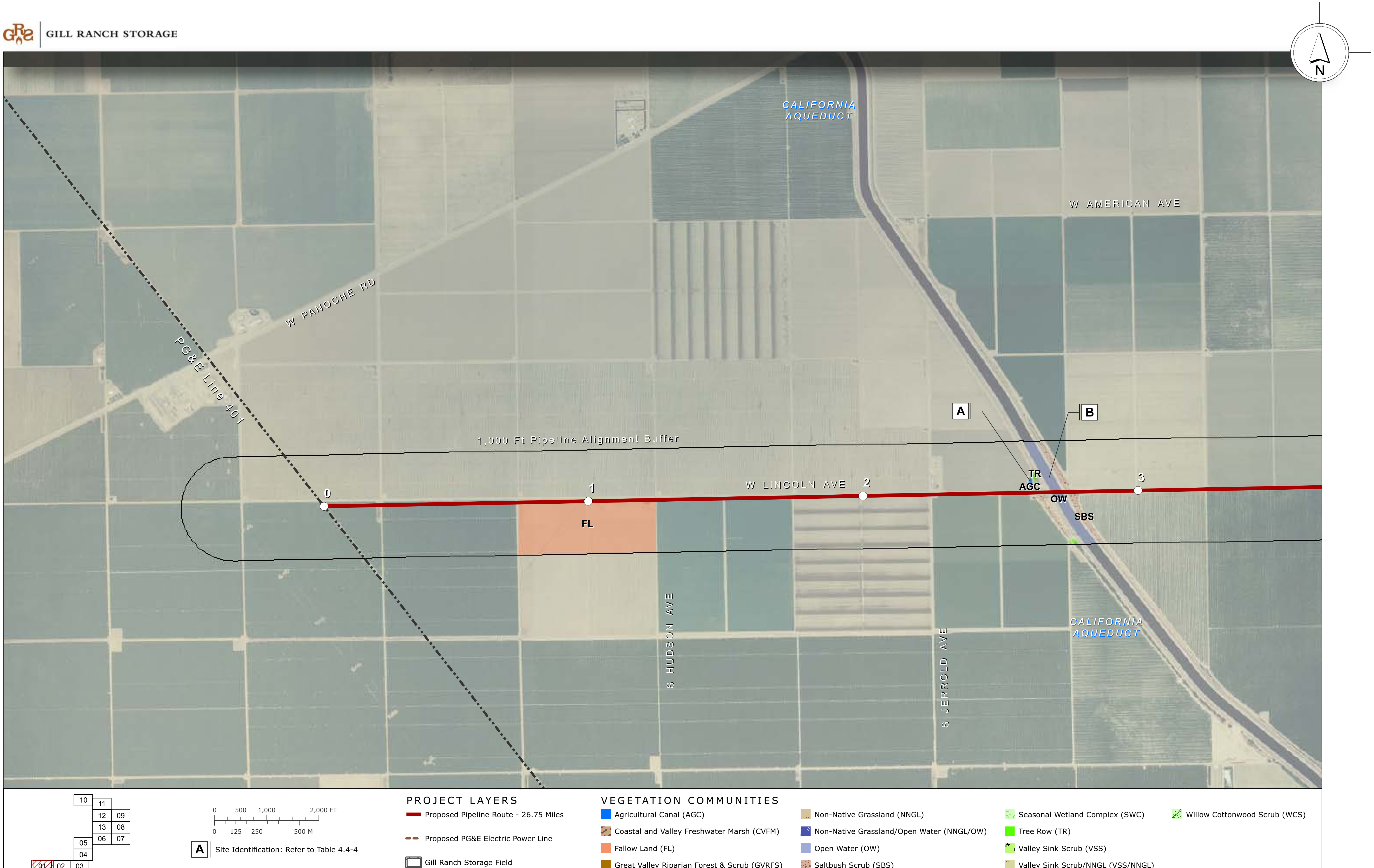
This section presents the results of the literature search and various field studies conducted in the Project area for special-status plants and animals, and sensitive resource areas.

### *Sensitive Resource Areas*

Sensitive habitat areas include natural areas, aquatic features, and/or otherwise unique areas which provide additional habitat values beyond what is typical in the Project area. These areas include agricultural ditches and ponds, potential nesting trees, seasonal wetlands, rivers and sloughs. Figure 4.4-1 indicates the location of specific resource areas and shows areas occupied by native and/or naturalized vegetation communities. Table 4.4-2 summarizes site specific data gathered during reconnaissance surveys for several specific resource areas.

### *Special-Status Plants*

**Literature Review and Database Queries:** Based on data in the CNDDB, the CNPS database, and other literature sources, 19 special-status plant species were identified as potentially occurring in the Project vicinity. A tabulation of scientific and common names, listing status, growth forms, flowering periods, general habitat conditions, and potential to occur in the immediate Project area is provided in Appendix B.2, Table B.2-1. The evaluation of this information resulted in a list of 18 species for which appropriate habitat exists within the Project area. A summary list of the species with potential to occur in the Project area is provided in Table 4.4-3, along with information on their status. Individual species accounts for each of these species (with an evaluation of their potential to occur in the Project area) are provided in Appendix B.2, Special-Status Plant Species Descriptions. Special-status plant and natural community occurrences recorded in the CNDDB within one mile of the Project area and Project alternatives are shown in Figure 4.4-2 (Maps 1 and 2).




A | Site Identification: Refer to Table 4.4-4

## PROJECT LAYERS

- Proposed Pipeline Route - 26.75 Miles
- Proposed PG&E Electric Power Line
- Gill Ranch Storage Field

## VEGETATION COMMUNITIES

- Agricultural Canal (AGC)
- Coastal and Valley Freshwater Marsh (CVFM)
- Fallow Land (FL)
- Great Valley Riparian Forest & Scrub (GVRFS)
- Non-Native Grassland (NNGL)
- Non-Native Grassland/Open Water (NNGL/OW)
- Open Water (OW)
- Saltbush Scrub (SBS)
- Seasonal Wetland Complex (SWC)
- Tree Row (TR)
- Valley Sink Scrub (VSS)
- Valley Sink Scrub/NNGL (VSS/NNGL)
- Willow Cottonwood Scrub (WCS)


| | | | |
|---|---|---|---|
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| | 13 | 08 | |
| | 06 | 07 | |
| 05 | | | |
| 04 | | | |
| 01 | 02 | 03 | |

0 500 1,000 2,000 FT
0 125 250 500 M

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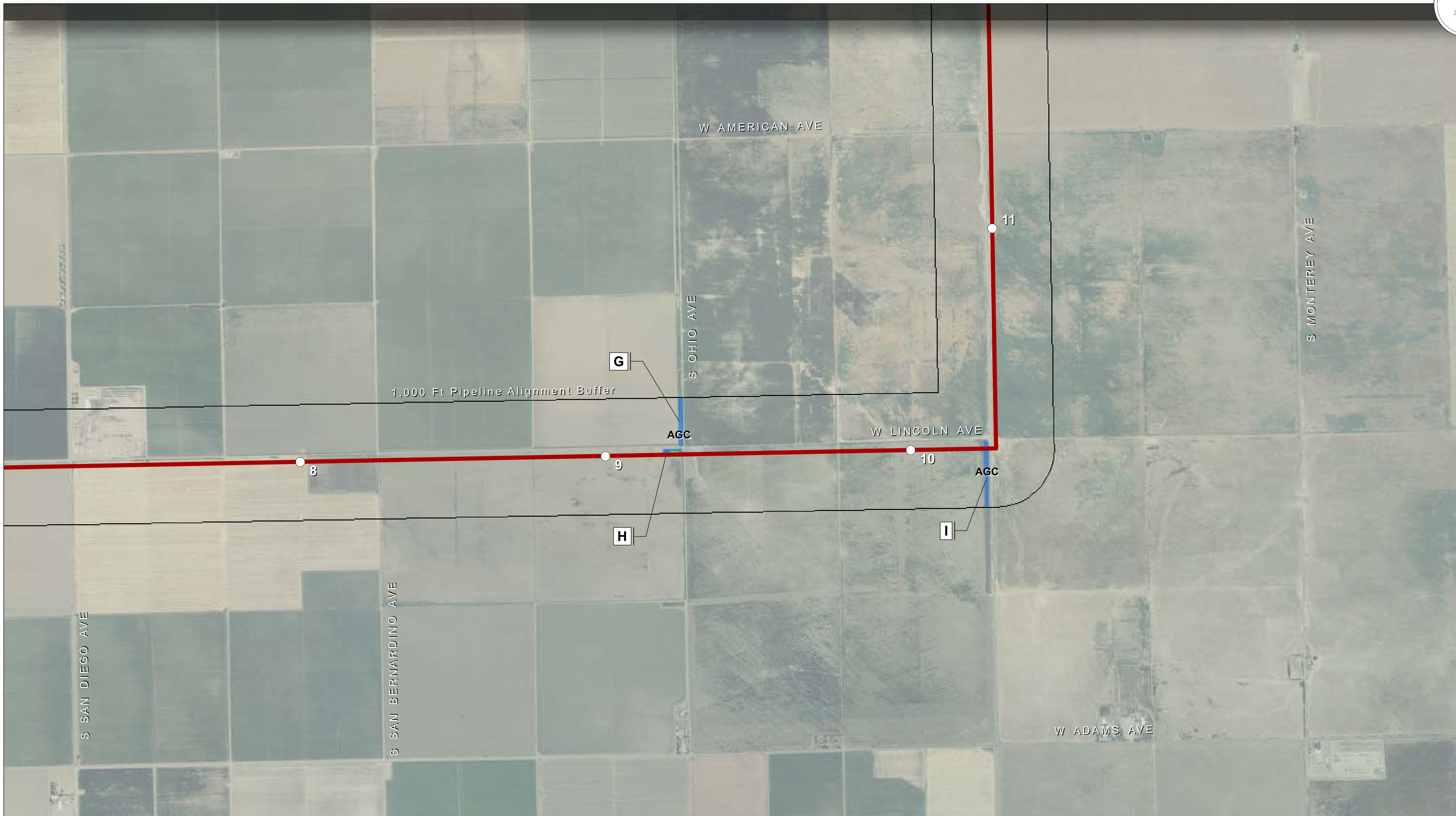
Proponent's Environmental Assessment
GILL RANCH GAS STORAGE
FIGURE 4.4-1 | SENSITIVE RESOURCES AND AGRICULTURAL CANALS

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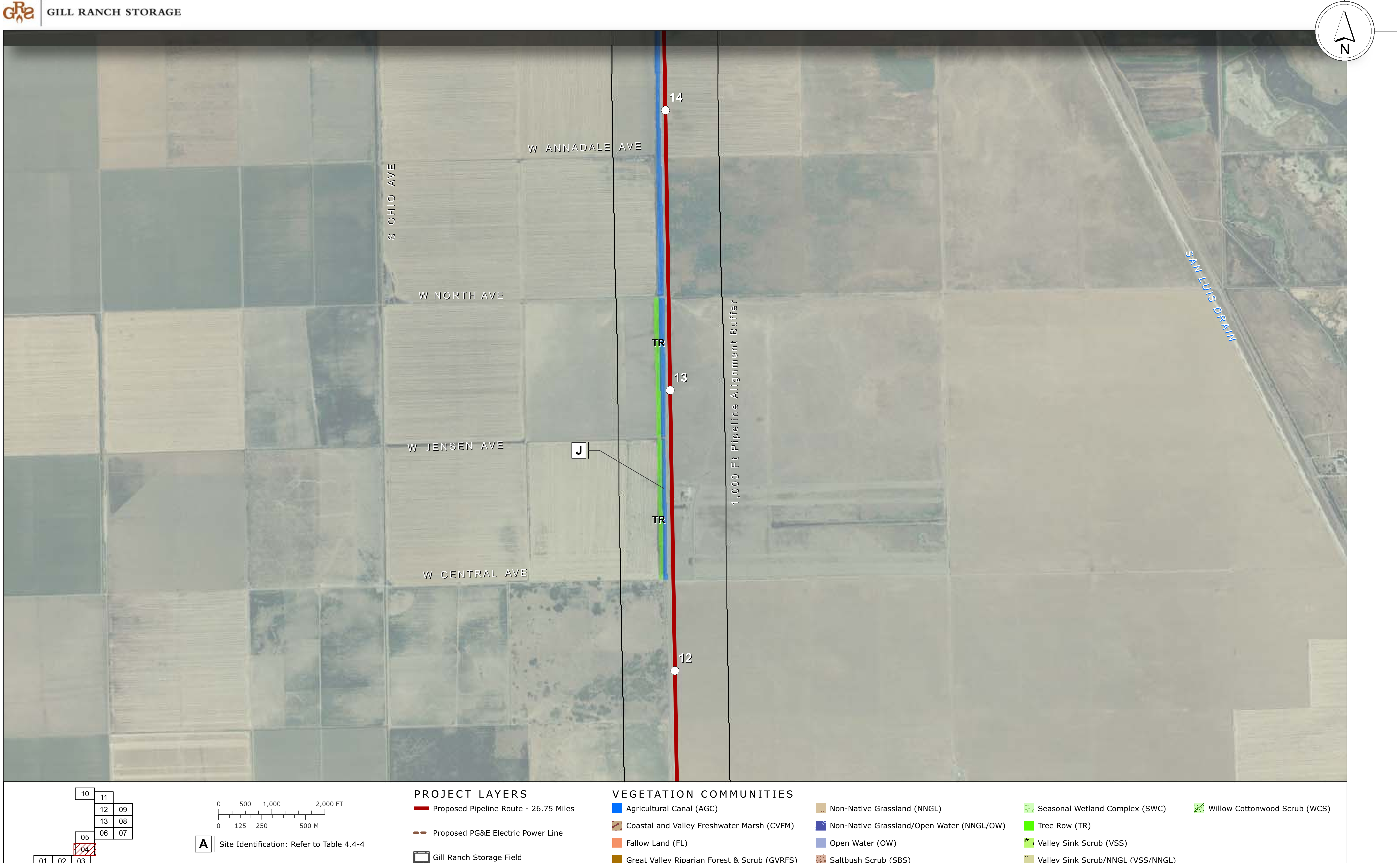


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Proponent's Environmental Assessment
GILL RANCH GAS STORAGE
FIGURE 4.4-1 | SENSITIVE RESOURCES AND AGRICULTURAL CANALS
MAP 04 OF 13


10 11 12 09 13 08 05 06 07 04 01 02 03

0 500 1,000 2,000 FT
0 125 250 500 M

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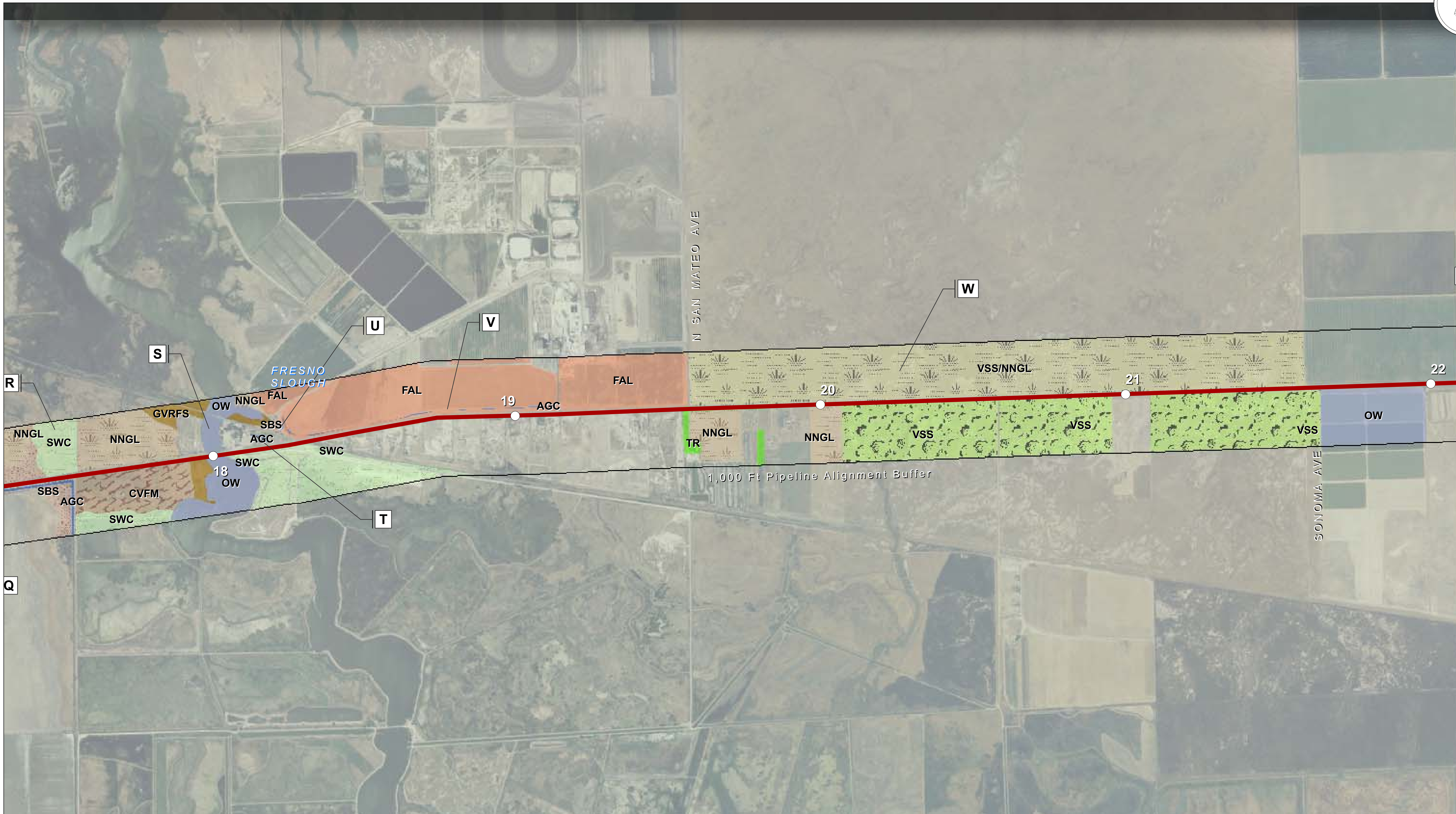


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0 125 250 500 M

A Site Identification: Refer to Table 4.4-4

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Proponent's Environmental Assessment
GILL RANCH GAS STORAGE
FIGURE 4.4-1 | SENSITIVE RESOURCES AND AGRICULTURAL CANALS

GILL RANCH STORAGE


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0 500 1,000 2,000 FT
0 125 250 500 M

A Site Identification: Refer to Table 4.4-4

PROJECT LAYERS

- Proposed Pipeline Route - 26.75 Miles
- Proposed PG&E Electric Power Line
- Gill Ranch Storage Field

VEGETATION COMMUNITIES

- Agricultural Canal (AGC)
- Coastal and Valley Freshwater Marsh (CVFM)
- Fallow Land (FL)
- Great Valley Riparian Forest & Scrub (GVRFS)
- Non-Native Grassland (NNGL)
- Non-Native Grassland/Open Water (NNGL/OW)
- Open Water (OW)
- Saltbush Scrub (SBS)
- Seasonal Wetland Complex (SWC)
- Tree Row (TR)
- Valley Sink Scrub (VSS)
- Valley Sink Scrub/NNGL (VSS/NNGL)
- Willow Cottonwood Scrub (WCS)

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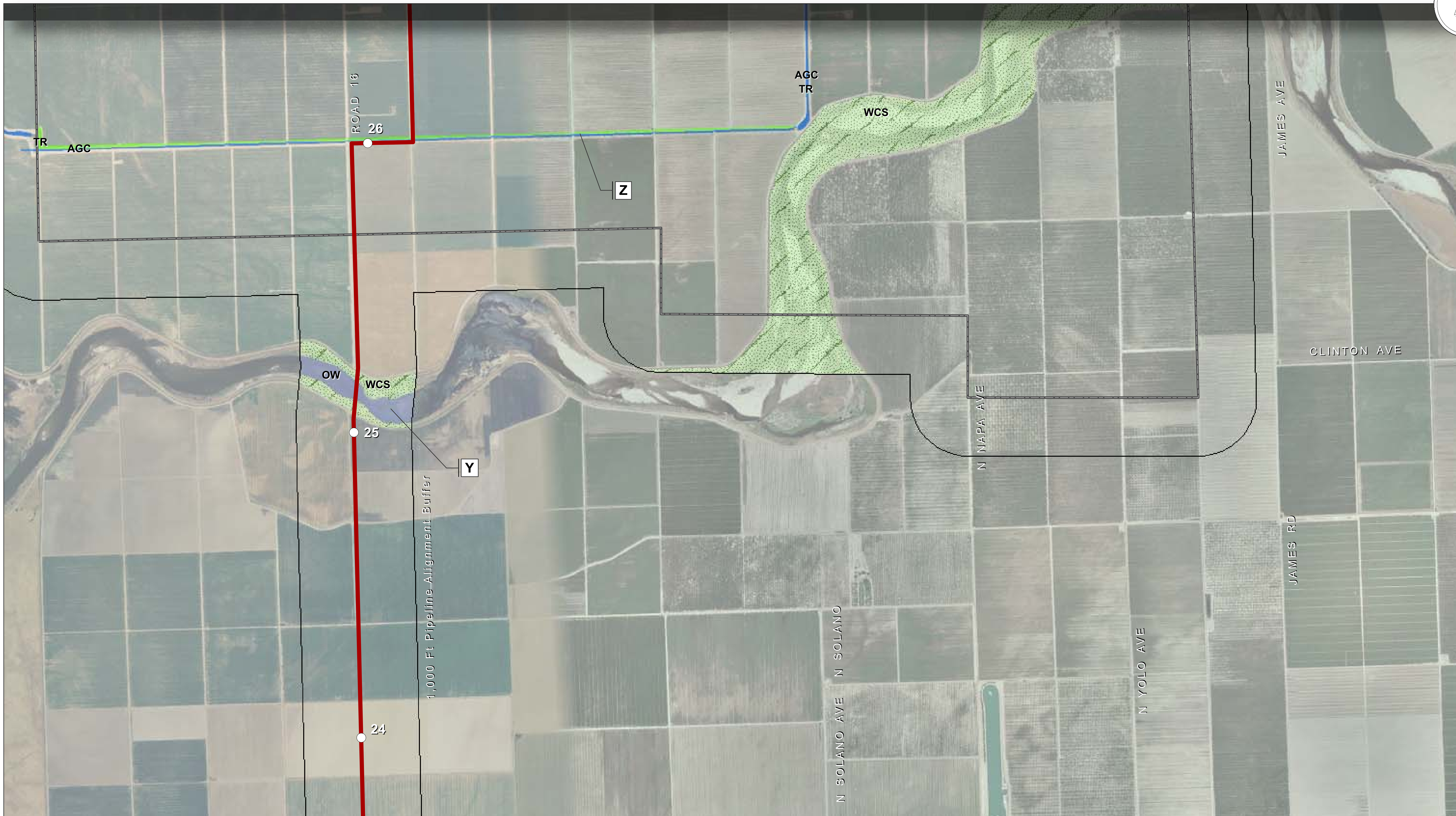
GILL RANCH GAS STORAGE
FIGURE 4.4-1 | SENSITIVE RESOURCES AND AGRICULTURAL CANALS
MAP 07 OF 13

GILL RANCH STORAGE




10 11 12 09 13 08 05 06 07 04 01 02 03

0 500 1,000 2,000 FT
0 125 250 500 M

A Site Identification: Refer to Table 4.4-4

PROJECT LAYERS

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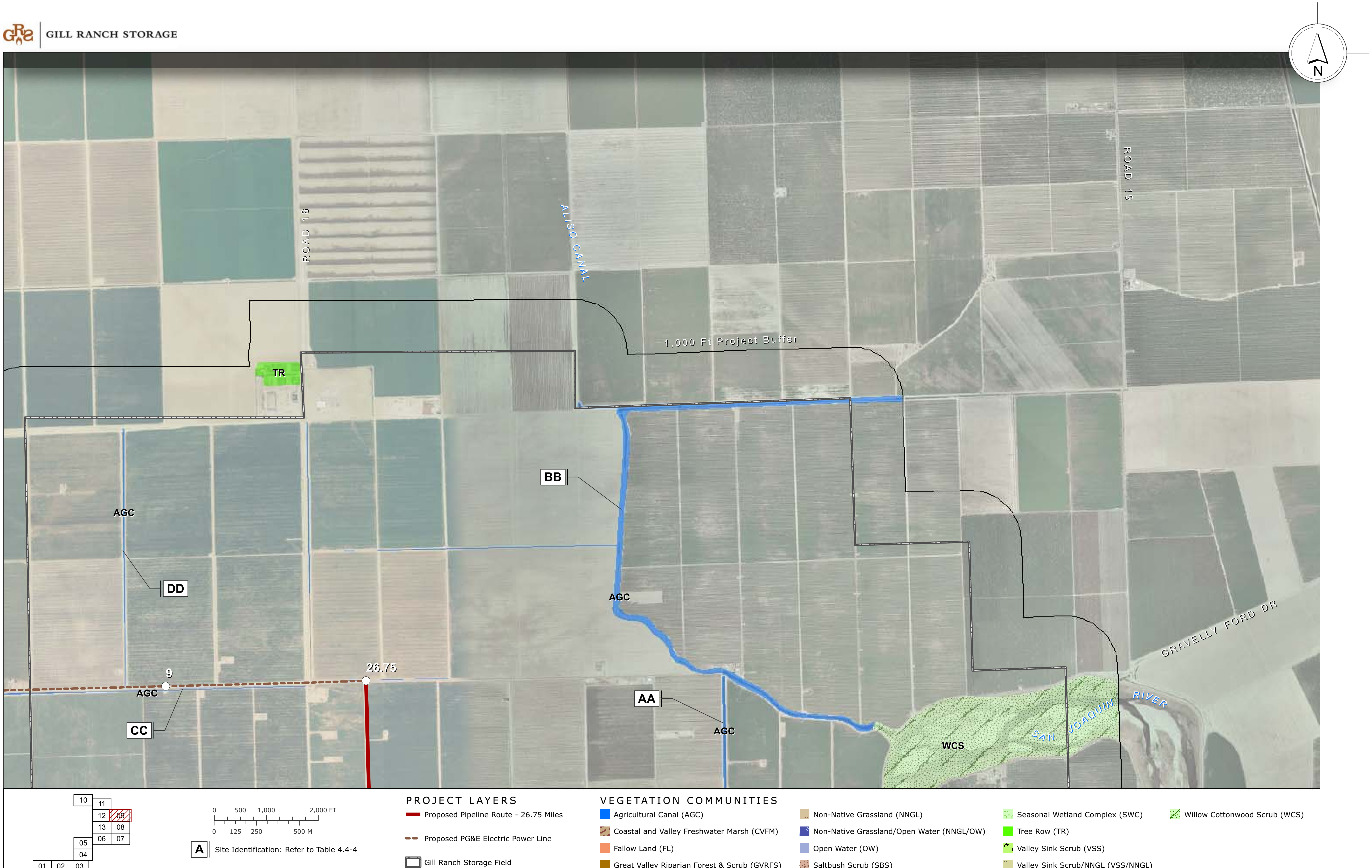
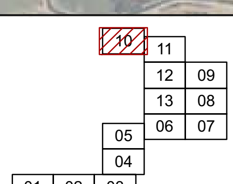





Proponent's Environmental Assessment
GILL RANCH GAS STORAGE
FIGURE 4.4-1 | SENSITIVE RESOURCES AND AGRICULTURAL CANALS
MAP 09 OF 13


A | Site Identification: Refer to Table 4.4-4

PROJECT LAYERS

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- Proposed PG&E Electric Power Line
- Gill Ranch Storage Field

VEGETATION COMMUNITIES

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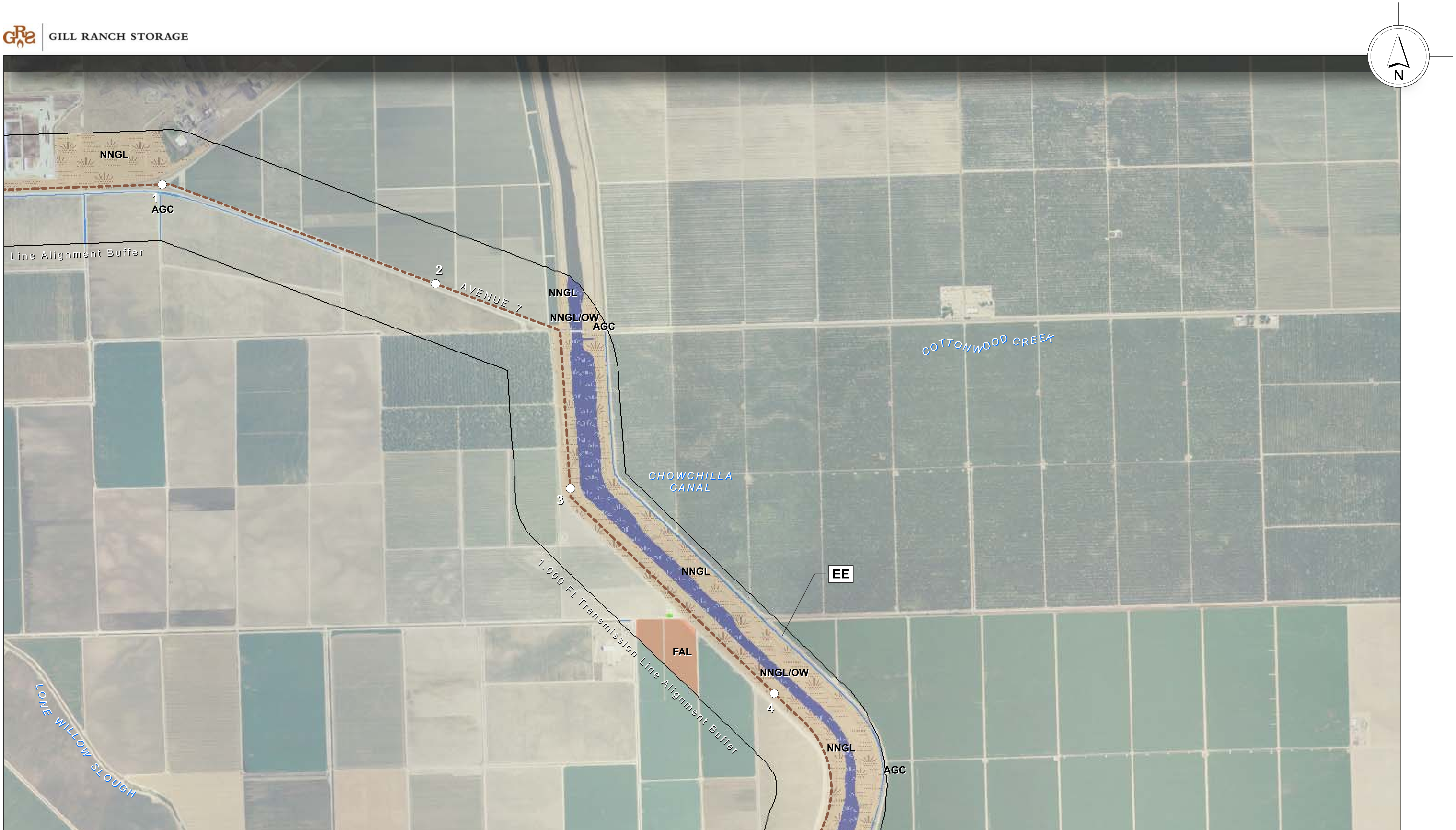


A Site Identification: Refer to Table 4.4-4

PROJECT LAYERS

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- Proposed PG&E Electric Power Line
- Gill Ranch Storage Field

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GILL RANCH STORAGE


10 11 12 09 13 08 06 07 05 04 01 02 03

0 500 1,000 2,000 FT
0 125 250 500 M

A Site Identification: Refer to Table 4.4-4

PROJECT LAYERS

- Proposed Pipeline Route - 26.75 Miles
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GILL RANCH GAS STORAGE
FIGURE 4.4-1 | SENSITIVE RESOURCES AND AGRICULTURAL CANALS

GILL RANCH STORAGE


10 11 12 09 13 08 05 06 07 04 01 02 03

0 500 1,000 2,000 FT
0 125 250 500 M

A Site Identification: Refer to Table 4.4-4

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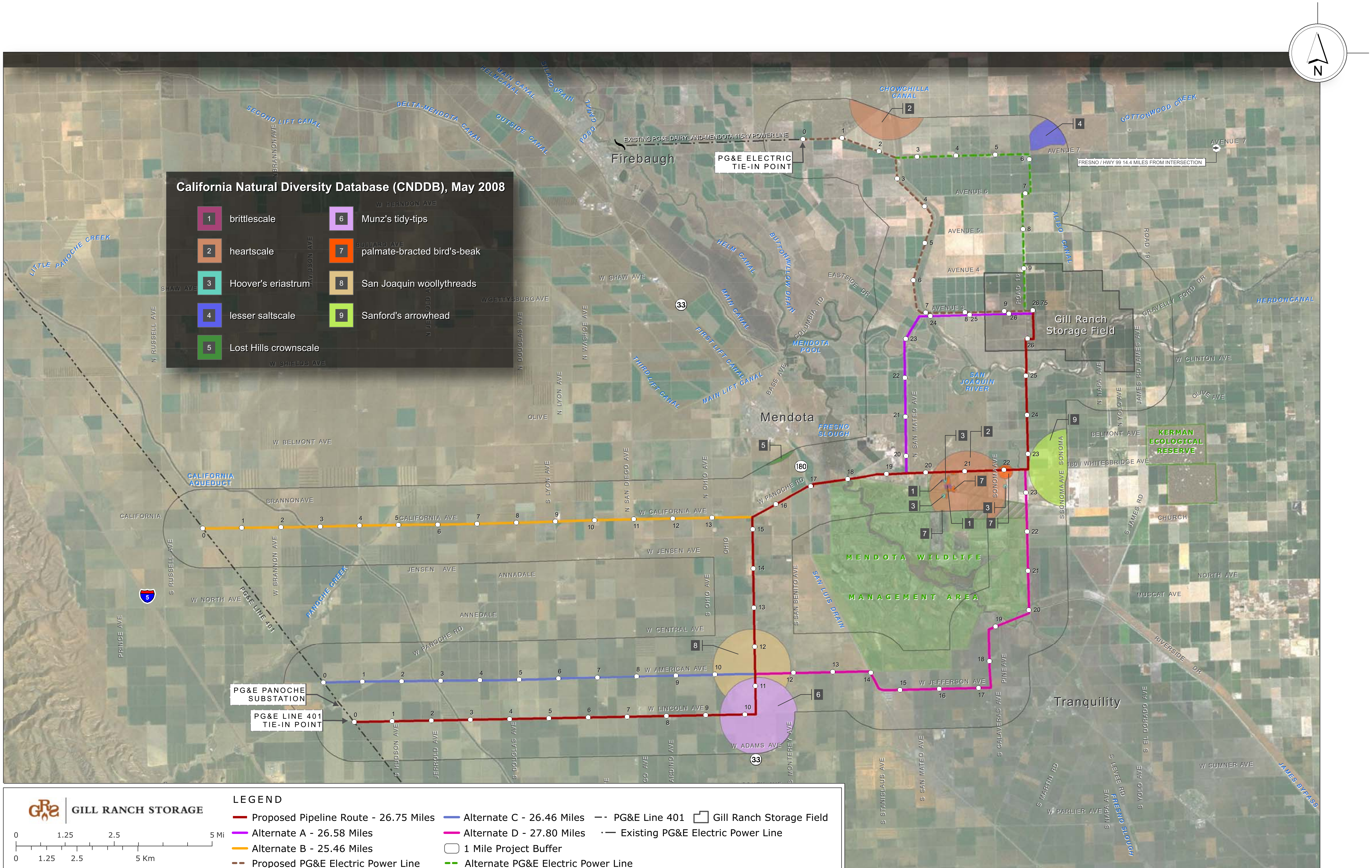
GILL RANCH GAS STORAGE
FIGURE 4.4-1 | SENSITIVE RESOURCES AND AGRICULTURAL CANALS

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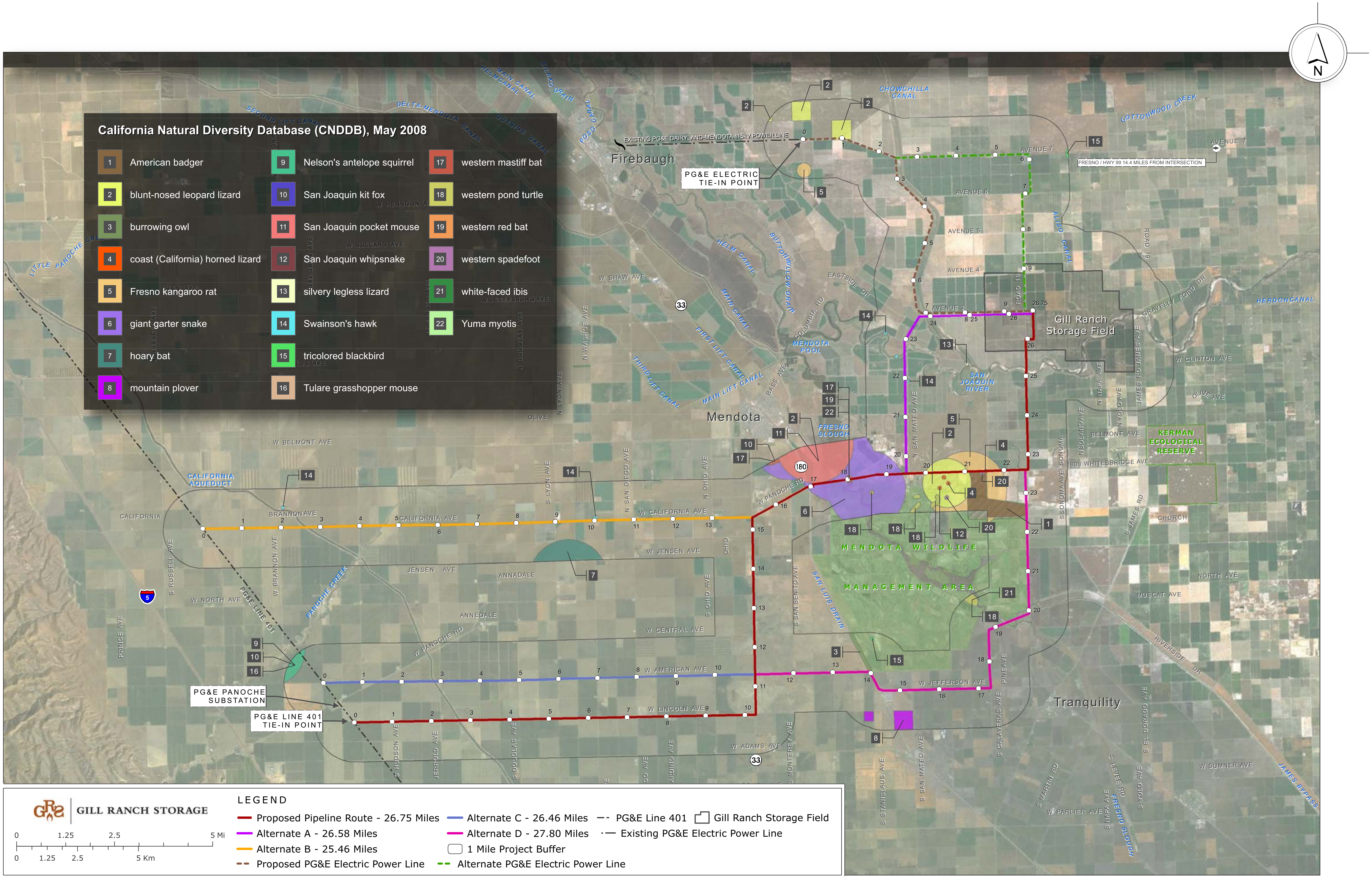
GILL RANCH GAS STORAGE
FIGURE 4.4-2 | CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB) | PLANTS
MAP 1 OF 2

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GILL RANCH GAS STORAGE

FIGURE 4.4-2 | CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB) | ANIMALS

MAP 2 OF 2

**Results:** Special-status plant occurrences recorded in the CNDDB within one mile of the Project area and Project alternatives is shown on Figure 4.4-2 (Map 1). A tabulation of scientific and common name, listing status, growth form, flowering period, general habitat conditions, and potential to occur in the immediate Project area is provided in Appendix B.2, Table B.2-1. The table includes scientific name, listing status, blooming period, habitat conditions, and potential for occurrence in the Project area. The evaluation of this information resulted in a list of 18 species for which appropriate habitat exists within the Project area. A summary list of the species with potential to occur in the Project area is provided in Table 4.4-3, along with information on their status. Individual species accounts for each of these species (with an evaluation of their potential to occur in the Project area) are provided in Appendix B.2, Special-Status Plant Species Descriptions.

**Table 4.4-3: Special-status Plant Species Potentially Occurring in the Project Area**

| Scientific Name | Common Name | Status |
|---|---|---|
| *Atriplex cordulata* | heartscale | CNPS 1B |
| *Atriplex depressa* | brittlescale | CNPS 1B |
| *Atriplex minuscula* | lesser saltscale | CNPS 1B |
| *Atriplex persistens* | vernal pool smallscale | CNPS 1B |
| *Atriplex subtilis* | subtle orache | CNPS 1B |
| *Atriplex vallicola* | Lost Hills crownscale | CNPS 1B |
| *Caulanthus californicus* | California jewel-flower | FE, CE, CNPS 1B |
| *Cordylanthus mollis* ssp. *hispidus* | hispid bird's-beak | CNPS 1B |
| *Cordylanthus palmatus* | palmate-bracted birds-beak | FE, CE, CNPS 1B |
| *Delphinium recurvatum* | recurved larkspur | CNPS 1B |
| *Eriastrum hooveri* | Hoover's eriastrum | FD (10/7/2003), CNPS 4 |
| *Eriogonum temblorense* | Temblor buckwheat | CNPS 1B |
| *Layia munzii* | Munz's tidy-tips | CNPS 1B |
| *Lepidium jaredii* ssp. *album* | Panoche pepper-grass | CNPS 1B |
| *Lepidium jaredii* ssp. *jaredii* | Jared's pepper-grass | CNPS 1B |
| *Madia radiate* | showy madia | CNPS 1B |
| *Monolopia (Lembertia) congdonii* | San Joaquin woollythreads | FE, CNPS 1B |
| *Sagittaria sanfordii* | Sanford's arrowhead | CNPS 1B |

Status Codes:
FE - federally endangered
CE - California endangered
FD - Delisted from the federal endangered species list
CNPS - California Native Plants Society
1B - Rare, Threatened, or Endangered in California and elsewhere.
4 - Plants of Limited Distribution – a watch list

**Preliminary Protocol Field Survey Results.** Early season field surveys were performed on April 15, 16 and 17 and May 2. Preliminary results of the surveys identified two species of concern, heartscale (*Atriplex cordulata*) and Lost Hills crown scale (*Atriplex vallicola*). Several populations of each of these species were observed between MP 19.5 and 20.5. This included approximately 3,600 individuals occupying 7,500 square feet of the pipeline ROW of heartscale and approximately 500 individuals and 1,800 square feet of Lost Hills crown scale were recorded. These populations are depicted in Figure 4.4-3. Please note that these results are preliminary in nature, and surveys will be completed in August of 2008.

As described in the methods section, MP 20.6 to 21.6 was not surveyed due to lack of access. Based on observations made from the adjacent road easement, this property provides excellent habitat for the above referenced species, and could also potentially support other special-status species.

### *Special-Status Wildlife*

As used herein, special-status wildlife species include species that are: listed under the federal ESA as FT and FE; proposed for listing as threatened (FPT) or endangered (FPE) pursuant to ESA; listed pursuant to CESA as CT and CE; species protected under various sections of the California Fish and Game Code (e.g., Fully Protected [CFP]); and California Species of Concern (SC). Species protected under the Migratory Bird Treaty Act are also addressed in this analysis.

**Literature Review and Database Queries:** Based on the available literature, 62 special-status wildlife species may occur in the Project vicinity. Information on these species is provided in Appendix B.2, Table B.2-2, including scientific and common name, listing status, general habitat characteristics and potential for occurrence in the Project area. Analysis of habitat requirements, habitat availability, and extant populations identified nine species unlikely to occur because the Project area does not overlap with their current known range and/or suitable habitat is absent. These species are not discussed further in this document. A summary list of the special-status wildlife species protected under ESA, CESA, or the California Fish and Game Code, and with potential to occur in the Project area, is provided in Table 4.4-4 along with information on their status. Individual species accounts for the 53 species (with an evaluation of potential to occur) are provided in Appendix B.2, Special-Status Wildlife Species Descriptions. A list of incidental wildlife observations made during habitat reconnaissance surveys is provided in Appendix B.2, Table B.2-3. Special-status animals recorded in the CNDDB within one mile of the Project area and Project alternatives are shown in Figure 4.4-2 (Map 2) and discussed below.

heartscale (*Atriplex cordulata*)

| Population | Number of Individuals | Area (square feet) |
|---|---|---|
| ATCO (P1) | 1,000 | 525 |
| ATCO (P2) | 600 | 556 |
| ATCO (P3) | 2,000 | 6,475 |
| ATCO (P4) | 15 | 4 |
| **Total** | **3,615** | **7,560** |

Lost Hills crownscale (*Atriplex vallicola*)

| Population | Number of Individuals | Area (square feet) |
|---|---|---|
| ATVA (P1) | 35 | 240 |
| ATVA (P2) | 500 | 1,582 |
| **Total** | **535** | **1,823** |

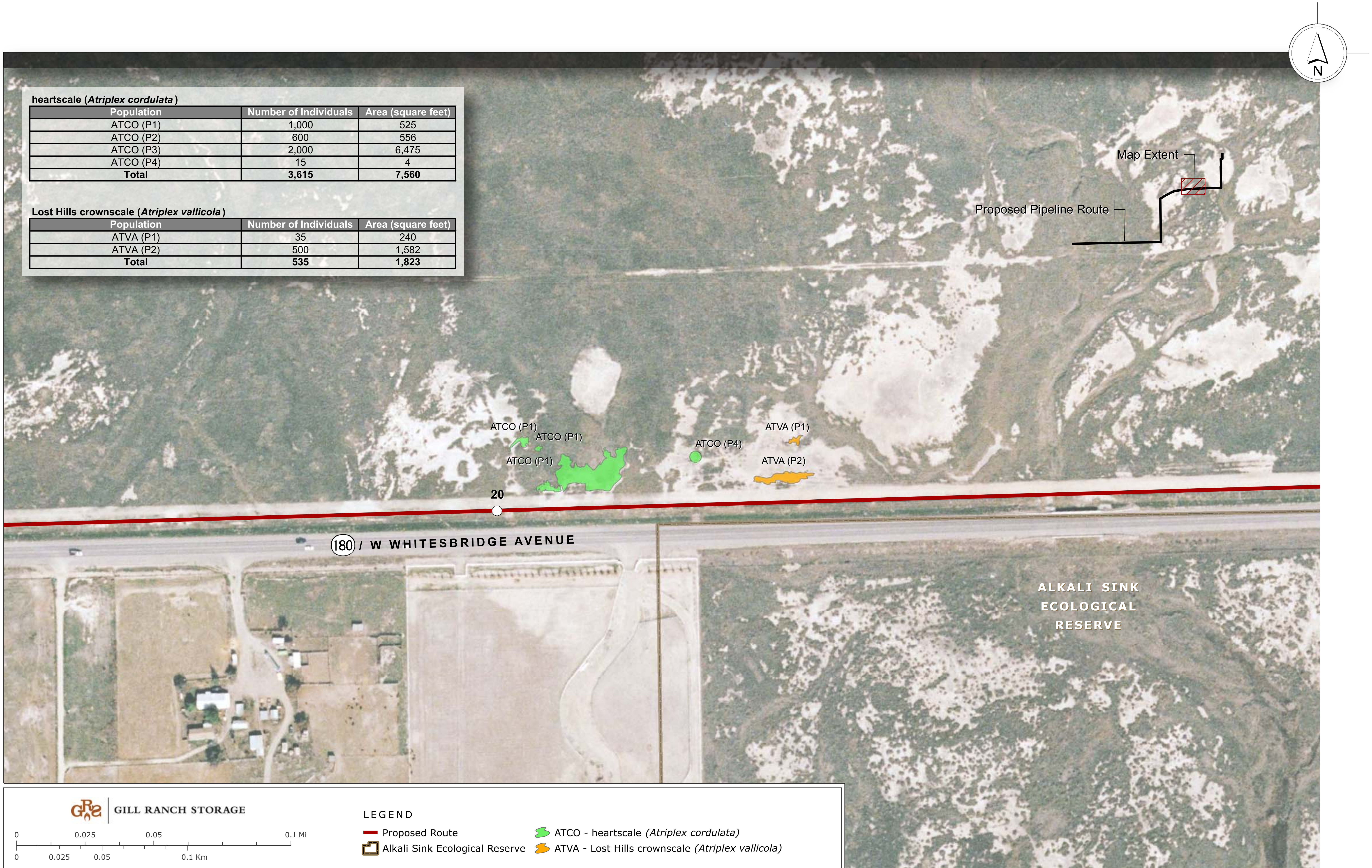




FIGURE 4.4-3 | PRELIMINARY SURVEY RESULTS: SPECIAL-STATUS PLANT SPECIES

**Table 4.4-4: Special-Status Wildlife Species Potentially Occurring in the Project Area**

| Scientific Name | Common Name | Status |
|---|---|---|
| *Branchinecta lynchi* | vernal pool fairy shrimp | FT |
| *Lepidurus packardi* | vernal pool tadpole shrimp | FE |
| *Desmocerus californicus dimorphus* | valley elderberry longhorn beetle | FT |
| *Hypomesus transpacificus* | delta smelt | FT, ST |
| *Pogonichthys macrolepidotus* | Sacramento splittail | FD (2003), SC |
| *Oncorhynchus mykiss irideus* | steelhead - Central Valley ESU | FT |
| *Ambystoma californiense* | California tiger salamander | FT, SC |
| *Gambelia sila* | blunt-nosed leopard lizard | FE, CE, FP |
| *Thamnophis gigas* | giant garter snake | FT, CT |
| *Elanus leucurus* | white-tailed kite | FP |
| *Haliaeetus leucocephalus* | bald eagle | FD, CE, FP |
| *Buteo swainsoni* | Swainson's hawk | CT |
| *Aquila chrysaetos* | golden eagle | FP |
| *Falco peregrinus anatum* | American peregrine falcon | FD, CE, FP |
| *Grus canadensis tabida* | greater sandhill crane | CT, FP |
| *Coccyzus americanus occidentalis* | western yellow-billed cuckoo | FC, CE |
| *Empidonax traillii brewsteri* | little willow flycatcher | CE |
| *Vireo bellii pusillus* | least Bell's vireo | FE, CE |
| *Riparia riparia* | bank swallow | CT |

Status Codes:
FE - federally endangered
FT - federally threatened
CE - California endangered
CT - California threatened
FE - Candidate for the federal endangered species list
FD - Delisted from the federal endangered species list
SC - Species of special concern
FP - California fully protected

### *Sensitive Habitats*

Sensitive habitat areas include natural areas, aquatic features, and/or otherwise unique areas which provide additional habitat values beyond what is typical in the Project area. These areas include agricultural ditches and ponds, potential nesting trees, seasonal wetlands, rivers and sloughs.

### *Wildlife Surveys*

At the time of this PEA, field surveys for certain special-status wildlife species are in progress. Interim results, where available, are presented below. Final results will be presented in a supplemental document in Fall 2008.

### Valley Elderberry Longhorn Beetle

Elderberry shrubs were found in the Project area at the Storage Field, San Joaquin River (pipeline crossing), and Chowchilla Bypass (transmission line crossing). Current construction plans allow complete avoidance (i.e., shrubs and a 100-foot radius buffer) of these plants through the use of HDD, transmission line spans, fencing, restricting activity to existing access roads and previously disturbed sites, and other measures. In the event that plants cannot be avoided, the applicant will conduct stem counts, exit hole surveys, and other measures as identified in Conservation Guidelines for the Valley Elderberry Longhorn Beetle, U.S. Fish and Wildlife Service, July 9, 1999.

### Blunt-Nosed Leopard Lizard

Protocol surveys performed to date failed to detect any blunt-nosed leopard lizards or their sign. Twenty-five side-blotched lizards (*Uta stansuriana*) and five western whiptails (*Cnemidophorus tigris*) were counted on or directly adjacent (road edge) to the proposed pipeline corridor between MP 19.5 and MP 20.5. This resulted in an average of 0.5 side-blotched lizards and 0.1 western whiptails per transect mile. Those numbers reflect a very low population density for these common lizards and are an index to overall lizard activity in the survey area.

Although the area between MP 19.5 and MP 20.5 appeared superficially to be potentially good blunt-nosed leopard lizard habitat, the area contained relatively few small mammal burrows and had a low density of shrubs. California ground squirrel burrows were largely limited to the corners of the property and near the road. A few pockets of kangaroo rat burrows were present, mostly near alkali flats. Also, few grasshoppers, a primary prey of blunt-nosed leopard lizards, were present during surveys. Consequently, the paucity of available cover in the form of burrows and/or shrubs, presence of extensive alkali flats and vernal pools that are at least seasonally inundated, and a low prey base of either insects or other small lizards, all indicate that the area is of marginal quality, at best, for blunt-nosed leopard lizard.

The area along the proposed pipeline from MP 20.5 to 21.6 where direct access was not granted by the landowner appears similar in habitat value to the surveyed area between MP 19.5 and MP 20.5 based on observations made from public lands adjacent to the property along Highway 180. The only difference observed is that the area between MP 20.5 and MP 21.5 may have a slightly higher shrub density than the area surveyed between MP 19.5 and MP 20.5. Based on these observations, blunt-nosed leopard lizards are unlikely to occur between MP 20.5 and MP 21.5.

The potential habitat surveyed near MP 17.0 (see Methods), interspersed with large quailbush (*Atriplex lentiformis*) shrubs and non-native grassland, offers relatively good lizard habitat. However, no blunt-nosed leopard lizards or their sign were observed in this area during surveys. Two side-blotched lizards and nine western whiptails were counted on or adjacent (road edge) to the proposed pipeline corridor, resulting in an average of 0.4 side-blotched lizards and 1.9 western whiptails per survey mile. The number of side-blotched lizards is similar to observations between MP 19.5 and MP 20.5 but the number of western whiptails at the MP 17.0 survey area is an approximate ten-fold increase over that recorded between MP 19.5 and MP 20.5. This suggests that the survey area near MP 17.0 offers relatively higher quality habitat for lizards than the area between MP 19.5 and MP 20.5. It should be noted, however, that most of the western whiptails near MP 17.0 were observed at the beginning of the survey period before Caltrans bladed off a portion of the habitat adjacent to and south of the fenceline near MP 17.0 as part of the agency's approved Highway 180 widening project. After this blading occurred, whiptails were only observed along the western fenceline near MP 17.0.

### Giant-Garter Snake

As presented in Section 4.4.1.2, Methods, potential habitat for giant garter snake was identified in the Project area only at an isolated agricultural channel referred to as "Four-Mile Slough" (Appendix B.2, Map 9). This channel and adjacent upland will be avoided through use of a 600-foot bore under the channel. Use of this approach qualifies as a Level 1 impact as designated in Programmatic Consultation with the U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glen, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California, Sacramento Office Fish and Wildlife Service, November 13, 1997 (USFWS 1997). Because standard avoidance and minimization measures for Level 1 impacts, as specified in the Programmatic Consultation, will be implemented, focused surveys for the species were unnecessary. However, relevant information on potential species occurrence exists from CNDDB (Figure 4.4-2) and recent surveys performed in the Project vicinity by E. Hansen under contract to the USFWS (Hansen 2008). One of the goals and objectives of Hansen (2008) was to assess status of giant garter snakes in the vicinity of the Mendota Wildlife Area, which lies immediately south of the proposed pipeline route and Four-mile Slough. This study applied 13 traplines and 12,376 trap days at Mendota Wildlife Area but failed to capture any giant garter snakes at the Mendota Wildlife Area or elsewhere in Fresno County where the species was last observed in 2001.

### Swainson's Hawk

CNDDB (CDFG 2008) includes several records of nesting Swainson's hawks within the Project area with the nearest records located along San Mateo Avenue and the San Joaquin River approximately 3 miles west of the proposed pipeline route (Figure 4.4-2). Numerous Swainson's hawks were observed in the Project area during surveys performed from April – June 2008. These surveys were supplemented with incidental observations of the species obtained during other visits to the Project area from summer 2007 through summer 2008. No active Swainson's hawk nests were found within 0.5-mile of the Project area during these surveys. The nearest active nests were located near the San Mateo Avenue crossing of the San Joaquin River, approximately 2 miles west of the Storage Field.

### Western Burrowing Owl

Burrowing owls nest opportunistically throughout the San Joaquin Valley in agricultural areas, along roadways, and on berms where disturbed soils create good burrowing conditions for owls and other burrowing animals (e.g., ground squirrels). CNDDB (CDFG 2008) includes nesting records for the species along the San Luis Drain approximately 2 miles east of the proposed pipeline route at MP-12 (Figure 4.4-2). However, no burrowing owls have been recorded to date within the Project area during Project-related surveys and site visits.

### Fresno Kangaroo Rat

CDFG and USFWS identified the privately-owned non-cultivated land along the proposed pipeline route between MP 19.5 and 21.6 as being potential habitat for Fresno kangaroo rat. The owner of the parcel between approximately MP 20.6 and MP 21.6 precluded access to this area for purposes of biological inventory. The applicants requested guidance from the USFWS (Letter dated April 25, 2008, to Mr. Kenneth Sanchez, Acting Field Supervisor, USFWS Sacramento District Office; Appendix B.2) on an appropriate assessment approach for Fresno kangaroo rat but no written response has been provided to date. However, in conjunction with blunt-nosed leopard surveys performed for the Project during June and July 2008, biologists recorded incidental observations of kangaroo rat burrows in a few small and scattered area between MP 19.5 and MP 20.5 where landowner permission to access had been granted. These burrows are likely to be occupied by Heerman's kangaroo rat (*Dipodomys heermani*), the only species of kangaroo rat captured during intensive trapping surveys at the Alkali Sink Ecological Reserve in recent years (see below). Burrow entrance size ranged from mostly small to relatively large, although burrow size is not a reliable indicator of species in sandy soils that erode and increase the size of otherwise smaller burrow entrances. Some of the scat observed at these burrows was within the size range of Fresno kangaroo rat but this is also an unreliable indicator of species occurrence. Pre-construction trapping is proposed prior to construction in suitable habitat where permission to access is granted (refer to Section 4.4.4).

The Alkali Sink Ecological Reserve, managed by CDFG and located immediately south of Highway 180 and the proposed pipeline corridor between approximately MP 20.0 and MP 21.5, is comprised of federally-designated critical habitat for the Fresno kangaroo rat (Federal Register Vol. 50, No. 20). However, the species was last found on the reserve in 1992 when a lone male was captured and prior to that capture it had been 13 years since one had been found at the reserve. CDFG grid surveys and independent research efforts have been performed repeatedly since 1992 but have failed to yield any Fresno kangaroo rats[1]. Reconnaissance trapping of active burrows has systematically been conducted over large portions of the reserve in recent years and targeted some of the most likely locations where Fresno kangaroo rats might persist. To date, all kangaroo rat captures were of the relatively common and non-protected Heerman's kangaroo rat.

### San Joaquin Kit Fox

San Joaquin kit fox are known to occur in the Project vicinity and CNDDB (CDFG 2008) includes several records for the species with the nearest located about 1 mile north of the

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[1] Source: Summary of Alkali Sink Ecological Reserve Blunt-nosed Leopard Lizard and Fresno Kangaroo Rat Survey Results, CDFG Unpublished Report.

proposed pipeline route at MP 16 near Mendota (Figure 4.4-2). To date, no kit fox, active dens, or other sign have been found within the Project area. Transect surveys for kit fox and active dens are proposed to be conducted prior to construction (Mitigation Bio-22).

#### Incidental Observations

Numerous incidental observations of wildlife in the Project area have been recorded by biologists during the performance of focused surveys and site visits and are presented in Appendix B.2, Table B.2-3.

### 4.4.2 Regulatory Setting

The following federal, state, and local laws, ordinances, and regulations related to biological resources are applicable to the proposed Project.

#### Federal

*Bald and Golden Eagle Protection Act: 16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978.*

The Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. Take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Transport includes convey or carry by any means; also deliver or receive for conveyance. The Act imposes criminal and civil penalties on anyone (including associations, partnerships and corporations) in the U.S. or within its jurisdiction who, unless excepted, takes, possesses, sells, purchases, barters, offers to sell or purchase or barter, transports, exports or imports at any time or in any manner a bald or golden eagle, alive or dead; or any part, nest or egg of these eagles; or violates any permit or regulations issued under the Act. The Department of the Interior administrates enforcement of the Act.

*Endangered Species Act of 1973, 16 USC §1531 et seq.; 50 CFR Parts 17 and 222.*

The federal ESA protects species designated as threatened or endangered by prohibiting actions that may jeopardize the continued existence of such species. The ESA includes provisions for the protection and management of plants and animals and delineates areas of critical habitat for such species. This legislation prohibits the “take” of species designed as threatened or endangered by the USFWS. Under the federal ESA, “take” can include harassment, harm, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or any attempts to engage in such conduct. To ensure that the take of species does not occur, the federal ESA requires federal agencies and private interests to consult with the USFWS on actions that may affect these species. The USFWS is the administering agency for the above authority for terrestrial, avian, and non-anadromous species, as well as freshwater fishes. The National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries Service) is responsible for protection of ESA-listed marine and anadromous fish.

*Migratory Bird Treaty Act: 16 USC §703-711; 50 CFR Subchapter B.*

The Migratory Bird Treaty Act (MBTA) includes provisions for protection of migratory birds. This MBTA prohibits the take of any migratory bird or any part, nest or eggs of any bird. The Act defines "take" as the action of or attempt to "pursue, hunt, shoot, capture, collect, or kill." The current list of species protected by MBTA can be found in Title 50, CFR §10.13. Loss of non-native species, such as house sparrows, European starlings, and rock doves, are not covered by this statute. The administering agency for the MBTA is the USFWS.

*Executive Order 11988, Floodplain Management, and 11990, Protection of Wetlands.*

These Executive Orders require that government agencies, in carrying out their responsibilities, provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains and wetlands. The administering agency is the USACE.

*Clean Water Act of 1977, Section 404 [add 401 and 402 CFR]; 33 USC §1251-1376; 30 CFR §330.5(1)(26).*

The Clean Water Act (CWA) is the primary federal law protecting the chemical, physical, and biological integrity of the nation's waters. These waters, termed "Waters of the U.S. include coastal and inland waters, lakes, rivers, and streams that are navigable as well as their tributaries and adjacent wetland. Waters of the U.S. also include waterbodies or wetlands that are subject to interstate commerce.

Section 404: Fill Placement into Wetlands and Waters of the United States. Any activity that results in the deposit of dredge or fill material within the "Ordinary High Water Mark" of Waters of the U.S. usually requires a Section 404 permit from the USACE. "Other waters of the U.S. (i.e., "other waters") include perennial and intermittent streams with connectivity, or "significant nexus" to navigable waters. Nationwide Permit (NWP) 12 authorizes certain utility activities, including activities required for the construction of gas pipelines and electric power lines in waters of the U.S. "provided that the activity does not result in the loss of greater than ½ acre of waters of the U.S." It is anticipated that the Project is eligible for NWP 12.

Section 402: Stormwater Discharge/National Pollutant Discharge Elimination System. Section 402 of the CWA regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program administered by the USEPA.

Section 401: Water Quality Certification. Under Section 401, Applicants for a federal permit or license that may result in discharges to Waters of the United States must obtain a Water Quality Certification. Therefore, any projects requiring federal approval under Section 404, must also comply with Section 401. Section 401 of the Act is administered by the State Water Resources Control Board, and local Regional Water Quality Control Boards.

*Rivers and Harbors Act of 1899 Section 10, 33 USC § 401 et seq.*

The Rivers and Harbors Act protects Waters of the U.S. from obstruction and/or modification. The administering agency for the Act is the USACE. Waters of the U.S. include navigable waters, waters used for foreign or interstate commerce and tidal areas. As noted above, it is anticipated that the Project is eligible for NWP 12, which also addresses RHA Section 10.

*Executive Order 13112 – Invasive Species.*

This Executive Order establishes an Invasive Species Council whose members include the Secretaries of State, Treasury, Defense, Interior, Agriculture, Commerce, Transportation, and the Administrator of the USEPA. It orders the establishment of an advisory committee to the Council and preparation of a national Invasive Species Management Plan to be updated biennially. The Council is ordered to provide national leadership concerning invasive species and to see that federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, and effective.

### State of California

*California Endangered Species Act of 1984 (CESA); California Fish and Game Code §2050-2116.*

CESA provides for the protection of rare, threatened, and endangered plants and animals, as recognized by the CDFG, and prohibits the taking of such species without its authorization. "Take" in the context of CESA means to hunt, pursue, kill, or capture a listed species, as well as any other actions that may result in adverse impacts when attempting to take individuals of a listed species. Unlike the federal ESA, this definition does not include the terms "harass" and "harm". In general, the California definition of take includes only acts that cause the death of a protected species but not indirect harm or harassment, including that resulting from habitat modification. The take of state-listed species through incidental or otherwise lawful activities requires a permit pursuant to §2081(b) of CESA. CESA also provides protection for those species that are designated as candidates for threatened or endangered listings. The CESA expanded upon protection afforded to rare, threatened, and endangered plants under the earlier California Native Plant Protection Act of 1977. Consultation with CDFG, the administering agency for the CESA, is required for projects authorized by a state lead agency that could affect a state-listed threatened or endangered species. The state has the authority to issue an incidental take permit under Section 2081 of the Fish and Game Code, or to coordinate with USFWS during the ESA Section 10(a) process to make the federal permit also apply to state-listed species. State-listed threatened and endangered species are listed in Title 14, CCR §670.2 and 670.5.

*California Environmental Quality Act (CEQA) of 1970, (Public Resources Code § 21000-21177).*

CEQA establishes requirements and procedures for state and local agency review of the environmental effects of projects proposed within their jurisdictions. Among other things, CEQA requires that a plant or animal that is not listed but can be shown to meet the criteria for listing under the CESA shall be given the same consideration as a listed species.

*California Species Preservation Act of 1970; California Fish and Game Code §900-903.*

The California Species Preservation Act provides for the protection and enhancement of the amphibians, birds, fish, mammals, and reptiles of California. The administering agency is the CDFG.

*California Fish and Game Code §3503.*

This section prohibits the taking and possession of any bird egg or nest, except as otherwise provided by this code or subsequent regulations. The administering agency is CDFG.

*California Fish and Game Code §3503.5.*

This section prohibits the taking, possession, or destruction of any birds-of-prey and their eggs and nests, in the orders Falconiformes or Strigiformes, except as otherwise provided by this code or subsequent regulations. This statute does not provide for the issuance of any type of incidental take permit. The administering agency is CDFG.

*California Fish and Game Code §3511 and 5050.*

This section prohibits the taking and possession of birds and reptiles listed as "fully protected." The administering agency is CDFG.

*California Fish and Game Code, § 1600-1603.*

The CDFG Lake and Streambed Alteration Program (Section 1600-1607) requires notification for any project that will "1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake." If the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement (Agreement) will be prepared. The Agreement includes reasonable conditions necessary to protect those resources and must comply with the California Environmental Quality Act (CEQA). The entity may proceed with the activity in accordance with the final Agreement. CDFG's jurisdiction within altered or artificial waterways is based upon the value of those waterways to fish and wildlife (CDFG 2008e).

*California Native Plant Protection Act of 1977; California Fish and Game Code §1900 et seq.*

The CNPPA includes provisions that prohibit the taking of listed rare or endangered plants from the wild and a salvage requirement for landowners. It provides the CDFG the authority to designate native plants as endangered or rare and provides specific protection measures for identified populations. The administering agency for the CNPPA is CDFG.

*California Fish and Game Code §1930-1933.*

This section provides for the Significant Natural Area program and database. The administering agency is CDFG.

*California Fish and Game Code §3513 – Adoption of the Migratory Bird Treaty Act.*

This section provides for the adoption of the MBTA's provisions. As with the MBTA, this state code offers no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game, migratory birds. The administering agency is CDFG.

*California Public Resource Act §25523(a); 20 CCR §1752, 1752.5, 2300-2309, and Chapter 2, Subchapter 5, Article I, Appendix B, Part (i).*

For biological resources, a proposed project is generally considered to have a significant effect on the environment if the project will substantially affect an endangered or rare species.

*California Pesticide Regulations, 3 CCR, Division 6.*

These regulations provide that the use of pesticides (rodenticides and herbicides) will be minimized. The administering agency is the California Department of Pesticide Regulation (CDPR).

## Local

### *County of Madera General Plan*

The Madera County General Plan provides policies to protect and preserve the natural features and habitats in Madera County while allowing compatible uses where appropriate. Ecological areas specific to this plan are wetlands, waterways, wildlife and vegetation. This plan is in compliance with the ACOE, USFWS, and the CDFG. Cooperation with these agencies at all levels of evaluation is required to ensure that appropriate mitigation measures and the concerns of these agencies are sufficiently addressed (Madera County 1995).

### TREE PROTECTION POLICIES AND ORDINANCES

The Madera County General Plan specifies that landmark trees as well as mature trees on scenic roads should be preserved. Riparian zones are defined as 50 feet to 100 feet wide.

The following specific General Plan policies pertain to tree protection in Madera County.

- Policy 5.F.4. The County shall ensure that landmark trees are preserved and protected. Landmark trees are defined as a tree or grove of trees designated by resolution of the Madera County Board of Supervisors to be of historic or cultural value, an outstanding specimen, an unusual species, and/or of significant community benefit.

- Policy 5.D.4. The County shall require riparian protection zones around natural watercourses. Riparian protection zones shall include the bed and bank of both low and high flow channels and associated riparian vegetation, the band of riparian

> vegetation outside the high flow channel, and buffers of 100 feet in width as measured from the top of bank of unvegetated channels and 50 feet in width as measured from the outer edge for the canopy of riparian vegetation. Exceptions may be made in existing developed areas where existing development and lots are located within the setback areas.

Madera County does not have an ordinance for the protection or replacement of trees during construction or life of a project.

### *County of Fresno General Plan*

This Plan provides policies to protect and preserve the natural features and habitats in Fresno County while allowing compatible uses where appropriate. Ecological areas specific to this plan are wetlands, waterways, wildlife and vegetation. Various policies in the plan also seek to protect riparian and wetland habitats in the county while allowing compatible uses where appropriate. This plan is in compliance with the ACOE, USFWS, and the CDFG. Cooperation with these agencies at all levels of evaluation is required to ensure that appropriate mitigation measures and the concerns of these agencies are sufficiently addressed (Fresno County 2000).

### TREE PROTECTION POLICIES AND ORDINANCES

The Fresno County General Plan specifies that landmark trees as well as mature trees on scenic roads should be preserved. Riparian zones are defined at 50 feet to 100 feet wide and mitigation for disturbance is required at a ratio of 3:1, with a 200 foot wide wildlife corridor along the Kern and San Joaquin River.

The following specific General Plan policies pertain to tree protection in Fresno County.

**Policy OS-F.4:** The County shall ensure that landmark trees are preserved and protected whenever possible.

**Policy OS-D.4:** The County shall require riparian protection zones around natural watercourses and shall recognize that these areas provide highly valuable wildlife habitat. Riparian protection zones shall include the bed and bank of both low- and high-flow channels and associated riparian vegetation, the band of riparian vegetation outside the high-flow channel, and buffers of 100 feet in width as measured from the top of the bank of unvegetated channels and 50 feet in width as measured from the outer edge of the dripline of riparian vegetation.

**Policy OS-L.5**: The County road improvement projects involving designated scenic roadways shall be constructed to insure that consideration is given to preservation of ornamental trees consistent with public safety standards and accepted road design.

Fresno County has ordinances for locations and types of tree planting, but the County does not have an ordinance for the protection or replacement of trees during construction or life of a project.

## 4.4.3 Impact Assessment

### 4.4.3.1 Significance Criteria

Appendix G of the California Environmental Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on biological resources if the project would:

- 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 CDFG or the 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 and state 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 within 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.

The following criteria is addressed in Section 4.9, Land Use Planning, Agriculture, and Recreation (refer to subsection 4.9.3.2, Impact LUP-4).

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

### 4.4.3.2 Impact Mechanisms

Most of the potential impacts related to biological resources would occur during Project construction activities. Potential impacts during the long-term operation and maintenance of the Project components are minor.

Potential construction-related impacts can occur as a result of several activities, including

- Trenching, grading and excavation (construction)
- Conventional boring and HDD (construction)

- Hydrostatic testing (construction)
- Diversion of groundwater and surface water (construction)
- Lighting (construction and operation)
- Noise (construction and operation)
- Traffic (construction and operation)
- Risk of fire and upset.

Following is a general description of potential impacts on biological resources that could result from these activities.

**Trenching, Grading, and Excavation.** Various earthmoving activities will occur throughout construction of the Project pipeline, power line and facilities. Potential direct impacts resulting from construction are displacement, burial, and crushing of invertebrates, animals, and plants. For purposes of this assessment, it was assumed that the entire 85-foot wide construction corridor for the pipeline would be cleared and graded and would result in the temporary removal of all vegetation, wildlife burrows, and other features within the construction corridor. Power pole installation will involve only minor grading, excavation, or augering at localized pole sites.

There is a potential for ground dwelling species (especially burrowing species) to become crushed, entrapped or buried during trenching activities. Entrapment could also occur in open trench areas leaving individuals vulnerable to predation and exposure. Similarly, wildlife can enter into staged pipe or equipment, and then become injured during pipe and equipment transport, layout, and burial.

Terrestrial wildlife species passing through the Project area may be temporarily and partially blocked by construction activities. Birds and large, mobile species can readily avoid construction areas by diverting around these locations. Small, ground dwelling species with limited home ranges, such as amphibians, reptiles, and small mammals, would be most affected by construction activities, with respect to disruption of movement corridors.

Major streams and other bodies of water will be crossed using horizontal boring, whereas trenching or other boring techniques will be used at minor water features. Without proper management practices, trenching through dry stream channels and excavating drilling pits could potentially lead to sediment mobilization during rain events. Temporary impacts to aquatic species include the potential for sediment discharge to streams, river channels and receiving waters that may inundate habitats, suffocate spawning beds, and temporarily impact water quality during periods of streamflow. Potential indirect impacts to botanical and wildlife resources include construction runoff affecting sensitive communities and the organisms present in these communities, including special-status species.

**Conventional Boring and HDD.** Drilling activities can impact terrestrial species by disturbing breeding, foraging, or hindering movement throughout the area. Equipment operation and pipe stringing can injure or kill wildlife present in the immediate areas. Unanticipated release of drilling fluid (i.e., frac-outs) can impact water quality and cause injury, direct mortality, habitat alteration and disturbance to aquatic species.

**Hydrostatic Testing.** Water discharged during hydrostatic testing can result in erosion and/or sedimentation of discharge points. Erosion and sedimentation can degrade water quality, alter habitat and cause direct burial of small ground dwelling or burrowing animals or plants. Discharge of hydrostatic testing will be pursuant to conditions set forth in a NPDES permit, and will not cause direct or indirect impacts.

**Diversion of Ground Water and Surface Water.** Dewatering of trenches or installation of dewatering wells may be necessary during trenching activities in areas of shallow groundwater. Dewatering pumps powered by a generator or compressor will operate up to 24 hours a day, depending on groundwater discharge. Excess noise created by generators/compressors can displace or disrupt wildlife. Temporary diversion of surface water may be necessary at some water crossings. Other potential impacts related to the diversion of surface or ground water include sedimentation, impacts to downstream water quality, disruption of surface water flow, and displacement of aquatic species.

**Lighting.** Artificial lighting during construction could affect wildlife behavior in the vicinity of the Project site, such as during HDD activities at the San Joaquin River and Fresno Slough, where crews would operate 24 hours per day for a period of several days.

**Noise.** Construction activities will temporarily elevate noise levels in the Project area. Noise will be caused by equipment such as excavators, water trucks, support vehicles, horizontal drill rigs and generators or compressors. Operation and maintenance of the Project will cause a localized increase in noise levels at the compressor station and well pads, beyond the current background level.

**Traffic.** Increased traffic from heavy equipment, support vehicles and delivery trucks can create hazards for species migrating through the Project area.

**Risk of Fire and Upset.** There will be an increased potential for fire during the construction phase (e.g., due to welding, vehicle exhaust or unauthorized smoking). There would also be a potential for accidental release of solvents, fuels and lubricating oils during the construction period. Fires and spills of hazardous materials can cause disturbance, habitat destruction, injury and direct mortality to wildlife. Section 4.8, Hazards and Hazardous Materials describes potential impacts related to hazards.

These general impacts are addressed below in the context of the Project-specific plans.

### 4.4.3.3 Impacts and Mitigations

This section summarizes potential impacts to biological resources from general construction-related activities described above, as wells as from maintenance and operation of the Project.

The majority of surface activity that could affect biological resources will be located within previously disturbed areas, including agricultural and developed lands. Approximately 60 percent of the Project area will be constructed in agricultural land (i.e., orchard, vineyard and field and row crops); 20 percent in developed land; and 20 percent in natural areas. Natural areas that exist within the Project area provide potential habitat for special-status species, as well as travel corridors and natural "islands" of habitat in a largely developed landscape. Natural areas present within 1,000 feet of the Project area are shown in Figure 4.4-1.

A conservative assessment of impacts was made by calculating impact areas for a maximum ROW width of 85 feet for all upland terrestrial areas (Table 4.4-1). Actual impacts to terrestrial habitat are expected to be less than shown in Table 4.4-1 because the full width of the ROW will not be disturbed at some locations. For example, significant portions of the pipeline alignment through riparian and wetland habitats will be avoided by implementation of HDD crossing methods and surface impacts will be limited to the entry and exit points. Likewise, the impact area associated with the power line was calculated using a 40-foot ROW, while only a relatively small portion of this area will be disturbed in the immediate vicinity of pole sites.

#### Substantial, adverse effect, either directly or through habitat modification, any special-status species

**IMPACT BIO-1: Potential Impacts to Special-Status Plant Species, Aquatic Species, and Ground Dwelling/Burrowing Wildlife Species Resulting from Construction Related Soil Erosion and/or Sedimentation.** Unanticipated erosion and mobilization of sediment has the potential to impact invertebrates (e.g., vernal pool fairy shrimp) and fish (e.g., Delta smelt, steelhead) if sediment reaches aquatic areas such as vernal pools, San Joaquin River, or Fresno Slough. Similarly, ground dwelling amphibians, reptiles, birds, and mammals such as spadefoot toad, blunt-nosed leopard lizard, burrowing owl, and San Joaquin kit fox are also vulnerable to displacement, injury, or death from erosion and sedimentation. A summary of erosion control measures proposed by the Applicant, including implementation of a project-specific Erosion and Sediment Control Plan, is provided in Section 4.7, Geology, Soils and Paleontology. With the implementation of these measures, potential impacts to biological resources from construction related soil erosion and sedimentation are considered less than significant, and no additional measures are required.

**IMPACT BIO-2: Potential Impacts to Native Plant Communities and Special-status Plant Species from Construction Activity.** Construction activities may potentially affect native plant communities such as valley sink scrub, saltbush scrub and various riparian communities that have the potential to support special-status plant species. Special-status plant species are historically known to occur in the area, and are currently mapped in the vicinity of the Project.

Special-status plant surveys have been conducted within areas that will be subject to disturbance. These surveys have identified populations of special-status plants is certain segments of the pipeline alignment. Mitigation BIO-8 addresses site restoration and revegetation, and ensures that disturbed habitat will be restored to pre-construction conditions.

Native communities and species can also be impacted by the introduction of exotic, invasive weed species. Weed seed may be imported and distributed throughout the Project area on the tires of construction and maintenance vehicles. Exotic species, including noxious weeds, are common in the developed portions of the Project area. Sensitive habitat exists between MP 19.5 and MP 21.6, and introduction of invasive or noxious weeds could adversely affect the quality of the habitat by increasing competition for space and resources. Vehicles are the primary vector for distribution and spread of noxious weeds. Vehicles will be limited to the construction ROW and additional measures provided in Mitigation BIO-9 will further reduce the introduction and spread of noxious weeds. With the implementation of these mitigation measures, potential impacts to native plant communities and special-status plants from construction activities are considered less than significant, and no additional measures are required.

**IMPACT BIO-3: Potential Impacts to Aquatic and Riparian Species from Frac-out During Horizontal Drilling Activities.** Water features and associated riparian habitats along the pipeline alignment, including at the San Joaquin River, Fresno Slough, and Four-Mile Slough, have potential to support special-status species including valley elderberry longhorn beetle, steelhead, western pond turtle, and waterfowl. During drilling operations, there is a potential for drilling mud and drilling equipment fluids (i.e., oils and hydraulic fluid) to enter stream channels during construction. Unanticipated release (i.e., frac-outs) of drilling mud may result when directional drilling is conducted in unconsolidated sediments associated with river and wetland crossings. Mitigation BIO-2 requires measures to reduce the potential for drilling mud and other equipment fluids from entering stream channels; these measures address equipment staging, vehicle refueling and maintenance activities.

In the event of frac-out, aquatic species could suffer injury, direct mortality, habitat alteration and disturbance. As discussed further in Section 4.9 Hydrology and Water Quality (refer to Impact HWQ-8), the Applicants proposes to install conductor casing in shallow portions of the HDD boring where there is unconsolidated sediments that may not adequately contain the drilling fluids. In addition, the Applicants proposes to implement a Frac-Out Contingency Plan to address potential impacts of muds that could enter surface waters. These measures will mitigate potential effects to aquatic life from unanticipated frac-out. This plan will provide for monitoring of drilling fluid properties, pump pressures, drilling fluid circulation, drill returns, fluid loss, and observation of the work area for early signs of fluid leakage. With the implementation of these measures, the potential impacts to aquatic resources during pipeline construction are considered less than significant, and no further mitigations are required.

**IMPACT BIO-4: Potential Impacts to Special-Status Vernal Pool Invertebrates from Grading and Trenching.** Vernal pool habitat located between MP 19.5 and MP 21.6 may support special-status species including vernal pool fairy shrimp and vernal pool tadpole shrimp. Vernal pools will be avoided to the extent feasible in this area, however grading and trenching activities may impact vernal pools, including permanent modification of distinctive soil properties and hydrologic patterns. Impacts related to direct injury to vernal pool species can be reduced by restricting construction in this area to the dry season. This restriction is provided in Mitigation BIO-10. Potential long-term impacts related to habitat loss due to habitat modification can be reduced by additional pre-construction surveys, site avoidance, construction monitoring, and site restoration. These measures will reduce the potential impacts to less than significant.

**IMPACT BIO-5: Potential Impacts to Valley Elderberry Longhorn Beetle from Construction and Maintenance Activities.** Construction and maintenance activities could impact elderberry, the obligate host plant for the valley elderberry longhorn beetle. Impacts to this federally-listed threatened species or its habitat could be considered significant. Elderberry shrubs occur in the Project area at the San Joaquin River (pipeline crossing) and Chowchilla Bypass (transmission line crossing) but would be completely avoided (i.e., shrubs and a 100-foot radius buffer) in these areas through the use of HDD, transmission line spans, fencing, restricting activity to existing access roads and previously disturbed sites, and other measures. Specific avoidance and minimization measures related to construction and maintenance activities are addressed in Mitigation BIO-2. These measures will mitigate potential impacts to elderberry shrubs within the Project area. If elderberry shrubs cannot be avoided, the Applicant will implement the measures described in Mitigation BIO-12, based on the Conservation Guidelines for the Valley Elderberry Longhorn Beetle, U.S. Fish and Wildlife (1999).

**IMPACT BIO-6: Potential Temporary Impacts on Wildlife Foraging Habitat.** Construction activities may temporarily impact foraging activities within the construction ROW. Many species, including birds, reptiles, and small mammals use agricultural areas for foraging. Potential impacts will be temporary and minimal. Due to the availability of other suitable habitat in the area, these impacts are not considered significant, and no mitigations are required.

**IMPACT BIO-7: Potential Impact to California Tiger Salamander from Injury, Fatality, or Temporary Habitat Loss.** California tiger salamander has not been recorded in the Project area but has limited potential to occur in vernally wet non-native grassland/valley sink scrub communities located from MP 19.5 to MP 21.6. This area contains vernally wet areas and ground squirrel burrows, which constitutes the primary habitat requirements for this species. Trenching and grading activities in these areas have the potential to injure or temporarily displace salamanders, if any occur in the Project area, from their habitat. Construction equipment also has the potential to crush or injure individuals. Mitigations BIO-2 (Work area Enforcement and Exclusion Area) and BIO-7 (Pre-construction Wildlife Surveys) will address any potential direct impacts to this species. Seasonal exclusions (Mitigation BIO 10) and site restoration (MM BIO-8) will address potential impacts to breeding habitat. These measures will reduce the potential impacts to less than significant.

**IMPACT BIO-8: Potential Impacts to Blunt-Nosed Leopard Lizard from Injury, Fatality, or Temporary Habitat Loss.** Construction or maintenance activities may cause direct or indirect impacts to blunt-nosed leopard lizards. Potential habitat for this species is present from MP 17.0 to MP 18.0 as well as from MP 19.5 to MP 21.6. As described in Section 4.4.1, protocol surveys are in progress within these areas where landowner permission to access has been granted. At the time of this report, these surveys have failed to detect blunt-nosed leopard lizards and the habitat has very low potential to support the species. Trenching and grading activities in these areas have the potential to injure or temporarily displace lizards that may be present. Construction equipment also has the potential to crush or injure individuals. General Mitigations BIO-1 through BIO-8, which include provisions for exclusion fencing and biological monitoring, as well as species-specific Mitigation BIO-14, which requires pre-construction surveys for this species, will reduce potential impacts to less than significant.

**IMPACT BIO-9: Potential Impact to Giant Garter Snake from Vibrations Caused by Boring Activities.** Potential giant garter snake habitat within the Project area will be avoided by implementation of HDD and other boring techniques. However there is a possibility that boring activities could create vibrations that disturb snakes, which hear primarily by detecting vibrations on the ground, rather than by receiving input from airborne sound (Hartline 1971). The distance that giant garter snakes can detect vibrations is unknown, as is the magnitude of vibrations that might result in disturbance to foraging, hibernating, or breeding activities. The HDD drilling areas and related construction work areas will be located several hundred feet from waterways and riparian zones. Due to the placement of these areas in upland habitats at considerable distance from potentially suitable habitat, impacts are expected to be less than significant. Level 1 impact, standard avoidance and minimization measures as specified in the Programmatic Consultation (Section 4.1.1), will be implemented and no focused surveys for the species are required. Implementation of Mitigations BIO-1 through BIO-8 will mitigate any potential impacts to this species to less than significant.

**IMPACT BIO-10: Potential Impacts to Special-status Bird Species.** Many special-status bird species, including those that are state or federally–listed, or protected by the federal Migratory Bird Treaty Act, have the potential to use habitat within the Project area. Examples of listed species include western yellow-billed cuckoo, little willow flycatcher, and least Bell’s vireo, each of which has low potential to occur based on their known range and individual habitat needs. These listed species typically are associated with riparian habitat, which is sparse within the Project area at Fresno Slough, San Joaquin River and Lone Willow Slough (a narrow agricultural canal adjacent to Chowchilla Canal). As described below in Impact BIO-15, disturbance to riparian habitat from pipeline construction will be avoided by implementation of HDD and conventional boring techniques. Installation of the Project electric transmission line will not impact riparian areas. The Applicants’ proposed Project siting and design as well as implementation of the frac-out contingency plan will mitigate any potential effects to these species and their habitat. General Mitigations BIO-1 through BIO-8 and Mitigation BIO-15 (Pre-construction Nesting Bird Surveys and Monitoring) will reduce potential impacts to these species to a less than significant level.

**IMPACT BIO-11: Potential Impacts to Western Burrowing Owl from Injury or Temporary Habitat Loss.** Construction may cause temporary habitat alteration, disturbance, injury, or mortality to western burrowing owls, which are known to occur within the Project vicinity but have not been recorded in the Project area. This species often nests in agricultural areas, along roadways, and on berms where disturbed soils create good burrowing conditions for owls and other burrowing animals (e.g., ground squirrels). According to the CDFG Staff Report on Burrowing Owl Mitigation (CDFG 1995) impacts include: 1) disturbance within 50 m (160 ft) of occupied burrows; 2) destruction of natural and artificial burrows (culverts, concrete slabs and debris piles that provide shelter; and 3) destruction and/or degradation of foraging habitat adjacent (within 100 m) of an occupied burrow (CDFG 1995).

Implementation of initial site surveys and pre-construction surveys as described in MM BIO-19 and application of general mitigation measures BIO MM-1 through 8 will ensure protection of this species, and reduce impacts to less than significant.

**IMPACT BIO-12: Potential Impacts to Fresno Kangaroo Rat from Injury or Temporary Habitat Loss.** Construction or maintenance activities may cause habitat alteration, disturbance, injury, or mortality to Fresno kangaroo rats. Potential habitat for Fresno kangaroo rat is present between MP 19.5 and MP 21.6, however, this species has not been seen in the Project vicinity since 1992. Trenching and grading activities have the potential to temporarily displace kangaroo rats from their habitat or entrap or crush individuals occupying burrows. General Mitigations BIO-1 through BIO-8, and Mitigation BIO-17 will address any potential impacts to this species, and reduce impacts to less than significant.

**IMPACT BIO-13: Potential Impacts to San Joaquin Kit Fox from Injury or Temporary Habitat Loss.** Construction or maintenance activities may cause habitat alteration, disturbance, injury, or mortality to San Joaquin kit fox, which are known to occur throughout the Project vicinity. Trenching and grading activities could potentially displace animals from their habitat or entrap or crush kit fox occupying burrows. Kit fox could also enter pipes in staging areas or open trenches and then become entrapped upon placement of pipe in the trench and subsequent backfilling. These potential direct impacts to kit fox will be avoided with implementation of General Mitigations BIO-1 through BIO-8. Additionally Mitigation BIO-19 proposes pre-construction surveys for this species. Implementation of these mitigations will reduce potential impacts to less than significant.

**IMPACT BIO-14: Potential Impacts to Nelson's Antelope Squirrel from Injury or Temporary Habitat Loss.** Construction or maintenance activities may cause habitat alteration, disturbance, injury, or mortality to Nelson's antelope ground squirrels, known to occur in the Project vicinity. Trenching and grading activities have the potential to injure or temporarily displace this species if present. Construction equipment also has the potential to kill or injure individuals. Application of General Mitigations BIO-1 through BIO-8, and species specific Mitigation BIO-18 will mitigate any potential impacts to less than significant.

### Substantial adverse effect on any riparian habitat or other sensitive natural community

**IMPACT BIO-15: Potential Effects on Riparian Habitat.** Riparian habitat exists at the Fresno Slough, the San Joaquin River and Lone Willow Slough. Installation of the pipeline will be by HDD at both Fresno Slough and the San Joaquin River. Entry and exit pits and HDD staging areas will be set back from the riparian area a minimum of 100 feet at the San Joaquin River and a minimum of 200 feet at the Fresno Slough. Power pole placement will avoid any impacts to the riparian corridor at Lone Willow Slough. Contingency procedures related to the unanticipated release of drilling fluids (i.e., frac-out) are provided in the Applicant proposed Frac-Out Contingency Plan and will reduce any potential impacts to riparian communities to less than significant.

Isolated or remnant riparian trees, and horticultural plantings of willow, cottonwood, etc., are present along some agricultural drains and along the Chowchilla Bypass Canal. These individual trees do not constitute "riparian habitat" in most cases, but pipeline and power line siting will avoid all mature trees when possible. However, if trees cannot be avoided this impact will be further reduced by replacing the trees at an appropriate ratio as a part of the Site Restoration Plan. Otherwise, potential impacts are less than significant and no further mitigation is required.

### Substantial adverse effect federal or state protected wetlands

**IMPACT BIO-16: Potential Temporary Impact to Potentially Jurisdictional Wetlands and Other Waters.** An investigation of potential wetland resources identified several potentially jurisdictional sites including the Fresno Slough, San Joaquin River, Four-Mile Slough, Chowchilla Bypass, several unnamed agricultural drainages and ponds as well as a 2-mile section of pipeline ROW with isolated vernal wetlands, from MP 20.5 to MP 21.5. (As noted above, the Applicants have not been granted access to the segment of the pipeline route). Any potential effects on the San Joaquin River, Fresno Slough, or Four-Mile Slough will be avoided by implementing HDD or other boring techniques in these areas. The Chowchilla Bypass and any agricultural ponds will be avoided during pipeline and power pole siting and construction.

Construction and restoration techniques will adequately address any potential temporary impacts to agricultural drainages resulting from trenching and pipeline installation. Agricultural areas provide marginal aquatic habitat, and are not likely to support sensitive species. Seasonal exclusions (i.e., construction during the dry season) described in Mitigation BIO-101 will greatly reduce any effects to seasonally wet areas. Additionally, site restoration as described in Mitigation BIO-8 will mitigate for any potential effects from temporary fill or hydrological interruption. Section 4.9 Hydrology and Water Quality discusses the Applicants' proposed best management practices that address the potential for erosion, sedimentation and water quality effects.

### Substantial interference with the movement of any wildlife species in established corridor

**IMPACT BIO-17: Potential Impacts to Special-Status Birds.** Construction, operation and maintenance activities have the potential to disturb, injure or kill nesting birds, their eggs or young, as well as alter foraging and nesting habitat. Most of the native birds in the Project area are protected by the Migratory Bird Treaty Act of 1918 (MBTA), which makes it unlawful to pursue, hunt, take, capture, kill or sell birds, including their active nests, eggs, or young. Some of these birds are also federally- or state-listed as endangered or threatened (e.g., Swainson's hawk), while others have special-status designation as California fully protected (e.g., white-tailed kite) or as species of special concern (e.g., northern harrier).

The Project is primarily located in previously disturbed areas currently in cultivation, thereby minimizing the potential to encounter nesting birds during construction. Moreover, operation and maintenance of the Project are not likely to impact nesting birds, which can avoid areas subject to operational disturbance. Implementation of pre-construction surveys as described in Mitigation BIO-15 and BIO-16 and use of a biological monitor during construction (Mitigation BIO-4) will ensure compliance with the various laws and regulations protecting birds in the Project area.

Swainson's hawk is the only threatened or endangered raptor known to nest in the Project area. Nesting Swainson's hawks could potentially be disturbed by construction activities and associated noise. Presence of humans and/or any activity that is out of the ordinary has the potential to disturb nesting hawks; however, Mitigation BIO-13 will address any potential impacts to nesting Swainson's during the construction phase. Implementation of these mitigations will reduce potential impacts to less than significant.

**IMPACT BIO-18: Potential for Avian Mortality Due to Power Line Electrocution and Collision.** Birds, particularly large birds, are susceptible to injury and direct mortality from electrocutions and collisions with power lines. Electrocution potential is generally avoided on transmission lines, which have greater than 60 inches of separation between energized phases (i.e., conductors) or between a phase and a ground. Collision potential is greatly reduced by siting lines away from bird concentration areas (e.g., wetlands) and major flyways (e.g., rivers) and by avoiding use of overhead ground wires. Measures for minimizing the risk of avian electrocution are presented in *Suggested Practices for Avian Protection on Powerlines: The State of the Art in 2006* (APLIC 2006). Measures for mitigating avian collisions are presented in *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994* (APLIC 1994). Pacific Gas & Electric Company (PG&E) has incorporated these measures in its system-wide Avian Protection Plan, which will be followed during construction of the Project transmission line. Therefore, impacts of powerline operation will be less than significant and no additional mitigation measures are required.

**IMPACT BIO-19: Construction of the Project Could Impede the Movement of Native Resident or Migratory Fish or Wildlife.** Construction activities including staging, grading, trenching, and pipe stringing may temporarily impede the movement of slow moving, ground dwelling species, however, these potential impacts will be temporary and relatively minor considering the relatively limited area that wildlife will be excluded from. General Mitigations BIO-1 through BIO-8 include relevant provisions to address these impacts, such as reducing the potential length of open trench and the amount of time they are left open; inspecting trenches before backfilling; and installing temporary dirt ramps in trenches when left open overnight. Implementation of these measures will reduce potential impacts to less than significant.

**Impact BIO-20: Disturbance from Light and Noise During HDD and Conventional Boring Activities.** Drilling and boring activities at large channels is not anticipated to require 24-hours per day operations, however, certain site conditions may dictate this schedule for one or more days. In this event, the noise and light levels generated at the work area will be greater than ambient. Wildlife occurring in the area could be disturbed or temporarily displaced by higher levels of noise and light, and wildlife may be temporarily discouraged from using impacted areas as movement corridors. Section 4.2 Aesthetics discusses potential impacts related to night lighting and describes measures proposed by the Applicants to address this impact, such as shielded and focused lighting. Section 4.11 Noise discusses potential noise impacts from construction and describes measures proposed by the Applicants to address this impact. Implementation of these Applicant proposed measures would address potential light and noise impacts to wildlife, and no mitigation is required.

#### Conflict with local policies or ordinances protecting biological resources

**Impact BIO-21: Potential for Removal or Death of a Protected Tree.** Project components are sited to avoid the removal of trees that are protected under local ordinances and policies. Therefore, no impacts related to loss of protected trees are anticipated and no mitigation is required. In the unlikely event that the Project alignment is changed such that a protected tree can not be avoided, then there is a potential that protected trees could be damaged or lost. In this case, implementation of General Mitigations BIO-1 through BIO-8 would provide adequate measures to protect trees to the extent feasible. In the event that a protected tree is damaged or lost, relevant County ordinances regarding tree removal and replacement will be adhered to, and impacts will be mitigated to less than significant.

### 4.4.4 Mitigation Measures

The following mitigation measures address the potential impacts from the construction, operation, and maintenance of the Project described above. These mitigation measures will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). It is anticipated that these mitigation measures will be further refined after completion of consultation with biological resources agencies including the USACE, USFWS and CDFG.

#### General Construction Related Measures

The following general measures will address and potential impacts from general construction related activities.

**Mitigation BIO-1: Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP).** The Applicant will develop a BRMIMP in advance of any Project related ground disturbance activities, to fully disclose the required mitigation measures with which the Project must comply during Project construction and operation. The BRMIMP will be developed in consultation with the CPUC and biological resource agencies.

The BRMIMP will include, but not be limited to, species impact avoidance and minimization measures, a habitat compensation strategy, environmental compliance reporting requirements, pre-construction survey methods, construction monitoring procedures, a Worker Environmental Awareness Program, frac-out contingency plan and post-construction clean-up and restoration plans.

The BRMIMP shall identify:

- All biological resources mitigation, monitoring, and compliance conditions specified in any acquired permits for the Project;
- All sensitive biological resources that may be impacted by the Project, or that will be avoided or mitigated by the Applicants;
- All required mitigation measures/avoidance strategies for each sensitive biological resource;
- All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
- Pre- and post-construction site photographs of all natural areas disturbed during Project construction activities;
- Duration of biological, cultural resource, and paleontological monitoring and a description of monitoring methodologies and frequency;
- Success criteria;
- Remedial measures to be implemented if success criteria are not met; and
- A discussion of biological resource-related facility closure measures.

**Mitigation BIO-2: Work Area Enforcement and Exclusion Area.** All construction activities will be limited to the Project ROW and designated staging areas and access roads. No pets or firearms will be permitted on the Project site. In sensitive habitat areas (i.e., habitats that potentially support listed species or sensitive habitat), orange construction fencing will be installed to delineate the work area and prevent equipment from entering sensitive areas. All site workers will be informed about the importance of maintaining any designated protection or exclusion areas. Sensitive resource areas will be identified by a qualified biologist

To reduce the potential for degrading existing habitat and attracting sensitive wildlife species and their predators to the area, all trash will be properly contained and removed from the work site and disposed of regularly. All construction debris and trash will be properly disposed of, and food-related trash will be removed from the site when work activities are complete at the end of each day.

During construction, all Project-related vehicle and equipment traffic will be restricted to established roads or access routes, and will observe a maximum 20-mile an hour speed limit within the work areas, except on County roads and highways. Prior to initiating pipeline construction activities, the vehicle and equipment access routes and work area will be delineated in the field (e.g., by installing construction fencing).

**Mitigation BIO-3: Worker Environmental Awareness Program.** The Applicant will develop and implement a Worker Environmental Awareness Program pursuant to which each of their employees, as well as employees of contractors and subcontractors who work on the Project site or related facilities during construction and operation, are informed about the sensitive biological resources potentially occurring in the Project area. An employee training session will be conducted before groundbreaking to explain any sensitive biological resource and special-status species concerns as well as applicable regulations. The Worker Environmental Awareness Program will:

- Provide for on-site or classroom presentation in which supporting written material is made available to all participants;
- Discuss the locations and types of sensitive biological resources within the Project area and adjacent areas;
- Present the reasons for protecting these resources;
- Present the meaning of various temporary and permanent habitat protection measures;
- Present what to do if previously unidentified sensitive resources are encountered; and
- Identify whom to contact if there are further comments and questions about the material discussed in the program.

The program will be administered by a field contract representative or qualified biologist with knowledge of the local area and associated sensitive resources. Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The Designated Biologist or Field Representative administering the program shall also sign each statement.

**Mitigation BIO-4: Biological Monitoring.** Prior to the start of any ground disturbance activities, the Applicant will select a Designated Biologist. The Designated Biologist will meet the following minimum qualifications:

- A bachelor's degree in wildlife biology, zoology, botany, ecology, or a closely related major;
- Three years of experience in field biology;
- One year of field experience with resources found in or near the Project area; and
- Ability to demonstrate the appropriate education and experience for the biological resource tasks that must be addressed during Project construction and operation.

The Designated Biologist will be present onsite during all ground disturbing activities that have the potential to impact plants, wildlife or native habitat. The Designated Biologist will:

- Ensure compliance with environmental permits and approvals as summarized in the BRIMP;
- Ensure implementation and compliance with the Worker Environmental Awareness Program; and
- Have the authority to halt construction at any time if biological resources are in being negatively impacted.

**Mitigation BIO-5: Wildlife Entrapment.** Wildlife entrapment prevention measures will be employed during construction, operation and maintenance of the Project in order to prevent wildlife entrapment. Stored piping will be temporarily capped in order to prevent wildlife from taking up residence within construction materials. Well cellars and other cavities associated with the Project will be appropriately designed and managed to prevent entrapment.

Potential entrapment of ground dwelling and burrowing species in open trenches during construction will be mitigated by providing covers over short spans of open trench or providing escape ramps at regular intervals in long spans. Trenches will be inspected on a daily basis by a biological monitor prior to onset of construction or backfilling.

**Mitigation BIO-6: Erosion Control and Sedimentation.** The following measures will be implemented during construction to minimize the incidence of sediment mobilization:

- Clearing of vegetation will be confined to the minimal area needed to conduct the construction activities;
- All excavated material will be sidecast in upland habitat areas within the work area;

- Any work near or adjacent to any drainage or wetland would be protected through installation of orange construction fencing backed by silt fencing. This will prevent all excavated material, Project equipment, and sediment from impacting sensitive habitat adjacent to or downslope from construction sites; and

- At completion of the pipeline construction work all disturbed soils would be stabilized by compaction and the entire construction site will be recontoured to pre-construction grades.

**Mitigation BIO-7: Pre-Construction Wildlife Surveys.** Within 15 days of the onset of construction, general pre-construction surveys will be conducted at each area with natural vegetation for special-status species and nesting birds. Pre-construction surveys will also precede any ground- or vegetation-disturbing maintenance activities performed during the life of the Project. As part of these surveys, the location of any sensitive biological resources observed will be mapped and designated for avoidance on Project construction plans. Sensitive resources near construction areas will be identified and clearly marked for avoidance. Take of federal or state-listed species will be avoided or will be consistent with appropriate permits and approvals.

**Mitigation BIO-8: Construction Site Restoration and Revegetation in Natural Areas.** Following the completion of construction in natural areas, the ROW will be recontoured to Pre-project contours, and sequestered top soil will be replaced in such a manner that historic drainage patterns are maintained. All graded areas will be revegetated with an appropriate native seed mix specific to the surrounding vegetation community. Revegetation of all disturbed sites will be maintained and monitored for an appropriate period of time to ensure successful restoration.

**Mitigation BIO-9: Seed Bank Retention and Noxious Weed Containment in Natural Areas.** During construction in natural areas, the seed bank will be preserved in the construction area. The upper six inches of topsoil will be scalped and temporarily stockpiled until site restoration is initiated. Upon completion of construction, the topsoil and salvaged vegetation will be redistributed over the surface of the construction site, thus disseminating the original seed bank over the construction areas. In addition, clearing of vegetation will be confined to the minimal area needed to conduct the construction activities.

To prevent the spread of invasive weeds, invasive exotic plants will be removed from the work area. When equipment is mobilized from an area infested with exotic plant species, the tires and undercarriages of all vehicles and construction equipment will be sprayed or washed to prevent the spread of noxious weed seeds into an unaffected area. Washing will occur prior to entering sensitive resource areas (i.e., any areas with native vegetation). Noxious weed washing stations will be located at ingress/egress points near any sensitive resource areas.

### Additional Project Specific Mitigation Measures

**Mitigation BIO-10: Protection of Wetlands and Vernally Wet Areas: Seasonal Construction Exclusion.** Vehicle movements and ground-disturbing activities in biologically sensitive areas will be restricted to the dry season, when construction activities are less likely to result in the mobilization of sediment. This mitigation applies to construction in the following areas, at a minimum:

- Valley Sink Scrub community between MP 19.5 and MP 21.6
- HDD Staging area on west side of Fresno Slough at MP 17.8
- Power line alignment across Chowchilla Bypass Canal

**Mitigation BIO-11: Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Surveys.** Potential habitat for the VPFS and the VPTS is located between MP 19.5 and MP 21.6. Construction disturbance to vernal pools will be avoided to the extent feasible in this area. Additional pre-construction surveys, site avoidance, construction monitoring, and site restoration measures will be implemented.

**Mitigation BIO-12: Valley Elderberry Longhorn Beetle Impact Avoidance and Compensation.** The proposed Project, as currently designed, does not directly impact elderberry plants, the obligate host plant for valley elderberry longhorn beetle. To ensure complete avoidance of impacts to this species, a 100-foot-diameter buffer will be established and maintained around all elderberry plants with a stem diameter of 1.0 inch or greater at ground level as described in *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999). These buffers will be delineated in the field using construction fencing. In the event that complete avoidance of elderberry shrubs, including a 100-foot buffer, is not possible, surveys for beetle exit holes will be performed on all elderberry plants with a stem diameter of 1.0-inch or greater at ground level and all minimization, protection, and compensation measures will be implemented as described in the *Conservation Guidelines.*

**Mitigation BIO-13: Swainson's Hawk Nest Surveys or Seasonal Avoidance.** Pre-construction surveys for nesting Swainson's hawks will be performed within 0.5 miles of the Project area according to established protocol (Swainson's hawk TAC 2000). Surveys will be timed to allow for full completion as specified in the protocol, before the onset of construction, using the CDFG-endorsed protocol in effect at that time. If any nests are located in the survey area, no construction activities will occur within 500-feet of the nest until such time that the young have fledged or the nest has been abandoned as determined by a qualified biological monitor.

**Mitigation BIO-14: Pre-Construction Surveys for Blunt-nosed Leopard Lizard.** Pre-construction surveys will be conducted following CDFG protocol in suitable habitat within the Project area. The blunt-nosed leopard lizard survey area is from MP 17.0 to MP 18.0 and from MP 19.5 to MP 21.6. These surveys will be conducted by a qualified researcher, following the protocol specified in: *Approved Survey Methodology for the Blunt-Nosed Leopard Lizard,* *California Department of Fish and Game, May 2004* (CDFG 2004). If blunt-nosed leopard lizards are observed during the pre-construction surveys, then appropriate agencies will be consulted to determine appropriate avoidance measures to ensure against adverse impacts to the species.

**Mitigation BIO-15: Pre-Construction Surveys and Monitoring for Nesting Birds.** When construction is scheduled to occur during the bird nesting season (February 1 to September 30), areas subject to ground or vegetation disturbance will be surveyed by a qualified biologist within 15 days of the start of construction. If an active nest of protected bird species is observed, the location will be flagged and recorded with a GPS unit. The nest will be avoided until no longer occupied (as determined by the biological monitor) unless a special purpose permit for removal of the nest is obtained from the USFWS.

**Mitigation BIO-16: Burrowing Owl Surveys (Burrowing Owl and Burrow Surveys and Pre-Construction Surveys).** Areas subject to ground disturbance will be surveyed for nesting burrowing owls prior to start of construction according to established guidelines (CDFG 1995). In the even an active nest is located in an area subject to disturbance, appropriate avoidance, minimization, or protection measures will be determined in consultation with CDFG.

**Mitigation BIO-17: Fresno Kangaroo Rat Surveys.** Trapping surveys for Fresno kangaroo rat will be conducted prior to construction by permitted individuals in suitable habitat from MP 19.5 to MP 21.6. If trapping surveys determine presence of Fresno kangaroo rat in the Project area then appropriate mitigation measures will be developed in consultation with CDFG and USFWS. Potential measures may include:

- Exclusion fencing at perimeter of construction areas;
- Trapping and relocation of kangaroo rats to suitable habitat outside of construction areas; and
- Avoiding burrow concentration areas.

**Mitigation BIO-18: Nelson's Antelope Ground Squirrel Surveys.** Pre-construction surveys will be conducted by walking transects in the Project area in suitable habitat. If surveys indicate presence of Nelson's antelope squirrel in the Project area then appropriate measures will be implemented to avoid impacts. Potential measures may include:

- Exclusion fencing at perimeter of construction areas;
- Trapping and relocation of ground squirrels to suitable habitat outside of construction areas; and
- Avoiding burrow concentration areas.

**Mitigation BIO-19: Pre-Construction San Joaquin Kit Fox Surveys.** Pre-Construction surveys for kit fox will be conducted by walking transects in suitable habitat throughout the Project area. If active dens are located in the Project area then appropriate mitigation measures will be developed in consultation with CDFG and USFWS to avoid impacts.

# 4.5 CULTURAL RESOURCES

Cultural resources addressed in this section include historic and prehistoric resources within the Project area, including areas of the Project that could directly or indirectly have an impact to historic, cultural, or archeological resources (i.e., the pipeline route, electric power line route, the Storage Field, and the construction staging areas). The description of existing conditions is based on Project-specific background research, Native American consultation, and a cultural resources field inventory of the Project area. Refer to Section 4.6, Geology, Soils, and Paleontology for discussion of potential Project impacts related to paleontological resources.

## 4.5.1 Environmental Setting

### 4.5.1.1 Natural Setting

The Project is located in the San Joaquin Valley, the southern half of an elongated trough called the Great Valley. The Great Valley is located on a 50-mile-wide lowland that extends approximately 500 miles south from the Cascade Range to the Tehachapi Mountains (Norris and Webb 1990:412). The Great Valley is divided by two prominent hydrologic features, the Sacramento and San Joaquin rivers, which drain into San Francisco Bay. Between the Mesozoic and Cenozoic eras, the Great Valley served as a shallow marine embayment containing numerous lakes, primarily within the San Joaquin Valley (Norris and Webb 1990:412). As a result, the upper levels of the Great Valley floor are composed of alluvium and flood materials. Below these strata are layers of marine and nonmarine rocks, including claystone, sandstone, shale, basalt, andesite, and serpentine. Waters began to diminish about 10 million years ago, eventually dwindling to the drainages, tributaries, and small lakes that exist today (Hill 1984:28).

The San Joaquin Valley makes up the Great Valley's lower half. It is bounded by the Sacramento/San Joaquin River Delta to the north, the mountains of the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi Mountains to the south. The San Joaquin Valley comprises two distinct hydrologic subbasins: the San Joaquin and the Tulare. The San Joaquin Subbasin is drained by the San Joaquin River. The Tulare Subbasin has no regular surface outlet; it was formed by the merging of alluvial fans from the Kings River to the east and the Los Gatos Creek to the west (Cone 1911). The Tulare Subbasin rivers—the Kings, Kaweah, Tule, and Kern—flowed into the subbasin forming large inland lakes. The Tulare Lake basin lies approximately 30 miles south of the Project area. is a seasonal lake and was extremely shallow and expanded horizontally across the flat landscape as it filled with winter and spring runoff. Its broad but shallow dimensions resulted in wide fluctuations of the lake's shoreline during both prehistoric and historical times. As it filled beyond its natural alluvial barriers, water was channeled down the Fresno Slough into the San Joaquin River. Tulare Lake was the largest naturally occurring lake in California as recently as 1920 (Norris and Webb 1990:433). The size of the lake was gradually reduced by historic development of irrigation systems and reclamation of waters draining from the Kings River and other sources. Today the lake only exists in times of flooding, and the deep reserve of groundwater is tapped for private and public use.

The Fresno Slough intersects the gas pipeline route. Historically, it served as the northern flood outlet of Tulare Lake and the Kings River. The Fresno Slough was also a flooded backwater swamp of the San Joaquin River. Prior to agricultural development and the control of the natural waterways, the area between Tulare Lake and the San Joaquin River was a vast swampland. A historical account written by George Derby, who circa 1850 had aspired to travel up the slough that connected the San Joaquin with Tulare Lake reports:

> *The ground between the lake and the San Joaquin entirely cut up by small sloughs which had overflown in every direction making the country a perfect swamp, which I found it a matter of great difficulty to cross [Yogi 1996:11].*

Agriculture also spurred the replacement of native plants and animals with domesticated species. Common native plants today include white, blue, and live oaks as well as walnut, cottonwood, willow, and tule. Also prominent is bulrush and cattail, various grasses, flowers, and saltbrush. The previously swampy valley floor once provided a lush habitat for a variety of animals, including mule deer, tule elk, pronghorn, grizzly and black bears, and mountain lions (Preston 1981:245–247). Mammals commonly noted today are the gray wolf, valley coyote, bobcat, gray and kit foxes, and rabbits. Birds in the area include American osprey, redwing blackbird, marsh hawk, willow and Nuttall woodpeckers, western meadowlark, and quail. The lakes, rivers, and streams throughout the vicinity provide habitat for anadromous and freshwater fish, including Chinook salmon, white sturgeon, Sacramento perch, rainbow trout, thick-tailed chub, and Sacramento sucker (Preston 1981:249).

### 4.5.1.2 Prehistory and Archaeology

No major investigations have occurred in the vicinity of the Storage Field surface facilities, gas pipeline, or electric power line routes, and much of the archaeological work in the southern part of the San Joaquin Valley has taken place around ancient lakes. The first large-scale excavations of the southern San Joaquin Valley were conducted near Tulare and Kern lakes by Gifford and Schenck (1926), who unearthed flexed burials, pottery, obsidian arrow points, milling stones and mortars, and intricately fashioned steatite artifacts. Later archaeological investigations revealed that occupation at the lake occurred possibly as early as 11,000 years ago (Fredrickson and Grossman 1977; Sampson 1991). The Witt Site (CA-KIN-32) on the southwest shore of Tulare Lake contains fluted projectile points as well as later types, suggesting continual occupation of the basin until historical contact (Fenenga 1993; Moratto 1984:81–82). Riddell and Olsen (1969:121) proposed that the contour at 192 feet above mean sea level (amsl) marked the Late Pleistocene shoreline of Tulare Lake. The significance of that level was confirmed by Fenenga (1993), who recovered Clovis materials at or near the 190-foot elevation.

Over the past 40 years, a basic prehistoric sequence has emerged from numerous studies conducted in central California (Moratto 1984:154). Excavation of CA-KER-116, a prehistoric site at Buena Vista Lake, found a deeply buried component ascribed to the Western Pluvial Lakes

Tradition and dating to the Pleistocene-Holocene transition (circa 11,500–7500 before present [B.P.]) (Fredrickson and Grossman 1977; Grossman 1968; Moratto 1984). Population density was low at that time, with a few settlements focused around the shores of ancient lakes, marshes or along old stream channels. The tradition is characterized by a dependence on hunting mammals and birds and marked by a well-developed flaked stone industry including percussion-flaked foliate knives, Silver Lake and Lake Mojave points, lanceolate bifaces, crescents, large flake scrapers, drills, and gravers. During the Early Holocene (between 8000 and 4000 B.P.), the prehistoric economy centered on hunting and fishing, although mortars and pestles as well as ornamental *Olivella* and *Haliotis* shells appear occasionally in assemblages (Sutton 1997).

At the beginning of the Middle Holocene about 4000 B.P., the subsistence base expanded to include seed processing as a supplement to foraging for fish and fowl. Intensive occupation of the region may not have occurred until around 4500 B.P. Sites dating to this period contain assemblages comparable to the Early Horizon components of the Delta region, suggesting that older traditions sometimes survive into later periods (Moratto 1984; Riddell 1951; Walker 1947; Wedel 1941). It is difficult to clearly determine the ancestry of these early peoples, although artifact assemblages associated with occupations postdating 3000 B.P. may be linked to the ancestors of the ethnographic Yokuts. Material from the Late Holocene (1500 B.P. to historic contact) indicates a greater reliance on acorns and other plant foods as well as trade with the Central Coast region and Southern California interior (Moratto 1984:183, 188).

### 4.5.1.3 Ethnography

The Project site lies within the homeland of the Northern Valley Yokuts. At the time of first contact with the Spanish missionaries, the Yokuts people, which also includes southern valley and foothill groups, collectively inhabited the entire San Joaquin Valley from the Tehachapis north to Stockton, as well as the western foothills of the Sierra Nevada from the Fresno River southward to the Kern River (Kroeber 1976). The Yokuts language belongs to the broader Penutian family, which subsumes a relatively diverse assemblage of languages including Miwok, Costanoan, Maiduan, and Wintuan (Silverstein 1978). Compared to other Penutian languages, however, Yokuts shows considerable internal linguistic homogeneity, especially given the extent of its geographic distribution. Dialects differ minimally and were mutually intelligible, at least among speakers of contiguous groups. This relative lack of linguistic differentiation suggests that ancestors of the Yokuts entered California after the arrival and subsequent radiation of the more linguistically diverse Penutian groups such as the Miwok and Costanoan (Moratto 1984:554).

The Project lies in territory ascribed ethnographically to the *Pitkachi* band of Northern Valley Yokuts, who occupied lands along the south side of the San Joaquin River extending east from Mendota to a point near Herndon (Kroeber 1976:484; Wallace 1978:462). The *Pitkachi,* named after the salt or alkali they collected from the San Joaquin Valley, occupied the sloughs formed by abandoned river channels (Kroeber 1976:484; Wallace 1978:462). The San Joaquin River, seasonal creeks, and sloughs provided a rich and diverse supply of both plant and animal resources that contrasted greatly with the surrounding dry and grassy valley plains. Principal settlements occurred on the banks of major watercourses or on low mounds close to available resources but high enough to avoid seasonal flooding.

The San Joaquin River and the Fresno Slough offered a rich and varied array of resources to the Yokuts tribes occupying its environs. The *Pitkachi* relied on the plentiful supply of riverine resources, including clams, fish, raccoon, otter, waterfowl, elk, antelope, jack rabbits, small seeds, grass nuts, and tule seed and roots. Wild seeds and acorns were harvested in the early summer and fall, respectively, and stored for use throughout the year. Burning was used to enhance the productivity of vegetable foods.

The Yokuts resided in round or oval, sunken houses with conically shaped pole frames covered with tule mats. Tules were used to manufacture a wide variety of items including baskets, floor mats, sun-shades, curtains, boats, baby cradles, and even women's skirts (Latta 1977). The Northern Valley Yokuts employed bone harpoon tips for fishing, stone sinkers for nets, chert projectile points for hunting, mortars and pestles, scrapers, knives, and bone awl tools to procure and manufacture food. They acquired marine shell from coastal tribes to make necklaces and other adornments.

The basic unit of Yokuts society was the nuclear family, which was identified with a totem symbol specific to the paternal line. Within each tribe, lineage totems were further grouped into one of two moieties, designated by the overarching symbols of the eagle and coyote (Wallace 1978:453). The basic political unit was the tribe or tribelet, which encompassed a single village or several settlements. In most Yokuts tribes, two chiefs, one representing each moiety, governed the tribe. Although they were expected to rule the tribe cooperatively, the leader of the eagle moiety was afforded a certain precedence (Kroeber 1976:496).

The serial incursion of Spanish, Mexican, and finally northern European settlers irrevocably changed the lifeways of the Yokuts and ultimately led to the complete displacement of native peoples from the valley. With the founding of Mission San Juan Bautista in 1797, Indians inhabiting the western portion of the San Joaquin Valley were forcibly recruited to serve at the mission. Latta (1999) writes that virtually all Yokuts living west of the San Joaquin River had been taken to the Spanish missions and that those remaining Indians who survived into the Mexican Period (1821–1846) perished in an 1833 epidemic.

### 4.5.1.4 History

The Spaniards were the first non-Indians to encounter the Southern Valley Yokuts when Pedro Fages led a group of soldiers through Tejon Pass into the San Joaquin Valley in 1772 (Wallace 1978:459). Four years later Francisco Garces also explored the region. Other Europeans did not follow until Lieutenant Gabriel Moraga led a group of Spanish explorers into the valley in 1806 (Clough and Secrest 1984:25–27). This party intended to locate new lands for missions, find and return runaway Indians, and relocate stolen livestock. Moraga is credited with naming both the Kings and San Joaquin rivers. Mexico's independence from Spain ended expansion of the missions in California by the early 1820s (Clough and Secrest 1984:26), and fur trappers began their forays into the California interior. Jedediah S. Smith may have been the first to enter the area during a fur trapping expedition in 1827. Smith's adventures included friendly encounters with the southern Yokuts near the Kings River, and trapping and camping along the San Joaquin River (Clough and Secrest 1984:27). After Smith's initial visit, other trappers followed until about 1837, by which time fur-bearing animals had been nearly exterminated in the valley. Other trappers included Kit Carson, Peter Skene Ogden of the Hudson's Bay Company, and Joseph Reddeford Walker.

During the mid to late 1840s settlers began to claim rights to former Mexican land grants in the area. Struggles ensued with the Indians as the claims were made and the settlers waited to be recognized legally by the U.S. government during a period of conflict and confusion over the ownership of these lands (Clough and Secrest 1984:34). Several government expeditions to the southern San Joaquin Valley during the mid to late 1840s resulted in recommendations for the development of agricultural settlements that would permanently alter the area (Preston 1981:62). After discovery of gold at Coloma in 1848, miners began entering the San Joaquin Valley. Mining claims were established along the San Joaquin River and various other localities throughout the foothills, and the mining boom spurred the establishment of other businesses as well.

As non-natives settled on the valley floor, towns soon emerged and wagon routes connecting these communities became common. To accommodate the wagons, ferries were built on the Fresno Slough and San Joaquin River. In 1854, Andrew Firebaugh established a trading post and ferry on the San Joaquin River at Firebaugh northwest of the Project area (Rehart 1999). Watson's, and later White's, ferry facilitated access across the Fresno Slough within the current Project area. By 1875, a bridge and road was constructed over the slough facilitating greater access between Fresno and the smaller agricultural communities.

In addition to EuroAmerican settlement, channelization and other manipulations of the valley waterways during the late 1800s forever changed life throughout the valley. The development of irrigation allowed agriculture to prosper in areas otherwise too dry and barren to grow food crops. The late nineteenth century witnessed the growth of other small towns in the western part of Fresno County. In 1891, Mendota was established along the Southern Pacific Railroad as a storage and switching facility site. The town was named for Mendota, Illinois by the Southern Pacific management. It was incorporated as a city in 1942 and was widely recognized for its large and successful production of cantaloupe. Agriculture continued to prosper in the valley, resulting in the intensification of local farming until the 1930s when individual farmers emerging from the Great Depression no longer found agriculture to be a lucrative endeavor. Since that time farmland has increasingly been developed for other commercial purposes. The southwestern San Joaquin Valley has seen further developments since the 1960s, including the construction of the California Aqueduct and several major highways.

## 4.5.2 Existing Cultural Resources

### 4.5.2.1 Methods

Applied EarthWorks, Inc. (Æ) conducted a comprehensive investigation of the Project area for cultural resources, including background research and a literature review, Native American consultation, and a pedestrian survey. Each of these methods is described below.

#### Pre-Field Research

Æ performed a records search at the Southern San Joaquin Valley Information Center of the California Historical Resources Information System (Information Center), located on the campus of California State University, Bakersfield, on 26 July 2007 and 23 May 2008. Site record files, maps, and other materials were examined to identify previously recorded cultural resources and prior surveys within the Storage Field, along the gas pipeline route and electric power line route, and within staging areas, as well as within a 0.5-mile radius surrounding those areas. The sources consulted included the Historic Property Data File, the National Register of Historic Places, California Register of Historical Resources, the listings of California Historical Landmarks, the California Inventory of Historic Resources, and the California Points of Historical Interest. Additionally, Æ gathered historical information on the history of agriculture and ranching activities in the study area. Data sources included United States Geological Survey topographic maps and historical atlases, internet sites, and Æ's own extensive in-house library.

#### Native American Consultation

On 25 July 2007, Æ faxed the Native American Heritage Commission (NAHC) a request for a sacred lands file search of the Storage Field and proposed gas pipeline route and asked for the contact information of Native American representatives in the Project vicinity. In its response dated August 3, 2007, the NAHC stated that the search failed to indicate the presence of resources in the specified areas, and provided Æ with a contact list of people knowledgeable about cultural resources in the Project vicinity. On November 19, 2007, Æ mailed information about the Project to Chairperson Clarence Atwell of the Santa Rosa Rancheria, Tribal Administrator Carol Bill of Cold Springs Rancheria of Mono Indians, Jerry Brown of the Chaushiha Tribe, Chairperson Ron Goode of the North Fork Mono Tribe, Environmental Coordinator John Goodfellow of the Table Mountain Rancheria, Chairperson Lee Ann Walker Grant of Table Mountain Rancheria, Chairperson Karin Kirkendal of the Dumna Tribal Government, Chairperson Connie Lewis of Big Sandy Rancheria of Mono Indians, James Redmoon of the Dumna Tribal Government, Keith F. Turner of the Dumna Wo-Wah Tribal Government, and Kenneth Woodrow.

Æ contacted the NAHC again on June 6, 2008 to inform them of Project refinements, including the gas pipeline route modifications and the location of the electric power line route and Project staging areas and to request a search of their sacred lands file for these areas. Æ received a response from the NAHC on June 16, 2008 stating that again the search failed to indicate the presence of resources in the specified areas. Included in the letter was an updated list of Native

American representatives to contact about the Project. On June 20, 2008, Æ mailed the revised Project information to all those originally contacted as well as to the new representatives listed including Lorrie Planas of the Choinumni Tribe, and Chairman John Davis of the Kings River Choinumni Farm. Records of communications with the Native American community are provided in Appendix B.3.

### Survey Methods

Æ Staff Archaeologist Andrew Monastero and Field Technician Jim Redmoon performed a pedestrian survey of the Storage Field surface facility sites, the gas pipeline and electric power line routes, and the proposed staging areas between January 17 and June 9, 2008. The Storage Field lies in land actively cultivated in row crops, orchards, and vineyards. Several well pads and related facilities are present throughout the Storage Field. Æ performed a pedestrian survey for the proposed 10-acre central compression station, the candidate locations for Injection and Withdrawal (IW) and Observation and Monitoring (OM) wells, and the proposed gas gathering and water handling lines leading from the compressor station to the injection wells. In all cases, an area slightly wider than the proposed area of impact was surveyed. The survey for the compressor station included a 425 by 365 meter area (approximately 38 acres). An approximate 20,000 and 33,000 square meter area (5 to 8 acres) was surveyed for each of the proposed and alternate well locations, depending on its size. A 30 meter (100-foot) wide transect was surveyed for approximately 10 miles of proposed gathering lines within the Storage Field.

The 27-mile gas pipeline route extends from Pacific Gas and Electric's (PG&E) existing Line 401 near I-5 to the compressor station site. Æ surveyed the entire proposed pipeline route except for a 1 mile segment along SR-180 between Sonoma Avenue and an unnamed farm road, where property access was not granted. Once access is granted, the area will be surveyed and the results will be reported in a supplemental document. The survey was conducted using parallel transects spaced at 15 meters apart resulting in a 30 meter (100 foot) wide corridor. In general, the survey area was confined to one side of the road; however, it was widened to cover both sides in areas where the route had not been finalized. Æ widened its survey coverage to accommodate the proposed horizontal directional drill crossings near active and remnant waterways, as well as areas planned for pipe lay down during construction. The proposed electric power line extends approximately 9.75 miles between PG&E's existing 115 kilovolt distribution line on Avenue 7½ and the compressor station site. Æ surveyed an approximate 15 to 20 meter wide corridor along the proposed electric power line route. Additionally, Æ conducted an archaeological survey at three of the four proposed construction staging areas. These included a 30-meter wide transect around an abandoned cotton processing plant north of the central compressor station, and two areas (measuring 92,150 and 60,837 square meters, respectively) on the Spreckels Sugar Plant just north of SR 180. The fourth staging area is proposed for the Mendota rail yard in an area that is currently used for parking and storage. Because of the extensive modification to this area, Æ's examination included background research and a site visit, only. A pedestrian survey was not conducted. Figure 4.5-1 shows the various areas surveyed for the Project.

The Project area was examined using parallel transects spaced approximately 15 meters apart. Each transect was walked in a zigzag fashion to allow maximum coverage of the ground surface. Special attention was paid to disturbed soil around rodent holes, in cleared areas, and along cut banks, especially in areas obscured by dense seasonal grasses or crops. Where feasible, vegetation was scraped away by trowel to expose the ground surface. The survey team also took note of remnant features of the former topography (e.g., remnant slough channels) that might have been attractive for earlier settlement or use.

Photographs of the study areas as well as of specific views of natural and cultural features were taken with a Pentax Optio A20 digital camera. Each photograph was logged on a Photograph Record. Observations regarding the natural and cultural landscape were recorded daily on a Survey Field Record.

When an artifact that appeared older than 50 years was discovered, surveyors marked its position and closely examined the area to determine if other materials occurred in association. Site boundaries were determined on the basis of the distribution of surface artifacts. Once the boundary of the cultural resource was established, it was assigned a sequential temporary number and recorded on a California Department of Parks and Recreation (DPR) Primary Record (DPR 523A). Additional details about the resource were recorded on an Archaeological Site Record (DPR 523C), as appropriate, following the procedures outlined in *Instructions for Recording Historical Resources* (Office of Historic Preservation 1995). Locational information for each discovered cultural resource was obtained using a Trimble GeoXT Global Positioning System employing the Universal Transverse Mercator (UTM) coordinate system and the 1983 North American Datum (NAD).

### 4.5.2.2 Findings

#### Records Search

The records search revealed that 12 cultural resources investigations have been conducted and four cultural resources were previously recorded along the proposed gas pipeline route; one cultural resources investigation was conducted and two cultural resources were identified along the proposed electric power line route; and two cultural resources investigations were conducted and one cultural resource was identified within the Storage Field area. Two cultural resources investigations have occurred within the proposed staging areas; however, no cultural resources had been previously identified at these locations. Both investigations took place along SR 33 adjacent to the Mendota railyard. An additional five cultural resources are located within 0.5-mile of the Storage Field, gas pipeline and electric power line routes. A list of the previously known cultural resources within and adjacent to the Project area are provided in Table 4.5-1 (see also Figure 4.5-2; *this figure is not for public distribution, and is provided to the CPUC under separate cover)*, and the known archaeological investigations within the Project area listed in Table 4.5-2.

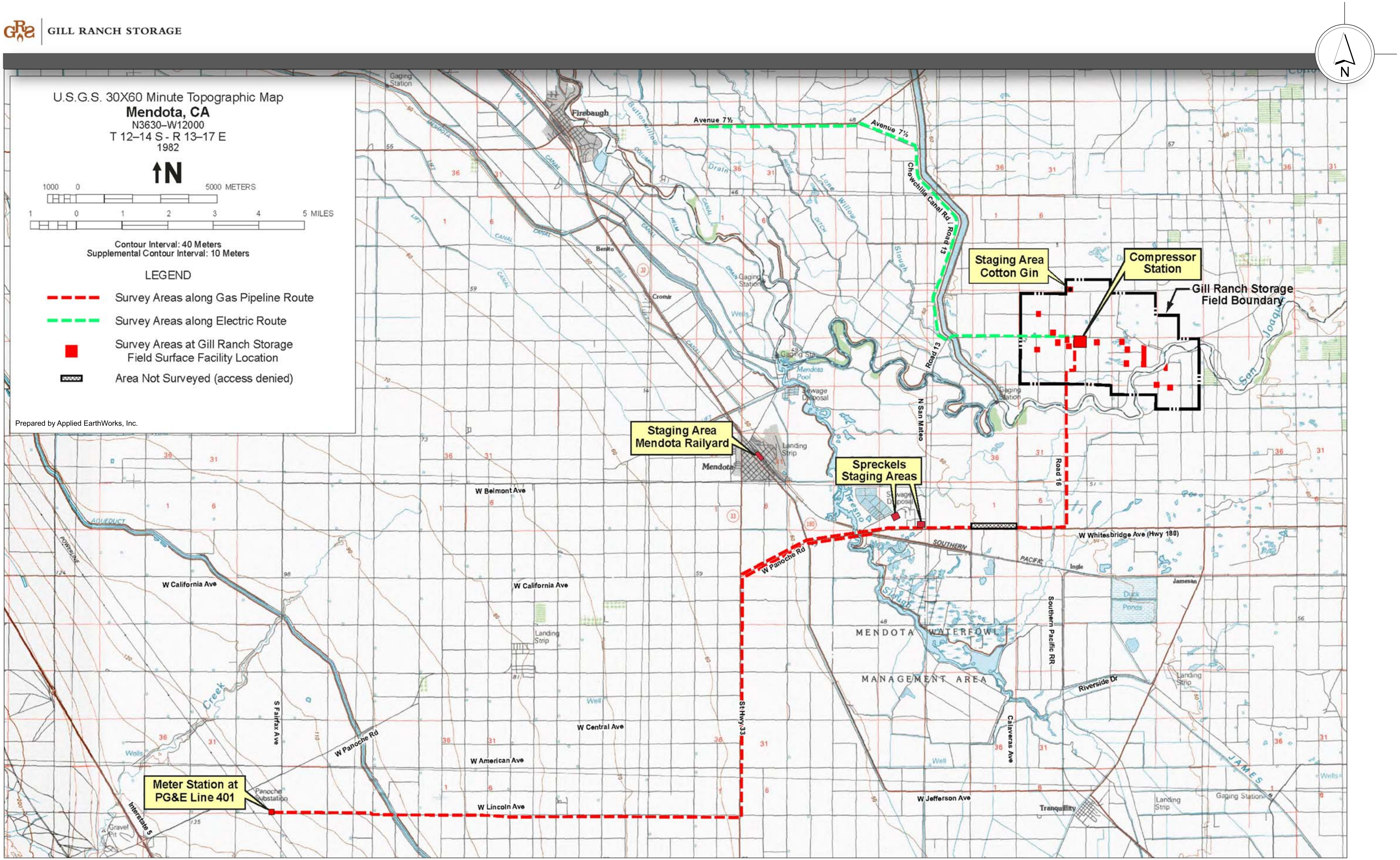





FIGURE 4.5-1 | CULTURAL RESOURCES SURVEY AREA

**Table 4.5 1: Previously Identified Cultural Resources**

| Trinomial / Primary Number | Area/Route | Site Type | Reference |
|---|---|---|---|
| Within Project Study Areas | | | |
| CA-MAD-4 | Electric Power Line | A moderate sized prehistoric site containing ground and flaked stone artifacts and a human burial. | Maseey & Hewes (1939) |
| CA-MAD-301 | Gas Storage Field/ Electric Power Line | A large prehistoric site containing numerous ground and flaked stone artifacts, and human burials. | Peak and Gerry (1975a) |
| CA-FRE-536 | Pipeline | Prehistoric site containing flaked stone artifacts, shell, and bone fragments. | Peak (1975), McGowan (1988), Coleman and Flint (2001) |
| CA-FRE-538 | Pipeline | Diffuse prehistoric scatter of baked clay fragments, projectile points, and beads. | Peak and Gerry (1975b) |
| Watson's Ferry | Pipeline | Location of ferry crossing over Fresno Slough, hotel and store (1868-late 1920s); evaluated as not significant. | Miksell (1989) |
| Jack's Resort Complex | Pipeline | Restaurant, cottages, and trailers (ca. late 1920s-recent); evaluated as not significant. | Miksell (1989) |
| Within 0.5 Mile of Project Study Areas | | | |
| CA-MAD-76 | Electric Power Line | Small prehistoric site with two human burials and bird bone ornaments. | Davis & Elsasser (1958) |
| CA-FRE-398 | Pipeline | *Pitkachi* Yokuts Ethnographic village site *Gewachiu.* | King (1968) |
| CA-FRE-2312 | Pipeline | Burial site. | Deacon (1966) |
| CA-FRE-497 | Pipeline | Prehistoric scatter of flaked and ground stone artifacts. | Ritchie (1971) |

A review of the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) revealed that none of the previously historic identified sites have been listed or determined eligible for inclusion in the national or California registers. However, only two of the sites have been evaluated. These include Jack's Resort Complex and the site of the non-extant 1870 hotel at the Watson Ferry crossing. There are no known historical sites within the Storage Field boundary, or within the gas pipeline and electric power line corridors. The Project would have no impact on historic places.

Additional data sources from Æ's in-house library revealed that few formal archaeological investigations have been completed in the general Project vicinity, and only limited information regarding those previous studies has been published. Most of these excavations were conducted along the Fresno Slough and San Joaquin River prior to 1970 and were focused specifically on large village mounds. These include the *Pitcachi* Yokuts village site of Gewachiu (CA-FRE-398) (McAlexander and Upson 1969) and the Tranquility site approximately 2.5 miles northeast of Tranquility (Hewes 1946). Human burials were removed from each of these sites, suggesting that the potential to uncover human remains in the Project area is high.

Library research, focused specifically on early Euro-American settlement and ranching within the Project area, revealed that by the late 1800s lands surrounding the Fresno Slough were parceled among several landowners, most of whom were prominent cattle or sheep ranchers (Thompson 1891). In the 1880s, the Storage Field and much of the electric power line route was part of the massive land holdings of the Miller and Lux Company, the largest producer of cattle in California during that time. A few homesteads, no longer extant, are depicted near the intersection of Lincoln Avenue. and SR 33 on Thompson's 1891 parcel map.

**Table 4.5-2: Known Cultural Resources Investigations within Project Area**

| Reference No. | Area/Route | Type of Investigation | Reference |
|---|---|---|---|
| MA-915 | Electric Power Line | Cultural Resources Inventory and Evaluation for the Proposed Madera Water Bank, Madera County, CA. | Roark (2002) |
| MA-49 | | An archaeological assessment within portions of the Lower San Joaquin Levee District Fresno, Merced and Madera Counties, CA. | Shapiro and Shapiro (1997) |
| MA-48<br>FRE-147 | Gas Storage Field | An archaeological assessment within portions of the Lower San Joaquin Levee District and the Madera County Flood Control and Water Conservation Levees, Fresno, Merced and Madera Counties, CA. | Syda and Shapiro (1997) |
| FRE-171<br>FRE-1617 | Gas Storage Field | Archaeological survey for widening of Route 33 between Mendota and Firebaugh. | Kus 1988<br>Marine 1999 |
| FRE-245<br>FRE-246<br>FRE-247 | Railyard Staging Area | Archaeological survey and architectural investigation for widening of I-180 between Mendota and Kerman. | Brady and Beck (1988), Caltrans (1996), Parks (1989) |
| FRE-1790 | Pipeline | Extended Phase 1 archaeological survey near CA-FRE-536 and FRE-538 for the Highway 180 Widening and Rehabilitation Project. | Coleman and Flint (2001) |
| FRE-644 | Pipeline | Archaeological reconnaissance along the Fresno Slough. | Peck (no date) |
| FRE-1925<br>FRE-2006<br>FRE-2007 | Pipeline | Cultural Resources Potential Assessment and Phase 1 Environmental Site Assessment for the proposed Federal Correctional Facility. | Dorworth (2001), Louis Berger Group, Inc. (2001a, 2001b) |
| FRE-140 | Pipeline | Archaeological survey for the proposed prison facility. | Brown and Becker (1997) |
| FRE-320<br>FRE-321<br>FRE-1959 | Pipeline | Cultural Resources Assessment, Archaeological Survey, and Research Design and Inventory for the PGT-PG&E Pipeline Expansion Project. | Canaday et al. (1992), Moratto et al. (1990), and Moratto et al. (1994) |

### Native American Consultation

A search of the NAHC sacred lands file regarding the Storage Field and gas pipeline route failed to indicate the presence of Native American cultural resources within the immediate Project area. The NAHC supplied Æ with a list of Native American representatives to be contacted regarding any information they might have with respect to cultural resources in the study locale. On November 26, 2007, Æ received a letter from Robert Marquez, Vice-Chairman of the Cold Springs Rancheria expressing concern for native gathering areas along the San Joaquin River, as well for the procedures for general construction, operation, and maintenance. He requested photos of the area adjacent to the San Joaquin River, data on prior construction and proposed pipeline construction techniques near existing waterways, and emergency procedures for pipeline leaks above or below ground. A copy of this letter was provided to the Applicants.

As requested by the NAHC, follow-up telephone calls were made on August 3, 2007 to the Native American individuals/organizations that were sent letters requesting information about cultural resources within the Project area. Mr. Franco of the Santa Rosa Rancheria commented that the Fresno Slough area is highly sensitive, particularly for large village sites and human burials. He emphasized that a pedestrian survey of the Project area was inadequate for identifying buried archaeological sites and suggested site testing to better define the site boundaries and depth of identified cultural resources as well as mandatory monitoring during construction adjacent to active and remnant waterways. He also emphasized the importance of having a burial agreement in place before subsurface excavation occurs. To date none of the other individuals/organizations contacted have responded.

The NAHC responded to Æ's request to search the sacred lands file for Native American cultural resources along the proposed electric power line route and staging areas on 16 June 2008. A search of the NAHC sacred lands file failed to indicate the presence of Native American cultural resources within the area. The NAHC supplied Æ with a list of Native American representatives to be contacted regarding any information they might have with respect to cultural resources in the electric power line and staging areas study locales. Æ contacted these individuals by mail on June 20, 2008. There has been no response to date.

### Survey Results

The field surveys resulted in the identification of six new prehistoric cultural resources within the Project area. All of the discovered resources are isolated artifacts and include three handstones, two pieces of basalt debitage, and a quartzite core. A more detailed description of the survey results for the various Project areas is provided below. Cultural resources locations are illustrated in Figure 4.5-2. (*This figure is not for public distribution, and is provided to the CPUC under separate cover.)*

#### *Storage Field Surface Facility Sites*

The Storage Field surface facility sites contain row crops, orchards, vineyards, fallow fields, farm access roads, equipment storage areas, and natural gas well pads. Ground visibility ranged from less than 30 percent in areas with existing crops to more than 90 percent in the fallow fields. Two isolated artifacts were identified in the surface facility study area in the vicinity of the previously recorded site, CA-MAD-301. These include two handstones (GL-ISO-1 and ISO-7) [Table 4.5-3]). The artifacts occurred more than 50 meters from one another and thus were recorded as isolated finds.

#### *Gas Pipeline Route*

The gas pipeline route lies within land primarily used for agriculture (i.e., almond and pistachio orchards, vineyards, and row crops). It transects three major surface water features (the California Aqueduct, Fresno Slough, and the San Joaquin River), as well as several smaller canals and irrigation ditches. Visibility ranged from less than 10 percent near active and remnant waterways to more than 90 percent in fallow agricultural fields. Identified cultural material along the pipeline route includes two isolated pieces of basalt debitage (GL-ISO-2, and ISO-4) and one isolated quartzite core (GL-ISO-3) [Table 4.5-3]).

**Table 4.5-3: Cultural Resources Discovered during the Survey**

| Designation | Item | Material | Description | Quadrangle |
|---|---|---|---|---|
| GL-ISO-1 | Handstone Fragment | Basalt | Bifacial | Mendota Dam |
| GL-ISO-2 | Flake | Basalt | Tertiary | Tranquility |
| GL-ISO-3 | Core | Quartzite | Multidirectional | Tranquility |
| GL-ISO-4 | Flake | Basalt | Tertiary | Tranquility |
| GL-ISO-6 | Handstone | Granite | Unifacial | Firebaugh |
| GL-ISO-7 | Handstone | Granite | Bifacial | Mendota Dam |

### *Electric Power Line Route*

The proposed electric power line route parallels the road following an existing electric power line. The route borders agricultural fields planted with tree fruit, grapes, and row crops and crosses one major water course, the Chowchilla Canal, which was dry at the time of the survey. The survey was conducted using parallel transects spaced approximately 10 meters apart within the 15 to 20-meter wide corridor. Ground visibility averaged 90 percent along the route. One isolated handstone (GL-ISO-6) was identified along the route. The record search revealed that the electric power line route intersects two previously identified cultural resources: CA-MAD-4, and MAD-301. Æ's archaeological surveyors thoroughly examined the electric power line route area at each of these locations in an attempt to relocate the sites and verify their contents and boundaries in relation to the electric power line route area. No artifacts, features, or other prehistoric cultural indicators were observed on the ground surface at either of the locations.

### *Staging Areas*

Four staging areas were investigated for the Project. These areas will be used primarily to off-load and store equipment and vehicles during the course of construction. No subsurface excavation is planned for the staging areas. Two of the areas occur within the Spreckels property just north of SR-180 (see Figure 4.5-1). Æ's archaeologists surveyed approximately 92,150 square meters (23 acres) for the southern staging area and approximately 60,837 square meters (15 acres) for the northern one using parallel transects spaced 10 to 15 meters apart. Both areas were covered in thick, knee-high spring grasses and ground visibility was extremely poor. No artifacts or features were observed within the survey area; however, if materials were present it would have been difficult to identify them given the dense vegetation.

A third staging area is planned for an area surrounding an abandoned cotton plant 1 mile north of the compressor station site. Æ surveyed a 30-meter wide transect around the perimeter of the cotton plant. The area was cleared of crops and spring grasses and overall the ground visibility was quite good (90 percent visibility). No artifacts were observed during the survey.

The Mendota railyard will be used for offloading materials and could be used as an additional staging site. The railyard is covered in gravel while other portions are paved. It is currently used for parking and equipment storage. Æ archaeologists visited the location and confirmed that a pedestrian survey of the area was not warranted given the proposed use of the site during Project construction.

## 4.5.3 Regulatory Setting

### 4.5.3.1 Federal

Various federal laws, regulations, and guidelines specify how cultural resources are to be managed in the context of projects that are considered “federal undertakings” (per 36 CFR 800). These federal statutes and guidelines may be relevant to the proposed Project if federal funding is used, federal permits or authorizations are required, or the project crosses land managed by a federal agency. It is presently anticipated that the Project will require coverage under USACE Nationwide Permit 12. There will be no other federal funding or authorizations required for the Project, and the Project does not cross land managed by a federal agency.

Relevant federal laws and regulations are: the National Historic Preservation Act of 1966 (NHPA), as amended; the National Environmental Policy Act of 1969; the Advisory Council on Historic Preservation's regulations, Protection of Historic Properties (36 CFR 800), establishing procedures for compliance with Section 106 of the NHPA; the National Park Service (NPS) regulations, NRHP (36 CFR 60); Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (FR 190: 44716–44742); and the NPS regulations, Curation of Federally-Owned and Administered Archaeological Collections (36 CFR 79). Pertinent federal laws and regulations are summarized below.

- **The National Historic Preservation Act (NHPA) of 1966** requires federal agencies to consider the preservation of historic and prehistoric resources. The NHPA authorizes the Secretary of the Interior to expand and maintain a NRHP, and it establishes an Advisory Council on Historic Preservation (ACHP) as an independent federal entity. Section 106 of the Act requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment on the undertaking prior to licensing or approving the expenditure of funds on any undertaking that may affect properties listed, or eligible for listing, in the NRHP.

- **The National Environmental Policy Act of 1969** requires federal agencies to foster environmental quality and preservation. Section 101(b)(4) declares that one objective of the national environmental policy is to “preserve important historic, cultural, and natural aspects of our national heritage... .” For any major federal actions significantly affecting environmental quality, federal agencies must prepare, and make available for public comment, an Environmental Impact Statement.

- **Advisory Council Regulations, Protection of Historic Properties** (36 CFR 800) establish procedures for compliance with Section 106 of the NHPA of 1966. These regulations define the Criteria of Adverse Effect, define the role of State Historic Preservation Officer (SHPO) in the Section 106 review process, set forth documentation requirements, and describe procedures to be followed if significant historic properties are discovered during implementation of an undertaking. Prehistoric and historic resources deemed significant (i.e., eligible for listing in the National Register of Historic Places, per 36 CFR 60.4) must be considered in project planning and construction. The responsible federal agency must submit any proposed undertaking that may affect NRHP-eligible properties to the SHPO for review and comment prior to Project approval.

- **National Park Service Regulations, NRHP** (36 CFR 60), set forth procedures for nominating properties to the NRHP, and present the criteria to be applied in evaluating the eligibility of historic and prehistoric resources for listing in the NRHP.

- **Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines** (FR 190:44716–44742) offer non-regulatory technical advice about the identification, evaluation, documentation, study, and other treatment of cultural resources. Notable in these Guidelines are the “Standards for Archaeological Documentation” (p. 44734) and “Professional Qualifications Standards for Archaeology” (pp. 44740–44741).

Cultural resources are also protected under regulations of the Department of Transportation Act of 1966. Section 4(f) of the act requires a comprehensive evaluation of all environmental impacts resulting from federal-aid transportation projects administered by the Federal Highway Administration, Federal Transit Administration, and Federal Aviation Administration that involve the use—or interference with use—of several types of land: public park lands, recreation areas, and publicly or privately owned historic properties of federal, state, or local significance. The Section 4(f) evaluation must be sufficiently detailed to permit the U.S. Secretary of Transportation to determine that there is no feasible and prudent alternative to the use of such land, in which case the project must include all possible planning to minimize harm to any park, recreation, wildlife and waterfowl refuge, or historic site that would result from the use of such lands. If there is a feasible and prudent alternative, a proposed project using Section 4(f) lands cannot be approved by the Secretary. Detailed inventories of the locations and likely impacts on resources that fall into the Section 4(f) category are required in project-level environmental assessments. The Project is not a federal aid transportation project.

### 4.5.3.2 State

#### California Environmental Quality Act (State Public Resources Code)

Under the California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.; CEQA), a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. A historical resource is a resource that is either listed or eligible for listing in the CRHR, listed in a local registry, or determined to be significant by the lead agency. (See Section 5024.1 and Section 21084 of the Public Resources Code.)

The fact that a resource is not listed in, or determined to be eligible for listing in the CRHR, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in a historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be a historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

CEQA statutes and guidelines direct public agencies to avoid damaging effects on historical resources whenever feasible. If avoidance is not feasible, the importance of the resource must be evaluated using the criteria outlined in the Guidelines. Resources deemed not important by CEQA criteria do not require further discussion in the CEQA process.

CEQA provides guidelines for mitigating impacts to archaeological and historical resources in Section 15126.4. Achieving CEQA compliance with regard to treatment of impacts to significant cultural resources requires that a mitigation plan be developed for the resource(s). Preservation in place is the preferred manner of mitigating impacts to significant historical resources.

If human remains are discovered in any location other than a dedicated cemetery, Section 7050.5(b) of the California Health and Safety Code also must be followed.

### 4.5.3.3 Local

#### Fresno County General Plan

Section J, Historical, Cultural, and Geological Resources, of the Open Space and Conservation element of the Fresno County General Plan, includes goal OS-J which seeks to identify, protect, and enhance Fresno County's historical, archaeological, paleontological, geological, and cultural sites and their contributing environment. This goal's associated policies are listed as OS-J.1 through OS-J.13.

#### Madera County General Plan

The Recreational and Cultural Resources section (Section 4) of the Madera County General Plan includes goal 4.D which seeks to identify, protect, and enhance Madera County's important historical, archaeological, paleontological, and cultural sites and their contributing environment. This goal's associated policies are listed as 4.D-1 though 4.D-8.

## 4.5.4 Impact Assessment

### 4.5.4.1 Significance Criteria

As noted above, under CEQA, a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. A historical resource is a resource that is either listed or eligible for listing in the California Register of Historical Resources, listed in a local registry, or determined to be significant by the lead agency (see Section 5024.1 and Section 21084 of the Public Resources Code).

A resource eligible for listing on the California Register of Historic Resources (PRC 5024.1, Title 14 CCR, Section 4852) is a resource that:

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

CEQA also emphasizes that evaluations take into consideration the historic integrity of a resource, combining its location, design, setting, materials, workmanship, feeling and association.

If the Project may damage an important historical resource, it may have a significant effect on the environment. Direct impacts may occur by:

- Physically damaging, destroying, or altering all or part of the resource;
- Altering characteristics of the surrounding environment that contribute to the resource's significance;
- Neglecting the resource to the extent that it deteriorates or is destroyed. Indirect impacts primarily result from the effects of project-induced population growth. Such growth can result in increased construction as well as increased recreational activities that can disturb or destroy cultural resources; or
- The incidental discovery of cultural resources without proper notification.

Properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR and thus are significant historical resources for the purpose of CEQA (Pub. Res. Code Section 5024.1[d][1]).

Appendix G of the CEQA Guidelines provides guidance for evaluating whether a development project may result in significant effects. Appendix G suggests that a development project could have a significant effect on cultural resources if the project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5.

- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.

- Disturb any human remains, including those interred outside of formal cemeteries.

Appendix G of the CEQA Guidelines also lists the following criteria related to Paleontological Resources:

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

The Project's potential impacts to paleontological resources are discussed in Section 4.6, Geology, Soils, and Paleontology.

### 4.5.4.2 Impacts and Mitigation Measures

#### Cause a substantial adverse change in the significance of a historical or archeological resource as defined in Section 15064.5 of the CEQA Guidelines

**IMPACT CR-1: Project development may cause a substantial adverse change in the significance of a previously identified cultural or archeological resource which may qualify as historical resources.** These resources include the nine previously identified prehistoric archaeological resources within the Project area (two archaeological sites and seven isolates). An historical resource, as defined in Section 15064.5 of the CEQA Guidelines, is a cultural resource that meets the criteria for listing on the CRHR and is considered "historically significant" (Public Resources Code Section 5024.1, Title 14 CCR, Section 4852). An archaeological resource is an archaeological artifact, object, or site. Archaeological sites may be determined to be an historical resource, as defined in 15064.5(a) of the CEQA guidelines, or considered to be a "unique archaeological resource." A unique archaeological resource is one that contains information to answer important scientific research questions; has a special and particular quality, such as being the oldest or best example available of its type; or is directly associated with an important prehistoric or historic event or person (Public Resources Code Section 21083.2(i)). Impacts to previously identified cultural resources can be reduced to less than significant with the implementation of the comprehensive procedure, including defining the boundaries of each previously identified cultural resource and its spatial relationship to the Project area, evaluating each archaeological site for significance, assessing the magnitude of any impacts, and avoiding or mitigating impacts if appropriate as discussed in Mitigation CR-1 below.

**Mitigation CR-1. Additional studies of previously identified cultural resources.** To comply with state and federal law, additional studies will be conducted in areas where cultural resources were previously identified prior to construction to determine potential Project-specific direct and indirect impacts on historical resources and develop appropriate mitigation measures. Any cultural resources that would be directly affected by the Project would be evaluated for significance according to the criteria of the NRHP and/or CRHR, as appropriate. Two archaeological sites were previously recorded within the Project area; however, these sites could not be relocated during the pedestrian survey. This is not atypical for sites that were recorded over 30 years ago and occur in areas of high agricultural activity. Because the boundaries of these resources and their spatial relationship to the impact area are unclear, boundary definition using more detailed surface and subsurface investigations will be required at each site. If it is determined that a site occurs within the Project boundaries, it will be necessary to conduct significance evaluations to determine if it qualifies as a historical resource. Because of the high potential for buried cultural deposits, subsurface testing also will be conducted at each isolate location to determine if buried cultural deposits are associated. Under CEQA, an isolated artifact does not qualify as a historical resource. Thus, if no buried cultural deposits are observed during subsurface testing at the isolate locations, further management of the isolate is not required. However, if subsurface testing reveals that the isolate is associated with a larger buried deposit, than the site will be evaluated and its significance determined.

Significance evaluations may require additional archival and background research, additional field documentation, or other studies. Evaluation of archaeological properties may require test excavations, backhoe trenching, or other forms of subsurface investigation; laboratory processing and analysis of recovered remains; and a variety of special technical studies. These evaluations will define the qualities of the resource that make it significant and assess site integrity as a means for judging the nature and extent of Project impacts. Significance evaluations and impact assessments will be performed by appropriately qualified specialists meeting the Secretary of Interior's Professional Qualifications Standards (FR 190: 44740–44741). Any artifacts and other remains that may be collected from the field, along with field records and other documentation, will be curated at an institution capable of providing secure, long-term storage, care, and access to the public.

A technical report documenting the results of isolate testing, subsurface boundary definition, resource evaluations, and other studies will be prepared. Because this report may detail locations within the Project areas known to be culturally sensitive, it will be a confidential technical appendix to any CEQA document prepared for the Project (See Govt. Code § 6254(r).) Summary sections included in the body of such CEQA document will not disclose sensitive site location information. The confidential technical report sections will discuss the importance of historical and archaeological resources identified during the study, identify the potential for significant impacts, and discuss adequate and feasible mitigation measures. The report will adhere to professional standards outlined by SHPO in *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Jackson 1990).

Portions of the Project are subject o U. S. Army Corps of Engineers (USACE) jurisdiction under the Section 404 of the Clean Water Act (Nationwide Permit 12). As such, the USACE will be the federal lead agency and will conduct a review of the Project. Under the federal review process for cultural resources, the lead federal agency will consult with the SHPO regarding the identification, evaluation, and subsequent mitigative treatment of historic resources. The SHPO does not play a role in the CEQA process unless state lands, state-owned properties, or unusually important resources are involved. For federal projects, the SHPO will be asked to review and concur with the federal agency's findings regarding the significance of resources and the appropriate treatment.

If the studies described above determine that "historical resources" or "unique archaeological resources" will be affected by the proposed Project, then additional impact mitigation may be required if the Project cannot be redesigned to avoid the resource. Impact mitigation may take a variety of forms depending on the nature of the site and the nature and extent of impacts. Site avoidance is the preferred mitigation measure. If historical or unique archaeological resources cannot be avoided entirely, portions of the resources outside the impact area may be preserved in an exclusion zone—a fenced area where construction equipment and personnel are not permitted. Together, avoidance and use of exclusion zones ensures the maximum *in-situ* preservation of significant cultural resources.

Where avoidance is infeasible and historical and unique archaeological resources are jeopardized by the Project, one or a combination of the following measures will be implemented:

- Data recovery excavation;
- Additional analysis of existing collections;
- Additional archival/historical research;
- Photographic documentation; and
- Archaeological monitoring during construction, followed by data recovery excavation or other appropriate measures if significant archaeological remains are exposed.

Final decisions regarding impact mitigation will be made in consultation with the Applicants, regulatory agencies, technical specialists, and other interested parties. If data recovery excavation is the recommended mitigation, then a data recovery plan will be prepared. Data recovery would be supervised by appropriately qualified specialists meeting the Secretary of Interior's Professional Qualifications Standards (FR 190: 44740–44741). Artifacts and other remains collected from the field, along with field records and other documentation, will be curated at an institution capable of providing secure, long-term storage, care, and access to the public.

In summary, the Applicants will follow a comprehensive procedure to define the boundaries of each previously identified cultural resource and its spatial relationship to the Project impact areas; evaluate each archaeological site for significance; assess the magnitude of impacts, and avoid or mitigate the impacts, if appropriate. With the implementation of this procedure, impacts of Project development on previously identified cultural resources will be reduced to less than significant, and no further mitigations are required.

**IMPACT CR-2: Project development may cause a substantial adverse change in the significance of a buried historical resource.** Lack of surface evidence of archaeological resources does not preclude the existence of archaeological resources, especially those that are buried under alluvium. Flooding in the San Joaquin Valley has resulted in the burial of older prehistoric deposits under deep alluvium. Some of the oldest prehistoric artifacts in the San Joaquin Valley, dating more than 8,000 years old, were discovered under 2 to 3 meters (approximately 9 to 11 feet) of sediment along watercourses south of the Project area. Impacts to buried historic resources in sensitive Project locations can be reduced to less than significant with the implementation of a buried site testing program, as discussed in Mitigation CR-2 below.

**Mitigation CR-2. Buried site testing program in sensitive cultural resource areas.** A buried site testing (BST) program will be implemented prior to construction in Project areas sensitive for buried archaeological sites. Highly sensitive areas for buried archaeological sites that will require BST include those portions of the pipeline and Storage Field facilities that are adjacent to the San Joaquin River, Fresno Slough, and other active and remnant waterways within the Project boundaries. Buried site testing (BST) includes the combination of controlled mechanical sampling of sediments and the manual screening of those sediments in an effort to locate buried archaeological deposits. Mechanized sampling is accomplished principally by using a backhoe to excavate trenches approximately 15 feet long at standard intervals within the target area. Sampling of the backhoe trenches will be controlled by mechanically excavating the sediments in standard levels, and in the process, setting aside one backhoe bucket load of sediment from each level for manual screening through 0.25-inch mesh. When intact cultural deposits are uncovered during the exploratory backhoe trenching, 1 by 1 meter test units will be excavated by hand to further explore the site's depositional history, cultural and natural stratigraphy, and to gather data for site evaluation. If BST indicates that a cultural resource does not meet established significance criteria, lacks integrity, or will not be impacted by the Project, then further investigations or mitigation are not necessary. If significant buried cultural resources will be impacted by construction, then mitigative treatment will be required. Prior to the excavation, a BST plan will be written specifying the areas to be tested, the methods and procedures to be used, and the protocols to follow upon discovery of cultural materials. In general, significance evaluation and treatment measures will follow protocols described in Mitigation CR-1. BST will be performed by appropriately qualified specialists meeting the Secretary of Interior's Professional Qualifications Standards (FR 190: 44740–44741).

With the implementation of this procedure, impacts of Project development on buried cultural resources will be reduced to less than significant, and no further mitigations are required.

**IMPACT CR-3: Project development may cause a substantial adverse change in the significance of historical or archeological resources discovered during construction.** It is possible that buried or concealed archaeological sites, features, or other cultural properties eligible for listing in the California or national registers are present within areas designated for development and these resources could become exposed during the course of construction or other Project-related activities. Such sites or features might include aboriginal middens or artifact scatters, remnants of aboriginal houses, fire hearths, human burials and cemeteries, and historical structural foundations, dumps and trash deposits. Impacts to buried historic resources that could become exposed during construction can be reduced to less than significant with the implementation of a cultural resources monitoring program, as discussed in Mitigation CR-3 below.

**Mitigation CR-3. Cultural resources monitoring program.** The Applicants will retain the services of a qualified professional archaeologist (as defined above) to monitor trenching, grading, or other ground disturbance within Project areas that were not subject to the subsurface investigations proposed in mitigations CR-1 and CR-2. Additionally, the Applicants will inform all contractors and subcontractors about the potential for archaeological discoveries during construction, and an archaeologist will provide a brief training session to all construction personnel on the appropriate responses to such discoveries. The orientation will include a description of the kinds of cultural resources that might be encountered during construction and the steps to be taken if such a find is unearthed.

If buried or concealed cultural resources are discovered during excavation, construction, or related development work, all such work will cease in the vicinity of the find until a qualified archaeologist properly investigates the find using the identification and evaluation procedures discussed for Mitigation CR-1. If human remains are found, procedures for their treatment will follow the CEQA Guidelines in 14 CCR 15064.5(e) (see also Impact CR-4). If the discovery is determined to be a significant historical resource that would be affected by the Project, then appropriate mitigative or protective measures will be taken following any procedures described above for Mitigation CR-1. With implementation of these measures, impacts related to historical or archeological resources discovered during construction will be reduced to less than significant, and no further mitigations are required.

### Disturb any human remains, including those interred outside formal cemeteries

**IMPACT CR-4: Historic or prehistoric interments identified at archaeological sites within the Project area or discovered during construction may be affected by the proposed construction.** Section 5097 of the California PRC and Sections 7050.5, 7051, and 7054 of the *California Health and Safety Code* have specific provisions for treatment of human burials. Disturbing human remains could violate these provisions, as well as destroy the resource. Impacts to prehistoric interments discovered during construction can be reduced to less than significant with the implementation of appropriate response measures, as discussed in Mitigation CR-4 below.

**Mitigation CR-4. Handling of human remains discovered during construction.** If human remains are found, State Health and Safety Code Section 7050.5 requires that work stop immediately. No further disturbance will occur until the Fresno or Madera County Coroner has made the necessary findings as to origin and disposition pursuant to PRC 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission. The commission will then contact the most likely descendent (MLD) of the deceased Native American, who will then serve as a consultant on how to proceed with the remains (e.g., avoidance, reburial). Work at the site will not resume until such remains have been treated in the manner agreed upon by all interested parties.

Additionally, because of potential to discover aboriginal human remains within the Project area, the Applicants would ensure that a burial agreement is in place prior to construction. A burial agreement is a signed agreement between the Project Applicant and the Native American party designated by the NAHC as the MLD to specify the procedures and protocols to follow upon discovery of aboriginal human remains and associated funerary objects during construction or Project related activities.

Compliance with Health and Safety Code Section 7050.5 and other applicable laws and regulations, execution of a burial agreement would reduce any potential impacts to human remains to less than significant levels, and no further mitigation would be required.

# 4.6 GEOLOGY, SOILS, AND PALEONTOLOGY

This section addresses potential impacts from Project construction and operations associated with geology and soils. This section also addresses seismic hazards and paleontological resources.

## 4.6.1 Environmental Setting

### 4.6.1.1 Topographic Setting

The Project is located in the San Joaquin Valley approximately 25 miles west of Fresno. The San Joaquin Valley is located in central California and extends from Bakersfield in the south to Sacramento in the north. It is bounded by the Sierra Nevada on the east and the Coast Range on the west. The San Joaquin Valley is part of a larger geologic region province known as the Great Valley Geomorphic Province, which covers an area approximately 60 miles wide by 400 miles long that extends from Bakersfield to Red Bluff, California (Bartow 1991). The relatively steep eastern slopes of the California Coast Range lie approximately 5 miles west of the western margin of the Project site; the site itself is situated on the flat to very gently sloping floor of the San Joaquin Valley. Elevation through the Project site ranges from approximately 155 feet to 400 feet above sea level, as shown in Table 4.6-1.

**Table 4.6-1: Site Elevations**

| Project Area | Elevation |
|---|---|
| PG&E Line 401 Tie-in (Pipeline milepost 0.0) | 400 |
| Intersection of Lincoln Ave and Hwy 33 | 190 |
| Fresno Slough Crossing | 160 |
| San Joaquin River Crossing | 175 |
| Central Compressor Station | 175 |
| PG&E Electrical Tie-in Point (Electrical Milepost 0.0 | 155 |

Source: USGS, NRCS Digital Raster Graphic of Fresno County California, 2002.

### 4.6.1.2 Regional Geology

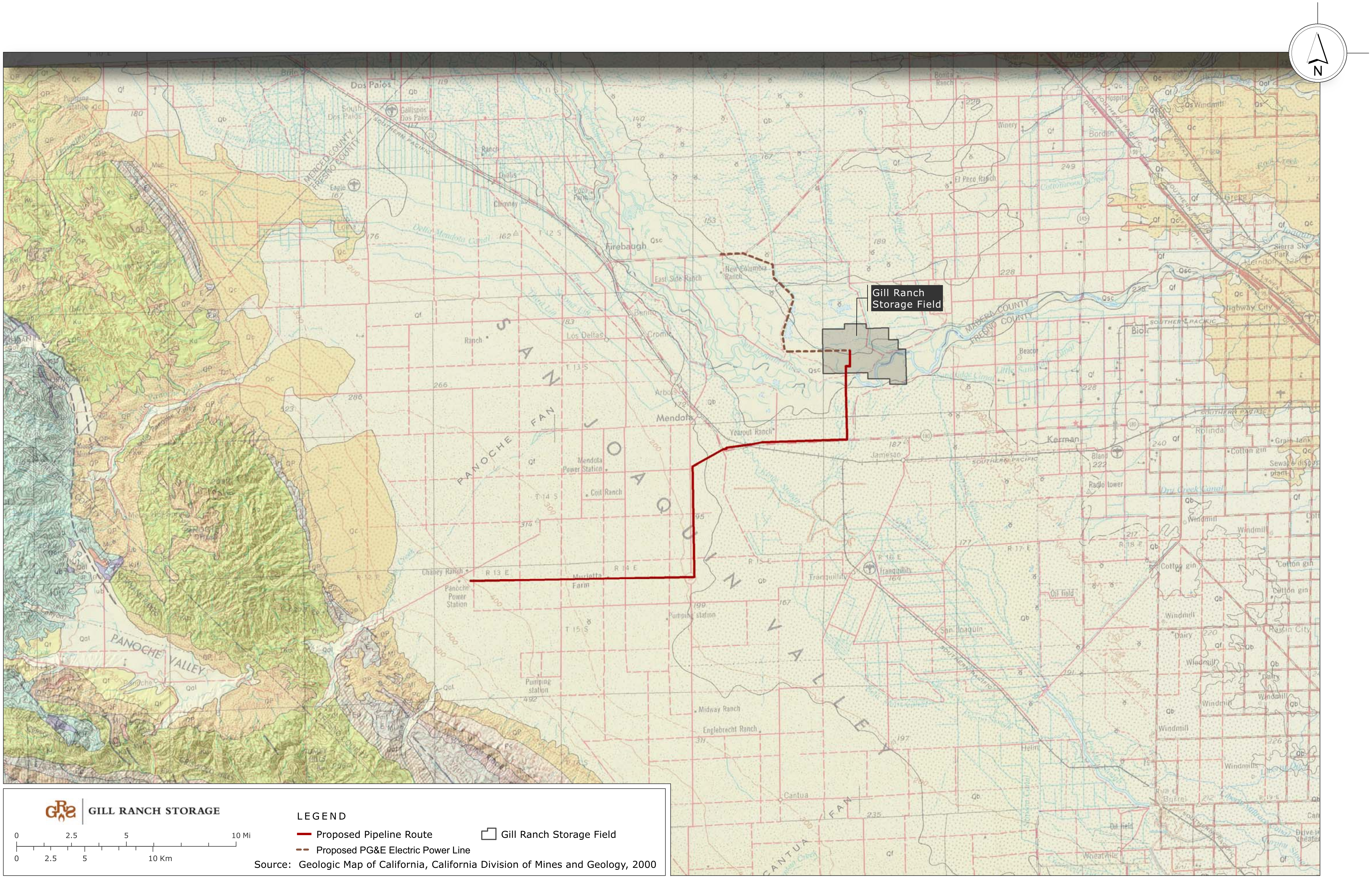
The Central Valley is an asymmetrical basin deepening to the west, containing sedimentary rock of both marine and Sierran origin. The structural access, 3 to 6 miles east of the western valley margin, has remained stationary during the late Quaternary and controls the general location and orientation of the valley (Lettis 1982). The Great Valley contains the Great Valley Sequence, a thick (approximately 6 to 8 miles deep) deposit of Late Jurassic to Cretaceous sediments shed from the Sierra Nevada volcanic arc and deposited along the continental margin into the offshore basin during the late Mesozoic to early Tertiary (Bartow and Nilsen 1990). Fine grained, shale and turbidites of marine origin characterize the central areas of the Central Valley (Peters et al. 2007).

Uplift of the Coast Ranges was contemporaneous with the change of tectonic regime from a convergent margin to a transform boundary (Peters et al. 2007). The major plate tectonic events that dominated the regional geologic history of the Central Valley were a Tertiary to Eocene convergent plate margin, the eventual change of the convergent margin to a transform boundary beginning in the mid-Oligocene with the onset of the San Andreas Fault, the resulting extension and volcanism from the changing plate motions which opened the basin and range province east of the Sierra, and an increase in compression east of the San Andreas Fault beginning about 5 million years ago (Bartow 1991). These events led to the emplacement of the Franciscan coastal rocks against the Sierran basement, the opening of the basin and range, and the later rapid uplift of the Sierran batholith in the late Miocene (Bartow 1991). The Great Valley Sequence is in conformable contact with the underlying coastal Franciscan assemblage in at least two exposures, and overlies the Sierran basement rock along the eastern margin of the Central Valley. Geophysical evidence indicates the Sierran basement rock extends westward to at least as far west as the Coast Ranges. Stratigraphy of the valley ranges from coarse deltaic deposits on the eastern edge of the basin to finer sediments representing deposition on the basin plain to the west, and overlying fan deposits (Bartow and Nilsen 1990).

### 4.6.1.3 Local Geology

East of the San Joaquin River, the Project site overlies lower fan deposits originating from the Sierra province. West of the San Joaquin River, it overlies alluvial overbank and floodplain deposits from the river, as well as upper to lower fan deposits of the Coast Range Province. The lower fan deposits east of the San Joaquin River within the Project site are mapped as the late Pleistocene Modesto Formation, and are described as fine-grained, sedimentary lower fan deposits shed from the Sierran Province. Overbank deposits of the San Joaquin River mantle the western edge of the river, covering the area approximately 500 feet west of the river's edge. The overbank deposits are Dos Palos Alluvium, and range from fine to coarse-grained channel deposits of the San Joaquin River of Sierran provenance. West of the overbank deposits, and continuing through the Project site to the fans of the Coast Range foothills is the Patterson Alluvium. The Project site covers the fine-grained middle and lower fan deposits of the Patterson Alluvium and the coarse-grained terrace and upper fan deposits of the Patterson Alluvium, which constitute the majority of the Project area geology west of the San Joaquin River. The Patterson Alluvium is fan material derived entirely from the Coast Ranges, which border the San Joaquin Valley at its western edge. The Project area geologic setting is shown on Figure 4.6-1.

Site-specific subsurface data for the alluvial fan deposits is not available for the Project site; however, a detailed geotechnical investigation (URS 2006), including soil borings, was performed in a similar geologic setting to the north. The investigation sampled Coast Range alluvium on the Panoche Creek fan. The current channel of the creek flows northeasterly and is located approximately 2.5 miles north of the proposed tie-in (to PG&E Line 401) at the western end of the pipeline alignment. Description of soil borings advanced to depths up to 65 feet below ground surface on the Panoche Creek fan indicate that the alluvial fan sediments are composed of loose sandy soils to medium dense fine-grained silts and clays in the upper 40 feet. These coarser deposits grade with depth to medium-stiff to stiff clays and silts which extend to 65 feet below the ground surface (URS 2006).


N
Gill Ranch
Storage Field
Dos Palos
Firebaugh
Mendota
Kerman
MADERA COUNTY
FRESNO COUNTY
MERCED COUNTY
SAN JOAQUIN VALLEY
PANOCHE FAN
PANOCHE VALLEY
CANTUA FAN
GILL RANCH STORAGE
LEGEND
Proposed Pipeline Route
Proposed PG&E Electric Power Line
Gill Ranch Storage Field
0 2.5 5 10 Mi
0 2.5 5 10 Km
Source: Geologic Map of California, California Division of Mines and Geology, 2000

### Sub-Surface Geology of the Gill Ranch Gas Field

The Storage Field facility will utilize depleted natural gas reservoirs in an existing gas field, the Gill Ranch Gas Field (Gas Field), located in central California approximately 20 miles west of Fresno, near the town of Mendota (Figure 3.1-1). The Gas Field consists of several geologically separate sandstone formations (Figure 3.5-2). The First and Second Starkey formations lie at a depth of about 6,000 feet below sea level and contain the depleted reservoirs to be developed during Phase I. The shallower Domengine/Kreyenhagen formations lie at a depth of about 4,500 feet bellow sea level. The reservoirs have both high porosity and permeability suited to gas storage and withdrawal.

The Starkey Formation is a Late Cretaceous (approximately 83 to 65 million years old) sand-rich fluvio-deltaic sequence. The formation was derived from erosion of the Sierra Range to the west and was deposited as a series overlying of delta deposits. The Starkey Formation contains river through delta plain deposits throughout the formation. Natural gas is trapped in the formation by folding; faulting changes in the Stratigraphy or combinations thereof (Moore and Nilsen 1990).

The Domengine Formation is a regionally important hydrocarbon reservoir in the Central and Sacramento Valleys. The Domengine Formation is the middle Eocene member of the Kreyenhagen Megasequence, ranging in age from 50.5 to 38 million years old (Johnson and Graham 2007). The formation is composed of nearshore sands, deep water mudstones, and submarine landslides. The Domengine Formation has been interpreted as lagoon and beach deposits on a north-south trending shoreline. Alternatively, the Domengine formation has been interpreted as northeast trending series of incised river valleys (Sullivan et al. 2003). The Domengine Formation was deposited during a major sea level rise approximately 50 million years ago that submerged Central Valley and coastal California (Johnson and Graham 2007).

The Kreyenhagen Formation overlies the Domengine Formation, and represents the same sea level rise. The Kreyenhagen Formation is dominantly shaley, with the fine grained member ranging up to 1000 feet in thickness. The fine-grained Kreyenhagen Formation encloses coarser grained Domengine Formation sandstone units at its base. The Kreyenhagen Formation has been a well known reservoir of oil (Johnson and Graham 2007). The Kreyenhagen Formation includes the Point of Rocks Sandstone Member, which is interpreted as a base of slope submarine landslide fan. The cumulative thickness of the Kreyenhagen Formation, when the Point of Rocks Sandstone Member is included exceeds 2 miles (Johnson and Graham 2007).

## 4.6.1.4 Soils

For purposes of this discussion, the term "soil" refers to the combination of organic and mineral material at the surface of the earth. Soil forms through a complex set of processes which include chemical and physical weathering of bedrock or sediments upon which the soil is developed, accumulation of organic matter through plant, animal, and microbial growth and decay, and accumulation of additional sediment by wind or water. The Natural Resource Conservation

Service (NRCS) (formerly the Soil Conservation Service), has mapped soil numerous types on the Project site and its vicinity (U.S. Department of Agriculture 2007).

### Pipeline Alignment

Soil types underlying the pipeline alignment fall into three broad categories: clay loam, loam, and sandy loam. The most abundant clay loam units are generally saline-sodic, while the loams and sandy loam units tend to be strongly to moderately saline-alkali in composition. Generally, clay loams are present along the western to middle portion of the pipeline alignment (from milepost 0.0 to about milepost 16.9) grading to loams through the middle portion, with moderately to strongly saline-alkali sandy loams dominating the soils in the eastern portion, closer to the San Joaquin River. Soils underlying the pipeline alignment are listed in Appendix B.4.

The clay loam soils generally have moderate to high shrink/swell potential, low strength, and high plasticity. The risk of corrosion to steel is high; risk for corrosion of concrete is moderate (western area) to high (eastern area). Sandy loam soils along the eastern area are classified as "saline alkali" and have a relatively high pH. The risk of caving in shallow excavations is generally low, and the erosion hazard is slight in these cohesive soils. The sandy loams are less cohesive. Although the risk of corrosion to steel is also generally high in these soils, the risk of corrosion to concrete is low. The shrink/swell potential is low to moderate for coarser texture soils. Soils underlying the compressor station are listed in Appendix B.4.

### Central Compressor Station

The soils underlying the central compressor station are primarily Traver and Traver-Chino loams and sandy loams. These soils are moderately well-drained, slightly to moderately saline alkali with calcium carbonate. The shrink-swell potential for the soils is low; the erosion hazard is moderate.

### Electric Power Line

Soils underlying the electric power line alignment are largely sandy loams with a smaller percentage of loams and loamy sands. Thirteen soil types occur, ranging from strongly saline-alkali to slightly saline alkali. Most of the alignment occurs over strongly to moderately saline-alkali soils. The most extensive soils along the alignment are the Fresno-El Peco fine sandy loams and the El Peco-Dinuba fine sandy loams, both of which are strongly saline-alkali. The Fresno-El Peco sandy loams are interfingered throughout much of the power line alignment with the Cajon loamy sand, which is slightly saline-alkali. The sandy loams are less cohesive than the loams or clay loams underlying other parts of the Project site. The risk of corrosion to steel is high in these soils, the risk of corrosion to concrete is low, and the shrink-swell potential is low to moderate for these coarser textured soils. Soils underlying the electric power line are in Appendix B.4.

### 4.6.1.5 Seismic Hazards

The Project is located within a seismically active area. Although it is not located within an active fault zone as defined by the Alquist-Priolo Fault Zoning Act (APFZA), the area has the potential to experience moderate ground shaking during earthquakes generated on faults at the western margin of the Central Valley (i.e., the Coast Range-Sierran Block Boundary [CRSBB]) and in the Sierra Nevada Foothills Fault System (SNFFS). Examples of significant earthquakes on the CRSBB are the 1983 Coalinga earthquake (M 6.4) and the 1975 Oroville earthquake (M 6.1).

The State of California considers a fault segment historically active if it has generated earthquakes accompanied by surface rupture during historic time (i.e., approximately the last 200 years). A fault that shows evidence of movement within Holocene time (approximately the last 11,000 years) is defined as active. A fault segment is considered potentially active if there is evidence of displacement during Quaternary time (approximately the last 2 million years) (Hart and Bryant 1997).

Project area faults are shown on Figure 4.6-2. The active faults closest to the Project site are several northwest-trending, strike-slip fault zones to the west. Beginning in the foothills of the Diablo range, and continuing west to east, these are the Ortigalita fault zone, the Quien Sabe fault zone, the Calaveras fault zone, and the San Andreas fault zone. Each of these fault zones is described below and summarized in Table 4.6-2.

- The Ortigalita Fault Zone (OFZ) lies approximately 16 miles west of the western margin of the Project site (i.e., at the tie-in to PG&E Line 401). The fault zone is a major dextral strike-slip boundary, extending from the Panoche Valley to about 19 miles northwest of the San Luis Reservoir. At least 3 miles of dextral slip is known to have occurred along the OFZ. Vertical slip rate is estimated at 0.01 to 0.04 millimeter (mm) per year, though the strike-slip rate is not known (Bryant and Cluett 2000).

- The Calaveras Fault Zone (CFZ) is the next westernmost fault zone, and lies approximately 32 miles west of the western margin of the Project Area. The CFZ is linked to the San Andreas Fault zone. The CFZ is divided into four segments, with increasing slip rates northward along the zone (up to 14 mm per year on the northernmost end and up to 9 mm per year at the southernmost tip of the fault). The fault zone ranges from tens of feet to greater than 1 mile in width. An earthquake along this fault in July of 1861 produced an 8-mile-long surface crack (Bryant 1999).

- The Quien Sabe Fault Zone (QSFZ) lies approximately 35 miles west of the western margin of the Project Area. It is a dextral strike-slip fault with a reverse component of vertical displacement. The QSFZ was the focal mechanism for a magnitude 5.8 earthquake on January 26, 1986. Vertical slip rate is estimated between .22 and .67 mm per year; horizontal slip rate is estimated between 0.0 to 2.0 mm/yr (Bryant 1998).

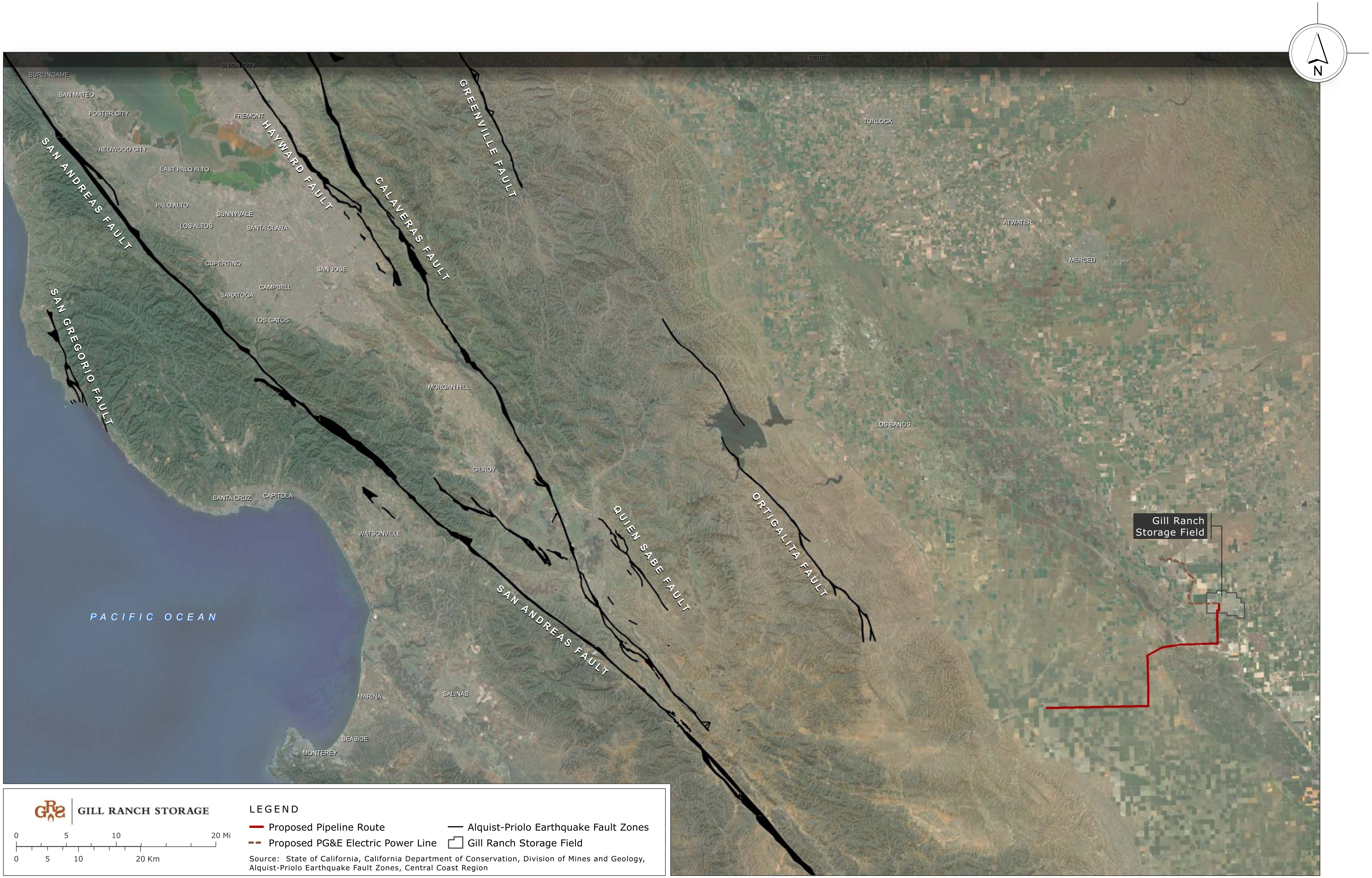
- The creeping section of the San Andreas Fault Zone (SAFZ) lies approximately 35 miles southwest of the Project site. The zone is an active 684-mile-long dextral, strike-slip fault. The SAFZ is the principal defining fault zone in the state of California, accommodating a large portion of the motion between the Pacific plate and the North American plate. The Pacific plate is moving northwestward relative to the North American plate. The SAFZ is capable of generating quakes with a magnitude greater than 8.0. There are numerous historical recorded earthquakes along the SAFZ, the largest of which was the 1906 San Francisco earthquake with a magnitude of 8.3. More recently, a magnitude 7.1 quake occurred along the San Andreas in 1989. Highest slip rates along the SAFZ are estimated at 23 to 35 mm per year throughout the Quaternary along this section of the fault (Bryant 2002) with an average fault creep along the entire length of the fault zone of 5 mm per year.
- The Great Valley is bordered along its western edge by the Great Valley Thrust faults. The faults have been divided into 14 segments based on surface expression along the range front. The fault system extends from Willows in the Sacramento Valley south to just beyond Parkfield, a cumulative length of over 300 miles. The Great Valley Thrust faults are composed of blind thrusts, surficial fault breaks, and major piercements. This thrust fault system includes faults that ruptured or transferred seismic energy during the 1983 Coalinga earthquake. An example of a high angle blind thrust fault is the Nunez fault, which ruptured during the Coalinga earthquake. The Nunez fault rupture had approximately 3 feet of displacement (Lin and Stein 2006).

The California Geological Survey (CGS) and the U.S. Geological Survey (USGS) have evaluated the potential levels of seismic shaking caused by earthquakes on known or suspected seismic sources (i.e., active faults) throughout the Project vicinity. Maps of the expected maximum level of seismic shaking caused by any of these sources have been developed for the Project vicinity. The expected maximum ground acceleration (10 percent probability of occurring in the next 50 years calculated using USGS application NSHMP_HazardApp) shows a peak ground acceleration of 0.2g near the eastern portion of the Project site, 0.4g over hard rock and up to 0.4g over alluvium near the western portion of the site.

**Table 4.6-2: Active Faults in the Project Vicinity**

| Fault | Historic Seismicity | Slip Rate (mm/yr) |
|---|---|---|
| Ortigalita Fault Zone | ≥ 3 miles dextral slip | 0.01 - 0.04 vertical<br>Unknown horizontal |
| Quien Sabe Fault Zone | M 5.8, 1986 | 0.22 -0.67 vertical<br>0.0 - 2.0 horizontal |
| Calaveras Fault Zone<br>Central (Paicines) Section | M 5.8 1979<br>M 6.3 1984 | 9 -14 horizontal |
| San Andreas Fault Zone | M 7.0, 1838<br>M 8.3, 1906<br>M 7.1, 1989 | 5 - 35 horizontal |
| Nunez Fault (Great<br>Valley Thrust Fault) | M 6.5, 1983 (Coalinga)<br>M 5.7, 1983 (aftershock) | Not available |

Richter magnitude (M) and year for recent or large events. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave.
Table derived from Quaternary Fault and Fold Database (Bryant 1998, 1999, 2000, 2002).




GILL RANCH STORAGE

0 5 10 20 Mi

0 5 10 20 Km

LEGEND

- Proposed Pipeline Route
- Proposed PG&E Electric Power Line
- Alquist-Priolo Earthquake Fault Zones
- Gill Ranch Storage Field

Source: State of California, California Department of Conservation, Division of Mines and Geology, Alquist-Priolo Earthquake Fault Zones, Central Coast Region

ENTRIX

Environmental and Natural Resource Management Consultants

Proponent's Environmental Assessment

GILL RANCH GAS STORAGE

FIGURE 4.6-2 | REGIONAL ACTIVE FAULTS

Another measure of the level of seismic shaking is "intensity," a more subjective description of the effects of earthquakes represented by the Modified Mercalli Intensity (MMI) scale (Table 4.6-3). Based on the estimates of ground acceleration describe above, maximum projected earthquake in the Project area is expected to have an MMI rating of VIII.

**Table 4.6-3: Modified Mercalli Intensity Scale**

| Intensity Value | Intensity Description | Average Peak Acceleration |
|---|---|---|
| I | Not felt except by a very few persons under especially favorable circumstances. | < 0.0015 g |
| II | Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing. | < 0.0015 g |
| III | Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to a passing of a truck. | < 0.0015 g |
| IV | During the day felt indoors by many, outdoors by few. At night, some awakened. Sensation like heavy truck striking building. | 0.015 g-0.02 g[1] |
| V | Felt by nearly everyone, many awakened; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. | 0.03 g-0.04 g |
| VI | Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. | 0.06 g-0.07 g |
| VII | Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. | 0.10 g-0.15 g |
| VIII | Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Sand and mud ejected in small amounts. Changes in well water. | 0.25 g-0.30 g |
| IX | Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Underground pipes broken. | 0.50 g-0.55 g |
| X | Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Shifted sand and mud. Water splashed (slopped) over banks. | > 0.60 g |
| XI | Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly. | > 0.60 g |
| XII | Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air. | > 0.60 g |

[1]g = gravity = 981 centimeters per second squared (cm/s^2)

### 4.6.1.6 Subsidence

During the San Joaquin Valley's formation, a large semi-confined aquifer developed below what is presently known as the Corcoran Clay member. The Corcoran Clay member is a part of the late Pliocene to middle Pleistocene fluvial and lacustrine Tulare formation (Bartow 1991) that separates the overlying unconfined aquifer of the San Joaquin Valley from the underlying semi-confined aquifer of the San Joaquin Valley (Ireland 1986). This semi-confined aquifer was the primary source of water tapped by numerous, deep (>1000 feet) groundwater wells that were instrumental in the early agricultural development of the valley (Ireland, Poland, and Riley 1984).

Beginning in 1920, groundwater pumping was the primary source of water for agriculture. Pumping of massive amounts of groundwater led to a decline in groundwater levels, which subsequently resulted in the compaction of the aquifer system (Ireland 1986). Groundwater pumping continued to be the primary source of agricultural water until surface water began to be imported into the valley with the construction of the Friant-Kern Canal in 1950 (Ireland, Poland and Riley 1984). The resulting subsidence of the valley floor has affected roads, pipelines, stream gradients, farming fields, and some structures. With an increase in the availability of surface water via canals and aqueducts, subsidence has decreased considerably or stopped in some areas (Ireland 1986).

The Project is located near the town of Mendota. USGS benchmark S661 is located 10 miles southwest of Mendota, and it is in this area that the locus of subsidence is at its greatest. Between 1943 and 1970, over 27 feet of subsidence was measured at this benchmark (Ireland, Poland and Riley 1984). This western edge of the San Joaquin Valley, along the foothills of the Diablo Range, is the area most affected by historic groundwater extraction. In 1968, groundwater pumping was significantly decreased in this area in favor of imported surface water, greatly decreasing the rate of subsidence. However, in 1977, renewed groundwater pumping at this location caused another topographic lowering of the area by 0.42 feet (Ireland, Poland, and Riley 1984).

Historic land subsidence within the San Joaquin Valley is at its greatest along the western and southern edges of the valley. The Project is located within approximately 5 to 10 miles of the locus of greatest depression. Subsidence of the aquifer has led to aquifer deposits becoming compacted. Future subsidence due to over-pumping is projected to be less apparent than in the early years of groundwater extraction in the valley, as consolidation of the sediments in response historic dewatering of the aquifers limits their vulnerability to further compaction (Ireland 1986).

Another source of subsidence independent of aquifer compaction from groundwater extraction is known as hydrocompaction. Originally referred to as “near-surface subsidence,” hydrocompaction was first widely noted by farmers in the central valley in the 1940s as associated with flood irrigation on previously uncultivated acreage (Galloway and Riley 1999). Historically, hydrocompaction in the Central Valley has caused undulations and surface deformation of 3 to 5 feet, with occasional settlement of up to 10 to 15 feet. Hydrocompaction of soils in the Central Valley has led to post-construction damage to projects such as the San Luis Canal and several of its associated pipeline alignments (Prokopovich 1963).

Sediments most vulnerable to hydrocompaction are alluvial sediments with high clay content (particularly montmorillonite). Drying and burial of these alluvial sediments preserves cavities, such as relict mud cracks, or holes where vegetation has been buried and decayed, that upon wetting contribute to collapse of the soils resulting in reduction in bulk volume. Soils in the

Central Valley having a high dry strength and low dry density and low moisture content are particularly prone to hydrocompaction. These soils are typically derived as alluvial fan deposits extending from the Coast Ranges (Galloway and Riley 1999). Major portions of the San Luis Canal affected by hydrocompaction were located south of the Delta Mendota Canal, and were located on alluvium derived from the Coast Ranges (Prokopovich 1963). Subsidence problems in soils susceptible to hydrocompaction have been mitigated for relatively easily by pre-wetting the soils prior to construction, thus causing the hydrocompaction to occur before loading the ground surface with critical structures (Galloway and Riley 1999).

#### 4.6.1.7 Landslide Hazards

A landslide (also called mass movement) involves the downslope transport of soil, rock, and sometimes vegetative material en masse, primarily under the influence of gravity. Landslides occur when shear stress generated by downslope forces of overlying colluvial material or fractured rock material exceeds the shear strength of the underlying soil or rock. Landslides are more likely to occur when pore pressures within the overlying material are raised by the inclusion of water within the interstitial spaces. The shear strength of the soil/rock may be reduced during high rainfall periods when materials become saturated. Landslides also may be induced by ground shaking from earthquakes. Landslides usually involve most or all of the soil profile and often part of the underlying parent material. They may take several forms, including soil creep, earthflow, slump, debris slide, debris flow, and rockfall.

Landslides occur in areas of elevated topography and steep slopes as a consequence of slope instability, either induced by seismic shaking, or a decrease in pore pressure of sediments due to elevated groundwater levels. The Project site overlies topography with very gentle to horizontal slopes. With the exception of potential localized bank failures along the San Joaquin River and Fresno Slough, areas susceptible to slope failure are not present within the potential Project Area.

#### 4.6.1.8 Paleontological Resources

Fresno County is home to numerous fossil localities, extending from plant finds to invertebrates, mammals and reptilian (including dinosaur) finds ranging in age from Cretaceous to Pleistocene. Locally, the Panoche Hills and Panoche Creek have been the source of numerous Cretaceous and Tertiary vertebrate discoveries. A search of the University of California Museum of Paleontology (UCMP) fossil index has listed 19 vertebrate fossil specimens within the Panoche Hills/Panoche Creek localities. Although the Project site is within several miles of these fossil localities, the pipeline alignment and surface facilities lie entirely within agricultural or otherwise developed areas (i.e., along roadways) over Holocene to modern Patterson Alluvium along the valley floor. No fossil finds within the Patterson Alluvium were recorded within the UCMP paleontological database.

## 4.6.2 Regulatory Setting

### 4.6.2.1 Federal

The federal Water Pollution Control Act of 1972 and Clean Water Act of 1977 regulate the discharge of pollutants into waters of the U.S., including the discharge of sediment to surface water as a result of erosion. The NRCS National Engineering Handbook presents standards for planning, design, and construction of soil conservation practices to be implemented during construction projects.

### 4.6.2.2 State

Under the Alquist-Priolo Earthquake Fault Zoning Act, the State of California defines an active fault as one that exhibits evidence that surface rupture has occurred within the last 11,000 years (i.e., Holocene activity). Under the Act, the state has identified active faults within California and has delineated "earthquake fault zones" along active faults. This act restricts development of structures for human habitation within the earthquake fault zones to reduce the potential for injuries and damage caused by fault rupture.

#### Seismic Hazard Mapping Act

The State of California passed the Seismic Hazard Mapping Act in 1990, following the 1989 Loma-Prieta earthquake. The act was passed to reduce the potential impacts on public health and safety and to minimize property damage caused by earthquakes. The act established a requirement for the identification and mapping of areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified ground-shaking. The act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures prior to permitting most developments designed for human occupancy within the Zones of Required Investigation.

A Seismic Hazard Zone Map for the Project site has not yet been published. However, the geologic conditions within the Project area (e.g., Quaternary sediments susceptible to liquefaction) are similar to adjacent areas with published maps identifying seismic hazards. The topography within the Project area is gently sloping to flat. As discussed in Section 4.6.1.6, the potential for earthquake-induced landsliding is low.

#### California Building Code

The 2007 California Building Code (CBC) is based on the 2006 International Building Code Uniform Building Code, with the addition of more extensive structural seismic provisions. The CBC was adopted by the California Building Standards Commission and became effective January 1, 2008. The California Building Code is contained in the Title 24 of the California Code of Regulations (CCR), California Building Standards Code, and is a compilation of three types of building standards from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes.

- Building standards that have been adopted and adapted from the national model code standards to meet California conditions.

- Building standards authorized by the California legislature that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

Seismic sources and the procedures used to calculate seismic forces on structures are defined in Section 1613 of the CBC. The code requires that all structures and permanently attached non-structural components be designed and built to resist the effects of earthquakes. The code also includes grading and other geotechnical issues, building specifications, and non-building structures. The Project would include these types of improvements, and therefore, the building code will be applicable.

The state fire marshal has authority to implement and enforce the provisions of the pipeline safety standards codified in Section 51010 to 51019 of the CCR. These regulations require pipeline inspection and assessment for improvements, replacement, or construction of pipelines. The regulations additionally require that pipelines be designed and constructed in accordance with federal standards. The design of new pipelines shall accommodate the passage of instrumented internal inspection devices. Leak mitigation systems and emergency response plans are also required.

### 4.6.2.3 Local

The following goals and policies of the Madera and Fresno County general plans related to geologic hazards are relevant to the Project.

#### Madera County General Plan

The Madera County General Plan identifies the following requirements (County of Madera 1995):

- Prior to development, the County requires a geologic-seismic and soils report covering hazards related to landslides, liquefaction, groundshaking or expansive soils.

- Flood-proofing of structures is required within 100 year flood zones.

- Limiting development on steep slopes/mitigating development on steep slopes is required to avoid or reduce landslide hazards.

#### Fresno County General Plan

Fresno County has established the following goals, policies, and programs regarding geologic hazards that are outlined in the Health and Safety Element (Seismic and Geologic Hazards chapter) of the County General Plan (County of Fresno 2000):

- Include appropriate recommendations for seismic strengthening and detailing to meet the latest adopted seismic design criteria.
- Apply policies regarding liquefaction to other ground failures which might result from ground shaking, but which are less well-defined.
- Require suitable design and construction measures in areas with soils of high shrink-swell or expansion potential.
- Give slope stability careful scrutiny in design, and in the adoption of conditions of approval and required mitigation measures.
- The County requires soils engineering and geologic-seismic analysis by a California registered engineer or engineering geologist prior to permitting development.
- Establish and enforce erosion control procedures for all construction and grading projects.

#### Fresno County Grading Ordinance

The Fresno County Code includes a grading ordinance that sets forth regulations for control of excavating, grading, earthwork construction, including fills or embankments and related work.

## 4.6.3 Impact Assessment

### 4.6.3.1 Significance Criteria

Appendix G of the California Environment Quality Act Guidelines (CEQA) provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on geology, soils, seismicity, and paleontology if the project would:

- Expose people or structures to potential adverse effects, including the risk of loss, injury or death involving 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.
- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death related to strong seismic ground shaking or seismic-related ground failure, including liquefaction or landslides.
- Result in substantial soil erosion or the loss of topsoil.
- 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.

- Be located on expansive soil, as defined in the Uniform Building Code (International Code Council 1994) or identified by the NRCS as having moderate to high linear extensibility, creating substantial risks to life or property.

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (Note that this criteria is listed under Cultural Resources, but is addressed in this section).

The following additional guideline is included in Appendix G but is not relevant to the Project:

- 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 waster water.

Waste water will be stored and taken off-site for disposal. The Project would not require the use of septic tanks or alternative on-site waste water disposal systems.

#### 4.6.3.2 Impacts and Mitigation Measures

Impacts were evaluated on the basis of information developed through review of existing published reports and mapping. Site-specific information prepared for the Applicants was also reviewed and when appropriate, and incorporated into the analysis of impacts. Quantitative modeling of slope stability or seismic effects was not performed as part of the analysis. The assessment assumes that published mapping of geology and soils at the Project site are adequate for characterization of potential landscape stability and suitability. Additionally, it is assumed that existing regulatory standards for the determination of significant adverse conditions related to structural safety are appropriate.

The Applicants are performing an initial geotechnical investigation of the Project; specifically at the proposed compressor facility and along the proposed pipeline route and watercourse crossings. As of the date of publication of this PEA, subsurface investigation within the Project site includes:

- Four seismic cone penetrometer test soundings to total depths of up to 100 feet below ground surface;

- Three cone penetrometer test sounding to total depths of up to 100 feet below ground surface; and

- Seven soil borings to total depths of up to 100 feet below ground surface.

In general, soil conditions encountered within the soundings and borings are consistent with those described in this section. Selected soil samples from soil borings have been analyzed for geotechnical parameters, including moisture and density, grain size, plasticity indices, shear strength and compressibility, expansion index, corrosion potential, and compaction properties.

A Project-specific hydrologic study is currently being prepared to estimate scour depths at pipeline crossings and recommended buffer zones (minimum setback envelopes) for each watercourse. In addition, a seismic hazard assessment to estimate location-specific spectral response accelerations at short and 1-second periods is currently being prepared

### Expose People or Structures to Rupture of a Known Earthquake Fault

**IMPACT GS-1: Minimal risks from fault rupture will occur.** The risk of fault rupture is greatest in the immediate vicinity of active faults. Because no recognized active faults underlie Project facilities (the nearest active fault is about 16 miles away), and there is no evidence of past fault rupture, the risk of fault rupture to the proposed gas pipeline, surface facilities, and electric power line would be less than significant. Moreover, The Project would be designed, constructed and operated in compliance with the applicable seismic codes and other applicable regulations, which will further minimize risks. With the incorporation of these design features, impacts related to earthquake faults would be less than significant, and no mitigation would be required.

### Expose People or Structures to Major Geologic Hazards

**IMPACT GS-2: Groundshaking from earthquakes could damage Project facilities.** The Project site is located within an area that is vulnerable to significant seismic shaking. Numerous regional active faults are capable of generating earthquakes which could cause seismic shaking at the Project site. The USGS estimates that there is a 10 percent chance that there will be an earthquake in the next 50 years that will be strong enough to produce ground acceleration from 0.16 to 0.43 g. This is characterized as moderate to strong shaking. Historically, the modern (post-1970) steel pipelines used to transport natural gas have fared well during even very strong ground shaking events. For example, PG&E's welded steel gas pipelines recorded little damage during the Loma Prieta 7.1 magnitude earthquake (PG&E 2007). From the years 1988 to 2007 there were a total of 193 significant incidents involving pipelines in California (U.S. Department of Transportation [DOT] 2008). "Significant" in these cases is defined as having caused more than $50,000 in damages (1984 dollars) and produced injury resulting in hospitalization or death. Of these significant incidents, natural force damage constituted less than 6 percent of failure causes, with earth movement accounting for 2 percent of damages (DOT 2008). In light of these statistics, likelihood of pipeline failure or rupture of a properly designed pipeline due to seismic shaking is low.

Additionally, all Project structures would be designed and constructed in conformance with the seismic design provisions of the most current version of the California Building Code, which will minimize risks. The code specifies design parameters based on site-specific soil/rock conditions and expected levels of seismic shaking. Structures also will be routinely monitored and will be inspected after seismic events. In addition, the operators will monitor seismic shaking conditions in areas of the site most vulnerable to seismic shaking (i.e., areas underlain by unconsolidated sediments). Monitoring will rely on available instrumentation (i.e., accelerographs) monitored by the California Integrated Seismic Network or accelerographs installed for the Project. When monitoring indicates that seismic shaking in excess of 0.1 g has occurred in the area of the Project site, the pipeline alignments will be inspected by a pipeline inspection crew under the operator's direction. If evidence of ground disturbance along the pipeline or at other Project facilities is observed during the inspection, the areas of disturbance will be evaluated by a qualified Professional Engineer/geotechnical engineer/geologist to determine if adverse conditions, including liquefaction have occurred, and any necessary corrective actions will be taken. With the incorporation of these Project design features and operational procedures, impacts related to ground shaking will be less than significant and no mitigation is required.

### Result in Substantial Soil Erosion or the Loss of Topsoil

**IMPACT GS-3: Construction could cause erosion and loss of topsoil**. The Project will require excavation for installation of the proposed pipeline and surface facilities. The required grading will result in the removal of vegetation and disturbance of soil structure, conditions that could promote erosion. The uniform topography throughout the Project site and low annual rainfall naturally mitigates the potential for a wide range of erosion hazards. The Project will be required by Fresno County and Madera County ordinance to establish erosion control measures for grading activities. The requirements of the grading ordinance include the preparation of an Erosion and Sediment Control Plan as discussed further in Section 4.8, Hydrology and Water Quality (refer to Impact HWQ-5). With implementation of the proposed Erosion and Sediment Control Plan, any impacts related to soil erosion due to grading and excavation will be less than significant, and no mitigation is required.

### Be Located on a Geologic Unit or Soil that is Unstable

**IMPACT GS-4: Bank failures could occur along the San Joaquin River.** The Project is located on the flat topography of the Great Valley. Steep slopes within the Project area are limited in extent to the banks of rivers, particularly the San Joaquin River. A slope failure requires a slope angle that exceeds the angle of internal friction of the materials composing the slope. The topographic conditions in the Project area do not present that scenario. The potential does exist for localized bank failures along the San Joaquin River from undercutting of banks, particularly during high-flow river stages or during prolonged seismic shaking. The proposed pipeline will be directionally drilled well below the surface of the river bed in accordance with the recommendations of a detailed, site-specific geotechnical study, and the pipeline construction work area will be set back from the river banks. With implementation of these Project design features and construction methods, any impacts related to slope failure will be less than significant, and no mitigation is required.

**IMPACT GS-5: Pipeline Deformation/Damage Could Result from Land Subsidence.** Substantial land subsidence has occurred within the San Joaquin Valley primarily in response to the aggressive historical extraction of groundwater from regional aquifers. The Project site is located within one of the areas of greatest historical subsidence. Between 1943 and 1970, over 27 feet of subsidence was measured at a benchmark approximately 10 miles southwest of Mendota; an additional 0.42 foot of surface lowering occurred after 1977 (Ireland, Poland, and Riley 1984). Although the rate of land subsidence has been greatly reduced with reductions in groundwater pumping, continued subsidence may occur. The potential for subsidence could increase in the event that increased reliance on groundwater as irrigation supply occurs in the future. Over the life of the Project, long-term subsidence could cause deformation of the pipeline, the Project component that will be most at risk. If significant deformation were to occur, the pipeline could be stressed and potentially damaged.

The Applicants will implement a monitoring inspection, maintenance, and repair program for the pipeline and surface facilities. The program will include various methods to detect and measure potential effects of subsidence, such as deflections of the pipeline due to differential settlement. Repairs to the pipeline will be made on an as-needed basis over the life of the Project. With the implementation of the proposed monitoring, inspection, maintenance program, any impacts related to subsidence will be less than significant, and no mitigation is required.

### Be Located on Expansive Soil

**IMPACT GS-6: Some Project components will be constructed on soils that have moderate to high shrink-swell potential, potentially causing structural damage.** Soils within the pipeline right-of-way having high clay content also tend to have a characteristic moderate to high shrink-swell potential. The soils with high shrink-swell potential include the Tranquility clays and Tachi clay, which generally occur between pipeline Mileposts 11 and 18.

No surface facilities are proposed in this pipeline segment except for a pipeline valve station, which will be primary underground, with minor above ground appurtenances. Soils with properties of shrink-swell potential expand when saturated and contract upon dessication. Soils with high linear extensibility and high shrink-swell potential create a potentially hazardous situation for structures with foundations constructed within these soils. Structures placed on soils with high shrink-swell potential may be subject to differential movement as a result of soil volume changes caused by significant fluctuations in moisture content. Pipeline installation would generally occur at depths below the portions of the soils profile affected by changes in soil moisture, thus avoiding significant "shrink-swell" effects.

Several well pads will be placed within the Storage Field, along with various structural foundations and pads for the central compressor station. Soils in the vicinity of the surface facilities generally have a low shrink-swell potential. The Project proposes to add a layer of crushed aggregate base to an area with the dimensions of the required pad size. Additionally, any building on the Project site will be required to comply with California Building Code requirements for foundations based upon a site-specific soil investigation. With the implementation of these design features and compliance with applicable building regulations, any impacts related expansive soils will be less than significant, and no mitigation is needed.

**IMPACT GS-7: The Project will be located on soils susceptible to hydrocompaction.** Hydrocompaction of soils in the Central Valley has led to post-construction settlement and damage of infrastructure and agriculture. Hydrocompaction in the Central Valley has been found to affect alluvial deposits derived from the Coast Ranges**.** The proposed alignment rests over the Patterson Alluvium, which is alluvium ranging to about 20 feet thick derived from the Coast Ranges. Historical evidence indicates that hydrocompaction has the potential to damage or deform structures built upon the surface.

A geotechnical investigation of the soils underlying the compressor station, well pads and other structures that could contribute to loading of the soils is underway to determine the potential for hydrocompaction. Findings regarding the potential for hydrocompaction will be incorporated into the facility design. The well pads and compressor station designs will prevent concentration of runoff and infiltration along the edges of the pads. If necessary (as determined by site-specific investigation) soils susceptible to hydrocompaction would be removed by excavation and replaced with fill compacted at optimum moisture to a recommended soil density. Alternatively, foundations for structures in areas of hydrocompaction hazards would be founded on foundation elements bearing at depths below susceptible soils. With the implementation of these measures, any impacts related to hydrocompaction are less than significant, and no mitigation is required.

### Be Located on Corrosive Soils

**IMPACT GS-8: Pipeline or structural damage/failure could result from construction in corrosive soils.** Corrosion of pipes can be caused by both external influences (e.g., by the influence of corrosive soils) and by internal influences (e.g., accumulation of moisture). Many of the naturally occurring soils along the pipeline alignment are strongly alkaline. The electronegative clays and high salt content of the soils presents a considerable corrosion hazard to steel pipelines. If steel pipe is buried in direct contact to corrosive soils, the pipe can deteriorate over time and compromise the integrity of the pipeline. Between 1988 and 2007, the DOT recorded 14 significant incidents involving pipeline damage due to external corrosion. The total cost of these failures over that time period was collectively valued at over $26 million. The Project proposes placement of pipeline in excavated trenches bedded in native excavated soils as backfill. The backfill material is expected to have high corrosion potential.

Several measures are included in the Project design to address the potential for corrosion in accordance with applicable DOT design standards. These measures typically consist of a dual system to inhibit degradation of the pipeline by corrosion. The system includes protective epoxy coating of the pipeline as the primary protection against corrosion. The pipeline coating treatment is supplemented by cathodic protection. Under cathodic protection, an electrical current is applied to induce a negative charge to the pipeline (i.e., acting as a cathode). Positively charged sacrificial anodes are installed along and connected to the pipeline. In the cathodic protection system, electrical currents that promote corrosion flow from the pipe to the sacrificial anodes. The number and locations of these systems are based upon soil tests after construction. Corrosion protection stations are installed to test the performance of the cathodic protection system.

Prior to burial, pipelines will be inspected for damage and general integrity. Inspection will provide an evaluation of the integrity of the pipeline for the transmission of natural gas. Any section of pipeline found to be compromised by any cause will be replaced or repaired prior to placement of the pipeline in the ground. During operation of the Project, pigging of all pipelines will be performed at regular intervals in accordance with DOT standards.

With the implementation of these design features, construction methods and operational procedures, any impacts related to pipeline corrosion are less than significant, and no mitigation is required.

Corrosive soils will not pose a problem for the gas injection and withdrawal wells because the wells will be installed using thick-walled steel casing that meet the State of California's Division of Oil, Gas & Geothermal Resources (DOGGR) specifications. The conductor casing is surrounded with a cement seal in the upper 50 feet of ground surface. This will effectively isolate the critical area of well casing, which protects the fresh water aquifer, is installed inside the conductor casing and is also surrounded with cement from its bottom to the ground surface (see Figure 3.5-3). In addition to cathodic protection of the pipelines, the Applicants are investigating a potential cathodic protection system for the storage wells. With the implementation of these design features any impacts related to corrosion in the injection/withdrawal wells will be less than significant, and no mitigation is required.

### Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature

**IMPACT GS-9: The Project will have a low potential for impacts on unique paleontological resources or geologic features.** Although the Project site is within several miles of known fossil localities in the Panoche Hills, the proposed pipeline alignment and surface facilities lie entirely within agricultural or otherwise developed areas (i.e., along roadways) and over Holocene to modern Patterson Alluvium along the valley floor. No fossil finds within the Patterson Alluvium were recorded within the UCMP paleontological database. The potential for significant fossils is limited by the processes of deposition of these alluvial sediments. Relatively high stream energy has reworked the alluvium, resulting in the probable disturbance and transport of any paleontological resources. The potential for the presence of articulated skeletons or undisturbed fossils is low.

The Applicants will prepare and implement a Paleontological Resources Discovery and Management Plan to avoid potential impacts on paleontological resources. This plan will include review of final construction plans to determine which portions of the Project may affect paleontologically sensitive sediments that lie deeper than 10 feet below the surface; worker training in the identification of paleontological resources; and appropriate notification and handling procedures. If potentially significant fossils (defined as deposits that are unique, or that may reasonably be expected to assist in the evaluation of specific areas of research or expand our understanding of prehistory) are encountered, construction will be stopped in the immediate vicinity of the fossil find until they are removed; and recovery and curation of fossils by a qualified paleontologist will be arranged. Given the low probability of encountering paleontological resources, and the implementation of these construction procedures, any impacts related to paleontological resources are less than significant, and no mitigation is required.

Geologic formations, their structure and the fossils preserved in them provide information about past environments. Unique geologic features are considered bedrock formations or geomorphic features of unusual scientific or aesthetic value, including fossil localities or "type sections" (i.e., locations defining the characteristics of a formation), that preserve with great detail the record of important past environments, or that are deemed of high value to academic or research interests are considered. No unique geologic features are known to occur at the Project site, including along the proposed pipeline route and power line route. Therefore, no impacts on unique geologic features are anticipated, and no mitigation is required.

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# 4.7 HAZARDS AND HAZARDOUS MATERIALS

This section describes the potential hazards associated with construction and operation of the Project, including the risk of upset and impacts to public safety associated with the storage and transport of natural gas, the use of hazardous materials[1], the likelihood of encountering historical contamination sites during construction, and hazards from wildland fires. This section describes the safety features of the Project and the relevant state and federal safety requirements.

## 4.7.1 Environmental Setting

This subsection provides a baseline for determining whether the Project will have significant hazards or hazardous materials effects.

### 4.7.1.1 Analysis Area

The analysis area for potential hazards and hazardous materials impacts includes the Project storage reservoirs in the Storage Field, the compressor site and other above ground facilities, the gas pipeline, and the electric power line.

### 4.7.1.2 Population Density

Population density along the proposed pipeline route and in proximity to the compressor station and well pads is an important factor in evaluating potential impacts to the public. The risk of exposing people to hazards from an accident or explosion from the pipeline or other structures increases in proportion to the population density near the facilities, and the safety standards in the relevant federal regulations become more stringent as human population density increases.

The Project is located in a sparsely populated area. In the Storage Field area, the nearest occupied residences to the proposed Project are located on Road 16, which provides the primary access to the Storage Field Project area. These homes are located 1 mile north of the proposed central compressor station site. A single occupied residence is located on the south bank of the San Joaquin River, in the southeast corner of the Storage Field, in Fresno County, within the Storage Field.

Population data along the proposed pipeline alignment was collected from field investigations. In general, areas along the pipeline route are sparsely populated. There are only a few agricultural buildings along the route. Some commercial and recreation uses are present between mileposts 18 and 19.5.

[1] The California Health and Safety Code defines a hazardous material as "any material that because of its quantity concentration or physical or chemical characteristics poses a significant present or potential hazard to human health and safety, or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, radioactive materials, and any material which a handler or the administrating agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment." (Health and Safety Code § 25501).

### 4.7.1.3 Hazardous Materials

An Environmental Data Resources (EDR) Area Study was conducted for the Project well sites and compressor site to identify previous contamination in the area that may have resulted from past or present uses of the property. According to the EDR report, only one site was identified at 4142, Road 16 (between Avenue 5 and Avenue 4) approximately 1.5 miles north of the proposed compressor site, outside the Storage Field. The nature of the site is not known; however, the Spills, Leaks Investigation and Cleanup (SLIC) database indicate that the case is closed. There are no recorded sites within the Storage Field boundary. Appendix B provides maps from the EDR report and the entire report is available under separate cover.

A comparable report was not developed for the corridor for the gas transmission pipeline or for the electric power line corridor. The likelihood of encountering contaminated soils or other hazardous conditions in these areas is considered low based on site observations, which found no obvious indicators of potential contamination, and the lack of land uses that would be likely to cause site contamination in this agricultural area.

Limited hazardous materials will be used during construction and operation of the Project. No acutely hazardous materials will be used.

### 4.7.1.4 Natural Gas

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic but is classified as a simple asphyxiant, posing a slight inhalation hazard. If inhaled in high concentration, oxygen deficiency can occur, resulting in serious injury or death. Methane has an auto-ignition temperature of 1,004 $^{o}$F and is flammable at concentrations between 5 and 17 percent by volume in air. Flammable concentrations of methane within an enclosed space in the presence of an ignition source can explode. Methane is buoyant at atmospheric temperatures and disperses rapidly in air; as such, unconfined mixtures of methane in air are flammable but rarely explosive. Physical properties of methane are summarized in Table 4.7-1.

**Table 4.7-1: Physical Properties of Methane**

| Physical Property | Methane |
|---|---|
| Molecular weight | 16.043 g/mol |
| Lower heating value | 21,300 BTU/LB |
| Density at standard conditions | 0.005 lbs/gal |
| Diffusion coefficient in air | 0.16 ($cm^2$/sec) |
| Auto ignition temperature in air | 1,004°F |
| Volume concentrations for flammability in air | 5.3 percent - 17 percent by volume |
| Stoichiometric mixture (in air) | 9.5 percent by volume |
| Minimum ignition energy | 0.274 mJ |
| Flame temperature (in air) | 2417°F |
| Toxicity to humans | Non-toxic, simple asphyxiant |

*Source*: http://encyclopedia.airliquide.com/Encyclopedia.asp?GasID=41

Notes

g/mol = grams per mole
BTU/LB = British Thermal Units per pound
lbs/gal = pounds per gallon
$cm^2$/sec = heat transfer coefficient by convection
°F = degree

## 4.7.2 Regulatory Setting

### 4.7.2.1 Federal

#### Pipeline Safety

*49 Code of Federal Regulations part 192*

U.S. Department of Transportation (DOT) regulations at 49 CFR Part 192 define hazard area classifications, based on population density in the vicinity of natural gas pipelines that corresponds to the minimum safety requirements. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows:

- Class 1 – location with 10 or fewer buildings per mile intended for human occupancy;
- Class 2 – location with more than 10 but fewer than 46 buildings per mile intended for human occupancy;
- Class 3 – location with 46 or more buildings per mile intended for human occupation or where the pipeline lies within 100 yards of any building or small well-defined outside area occupied by 20 or more people during normal use; and
- Class 4 – location where buildings with four or more stories aboveground are prevalent.

Areas with higher population density require higher safety factors in pipeline design, testing, and operation. Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, Maximum Allowable Operating Pressure (MAOP), inspection and testing of welds and frequency of pipeline patrols and leak surveys must all conform to higher standards in more populated areas.

Pipelines constructed on land in Class 1 locations must be installed with a minimum cover depth of 30 inches in normal soil and 18 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil and 24 inches in consolidated rock.

Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. Class locations also specify the maximum distance to a sectionalizing block valve for onshore line segments. Part 192 regulations require at least one sectionalizing block location every 20 miles in Class 1 locations, every 15 miles in Class 2 locations, every 8 miles in Class 3 locations, and every 5 miles in Class 4 locations.

As shown in Table 4.7-2, approximately 25.3 miles (95 percent) of the alignment is in DOT Class 1 areas. The remaining 1.5 miles (5 percent) is located in Class 2 areas. However, future population growth in this area could raise this area to a Class 3 area classification.

Table 4.7-2 summarizes the existing structures, by major pipeline segment, and indicates the minimum U.S. Department of Transportation (DOT) area classification, as well as the Project's proposed design classification. Preliminary class locations for the proposed Project have been developed based on the distance from the proposed pipeline centerline to other nearby structures and manmade features within 220 yards of the pipeline centerline. As Table 4.7-2 shows, the design classification for each major pipeline segment exceeds the DOT area classification.

### *Safety Regulations*

The DOT regulates pipeline safety pursuant to Title 49 USC Chapter 601. The DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. The Office of Pipeline Safety administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline.

**Table 4.7-2: Pipeline DOT Hazard Classifications**

| Project Segment | Milepost | Description of Structures Within 220 Yards of Pipeline Centerline | DOT Area Classification | Proposed Design Classification |
|---|---|---|---|---|
| Line 401 Tie-in to Hwy 33 | 0.0 – 10.2 | Sparsely populated (agricultural buildings approx. 3 residences) | 1 | 2 (Mainline valve at Milepost 0.0) |
| Hwy 33 to Slough | 10.2 - 18 | Sparsely populated (agricultural buildings approx. 3 residences) | 1 | 2 (valve at MP 14.2 ) |
| Slough to San Mateo Avenue | 18 – 19.5 | Commercial and recreational uses at east bank of Slough several residences and agricultural structures on south side of Hwy 180. | 2 | 3 |
| San Mateo Avenue to 4-mile Slough | 19.5 – 22.6 | Sparsely populated | 1 | 2 (valve at MP 19.5 ) |
| South-North Segment to Compressor station | 22.6 – 26.8 | No structures present | 1 | 2 Mainline valve at compressor station, Milepost 26.8 |

Many of the regulations are written as performance standards, which set the level of safety to be attained and allow the pipeline operator to use various technologies in order to achieve safety. Section 5(a) of the Natural Gas Pipeline Safety Act (NGPSA) (49 USC 60105(a)) provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. Section 5(b) of the NGPSA (49 USC 60105(b)) permits a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions. A state also may act as the DOT's agent to inspect interstate facilities within its boundaries; however, DOT is responsible for enforcement action. The majority of the states have either Section 5(a) certifications or Section 5(b) agreements, while nine states act as interstate agents. California has a Section 5(a) certification.

DOT pipeline standards are published in 49 CFR Parts 190-199. Part 192 specifically addresses natural gas pipeline safety issues, but does not address pipeline siting and routing. Siting and routing is primarily a matter of private negotiation between pipeline companies and landowners and may be subject to review and approval (including appropriate environmental review) by other agencies with jurisdiction over a project.

The pipeline and aboveground facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with DOT Minimum Federal Safety Standards in 49 CFR Part 192. These regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

Part 192 includes the requirement to establish a written plan governing operation and maintenance activities. Under Part 192.615, each pipeline operator must establish an emergency plan that includes procedures to minimize the hazards in a natural gas or hazardous materials pipeline emergency. Key elements of the plan include procedures for:

- Receiving, identifying, and classifying notices of events that require immediate response by the [pipeline] operator;
- Establishing and maintaining communications with local fire, police, and public officials, as well as coordinating emergency response;
- Making personnel, equipment, tools, and materials available at the scene of an emergency;
- Protecting people first and then property, and making them safe from actual or potential hazards; and
- Implementing emergency shutdown of the system and safely restoring service.

Part 192 requires each operator to establish and maintain a liaison with the appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas and hazardous materials pipeline emergency, and to coordinate mutual assistance.

### *High Consequence Areas*

The DOT Pipeline and Hazardous Materials Safety Administration's (PHMSA's) Office of Pipeline Safety (OPS) has published a series of rules that (1) define high consequence areas (HCAs) where a gas pipeline accident could do considerable harm to people and property, and (2) require an integrity management program to minimize the potential for an accident. The DOT (68 Federal Register 69778, 69 Federal Register 18228, and 69 Federal Register 29903) defines HCAs as they relate to the different hazard classification zones (discussed above), potential impact circles, or areas containing an "identified site" as defined in 49 CFR Part 192.903 of the DOT regulations.[2]

The HCAs may be defined in one of two alternative methods. In the first method (Method 1), an HCA is based on the hazard classifications discussed above and includes:

- Current Class 3 and 4 locations;

[2] An "identified site" is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

- Any area in Class 1 or 2 locations where the potential impact radius[3] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle[4]; or

- Any area in Class 1 or 2 locations where the potential impact circle includes an identified site.

In the second method (Method 2), an HCA includes any area within a potential impact circle that contains:

- Twenty or more buildings intended for human occupancy; or

- An identified site.

Once a pipeline operator has determined whether and where there are HCAs on its pipeline, it must apply its integrity management program to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for integrity management plans at Part 192.911. The pipeline integrity management rule where an HCA is present along a segment of a pipeline requires inspection of the entire pipeline every seven years to determine the presence of HCAs.

An HCA is potentially present, or may be present in the future, along Highway 180, east of the Fresno Slough crossing. The presence of HCAs along the pipeline corridor will be determined based on the potential impact circle (a function of proposed pipeline diameter and operating pressure), and population density, and a pipeline integrity management plan, discussed below, will be implemented if necessary.

### The Federal Pipeline Safety Improvement Act

In 2002, Congress passed an act to strengthen the nation's pipeline safety laws: the Pipeline Safety Improvement Act of 2002 (HR 3609) (the PSIA). Under the PSIA, gas transmission operators are required to develop and follow a written integrity management program containing all the elements described in Part 192.911 of the DOT regulations and to address the risks on all transmission pipeline segments which includes an HCA. Specifically, the law establishes an integrity management program that applies to all HCAs.

### Natural Gas Pipeline Safety Act

The DOT Office of Pipeline Safety administers the Natural Gas Pipeline Safety Act (NGPSA) (49 U.S.C. Chapter 601) national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline (DOT OPS). The DOT's PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level.

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[3] The potential impact radius for natural gas is calculated as the product of 0.69 and the square root of the maximum allowable operating pressure of the pipeline in pounds per square inch multiplied by the pipeline diameter in inches.
[4] The potential impact circle is a circle of radius equal to the potential impact radius.

## Hazardous Materials

### *The Superfund Amendments and Reauthorization Act of 1986*

The Superfund Amendments and Reauthorization Act of 1986 (SARA Title III), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), along with the Clean Air Act of 1990, establish a nationwide emergency planning and response program and impose reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials. The Clean Air Act (as implemented in 40 CFR Part 68.100 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. Additionally, SARA identifies requirements for planning, reporting, and notification concerning hazardous materials.

### *Clean Water Act (CWA)*

The Spill Prevention Control and Countermeasures (SPCC) requirements (Title 40 CFR Part 112) were developed pursuant to the Clean Water Act. SPCCs are intended to reduce the threat of spills of hydrocarbons to navigable waters of the United States. The aboveground oil storage capacity for triggering the SPCC requirements is 1,320 gallons.

### *Resource Conservation and Recovery Act*

The Resource Conservation and Recovery Act (42 USC Section 6922) (RCRA) establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. The 42 USC Section 6922 requires generators of hazardous waste to comply with record keeping requirements relating to the identification of quantities of hazardous wastes generated and their disposition, labeling practices and use of appropriate containers, use of a manifest system for transportation, and submission of periodic reports to the U.S. Environmental Protection Agency (EPA) or authorized state.

### *Title 40, Code of Federal Regulations, Part 260*

These regulations were promulgated by the EPA to implement the requirements of RCRA as described above The regulations define the characteristics of hazardous waste in terms of ignitability, corrosivity, reactivity, and toxicity and list specific types of wastes deemed hazardous.

## Aviation

FAR Part 77 (Title 14, CFR, 77) requires that the Federal Aviation Administration be notified before beginning construction of any structure higher than 200 feet above ground level or tall enough to protrude into an imaginary surface defined from the end of a nearby runway. The slope and distance of the imaginary surface vary, based on the type of airport and operations present.

#### Electrical

The National Electric Safety Code (NESC) covers basic provisions for safeguarding persons from hazards arising from the installation, operation, or maintenance of electrical systems.

### 4.7.2.2 State

#### Pipeline Safety

Section 5(a) of the NGPSA provides for a state agency to assume all aspects of the safety program for intrastate pipeline facilities by adopting and enforcing the federal standards, while Section 5(b) permits a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions by agreement. The majority of the states have either Section 5(a) certifications or Section 5(b) agreements, while nine states act as interstate agents. California has a Section 5(a) certification.

In addition to Federal pipeline safety regulations, the CPUC has developed General Order 112-E, which establishes minimum requirements for the design, construction, and quality of materials, locations, testing, operations and maintenance of facilities used in the gathering, transmission and distribution of gas. General Order 112-E provides requirements for reporting, construction and safety standards, liquefied naturals gas facilities, gas holders, and petroleum gas vessel stations.

#### Hazardous Materials

Title 22 of the California Code of Regulations, Division 4.5, Chapter 11 contains regulations for the classification of hazardous wastes. A waste is considered a hazardous waste if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases) in accordance with the criteria established in Article 3 Characteristics of Hazardous Waste. Article 4 lists specific hazardous wastes, and Article 5 identifies specific waste categories, including RCRA hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, and special wastes.

#### Department of Conservation, Division of Oil, Gas, and Geothermal Resources

The Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells. The regulatory program emphasizes responsible development of oil, natural gas, and geothermal resources in the state through sound engineering practices that protect the environment, prevent pollution, and ensure public safety. DOGGR regulations provide specific data requirements for DOGGR's review of all proposed oil and gas wells (CCR Title 14, Division 2, Section 1724.7), and additional regulations specific to gas storage wells (CCR Title 14, Division 2, Section 1724.9). The DOGGR has issued further requirements that are specific to well development in the Storage Field in order to address potential safety effects of ground surface subsidence on well stability. These are described further in Section 4.7.3.2 Impacts and Mitigation Measures.

### Worker Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Occupational Health and Safety Administration (Cal/OSHA) is responsible for developing and enforcing workplace safety standards and assuring worker safety in the handling and use of hazardous materials.

Among other requirements, Cal/OSHA obligates many businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans. The Hazard Communication Standard requires that workers be informed of the hazards associated with the materials they handle. For example, manufacturers are to appropriately label containers, Material Safety Data Sheets need to be available in the workplace, and employers need to properly train workers.

#### *Electrical Safety*

Title 8 CCR, Section 2700 *et seq*. High Voltage Electrical Safety Orders, establishes essential requirements and minimum standards for installation, operation, and maintenance of electrical installation and equipment to provide practical safety and freedom from danger.

The GO-52, CPUC, "Construction and Operation of Power and Communication Lines," applies to the design of facilities to provide or mitigate inductive interference.

The GO-95, CPUC, "Rules for Overhead Electric Line Construction," the purpose of these rules is to formulate uniform requirements for overhead electrical line construction, or reconstruction to ensure adequate service and secure safety to persons engaged in the construction, maintenance, operation or use of overhead electrical lines and to the public in general.

The GO-112-E, CPUC, provides "Rules for Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems."

#### *Wildland Fire*

The California Public Resources Code includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that has an internal combustion engine[5], specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas.

The Project site is not considered at a high risk for wildland fires. It is on level ground, dominated almost exclusively by irrigated agriculture (row crops, vineyards, and orchards). Additionally, the State has not identified any "very high fire hazard severity zones" as defined by AB 337 (Bates), Chapter 1188, Statutes of 1992 in the vicinity of the Project site.

[5] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap is commonly used to retain carbon particles from the exhaust.

### 4.7.2.3 Local

#### Fresno County General Plan

The Safety and Public Facilities Elements of the Fresno County General Plan includes goals and policies relevant to hazards and hazardous materials. These goals and policies are intended to reduce the risk of loss of life, injury or damage to property and the environment due to fire hazards, and the use, transport, treatment, and disposal of hazardous materials and hazardous wastes (Goals HS-F and S-5).

#### Madera County General Plan

Section 6, Health and Safety, of the Madera County General Plan includes goals and policies relevant to fire hazards and hazardous materials. These goals are intended to minimize the risk of loss of life, injury, and damage to property and watershed resources resulting from unwanted fires (Goal 6.C) and from the use transport, treatment, and disposal of hazardous materials and hazardous wastes (Goal 6.G).

#### Madera County Airport Land Use Commission (ALUC)

The purpose of the ALUC is to provide for the orderly development of each public use airport within the County of Madera and the surrounding area so as to promote the overall goals and objectives of the California airport noise standards adopted pursuant to Section 21669 (Public Utility Code) and to prevent the creation of new noise and safety problems. It is the purpose of this article to protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses.

#### Business Plan (Emergency Planning and Community Right-to-Know Act [EPCRA])

California's version of EPCRA is set forth in Chapter 6.95 of the California Health and Safety Code (H&SC), Article 1, Hazardous Materials Release Response Plans and Inventory. Article 1 requires emergency response plans for facilities that store hazardous materials in excess of 55 gallons, 500 pounds, or 200 cubic feet. Facilities that handle more than these quantities of hazardous materials must submit a Hazardous Materials Business Plan (HMBP) to the Certified Uniform Program Agency (CUPA). The CUPA for Fresno County is Fresno County Environmental Health Department. The CUPA for Madera County is Madera County Department of Environmental Health.

#### Uniform Fire Code, Article 80

The article includes provisions for storage and handling of hazardous materials. Considerable overlap exists between this code and Chapter 6.95 of the Health and Safety Code. Other articles that may be applicable include Article 4, Permits, and Article 79, Flammable and Combustible Liquids. The administering agencies for the above authority for this Project are the Fresno County Fire Protection Division (FCFPD) and Madera County Fire Department (MCFD).

## 4.7.3 Impact Analysis

### 4.7.3.1 Significance Criteria

Appendix G of the California Environmental Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact related to hazards and hazardous materials if the project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- 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.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Additional criteria included in Appendix G but not relevant to this project are:

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

No schools are present within one-quarter mile of any of the project facilities, nor are any proposed in the agricultural Project area.

- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area. Although the Mendota Airport is approximately 1.5 miles north of the pipeline alignment there would be no increased risk for pipeline construction workers as the alignment is along a public roadway. The Project site is not located within an airport land use plan or within 2 miles of a public use airport.
- 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 private airstrips are located along the pipeline corridor. The closest private agricultural airstrip is located along Road 16, approximately 1 mile north of the proposed central compressor site. Neither the compressor site nor other Project features present potential conflicts with this airstrip. The Applicant considered an electrical power line corridor along Road 16, but selected a different route that avoids all residences and agricultural facilities, including this private airstrip, along Road 16.

- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

The Project is located in a sparsely populated area, and neither construction nor operations would impede access to or from the Project area or in any way interfere with an adopted emergency response plan or emergency evacuation plan. All construction would occur either on the Gill Ranch Project site or off-road. No road closures would be required, and any lane closures would be temporary and limited to short road segments. Operations would have no impact on emergency response or access. The pipeline would be buried, and most other Project components would be located within Storage Field. The electrical power line would be located in an existing utility corridor and, therefore, would not affect emergency response or access.

### 4.7.3.2 Impacts and Mitigation Measures

#### Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

**IMPACT HAZ-1: The Project would involve the routine storage and transport of natural gas, a hazardous material.** The Project is located in a sparsely populated rural area, which minimizes any potential risks to the public. The Project would be constructed and operated in accordance with all applicable regulatory requirements described in Section 4.7.2. In particular, the proposed pipeline and its associated aboveground facilities would be designed, constructed, operated, and maintained in accordance with or exceeding DOT Minimum Federal Safety Standards in 49 CFR Part 192. These regulations are intended to protect the public and to minimize the potential for pipeline accidents and failures. The standards include specifications for material selection and qualification, pipe wall thickness, design pressures, hydrostatic test pressures, MAOP, inspection and testing of welds, and frequency of pipeline patrols and leak surveys. Additionally, the pipeline would include enhanced safety features. In areas where the population density is well below the Class 2 thresholds (discussed in Section 4.7.1), the pipeline would be designed to Class 2 standards. One segment of the pipeline that meets Class 2 thresholds due to the presence of residences (MP 18-19.5) will be constructed to meet the more stringent Class 3 standards. With the implementation of applicable regulatory requirements, which have been developed to protect the public and the environment, any impacts from the Project related to the proposed routine natural gas storage and transportation will be less than significant, and no mitigation is required.

#### Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions

**IMPACT HAZ-2: Accidental releases of natural gas from surface facilities could result in explosion or fire.** The design measures mandated by the DOT regulations include the blocking in and subsequent venting of all natural gas from within a facility during identified emergency situations. Other unscheduled releases may include the venting of pressure safety valves. In all cases the vent locations are identified during design and specific layout and equipment choices are made to eliminate any possible ignition source within a defined proximity. As natural gas is lighter than air it is standard design practice to route and direct all vents upward to a safe location.

The proposed surface facilities would be remote and well-removed from populated areas. The facilities would be designed, constructed, and operated in accordance with stringent DOT and DOGGR regulations. Written procedures for the operation, inspection, maintenance and repair of the equipment and facilities would be established in an Operating and Maintenance Plan as required by the DOT in the Code of Federal Regulations (49 CFR, Part 192, Subparts L and M). Applicant Proposed Measures include various safety plans and procedures including a facility-wide Emergency Response Plan and personnel safety training.

Accidental release of natural gas from surface facilities can occur as a result of pressure relief device activation or unintended opening of vent valves. To guard against such occurrences, the Compressor Station will be equipped with safety features to first prevent and second to alert operators to circumstances which may lead to accidental release.

Pressure relief devices will activate when system pressures exceed normal operating levels either due to pressure buildups from connected systems or due to inadvertent operation of block valves. The station controls will react to unexpected pressure buildups by reducing gas flow through variable speed controlled compressors and/or limiting capacity of actuated control valves. In extreme circumstances the station control system will shut in portions of the plant through use of actuated block valves. Actuated block valves are used throughout the system to direct gas flow appropriately for each mode operation (withdrawal or injection). These valves are opened and closed by operators according to procedures through interface with the station control system. The station control system is configured to allow opening/closing of these valves only as appropriate for the current mode of operation and will ignore inputs from operators made in error. Manual operated block valves will be equipped with locking devices to prevent unplanned position switching. All critical system valves will be equipped with position monitoring instrumentation to allow verification by the control system that valve positions are appropriate for the current mode of operation.

The Compressor Station will be equipped with a blowdown valve and numerous manually operated vent valves used for maintenance. The blowdown will be an actuated valve integrated with the station ESD control system which is a dedicated stand alone panel. This valve will have no operator interface other than the ESD buttons throughout the plant which are designed specifically to minimize risk of inadvertent activation. Manual vent valves will be equipped with locking devices to prevent unplanned opening as well as plugs or caps which will be installed whenever the valve is not intended to be used.

In addition to the preventive measures described above, the Compressor Station control system will monitor all system parameters (pressure, temperature, flow, etc.) and will provide operators with alarms in the form of lights and buzzers in the event that normal conditions are exceeded or when equipment operations do not respond appropriately to operator or automated commands. When an alarm is activated, operators will have an opportunity to correct operational settings or shutdown malfunctioning equipment before automated equipment or plant shutdowns are initiated. In the event that equipment or plant shutdowns do not prevent an over pressure, pressure relief devices will vent gas until normal pressures are reestablished and then will close to minimize the quantity of accidentally released gas.

Each individual injection/withdrawal well will be equipped with an emergency shutdown system (ESD). The ESD system monitors the pressure in the surface piping at key locations at the well site. In the event there is either an indication of abnormal high or low pressure, the wellhead master valve will close, thus blocking the flow of gas from the well. Each injection/withdrawal well site location will be equipped with an actuated valve located between the gathering line and the wells that can be closed from the compressor station control room if conditions warrant. The control room will also be receiving real time data from each injection/withdrawal site. If the alarm set points are exceeded, the station operator can respond accordingly by adjusting flow, shutting the valve or visiting the site or by taking some other appropriate action. The well site piping and other hardware positioned between the well head and the compressor station are rated for higher pressures than the system will practically experience because of the pressure limits of the compressors and the necessary over pressure protection design of the station and well site.

The well drilling program will be designed to meet DOGGR regulations. The surface well casing will be set at a depth to protect all shallow water zones from the future drilling and ultimate storage operations. The production casing will be designed to provide the necessary protection at the surface in the unlikely uncontrolled well event. The drilling rig will be equipped with all required safety features including properly sized blow out preventers, choke manifolds, accumulators, lines and vents. The well drilling program is designed to drill the wells over balanced so the column of fluid in the well will exceed the formation pressure under normal conditions.

Given the surface facility location, and with the implementation of these safety and design measures, any impacts from a potential release of natural gas or other hazardous materials from the well sites or central compressor station will be less than significant, and no mitigation is required.

**IMPACT HAZ-3: A release of natural gas from the subsurface project components due to land subsidence or gas migration in the gas reservoir could result in a hazardous condition.** The Storage Field is located in an area that has experienced land subsidence as a result of regional groundwater extraction. Although the rate of subsidence has declined in recent years, future subsidence could affect the structural integrity of the wells, and, over time, the shallow portions of the well casings could potentially weaken to a point at which natural gas is released to the surrounding surface area. The DOGGR, as the agency that regulates gas well development, has issued requirements for well development in the Storage Field in order to address potential safety effects of ground surface subsidence on well stability. DOGGR Field Rule 507-003, dated March 5, 2007, states:

> *In the Gill Ranch Gas field there is significant land subsidence caused from water production for agricultural uses. The well casing is subject to compression and failure from the water producing depth to the surface. The well casing should be unlanded to relieve the stress every 5 years. (DOGGR 2007)*

The proposed wells would be constructed and maintained in accordance with DOGGR regulations, including Field Rule 507-003 that specifically applies to the Storage Field. Applicants will work with DOGGR to develop a mutually acceptable well design that protects the well structural integrity from future subsidence. Applicants intend to complete the wells in a manner that satisfies the DOGGR field rules, protects the present and future casing integrity, but removes the requirement to unland the well casing every 5 years. The Applicants will install surface casing to protect the fresh water zones as well as install production casing to the top of the storage zone. The production casing cement will be installed in a manner that will provide the required protection and eliminate the need to unland the casing every five years. The surface wellhead equipment will be designed to allow casing movement if subsidence continues but the cement that surrounds the production casing will not come high enough inside the surface casing to exacerbate casing compression failure.

A further safety consideration related to gas storage is the potential for gas to migrate beyond the intended storage reservoir. From a geological standpoint, the reservoir trapped and contained the native natural gas for millions of years and can reasonably be expected to be a competent “container” for the life of the storage project. Moreover, the proposed I\W wells will be drilled to the deepest production zone within the Gas Field. If gas migration were to occur, the gas would first migrate to and be captured in the more shallow zones. If gas migration were to occur, strategically positioned observation wells will alert the operator and operational changes will be implemented to stop the migration. Casing leaks in existing wells could also become a migration path. These casing leaks can be repaired. From a mechanical aspect, all historical well penetrations of the reservoir have been reviewed and any wells that are suspected or potential migration candidates will be re-entered and made sound.

A July 2007 International Gas Consulting (IGC) report titled, “Safety Record Study of Underground Gas Storage in Depleted Gas Reservoirs: A Safe Industry in the Past, Present, and Future” evaluated 30 years of historical storage project data and concluded that storage has a good safety record.[6]

The Project would be designed, constructed, and operated in accordance with DOGGR regulations, and standards intended to avoid gas migration to the ground surface or to beneficial groundwater aquifers. In particular, the installation of gas storage reservoir Observation and Monitoring (OM) wells will allow the operator to detect possible migration to areas outside the designated gas field and to adjust gas field operations accordingly. Given the site conditions and these design measures, the potential public safety risks related to gas migration are considered less than significant, and no further mitigation is required.

[6] The IGC Report was prepared at the request of Sacramento Natural Gas Storage, LLC (SNGS) and was filed with the CPUC in July 2007 as a supplement to the PEA for the SNGS Project in proceeding number A.07-04-013. The IGC Report is available on the CPUC web site at: http://www.cpuc.ca.gov/environment/info/dudek/sngs/SupplementtoPEAefiled071607.pdf.

**IMPACT HAZ-4: A rupture of the natural gas pipeline could ignite and cause an explosion and new power lines could cause fire or other hazardous conditions.** A gas pipeline rupture can be caused by third party damage, internal or external corrosion, pipeline malfunction, or other causes. In a worst-case scenario, a pipeline rupture could result in explosion, and the release of gas and mixing with air can ignite and cause a fire if there is an ignition source. The consequence of a worst-case rupture (guillotine cut) of the pipeline and release of natural gas was calculated following the protocol established in 49 CFR Part 192 – Pipeline Safety: High Consequence Areas for Gas Transmission Pipelines (EPA 2002). The result of this calculation is the Potential Impact Radius (PIR).[7] The PIR is defined by DOT as the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property. The analysis is based on a model developed by C-FER, a Canadian research and consulting organization (C-FER Technologies 2000). The C-FER analysis considered the complete rupture of a natural gas pipeline. The model included a simplified mathematical treatment of several phenomena important to characterizing the extent of damage following a pipeline rupture, such as critical heat flux, the time of ignition of the escaping gas, the height of the burning jet, and the pipe decompression rate. The model also included estimates of several important parameters associated with the phenomena.

The method calculates the heat flux (radiation intensity) from a full cut of the pipeline. The impact area is based on acute effects to humans (blistering and mortality) and structures (spontaneous and piloted ignition to wooden structures). Outside the impact area, property would not be expected to ignite and burn, people who are indoors would be protected indefinitely, and people outdoors would be exposed to a "finite but low chance of fatality."

The proposed pipeline will be designed for a Maximum Allowable Operating Pressure of 1,415 psig (pounds of pressure per square inch gauge) to allow free flow into PG&E's system, which can operate at pressures of approximately 1,000 psig. Given this MAOP and an outside diameter of 30 inches for the proposed natural gas pipeline, the C-FER Model defines the worst-case impact area as 779 feet on either side of the pipeline centerline. The normal operating pressure of the natural gas pipeline would be below the MAOP; as such the actual hazard footprint is expected to be less than 779 feet.

The probability of a worst-case release and explosion is extremely low. A small release from a pin hole leak or other pipeline anomaly has a greater probability of occurring, but would also have a lower probability of igniting since the gas would likely dissipate below the flammable limit and be detected before reaching an ignition source.

Title 49 CFR Part 191 defines reportable incidents and requires all operators of transmission and gathering systems to notify the DOT of any reportable incident and to submit a report within 20 days of such incident. Based on the data collected by the DOT Office of Pipeline Safety (OPS) the probability of a worst-case pipeline rupture is very low. For example, in a 2002 study, OPS compared the national annual rate of accidental fatalities from various manmade and natural

[7] PIR is determined by the formula r = 0.69* (square root of ($p*d^2$)), where r is the radius of a circular area in feet surrounding the point of failure, p is the maximum allowable operating pressure (MAOP) in the pipeline segment in pounds per square inch and d is the nominal diameter of the pipeline in inches. Therefore the PIR = 0.69*Square root (1,250)*($(30)^2$) = 732 feet

hazards. The report indicated an annual average of 3.1 public fatalities per year as a result of gas transmission accidents for more than 300,000 miles of transmission and gathering lines in service nationwide. This equates to an annual risk of fatality by gas transmission and gathering lines of approximately 1 x 10-5 (DOT 2002).

The proposed pipeline would be designed, constructed and operated in accordance with the applicable DOT guidelines. The pipeline design would exceed the DOT hazard classifications for the Project area (i.e., in Class 1 areas, the pipeline would be designed to meet Class 2 requirements, and in Class 2 areas, the pipeline would be designed to meet Class 3 requirements). For any defined HCAs, a Pipeline Integrity Management Plan would be implemented throughout the life of the Project. With implementation of these measures, the potential impacts related to transportation of natural gas is considered less than significant, and no further mitigation is required.

The most common threat to buried pipelines is third party dig-ins. The proposed pipeline will be designed, constructed, and operated with the specific intent of minimizing the probability of a dig-in using the following measures:

- The proposed pipeline will be located when possible in a private easement. National safety data indicates that most dig-ins occur in the public right of way.
- The proposed pipeline will be buried with a minimum depth of cover of 60 inches. National codes generally require a minimum of 36 inches.
- The proposed pipeline will have a warning tape placed in the pipeline trench approximately 2 feet above the pipe.
- The proposed pipeline will have warning signs and markers as required by applicable codes.
- The Applicants will become members of the Underground Service Alert (USA North) Underground Facility Damage Prevention Service that provides facility marking, information, or clearance to dig to excavators and facility owners.

Public safety concerns related to power lines include risk of fire and electrocution. Power lines may pose a threat of fire if a conducting object were to come into close proximity to the power line (resulting in a flashover to ground) or electrocution if a person were to come into close proximity to the power line. The proposed power lines will be designed in accordance with CPUC GO-95 guidelines for safe ground clearances established to protect the public from electric shock caused by induced currents and this would also provide adequate distance from objects below the line thereby reducing fire risk. With the implementation of design features and construction methods detailed in GO-52 and GO-95 potential impacts related to power lines is considered less than significant, and no further mitigation is required.

**IMPACT HAZ-5: Hazardous materials used during construction and operation of the project could spill or otherwise get into the environment and cause an adverse impact.**

### *Construction*

The hazardous materials to be used during construction of the Project (including pipeline, compressor and well sites, and electrical power line) are limited to fuels and other materials such as hydraulic fluids and lube oils used by heavy construction equipment during the construction. Paint primer, paint, and paint thinners would also be used. These materials would be stored at staging areas or within designated work areas. No acutely hazardous materials would be used or stored during construction.

The most likely incidents involving hazardous materials are associated with minor spills or drips. Impacts from such incidents would be effectively avoided by implementing standard Construction Hazardous Materials Measures. These practices include thoroughly cleaning up minor spills as soon as they occur. Material Safety Data Sheets (MSDS) for all hazardous materials used during construction would be on-site and available to construction personnel. As required by Cal/OSHA, construction personnel handling hazardous materials would be trained to understand the hazards associated with these materials and would be instructed in the proper methods for storing, handling, and using these hazardous materials.

Non-hazardous wastes would be transported to a licensed Class III landfill. Waste such as welding rods or any metallic wastes would be segregated and recycled. Any hazardous waste would be properly labeled, manifested, and disposed of at a licensed disposal facility. Removed vegetation would be disposed of at an approved landfill or along the right-of-way if approved by the property owner. Excavated soil, if thought to be contaminated due to color or odor, would be tested and, if hazardous, disposed of at a licensed waste facility. Specific methods for management of water encountered during trench dewatering will be identified pending further studies. Specific details, including measures to ensure that the applicable regulatory requirements are met, are discussed further in Section 4.8 Hydrology and Water Quality.

Training for construction personnel would also include steps to take in the unlikely event of a spill or accidental release. Other hazardous materials and hazardous waste measures are described in Section 3.9, Summary of Design, Construction and Operation Compliance Measures and include preparation of a Hazardous Materials Plan, and equipment maintenance and refueling restrictions which will address several aspects of hazardous materials and hazardous waste handling, transport, storage, and contingencies.

Given the implementation of these measures, impacts from accidental releases of hazardous materials during construction will be considered less than significant, and no mitigation is required.

### *Operation*

The pipeline is buried and there are no hazardous materials or wastes associated with pipeline operations. The tie-in facility and valve stations would not require routine use or storage of hazardous materials, and would not generate waste, nor would operation of the electrical power line.

Operation of the compressor and well sites would require the use and onsite storage of hazardous materials, which would result in the generation of hazardous waste. The types of materials that are required for operation of the central compressor station include tri-ethylene glycol, lube oils, transformer oil, corrosion inhibitor, and methanol. The volumes and toxicity of these materials are relatively low, and therefore threats to public safety and environmental damage are relatively low. These materials would be handled in accordance with all applicable manufacturers' specifications for storage and handling, and would be required to comply with local, state, and federal requirements. The storage, use, and disposal of these materials are covered under Chapter 6.95 of the California Health and Safety Code (H&SC), Article 1, which is more commonly referred to as the "Business Plan." The requirements of this program control the use and storage of hazardous materials to ensure public safety and protection of the environment. Madera County Environmental Health is the lead agency (CUPA, as defined in Section 4.7.2.3) for implementation of a Business Plan for the central compressor station and well pads within Madera County. Various other plans and programs as listed in Section 3.0 Project Description, would include procedures to ensure proper use and storage of these materials. The volume of compressor oil stored on site is approximately 2,400 gallons; of this total, 1,400 gallons will be inside the compressor building either on skid or as make-up oil, and 1,000 gallons will be contained in bulk storage.

Wastes generated during routine operations at the compressor station and well sites would be minimal and would include contaminated materials from clean up of spills and drips and used lube oil, which in most cases would be recyclable. All wastes characterized as hazardous would be disposed of properly at an authorized hazardous waste management facility. Used lube oil from the compressors will be piped to and collected in 5 to 300-gallon tanks. An additional 21,000 gallon waste oily water (95 percent water, 5 percent oil) tank will be located at the compressor station. The 2 transformers for the substation will contain 4,000 gallons of transformer oil each for a total of 8,000 gallons. If a release of hazardous materials or waste occurred at the compressor station, a potential health and safety impact could result. Storage of hazardous materials would primarily occur at the central compressor station site which is approximately 1 mile from the nearest residential location. The nearest candidate gas well site is also approximately 1 mile away from the nearest residence. In addition, because the materials would be handled, stored, and transported according to applicable regulations, the probability of an accidental release reaching the public is considered unlikely. As noted above, the Applicant's proposed Hazardous Materials Handling Plan will address several aspects of hazardous materials and hazardous waste handling, transport, storage, and contingencies.

With implementation of hazardous materials management plans and compliance with the applicable requirements for storage and usage of hazardous materials, impacts from chemical spills or releases of hazardous materials during operation will be considered less than significant, and no mitigation is required.

**IMPACT HAZ-6: Excavation activities during pipeline construction could damage other high pressure pipelines in close proximity to the work being performed and cause an accident or explosion or otherwise impact the integrity of the existing pipeline.** The consequences of a rupture of a hazardous materials pipeline co-located with or crossed by the proposed pipeline are similar to the consequences of a rupture of the proposed pipeline. This risk would be avoided by following standardized procedures for locating and working safely in proximity to other pipelines and underground structures.

Prior to trenching, known pipelines, telephone cables, and other underground structures would be located. All necessary precautions would be taken to protect the structures from damage as a result of the construction work. The Applicant would use the DigAlert System to identify the foreign underground structures. The owners of all foreign underground structures would be notified in writing and would be telephoned again prior to excavating near their facilities. The underground structures would normally be crossed by ditching under them unless the owner of the pipeline(s) allowed the natural gas pipeline to be installed over them. The trench would be hand dug in areas in close proximity to existing pipelines. A minimum clearance of 1 foot would be maintained where feasible between such lines or structures and the line being laid unless otherwise specified. Where this clearance is not feasible, special procedures would be followed to protect existing structures. Pipe and/or pipe coating damaged by the construction work would be repaired. Special care would be taken to protect other pipelines and coatings in the vicinity of the new pipeline construction.

For high priority subsurface installations[8], the Applicant would follow the requirements of SB 1359 (Chapter 651, Statutes of 2006). This law provides a process for identifying and delineating high priority subsurface installations, prior to construction activities occurring near these installations.

With implementation of the procedures described above and compliance with the requirements of SB 1359, impacts from excavation activities during pipeline construction will be considered less than significant and no mitigation is required.

### Be located on a site which 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.

**IMPACT HAZ-7: Contaminated soil or water from past spills or releases could be exposed during excavation activities during Project construction and be released into the environment and cause further impacts.** Exposure of contaminated soil or water could result in a threat to human or ecological receptors. The Project site, including the pipeline alignment, compressor and well sites, and the electrical power line corridor, is not included on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, and based on the results of the EDR report, no known sites of contaminated soil or water are located within the

[8] High priority subsurface installations are defined by Government Code §4216(d) as high-pressure natural gas pipelines with normal operating pressures greater than 60 psig or greater than 6 inches nominal pipe diameter, petroleum pipelines, pressurized sewage pipelines, high-voltage transmission lines, conductors, or cables equal to or greater than 60kV, or hazardous materials pipelines that are potentially hazardous to workers or the public if damaged.

Storage Field. Applicant-proposed measures would reduce risks in the event that contaminated soil or water is encountered during excavation activities for the surface facilities or pipeline. These standard measures include monitoring excavated soils for visual indicators of contamination or odors; suspension of work and sampling and assessment of soils and water; and remedial actions based on such monitoring. Other contingency actions would include training and site security; notification of local agencies; and proper storage, removal and disposal procedures.

With implementation of these contingency measures, impacts from contaminated soil and water exposure during pipeline construction excavation activities will be less than significant, and no mitigation is required.

### Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands

**IMPACT HAZ-8: A wildland fire could result from either the construction or operation of the Project.** The wildland fire risk for the Project is low. There are no "very high fire hazard severity zones" within or near the Project site, which includes the pipeline alignment, compressor and well sites, and the electrical power line corridor. In addition, the properties surrounding the Project site are generally level, have mostly been cleared of vegetation, and either have been or are currently being used for agricultural purposes. Applicant-proposed measures to reduce risks of a wildland fire include implementation of a site-specific Fire Protection Plan, Construction Safety Plans, and an Operations and Maintenance Plan that would include fire protection measures. With the incorporation of these measures, impacts related to wildland fire will be considered less than significant and no mitigation is required.

# 4.8 HYDROLOGY AND WATER QUALITY

## 4.8.1 Environmental Setting

### 4.8.1.1 Climate

The Project is located in the San Joaquin Valley. The climate in this area is characteristic of its location both latitudinally and geographically. The region occupies the broader temperate zone where temperatures are moderated by the influence of the nearby Pacific Ocean. The region experiences hot, dry summers and moderate to cold winters. Precipitation in the summer is infrequent and is usually limited to scattered thunderstorms. Temperatures locally vary from lows of about 36º Fahrenheit to 55º Fahrenheit in the winter to between 67º and 97º Fahrenheit in the summer months. Precipitation occurs primarily in the winter months, averaging about 12 inches of rainfall on a yearly basis, and 1.5 inches monthly throughout the winter months. Within the western region of Fresno County, only about 6 to 8 inches of rainfall occur annually (Fresno County General Plan Background Report 2000). Winds are typically from the northwest. The location of the San Joaquin Valley, bordered by the Diablo Range to the west and the Sierra Nevada range to the east, places the Valley in the rain shadow of the Diablo Range. The altitude of the San Joaquin Valley ranges from about 130 to 175 feet above sea level. Peaks in the Diablo Range rise to over 5,000 feet; elevations of the Sierra Nevada range from 4,000 feet to over 14,000 feet above sea level. Runoff from Sierran snowmelt is the primary contributor of surface water to streams draining into the San Joaquin Valley, as well as water imported into the valley.

### 4.8.1.2 Surface Water

The locations of the Project components relative to surface water features in the Project vicinity are shown on Figure 3.1-1, in Section 3.1. Surface water features that will be crossed by the Project gas pipeline include, from west to east, the California Aqueduct (MP 2.7), Fresno Slough (MP 18.0), Four-Mile Slough (MP 22.4), and the San Joaquin River (MP 25.1). In addition, the Project alignment crosses numerous small water supply and irrigation return water canals. The power line will cross the Chowchilla Bypass Canal. Each of these features is described below, and photographs of surface features are provided in Section 3.1 Project Location.

#### California Aqueduct

The western portion of the gas pipeline alignment will cross under the California Aqueduct (Aqueduct) at approximately MP 2.7. The Aqueduct is one of California's most important water conveyance structures, transporting water over 400 miles from the Sacramento-San Joaquin Delta through the San Joaquin Valley, over the Tehachipi Mountains, and south to the Los Angeles basin. The Aqueduct is a man-made concrete-lined canal that provides water supply to agricultural, industrial, and municipal users. Typically, the canal has a trapezoidal cross-section. The depth of flow is variable depending on location and season. The gas pipeline will cross under the Aqueduct using Horizontal Directional Drilling (HDD) technology. A Preliminary detail drawing of this crossing is provided in Appendix A.

### Fresno Slough

The gas pipeline will cross under the Fresno Slough at approximately MP 18.0. The Fresno Slough is also known as the James Bypass, or the North Fork of the Kings River. The Fresno Slough is an intermittent stream; it is a dry reach through most of the year. Flow usually only occurs as the result of floods and agricultural water input. The Fresno Slough has its headwaters as the Kings River near Inyo County. The Kings River is controlled by the Pine Flat Dam, which holds the Pine Flat Reservoir, a flood control/agricultural water retention area capable of holding 1,000,000 acre-feet of water. An additional 252,000 acre-feet of storage capacity is contained upstream of the Pine Flat Reservoir in smaller hydroelectric facilities owned by PG&E. Flood flows up to 4,750 cfs are diverted to the North Fork/Fresno Slough. Flows over 4,750 cfs are diverted to the South Fork of the Kings River (Fresno County General Plan 2000). The gas pipeline will cross under the Fresno Slough using HDD technology.

### Four-Mile Slough

The pipeline will cross under Four-Mile Slough, an irrigation canal located at approximately MP 22.4 of the proposed gas pipeline alignment. The Project proposes to install the pipeline under the channel of the slough using a boring method that will avoid construction in the banks or bed of the canal.

### San Joaquin River

The San Joaquin River (in its entirety) is a perennially flowing water body, and the Fresno Slough is an intermittent stream. Artificial bodies of surface water presently function as water conveyances or storage; these include the Chowchilla Bypass, Mendota Dam, Mendota Pool, Friant Dam, and Delta-Mendota Canal. Upstream of the Storage Field are various gravel pits along the river banks that are hydrologically connected to the San Joaquin River. Within the vicinity are numerous channels that support crop irrigation.

Historically, the San Joaquin River was recharged from a combination of runoff originating as precipitation in the Sierra Nevada range and groundwater derived recharge (San Joaquin River Restoration Study 2002). A combination of diversions and subsidence of the Valley floor from groundwater withdrawal has altered the hydrologic character of the River. Lowering of both the confined and unconfined aquifers by groundwater pumping has changed the San Joaquin River through most of its length, including at the gas pipeline crossing area, such that reaches of the River that previously retained water (i.e., gaining reaches) presently do not retain water (i.e., they are now losing reaches) (San Joaquin River Restoration Study 2002). Further, compaction of the aquifer is considered a permanent consequence of the groundwater withdrawal, particularly in semi-permeable clay layers that have been dewatered (Ireland 1983). Under these circumstances, infiltration from the river to the surrounding formation constitutes the dominant hydrologic character of the San Joaquin River surface water/groundwater system. During the majority of the year, the reach of the San Joaquin River at the proposed gas pipeline crossing is dry (San Joaquin River Restoration Study 2002). Structures affecting the flow regime of the San Joaquin River in this reach are Friant Dam, the Chowchilla Bypass Structure, Mendota Dam, and various gravel pits that are hydrologically connected to the river.

Within the Project pipeline crossing area, the San Joaquin River occupies incised floodplains. High-flow scour channels are apparent on the floodplain. The River bottom is primarily sandy, rather than gravelly as in the upper reaches. Channel width upstream of the Chowchilla Bypass structure has historically been widening; cross sections from 1914 to 1998 ranged from 880 to 1,011 feet wide and from 11.1 to 11.4 feet deep, respectively. The channel is aggradational; the overall gradient is 1.4 feet per mile, and the hydraulic capacity of the channel is 6,000 cubic feet per second (cfs); however, flooding is reported with flows as low as 2,500 cfs (Mussetter Engineering Inc. 2002). Little riparian vegetation occurs along this stretch of River. Estimates of discharge across the channel profile show that a discharge of 13,800 cfs will be necessary to overtop the banks (San Joaquin River Restoration Study 2002). Flow rate data from the Mendota station from 1993 to present show a peak flow of only approximately 6,000 cfs (Westlands Water District 2007). The San Joaquin River channel from Friant Dam to the Chowchilla Bypass has a capacity above 8,000 cfs; beyond the Chowchilla Bypass, the River channel narrows to maximum capacity of 8,000 cfs (Fresno County General Plan 2000). Downstream of the Chowchilla Bypass, the San Joaquin River generally carries less than 2,500 cfs (Fresno County General Plan 2000).

The San Joaquin River derives its flow almost entirely from releases upstream of the Friant Dam, which accumulates seasonal runoff originating in the Sierra Nevada. Runoff can be seasonally divided based on historic baseflow trends. These separate events occur as summer baseflow, fall baseflow, fall floods, winter floods (occurring from warm rain-on-snow events), winter baseflow, the spring snowmelt peak and spring/summer snowmelt recursion. The greatest flows occur during winter floods (rain on snow events), however, the effect of the floods on the channel are mitigated by the presence upstream of the Friant Dam. Two uncontrolled creeks (Cottonwood Creek and Little Dry Creek) downstream of the Friant Dam and upstream of the Project pipeline crossing contribute water to the San Joaquin River (San Joaquin River Restoration Study 2002).

The Friant Dam moderates the flow of water during peak runoff events and traps a portion of runoff during the spring snowmelt season from the Sierra Nevada. The purpose of the Friant Dam is to store water in the Millerton Reservoir for later release to agriculture downstream (Ferrari and Nuanes 2007). The Millerton Reservoir has a total capacity of 520,500 acre-feet. Releases from the Friant Dam are split between the Friant-Madera Canal (average annual flow 262,800 acre-feet), Friant-Kern Canal (average annual flow 1,027,000 acre-feet), and the San Joaquin River (average annual flow 695,500 acre-feet). Typically, between 180 to 250 cfs is released to the San Joaquin River from May through October, and between 40 to 100 cfs is released from October through May (San Joaquin River Restoration Study 2002). Peak flow released to the San Joaquin River occurs when the holding capacity of the Millerton Reservoir is exceeded. As of 1989, approximately 95 percent of all runoff trapped by Friant Dam was diverted to Kern and Madera Counties (Furman 1989). The Friant Dam provides water to approximately 1,000,000 acres of agricultural land in Fresno, Madera, and Tulare counties (Ferrari and Nuanes 2007). Additional storage capacity exists upstream of Friant Dam in the form of numerous small dams owned and operated by PG&E for the purpose of generating hydropower. The total storage of these dams upstream of Friant Dam is 609,530 acre-feet

(Fresno County General Plan 2000). Of the 520,500 acre-feet of storage at Millerton Reservoir, 170,000 acre-feet are reserved for flood control.

Several open pits along the River banks between Friant Dam and the gas pipeline crossing are used for gravel extraction. Fresno County has 93 million tons of permitted aggregate resources, some of which are located within the San Joaquin River (Fresno County General Plan 2000). Much of the San Joaquin River between Friant Dam and the Project gas pipeline crossing is designated by Fresno County as MRZ-2 (area of significant mineral deposits), although much of what was once mined for aggregate is now classified as MRZ-1 (depleted). There are at least 12 mineral resource sites along this stretch of the River. Projected consumption of aggregate is expected to be 528 million tons over the next 50 years, most of which is expected to be mined from the Kings River (Fresno County General Plan 2000). The total surface area of the gravel pits along this stretch of the River that are hydraulically linked to the San Joaquin River is estimated at 1,360 acres. The presence of the gravel mines alters river flow by construction of levees (Fresno County General Plan 2000) and by evaporation (San Joaquin River Restoration Study 2002).

The closest diversion structure to the Project gas pipeline crossing is the Chowchilla Bypass, located approximately 1.5 miles downstream of the proposed San Joaquin crossing. This structure was designed to divert flood flows from the San Joaquin River (downstream of Friant Dam) to the Chowchilla Bypass, which conveys the flows through the eastside canal to the Mariposa Bypass structure where the flow is directed back to the San Joaquin River, approximately 30 miles downstream (northwest of West Highway 152). The Chowchilla Bypass is operated to divert some flow from the River during periods of high runoff. For example, during River flows of 8,000 cfs, the structure diverts water to reduce the flows downstream of the structure to 2,500 cfs (San Joaquin River Restoration Background Report 2002). An irrigation ditch linked to the Chowchilla Bypass intersects the gas pipeline just south of the Storage Field.

The confluence of the Fresno Slough, Delta-Mendota Canal, Mendota Pool, and Mendota Dam is located approximately 4.7 miles west and downstream of the Chowchilla Bifurcation Structure. These elements are part of a system intended to divert water imported from the Sacramento-San Joaquin Delta to the San Joaquin Valley by way of the Delta-Mendota Canal. Prior to distribution, water that is imported via the Delta-Mendota Canal is stockpiled in the Mendota Pool, which has a capacity of 3,000 acre-feet. The Delta-Mendota Canal has a capacity of 4,600 cfs, but typically delivers water at a rate of 2,500 cfs to the Mendota Pool. At the Pool, a series of diversion canals removes the water, leaving behind about 500 cfs that is discharged out of the Mendota Pool and into the San Joaquin River. The Mendota Pool is not intended for flood control, and during high-flow events, flashboards are lifted off the dam to allow the flow to pass through. Analysis of precipitation station and river gage station data from 1993 to 2006 at the Mendota Dam shows only four instances in which flows near the Project site reached flood stage – in 1995 at a rate of 4,300 cfs, 1997 at 5,100 cfs, 1998 at 4,300 cfs, and 2006 at 4,300 cfs. Typically, peak flow rates for all other years were approximately 800 cfs.

### Other Surface Water Features

The Project alignment crosses numerous small water supply and irrigation return water canals. The power line crossed the Chowchilla Bypass Canal, a major north-south canal west of the Storage Field. Of the water bodies that are crossed by the proposed gas pipeline or electric power line, only the San Joaquin River, Four Mile Slough, Fresno Slough and one seasonally wet area are natural features. Agricultural ditches, ponds and canals are largely man-made and most can be avoided during construction. Excavation within the Project area as proposed intersects a total of seven minor or seasonal surface water features. Excavation of open trench for placement of the pipeline is proposed through five agricultural channels, one through a seasonally wet area, and one in the Fresno Slough overflow (refer to Section 4.4, Table 4.4-4 for further description of these water features). Each of these excavations will be backfilled after placement of the proposed gas pipeline.

## 4.8.1.3 Groundwater

The Storage Field overlies alluvial material consisting of glacial outwash, coast range alluvium, arkosic sands from the Sierra Nevada, pumice and ash in turn overlying the Corcoran Clay. These upper unconsolidated to semi-consolidated sediments constitute the unconfined to semi-confined water bearing zone. The Corcoran Clay (also known as the E-clay) is underlain by further layers of arkosic alluvium shed from the Sierra Nevada. These lower layers make up the confined aquifer. The upper unconfined to semi-confined zone contains the Sierran and Coastal aquifers and the lower confined zone contains the Sub-Corcoran aquifer (Belitz and Heimes 1987). Within the aquifer there are as many as six notable clay layers at various depths, four of which overlie the Corcoran Clay. These separate semi-confining clay layers create perched groundwater zones throughout the unconfined to semi-confined aquifer. Extending along the unconfined to semi-confined aquifer is a zone of shallow groundwater within the flood deposits that overlie the Sierran sands. This uppermost aquifer is recharged from irrigation return flows or "tail water." (Mitten, LeBlanc, and Bertoldi 1970).

Beginning in the mid-1920s, groundwater was the primary source of water for agriculture in the Central Valley. Pumping of massive amounts of groundwater led to a decline in groundwater levels which subsequently resulted in dewatering and hence, the compaction of the aquifer system (Ireland, 1986). Groundwater pumping continued to be the primary source of agricultural water until surface water began to be imported into the valley with the operation of overland canals designed for importation of surface water in the 1950s (Ireland, Poland, and Riley 1984).

### Confined Aquifer

The confined aquifer occurs below the Corcoran Clay member of the Tulare Formation (also known as the "E-Clay"), an extensive Pleistocene lake bed deposit underlying most of the San Joaquin Valley (Ireland 1986). The Corcoran Clay ranges in thickness throughout the Valley from 20 to 120 feet, and ranges in depth (at the base of the unit) from 400 to 900 feet deep (Belitz and Heimes 1990). Within the western basin of the San Joaquin Valley, the Corcoran Clay ranges from 80 to 350 feet below the ground surface. From the 1920s to the 1950s, groundwater withdrawal in the valley was primarily drawn mostly on the water pumped from the confined aquifer. From 1950 to about 1965, groundwater was withdrawn at a rate of nearly 1 million acre-feet per year, primarily from the confined aquifer (Belitz and Heimes 1990). This drawdown resulted in a number of changes to the confined aquifer system as well as both the semi-confined and shallow groundwater systems. The primary change to the confined aquifer was the deep subsidence experienced in the Project vicinity (28 feet at its center), the lowering of the potentiometric surface by an estimated 100 to 200 feet, a reversal of flow from eastward to westward (Belitz and Heimes 1990), and the permanent compaction of the semi-permeable water-bearing clay layers (Ireland 1986).

#### Unconfined – Semi-Confined Aquifer

The unconfined to semi-confined aquifer overlies the Corcoran Clay member. The primary water bearing strata of this upper aquifer are the Sierran Sands, and the Coast Ranges alluvium. The Sierran Sands are approximately 80 percent sand and gravel and 20 percent clay and silty clay, while the coast Range Alluvium are approximately 80 percent silt and clay and 20 percent sand (Belitz and Heimes 1990). In 1969, Page and LeBlanc recognized the A, C, and E clay layers in the Fresno area (Mitten et al. 1990). The unconfined aquifer currently supplies most of the groundwater pumped to the area (Mitten et al. 1970). Water levels of the unconfined to semi-confined aquifer overlying the Corcoran Clay range from 50 to 200 feet below the ground surface throughout the Project vicinity (Westlands Water District 2005). Pumping within the confined and unconfined to semi-confined aquifers has resulted in the development of a net downward flow of groundwater (overdraft) throughout most of the western San Joaquin Valley. The vertical gradient ranges from 0.003 feet per foot to 1.1 feet per foot.

### 4.8.1.4 Shallow Groundwater

A consequence of the irrigation of cropland has been the creation of an artificially raised shallow groundwater table throughout the region. Application of groundwater, and later imported water, to the surface of the San Joaquin Valley floor has created a shallow groundwater table which had previously not existed. Prior to aggressive irrigation in the early 1950s, the groundwater table was typically encountered at depths of 100 to 200 feet below the ground surface, as measured in 1952 (Belitz and Heimes 1990). Today, the uppermost groundwater table is generally within 20 feet of the ground surface. This shallow groundwater zone occurs in the alluvial and flood plain deposits overlying the Sierran Sands and Coast Range alluvium (Mitten et al. 1970). The presence of this shallow groundwater zone increases the vertical gradient of groundwater flow throughout the San Joaquin Valley.

The shallow groundwater table has been a management issue for farmers and landowners in the region. To address the problem of shallow groundwater, a regional tile drain system covering 65.6 square miles west and southwest of Mendota was installed from 1980 to 1981 (Belitz and Heimes 1990). The tile drain system successfully lowered shallow groundwater levels by 1 to 3 feet by diverting flow that will otherwise recharge the shallow aquifer (Belitz and Heimes 1990). The drain system still exists, though it has been abandoned throughout most of the area.

### 4.8.1.5 Current Groundwater Patterns

The Westlands Water District has made available yearly and seasonal groundwater elevation contour maps and depth to groundwater maps from the years 1994 to 2006 that include both the confined and unconfined to semi-confined aquifers. Bi-yearly (seasonal) groundwater contour maps were published for the months of October and April for each year available. Approximately one-half of the length (the western portion) of the proposed pipeline alignment traverses the area covered by the Westlands shallow groundwater data.

The highest ground surface elevations in the Project area are at the far western edge of the proposed pipeline. Depth to the uppermost shallow groundwater is greatest at the western end of the Project area and is typically between 20 to 25 feet below ground surface. The surface of the shallow groundwater table slopes downward to the east, toward the center of the Valley and the San Joaquin River. In the eastern portion of the Project area, the depth to shallow groundwater averages between 5 to 10 feet below the ground surface. Seasonal variation in groundwater levels measured during the months of October and April tend to be minimal (WWD 2005).

Groundwater level contours indicate water surface elevations in the unconfined to semi-confined aquifer tend to mimic ground surface elevations throughout the Project area. Elevations of this aquifer range from about 100 feet to 150 feet above sea level throughout the Project area. Based on review of the available data, the depth to the aquifer ranges from 200 feet below the ground surface to 50 feet below ground surface, from west to east. This unconfined to semi-confined aquifer flow trends along an east-northeast direction, with gradients ranging from 0.0026 feet per foot to 0.0018 feet per foot, averaging 0.0023 feet per foot. Variation in seasonal gradients and flow direction is minor.

Water surface elevations for the deep confined aquifer range between 0 to 100 feet above sea level on an annual basis throughout the Project area. The most commonly occurring elevation of the confined aquifer is approximately 50 feet above sea level. Depths to the water surface to the confined aquifer range from about 450 feet below ground surface to 200 feet below ground surface. As with the unconfined to semi-confined aquifer, the greatest depths to water surface occur along the western portion of the Project area. Groundwater contour lines appear to roughly mimic topography, with flow through the Project area to the northeast.

### 4.8.1.6 Water Quality

Application of irrigation water, pesticides and fertilizers to the ground has resulted in increasing concentrations of salinity, pesticides, and nitrates in the soils and groundwater of the San Joaquin Valley. The creation of a shallow water table by irrigation is known to contain and transport these substances into rivers, streams, and domestic drinking water supply wells.

The National Water-Quality Assessment Program (NAWQA) water quality studies throughout the San Joaquin River basin have tracked pesticide and organic contaminant presence in both groundwater and surface water bodies. Information gathered for the eastern San Joaquin Valley (north of the Project area) from 1992 to 1995 indicate that 49 different pesticides were detected in the San Joaquin River, seven of which exceeded criteria for the protection of aquatic life, with diazinon concentrations peaking to acutely toxic to aquatic life. Pesticide concentrations in the San Joaquin River were not found to exceed drinking water levels. Groundwater sampling indicated a generally low concentration of pesticides, with a high concentration (frequently exceeding drinking water standards) of nitrates (Dubrovsky et al. 1995). Sampling conducted by the USGS in 2001 for pesticides within the San Joaquin River ranged in concentrations from not detectable for many pesticides to consistently detectable levels (Orlando et al. 2003). Overall, 13 pesticides were consistently detected with diazinon detected in all samples, at concentrations up to 241 nanograms per liter (Orlando and Kuivila 2003).

The San Joaquin District of the California Department of Water Resources (DWR) has developed maps of the depth of the shallow groundwater surface and corresponding maps of the groundwater salinity levels. The uppermost shallow groundwater table is between 5 to 20 feet below the ground surface throughout the covered range within the Project area. Associated with this shallow water table are high salinities characteristic of repeated application of irrigation water to agricultural precipitates. Salinity in the Project area ranges from greater than 20,000 MicroSiemens per centimeter near the Fresno slough to between 4,000 to 10,000 MicroSiemens per centimeter within the shallow aquifer (DWR 2001).

The surface and subsurface water quality within portions of the San Joaquin Valley contain elevated levels of selenium (Central Valley RWQCB 2001). Selenium is a naturally occurring element found in relatively high concentrations in the sediments and soils on the west side of the Valley that are derived from marine sedimentary bedrock units in the Coast Ranges. The adverse affects of high selenium concentrations in surface water on wildlife within the Kesterson Wildlife Refuge have been the subject of numerous scientific studies conducted over the last two decades. The results of the studies prompted designation of a segment of the San Joaquin River as “impaired” for selenium pursuant to Section 303(d) of the Clean Water Act (CWA). The impaired segment extends downstream from the confluence of Salt Creek with the San Joaquin River to Airport Way Bridge near Vernalis. The Project gas pipeline will cross the San Joaquin River upstream of the “impaired” segment of the river.

Evaluation of the sources of selenium which have contributed to the selenium loading of the Kesterson Wildlife Refuge and the lower San Joaquin River identified an area referred to as the Drainage Project Area (DPA) as the major source of selenium for the watershed. The 97,000-acre DPA is located on the west side of the river downstream of the Project area and just downstream of the Mendota Pool. Elevated levels of selenium within the DPA are generally related to discharges from an extensive tile drain system that underlies the area. For the period 1986 through 1998, the average annual selenium loading attributed to the DPA (8,660 pounds) accounts for about 88 percent of the selenium total loading (9,788 pounds) of the San Joaquin River at Vernalis (RWQCB 2001). The remaining load is contributed by surface and subsurface water discharges throughout the basin. In response to the water quality degradation related to selenium, the Central Valley Regional Water Quality Control Board (RWQCB) has established a Total Maximum Daily Load (TMDL) for selenium for the impaired segment of the San Joaquin

River. The established TMDL targets a goal of meeting a 5 micrograms per liter four-day average water quality objective for concentration of selenium in the River.

#### 4.8.1.7 Flood Hazard Zones

Analysis of flood hazard zone maps developed by the Federal Emergency Management Agency (FEMA) for the region indicate there are four designations of flood hazard zone throughout the Project area (Figure 4.8-1). These are Zone "X," Zone "A," Zone "AO," and Zone "AE." These zone designations are defined in Table 4.8-1.

**Table 4.8-1: Flood Hazard Zones**

| ZONE | DESCRIPTION |
|---|---|
| Zone X (Moderate to Low Risk) | Areas outside the 1-percent annual chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is not required in these zones. |
| Zone A (High Risk) | Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones. |
| Zone AO (High Risk) | River or stream flood hazard areas and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones. |
| Zone AE (High Risk) | Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. In most instances, base flood elevations derived from detailed analyses are shown at selected intervals within these zones. |
| *Source*: FEMA Map Service Center, 2008 | |

As shown in Figure 4.8-1, flood zones designated "A" are located within the Project area at the following locations:

- Pipeline MP 17 to 19.4, near the Mendota Wildlife Management Area
- Pipeline MP 25.1 to 25.8, near the San Joaquin River crossing
- Electrical power line MP 0.0 to 8.3 in the vicinity of the Chowchilla Canal
- Southeastern portion of the Storage Field along the San Joaquin River, near some of the proposed observation and monitoring well pads

The largest of these flood zones occurs in the Mendota Wildlife Management Area and in the area north of the Mendota Pool and east to the Chowchilla Canal. Other "A" Zones throughout the Project reach tend to be narrow and interfingered with "X" Zones, and tend to occupy confined channels. The remainder of the Project area falls in Zone X.

The Project area within the Storage Field, including the central compressor station, is in Zone X, except for the area immediately adjacent to the San Joaquin River, which is in Zone A. The flood zone designations at the Storage Field are determined, in part, by the existing levees on both banks of the San Joaquin River. The integrity of the levees in the Project area is not known. However, these levees were designed to accommodate regulated flow volumes from upstream releases at Friant Dam. Therefore, it is anticipated that these levees provide adequate protection to the surrounding properties, including the Project area, as indicated by the FEMA designations.

The proposed pipeline alignment crosses the San Joaquin River. The crossing will occur under the river channel and will be constructed using HDD methods. The Zone A designation within the San Joaquin River appears to be confined to within a few hundred feet of the channel in either direction at this location.

The proposed pipeline will cross "A" flood zones through the Mendota Wildlife Management Area. Other high-risk flood zones within the Project area tend to be interfingered with low risk zones, and are confined to narrow, artificial channels. A-designated flood zones occur within channels draining the foothills located west of the Project area. The nearest channel with Zone A designation is located approximately 0.5 miles northwest of the proposed PG&E Line 401 tie-in point, at West Panoche Road. Other channel areas, such as Panoche Creek, are more distant from the Project alignment.

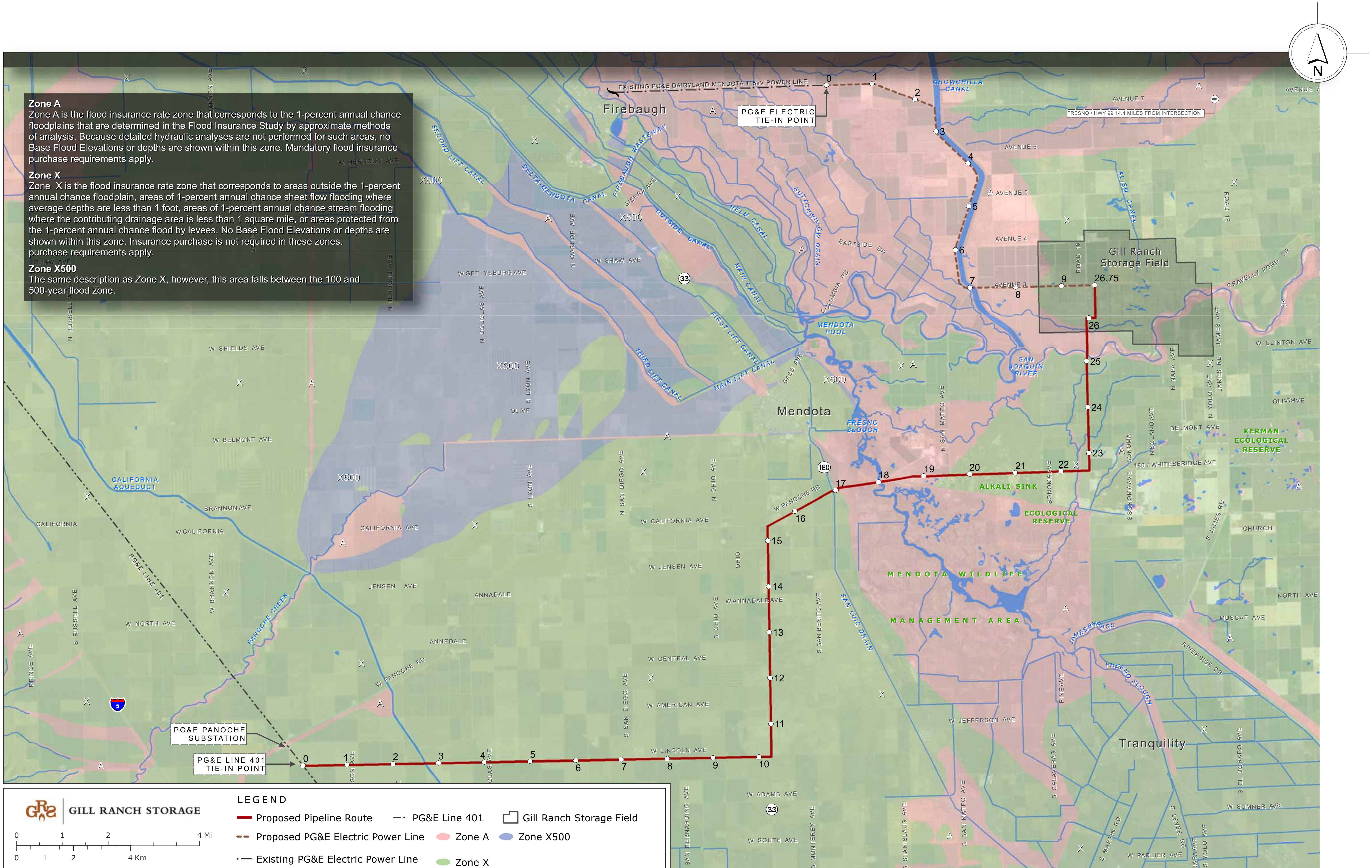


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FIGURE 4.8-1 | FEMA FLOOD ZONES

## 4.8.2 Regulatory Setting

The Project includes components under the jurisdiction of federal, state, and local agencies. Applicable regulations are summarized below.

### 4.8.2.1 Federal

#### Federal Clean Water Act (33 U.S.C. § 1251 et seq.)

The U.S. Environmental Protection Agency (USEPA) is the federal agency responsible for water quality management and administers the federal Water Pollution Control Act Amendments of 1972 and 1987, collectively known as the CWA. The CWA establishes the principal federal statutes for water quality protection. It was established with the intent "to restore and maintain the chemical, physical, and biological integrity of the nation's water, to achieve a level of water quality which provides for recreation in and on the water, and for the propagation of fish and wildlife." Several key sections of CWA guide the regulation of water pollution in the United States:

- **Section 208, Water Quality Control Plans.** This section requires the preparation of local water quality control plans by regulatory agencies throughout the nation. Each water quality control plan covers a defined drainage area. The primary goal of each water quality control plan is to attain water quality standards established by the CWA and the state governments within the defined area of coverage. Minimum content requirements, preparation procedures, time constraints, and federal grant funding criteria pertaining to the water quality control plans are established in Section 208 of the CWA. Preparation of the water quality control plans has been delegated to the individual states by the USEPA.

- **Section 401, Water Quality Certifications.** This section of CWA requires that, prior to the issuance of a federal license or permit for an activity or activities that may result in a discharge of pollutants into navigable waters (see Section 404 discussed, below), the permit applicant must first obtain a certification from the state in which the discharge would originate. A state certification indicates that the proposed activity or activities would not result in a violation of applicable water quality standards established by federal or state law, or that there are no water quality standards that apply to the proposed activity.

- **Section 402, NPDES.** The National Pollutant Discharge Elimination System (NPDES) requires permits for pollution discharges into water bodies such that the permitted discharge does not cause a violation of federal and state water quality standards. NPDES permits define quantitative and/or qualitative pollution limitations for the permitted source, and control measures that must be implemented to achieve the pollution limitations. Pollution control measures are often referred to as best management practices (BMPs). Discharges are not anticipated during ongoing Project operations.

- **General Order for Dewatering and Other Low Threat Discharges.** The California Regional Water Quality Control Board Central Valley region has made available the General Order for Dewatering and Other Low Threat Discharges to Surface Waters. This is Order No. R5-2008-0081, also found as NPDES CAG 995001. This general permit covers discharges of construction dewatering under theses circumstances: the discharge does "not contain significant quantities of pollutants and they are either (1) four months or less in duration, or (2) the average dry weather discharge does not exceed 0.25 mgd (million gallons per day)". The General Low Threat Discharge Permit applies to the proposed Project based on the short duration of discharge, and the anticipated low volume discharge of drilling fluids, dewatering and hydrotesting.

- **Section 404, Discharge of Dredge and Fill Material.** Section 404 assigns the United States Army Corps of Engineers (USACE), with permitting authority for proposed discharges of dredged and fill material into waters of the U.S., defined as "…waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; territorial seas and tributaries to such waters."

The USACE typically considers all natural drainages with defined beds and banks to be waters of the U.S. Section 404 establishes procedures by which the permitting agency is to review, condition, approve, and deny permit requests. Per the regulations, permitting agencies are responsible to conduct public noticing and provide the opportunity for public hearings during the review of each permit request. This includes informing United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) of each permit request. Consultation with USFWS and/or NMFS is required for proposed discharges that could affect species protected by the federal Endangered Species Act (ESA). Measures that are required by USFWS and/or NMFS to minimize impacts to federally protected species must be included as conditions of the permit. Based on discussions with USACE, the Project is subject to Section 404 regulations, primarily due to the pipeline crossing at the San Joaquin River. Nationwide Permit (NWP) 12 authorizes certain utility activities, including activities required for the construction of gas pipelines and electric power lines in waters of the U.S. "provided that the activity does not result in the loss of greater than ½ acre of waters of the U.S." It is anticipated that the Project will be eligible for NWP 12.

### Rivers and Harbors Act

The Rivers and Harbors Act (RHA) of 1899 prohibits the unauthorized alteration or obstruction of any navigable waters of the United States. As defined by the RHA, navigable waters include all waters that are:

- Historically, presently, or potentially used for interstate or foreign commerce; and

- Subject to the ebb and flow of tides.

Regulations implementing Section 10 of the RHA are coordinated with regulations implementing CWA Section 404. The RHA specifically regulates:

- Construction of structures in, under, or over navigable waters;
- Deposition or excavation of material in navigable waters; and
- All work affecting the location, condition, course, or capacity of navigable waters.

The RHA is administered by the USACE. If a proposed activity falls under the authority of RHA Section 10 and CWA Section 404, the USACE processes and issues a single permit. For activities regulated only under RHA Section 10, such as installation of a structure not requiring fill, permit conditions may be added to protect water quality during construction. The San Joaquin River is considered navigable water between the mouth of the river and Sycamore Road (a point located about 7 miles downstream of U.S. Highway 99 near Fresno). The proposed pipeline alignment will cross the San Joaquin River at a location approximately 18 miles downstream from U.S. Highway 99. Therefore, the Project will cross the designated navigable portion of the river. As noted above, it is anticipated that the Project is eligible for NWP 12, which also addresses RHA section 10.

#### National Flood Insurance Program

FEMA administers the National Flood Insurance Program (NFIP). FEMA has completed Flood Insurance Rate Maps that identify Special Flood Hazard Areas in the Project area. To comply with the NFIP, communities must adopt a floodplain management ordinance addressing construction and habitation in flood zones. In California, the DWR provides and encourages communities to adopt the California Model Floodplain Management Ordinance.

#### Executive Order 11988-Floodplain Management

Executive Order 11988 requires federal agencies to recognize the values of floodplains and to consider the public benefits from restoring and preserving floodplains. Under this order the USACE is required to take action and provide leadership to:

- Avoid development in the base floodplain;
- Reduce the risk and hazard associated with floods;
- Minimize the impact of floods on human health, welfare, and safety; and
- Restore and preserve the beneficial and natural values of the base floodplain.

### 4.8.2.2 State

#### Porter-Cologne Act

The Porter-Cologne Act (California Water Code Section 13000) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, and groundwater, and to both point and non-point sources of pollution. Pursuant to the Porter-Cologne Act, it is the policy of the state of California that:

- The quality of all the waters of the State shall be protected;
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason, and;
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation.

Pursuant to the Porter-Cologne Act, the responsibility for protection of water quality in California rests with the State Water Resources Control Board (SWRCB). The SWRCB administers federal and state water quality regulations for California's ocean waters and also oversees and funds the state's nine Regional Water Quality Control Boards (RWQCBs). The RWQCBs prepare water quality control plans, establish water quality objectives, and carry out federal and state water quality regulations and permitting duties for inland water bodies, enclosed bays, and estuaries within their respective regions. The Porter-Cologne Act gives the SWRCB and RWQCBs broad powers to protect water quality by regulating waste discharge to water and land and by requiring clean up of hazardous wastes.

### Section 401 Water Quality Certification

The Central Valley RWQCB has jurisdiction over any issues concerning CWA Section 401 Water Quality Certifications that may be required for the Project.

### Central Valley Regional Water Quality Control Board R5-2006-0061

The Central Valley RWQCB approved resolution number R5-2006-0061 on May 22, 2007. This resolution establishes a limit for diazinon or chlorpyrifos into the San Joaquin Water System. Shallow groundwater in the Central Valley has been shown to have detectable levels of diazinon (Orlando and Kuivila 2003). The amendment prohibits discharge of diazinon into the San Joaquin River over a concentration of 0.16 micrograms per liter (one hour average) and 0.10 micrograms per liter (four day average) not to be exceeded once in a three year period.

### Water Quality Control Plan – Central Valley Region

The Water Quality Control Plans of all nine of the RWQCBs and the California Ocean Plan (prepared and implemented by the SWRCB) collectively constitute the State Water Quality Control Plan. Per the requirements of the CWA and the California Porter-Cologne Act, the Central Valley RWQCB has prepared a Water Quality Control Plan for the watersheds under its jurisdiction. The Water Quality Control Plan, Central Valley Region has been designed to support the intentions of the CWA and the Porter-Cologne Act by: (1) characterizing watersheds within the Central Valley; (2) identifying beneficial uses that exist or have the potential to exist in each water body; (3) establishing water quality objectives for each water body to protect beneficial uses or allow their restoration, and; (4) providing an implementation program that achieves water quality objectives. Implementation program measures include monitoring, permitting, and enforcement activities.

### Storm water Permit

Construction activities that involve 0.5 or more acres of land disturbance must comply with the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ), which regulates storm water originating from construction activities. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Section A of the Construction General Permit describes the elements that must be contained in a SWPPP. These elements include a site map(s) that shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the Project. The SWPPP must list the Best Management Practices (BMPs) that the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants, to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The SWRCB is in the process of reissuing the Construction General Permit and released a preliminary draft of the new permit on March 2, 2007 (SWRCB 2007). A revision to the draft was released in March 2008. When adopted, this permit will replace the 1999 Construction General Permit and, as proposed, would require the permittee to implement additional minimum BMPs. The revised draft permit also requires specific analytical procedures to determine whether the BMPs are preventing further impairment due to sediment and preventing non-visible pollutants from violating water quality objectives. The new requirements would require monitoring (i.e., sampling and testing) of the quality of storm water discharges at most sites. In addition, all sites would be required to meet new development and redevelopment performance standards to minimize or mitigate hydrologic impacts.

The Construction General Permit references federal NPDES provisions (40 CFR 122.26(a)(2)), which "exempt construction activities at oil and gas sites from the requirement to obtain an NPDES permit for storm water discharges except in very limited instances." This exemption applies to disturbances to the ground from oil and gas exploration, production, processing, and treatment operations or transmission facilities including gathering lines, flow-lines, feeder lines, and transmission lines. The proposed Project generally meets the provisions for the exemption of oil and gas operations. Exemption from the General Construction Permit will be confirmed by reviewing recent legal developments relating to the exemptions and through discussions with the Central Valley RWQCB.

### California Water Code, Section 13260

According to the State Water Resources Control Board, "any person discharging waste or proposing to discharge waste that could affect the quality of the waters of the state, other than into a community sewer system, and any person operating or proposing to construct an injection well is required to file a Report of Waste Discharge with the applicable RWQCB. Reports are also required for any material change or proposed change in the character, location, or volume of such a discharge." Discharge to surface or groundwater requires Report of Waste Discharges Form 200, from the State Water Resources Control Board. This Resolution affects water discharge from construction projects that include dewatering of trenches during excavation and construction activities.

#### Fish and Game Code, Sections 1601 to 1603

Under Sections 1601 to 1603 of the Fish & Game Code, the California Department of Fish and Game must be notified prior to any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. The term "stream" can include intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blueline streams, and watercourses with subsurface flows.

### 4.8.2.3 Local

#### Fresno County General Plan

The Fresno County General Plan contains numerous policies that address regional planning for protection and management of groundwater and water quality; support for water banking; and use of over-irrigation as a means of groundwater recharge (reference, for example: Policies OS-A.1 through OS-A.16).

#### Madera County General Plan

The Agricultural and Natural Resources Element of the Madera County General Plan also contains policies related to water resources. These policies address protection of percolation and groundwater recharge; control of sedimentation and excessive grading; avoidance of flood hazards; and use of construction BMPs (reference, for example: Policies 5.C.1 through 5.C.4, 5.C.7; Polices 3.E.1 through 3.E.6; and Policies 6.B.1 through 6.B.6):

## 4.8.3 Impact Assessment

### 4.8.3.1 Significance Criteria

Appendix G of the California Environment Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on hydrology and water quality if the project would:

- Violate any water quality standards or waste discharge requirements;
- 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);

- 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;
- 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;
- 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;
- Otherwise substantially degrade water quality;
- 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;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows; and
- 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 and/or inundation by seiche, tsunami, or mudflow.

#### 4.8.3.2 Impacts and Mitigation Measures

This impact assessment is based on review of the Project in relation to existing hydrologic and water quality conditions. Project plan elements that are relevant to this assessment include the pipeline alignment and surface facility locations, and the electric power line route; estimates of impervious surfaces; conceptual plans for grading, drainage and flood protection; pipeline and facility construction methods; pipeline hydrotest plans; produced water disposal plans; and other design, construction, and operations plans that could affect surface water and groundwater resources.

The primary Project activities that could affect surface and groundwater resources include:

- Dewatering of trenches during construction
- Dewatering of HDD drill borings during construction
- Disposal of hydrostatic test water
- Return and disposal of drilling mud during the drilling process

- Potential unintended return of drilling fluids to the surface via fracturing of surrounding rock (frac-out)
- Potential for erosion of trench and drilling spoils.

### Violate any water quality standards or waste discharge requirements

**IMPACT HWQ-1: Discharge of construction dewatering effluent to groundwater or surface water bodies could degrade water quality.** During construction of the buried pipeline, dewatering of trenches and other excavations will generate groundwater effluent. Published groundwater contour maps obtained from the Westlands Water District indicate that the shallow groundwater table ranges in depth from 5 feet below the ground surface to 20 feet below the ground surface throughout the Project area. The shallow depths to groundwater tend to occur within the central and eastern region of the Project area, and the deeper portions of the groundwater occur in the western portion of the pipeline alignment. This mimics the generally observed pattern of groundwater elevations throughout the Project area for all aquifers. The excavations required for the Project may encounter the abandoned tile drain system known to be present in the Project vicinity. Trenching, boring, and HDD techniques will be used to install the buried pipeline. Based on the depth of the proposed trench (typically 8 feet below ground surface) and the even greater depth of proposed borings, it is likely that the shallow water table will be encountered during these activities, and dewatering will be required during subsurface construction.

The shallow groundwater in the Project area is generally recharged and sustained by irrigation water applied for agriculture. Agriculturally derived water has been demonstrated to have detectable levels of several pesticides, including high concentrations of diazinon, as well as high levels of nitrates exceeding drinking water standards (Dubrovsky et al. 1995). Concentrations of diazinon encountered in Central Valley groundwater have been found to be acutely toxic to aquatic life (Orlando et al. 2003). Additionally, the shallow groundwater is generally high in dissolved solids, including elevated levels of selenium.

A geotechnical investigation of the Project construction areas is underway; the results of this study will provide additional information on the estimated volume of water that may be encountered during construction. Pending completion of this study, the potential volume of groundwater effluent that may be generated by dewatering during the construction period is not known, and the specific method for management of the effluent has not been determined pending further studies. Previous projects that have required dewatering have disposed of the extracted groundwater by containment in an unlined excavation where the extracted groundwater was allowed to percolate back in to the ground. Should the extracted groundwater be put into a reinjection well, the effluent will be tested for pesticide residues and treated to standards set by Resolution Number R5-2006-0061 before reinjection to contain or abate spreading pesticide or nitrate contamination into deeper aquifers. Regardless of how extracted wastewater will be treated, contaminant levels in wastewater generated by dewatering prior to discharge would have to meet the limits set by Resolution Number R5-2006-0061.

The Applicants will comply with the requirements of applicable regulations including Central Valley RWQCB Resolution Number R5-2006-0061. Compliance measures will likely require that water generated during construction dewatering will not be directly discharged to surface water bodies. Prior to applying for the low threat discharge permit, groundwater under the proposed pipeline alignment and within the Project area will be tested for contaminants, as appropriate. Dewatering effluent will be discharged to the land only if permitted under the requirements of Central Valley RWQCB Resolution Number R5-2006-0061. Additionally, the dewatering effluent will be managed to prevent the release of diazinon or chlorpyrifos to surface water bodies pursuant to the intention and requirements of Resolution R5-2006-0061. Dewatering effluent applied to agricultural fields (or containment reservoirs) will not be allowed to flow directly into the surface water bodies. With the implementation of these construction methods and compliance with applicable RWQCB regulations, any impacts related to groundwater or surface water quality will be less than significant, and no mitigation is required.

**IMPACT HWQ-2: Discharge of hydrostatic testing water from a municipal source could degrade water quality or be toxic to aquatic life.** Following installation, the integrity of the pipeline will be assessed by hydrostatic testing (i.e., filling the pipe with water and pressure testing). Based on preliminary Project plans, hydrostatic testing of the pipeline will be performed in three sections. From west to east these sections will require an estimated volume of approximately 1.1 million, 1.4 million, and 2.1 million gallons of water, respectively. Potential sources of hydrotest water have been identified as follows, in order of preference:

- Water from a local purveyor, such as Westlands Water District, which maintains water supply lines located near the western end of the Project pipeline
- Water from privately owned agricultural wells
- Municipal water supplies

**Water provided by a local purveyor, such as Westlands Water District**. There is currently water delivery infrastructure near the proposed pipeline alignment, so there would be no need for long distance delivery of water, or need to pump water from a well. Upon completion of hydrostatic testing of the western section of pipeline, the eastern section of pipeline (which is not in the Westlands Water District) could also be hydrostatically tested with the same water. Upon completion, the water would be returned to the local purveyor. Water supplied by local purveyors such as Westlands Water District normally meets standards for irrigation use, and no additional chemicals would be added by the hydrotest process. Therefore, there would be no impact to water quality or water resources under this scenario.

**Water derived from a local well or wells**. This option would entail removal of water by pumping from one or more groundwater wells and conveying to the hydrotest site via temporary agriculture connection. Under this scenario, a private land owner would be contracted with to provide water for the testing procedure. Upon completion of the hydrostatic testing, the water could be used for irrigation or treated and reinjected, allowed to percolate in a detention basin, or discharged to a storm water basin after treatment. Water from a private agricultural well would likely require treatment based upon whether reinjection of the water is the preferred method of disposal or irrigation. Water to be reinjected may have to be treated for pesticides and nitrates prior to reinjection to avoid contamination of the aquifer. If reinjection is proposed then prior to reinjection, the hydrotest water would need to be tested to ensure that the quality is equal to or better than that of the water in the injection well and to ensure that the water meets all applicable regulatory water quality objectives. Regardless of how extracted wastewater may be treated, contaminant levels in wastewater prior to discharge should fall below limits set by resolution number R5-2006-0061.

**Water derived from a municipal source**. This option would likely require the use of large trucks to deliver water to the hydrotest site. The water would likely be chlorinated; chlorine is acutely toxic to aquatic organisms, and is stable for a long period of time. If municipal water is proposed as a hydrostatic test water source, then it would need to be treated to remove chlorine prior to discharge.

The potential impacts to water quality related to hydrostatic testing can be reduced by ensuring proper treatment prior to disposal. The Applicants will develop and implement a hydrotest plan that includes appropriate disposal and treatment methods. A hydrotest plan will be developed by the pipeline contractor which will be reviewed by engineering and environmental personnel for final approval, then submitted to the appropriate permitting agency during the permitting process for discharge of the hydrotest water. With the implementation of the hydrotest plan, any impacts related to use and discharge of municipal water will be less than significant and no mitigation is required.

### Substantially deplete groundwater supplies or interfere substantially with groundwater recharge

**IMPACT HWQ-3: Operational water demands or impervious surfaces could deplete groundwater supplies impervious surfaces could interfere with groundwater recharge.** The Project area is experiencing water shortages that affect the agricultural operations and other water uses regionally; new groundwater extraction could exacerbate this water shortage. An estimated volume of 300 gallons per day (gpd) will be supplied from a new well to be installed within the Storage Field, possibly at the compressor station site**.** This water will be used for minor industrial processes and as potable water for personnel and minor landscaping, if landscaping is installed. Project water demand will be low relative to other industrial, commercial and agricultural applications in the region. Therefore, no impact to groundwater supplies are anticipated, and no mitigations are required. Additional discussion of groundwater demand, uses, and water conservation measures is provided in Section 4.13 Public Services and Utilities.

Surface facilities within the Storage Field will comprise approximately 22 acres (including 10 acres for the central compression station, and approximately 12 acres for the well pads). Based on the estimated surface area of impervious surfaces (Appendix A, Table A-2), approximately 1.7 acres of the 10-acre central compressor station will be impervious (e.g., buildings, equipment foundations, or service roads). A very small area of impervious surfaces will also be developed at the various well pads and pipeline surface facilities, for a total estimated impervious area of 3 acres for the entire Storage Field. The Project is located in an area that is largely undeveloped and used for agricultural purposes. The Applicants will develop a Grading and Drainage Plan that maintains surface water runoff onsite and then allows water to percolate into onsite soils. Given the undeveloped nature of the Project area, the addition of 3 acres of impervious surface over several locations within this agricultural area will not interfere with groundwater recharge. Given the Project design, the open agricultural setting, and the proposed grading and drainage plans, any impacts from operational water demands or impervious surfaces would be less than significant, and no mitigation is required.

**IMPACT HWQ-4: Construction Dewatering could cause the temporary disruption of groundwater flow.** The Project includes installation of a buried gas pipeline along the proposed alignment. Most of the pipeline will be installed by conventional cut-and-cover (i.e., trenching) methods. Segments of the pipeline will be installed under major water bodies (including the San Joaquin River, Fresno Slough, and Four-Mile Slough) using HDD or boring techniques. Crossings under some roadways and smaller channels will be installed with jack-and-bore methods. Some trenched segments of the alignment will be installed in areas of very shallow groundwater. During construction, the excavations will intercept groundwater and will need to be dewatered. Removal of groundwater during dewatering will likely cause localized changes in groundwater flow directions. However, dewatering will be temporary (i.e., only during the pipeline installation) and the trenches will be backfilled with excavated soil. Following consolidation of the backfill, minimal changes in the hydrogeologic environment are expected. Flow of groundwater through (or under) the alignment will resume after construction. Additionally, the shallow groundwater is not used (due to degraded water quality) for irrigation or domestic water supply, and temporary localized changes in groundwater flow direction will not affect water supply wells. Potential impacts from changes in groundwater flow (e.g., preferential flow along the pipeline or obstruction of flow) are considered less than significant, and no mitigations are required to address this issue along the trenched segments of the pipeline alignment.

Deeper pipeline installation will occur in the HDD and bored segments of the pipeline. HDD techniques will minimize changes in groundwater flow because the borings will be kept full of drilling mud. Temporary localized changes to hydrogeologic characteristic of sediments adjacent to the borings may result from the formation of a filter cake (i.e., thin accumulation of clay) at the margins of the borings. However, after construction, the filter cake will gradually break down and flow around, over and under, the installed pipe, and groundwater levels and flow direction will return to pre-construction conditions. These short-term, localized impacts to groundwater flow will be less than significant, and no mitigation is required.

### Substantially alter the existing drainage pattern of the site or area, resulting in substantial erosion, siltation, or flooding on- or off-site

**IMPACT HWQ-5: Storm water runoff from construction activities could increase risk of erosion and sediment transport and degrade surface water quality in local waterways.** Proposed surface facilities will be constructed on generally level terrain and will not alter drainage patterns. The Project proposes to install a buried pipeline that will be constructed below major stream channels, including the Fresno Slough and the San Joaquin River, using HDD and bore methods. Disruption of flow patterns in these water features will be avoided by these design features and construction methods.

The Project will include excavation and grading on level topography underlain by unconsolidated Quaternary sediments. Grading operations will remove vegetation and expose soil to an increased risk of erosion and sediment transport. Sediment transported into water bodies could result in the degradation of water quality (e.g., increased turbidity) or sedimentation within streams or water supply channels (e.g., reduction in flow capacity or damage to irrigation facilities such as pumps). Additionally, inadvertent releases of hazardous materials used during construction or operations could result in water quality degradation. There are three main sources of potential impacts to storm water runoff from the Project:

- Disturbed native soils and stockpiles, excavated material from pipeline trenches, and/or cuttings from directional drilling operations, could erode and cause sediments to enter nearby waterways as storm water runoff.

- Equipment operation and maintenance could cause releases of petroleum products and sediments to the ground which would run off during precipitation.

- Other wet or dry chemicals and products used during drilling, hydrotesting, corrosion protection system installation, or other Project activities could enter storm water runoff if not managed properly.

The Applicants will prepare an Erosion and Sediment Control Plan (ESCP) prior to Project construction. The ESCP will address both construction and post-construction management of runoff to control erosion and sedimentation related to Project activities. The ESCP will be developed to ensure that storm water discharge meets Basin Plan water quality objectives and that the existing beneficial uses and water quality at the discharge points are maintained and protected. The ESCP will include specific measures to:

- Prevent silt, eroded materials, construction debris, concrete or washings thereof, or hazardous substances from being introduced into any watercourse, stream, or storm drain system;

- Ensure that discharge of runoff or dewatering effluent does not cause erosion of soil or transport of soil;

- Provide “housekeeping” measures to minimize the potential for contamination of soil or groundwater through leaks or inadvertent release of hazardous materials from construction equipment or storage areas;

- Provide controls to prevent discharge of sediment from all stockpiled soil and sediment;

- Prohibit the stockpiling of soil (including drilled cuttings generated by HDD operations), storage of hazardous materials, and stockpiling of construction materials in flood zones during the rainy season, typically between October 15 and April 15. Any limited stockpiling that may need to occur during that period would be done outside of flood zones ; and

- Ensure that the discharge of soil or other material does not have an adverse effect on receiving waters or cause or contribute to a violation of water quality standards.

The ESCP will identify:

- Potential pollutant sources, including sources of sediment (such as areas of soil exposed by grading activities and soil/sediment stockpiles); and

- Any non-storm water discharges, including springs or other groundwater discharges.

The ESCP will also identify site-specific erosion and sedimentation control BMPs that will be used to protect waterways and topsoil from storm water runoff as well as the placement and maintenance of those BMPs. The BMPs will include measures such as the following:

- Measures for controlling erosion and sedimentation, such as ground covers, revetment systems, or bioengineering stabilization (e.g., live staking or vegetated geogrids);

- Procedures for handling and disposing of hazardous materials (e.g., fuel and lubricants) and construction waste;

- Measures for post-construction erosion and sediment control; and

- Methods to eliminate or reduce non-storm water discharges to receiving waters.

The ESCP will also demonstrate compliance with all applicable local and regional erosion and sediment control and storm water management standards; identify responsible parties; provide a detailed construction description and timeline; and provide a monitoring and maintenance schedule for the BMPs for sediment control, spill containment, and post-construction measures.

Given the level terrain, and with the implementation of these construction methods and ESCP measures, any impacts related to storm water runoff during construction will be less than significant, and no mitigation is required.

**IMPACT HWQ-6: Increased impervious surfaces could increase runoff, causing erosion and sedimentation.** The Project will result in new impervious surfaces, which could cause localized changes in runoff flow rates and direction. Pending completion of a detailed Grading and Drainage Plan, the specific methods of runoff control have not been determined. The estimated surface area to be covered (i.e., impervious cover) at the central compressor facility is approximately 1.7 acres (Appendix A, Table A-2). Based on the conceptual design plans for the Project, the major structures within this facility will include the operations, compressor and generator buildings, air coolers, water tank, and surface roads. Impervious surfaces at the well pads and pipeline surface facilities will be limited to the wellhead areas and minor equipment components associated with the wells, for a total estimated 3 acres of impervious surfaces.

The construction of impervious surfaces could cause changes in the local hydrologic conditions by restricting infiltration of rainwater and runoff and increasing runoff rates and volumes generated in covered areas. Potential impacts include increased erosion adjacent to impervious surfaces. Although the affected area are relatively small in relation to, and are located throughout the geographic extent of the Project area, the impacts of erosion and sedimentation related to increased runoff could adversely affect water quality. To address this concern, the ESCP described above under Impact HWQ-5 will also include design features, to be developed during final design, to manage the runoff from areas with impervious surfaces. Options for runoff control include:

- Contouring to disperse runoff and avoid concentration of flows resulting in shallow erosion channel formation; or

- Directing runoff into retention basins, vegetated swales, or infiltration trenches.

Given the small amount of impervious surface and the level terrain, and with the implementation of these design features and additional ESCP measures, any impacts related to erosion and sedimentation due to runoff from impervious surfaces during long-term operations will be less than significant, and no mitigation is required.

### Create or contribute runoff water exceeding the capacity of planned storm water drainage or providing additional sources of polluted runoff

**IMPACT HWQ-7: Runoff from the new facilities could enter area drainage systems, causing erosion, sedimentation or pollutant loading.** Storm water drainage systems in the Project area include natural and man-made channels. The proposed surface facilities will be located on level agricultural land. The nearest drainage channel to the proposed central compressor station site is located approximately 1 mile south of the facility site. The gas pipeline surface facilities (i.e., valve station and pipeline tie-in facilities) are also distant from drainage channels. Minor amounts of runoff could occur from Project surface facilities. Pending completion of a detailed grading and drainage plan, it is anticipated that storm water will be contained within the boundaries of the surface facilities and allowed to percolate into onsite soils, with minimal offsite runoff.

Potential sources of pollution to surface waters, such as onsite chemicals or transformer oil, will be properly contained to prevent offsite runoff during rain events. Containment structures will be appropriately designed, constructed and maintained in accordance with a site-specific pill Prevention, Countermeasure and Control Plan (SPCC), or in accordance with equivalent protections if an SPCC is not required (e.g., due to low onsite storage volumes). Given the small volumes of onsite chemicals and other pollutant sources, and with the implementation of these design features and additional spill prevention measures, any impacts related to erosion, sedimentation or pollutant loading due to runoff from surface facilities during long-term operations will be less than significant, and no mitigation is required.

### Otherwise substantially degrade water quality

**IMPACT HWQ-8: The use of HDD methods during pipeline construction could result in hydraulic fracturing of subsurface materials and adverse leakage of drilling mud into surface or subsurface waters.** HDD methods will be used where the pipeline will cross the California Aqueduct, San Joaquin River, and Fresno Slough. HDD methods are commonly used under stream channels to avoid environmental impacts related to alternative crossing methods at streams. HDD involves mud rotary drilling to create a boring through which the pipeline is placed. In mud rotary drilling, a rotating drill bit is advanced by a drilling rig. A drilling fluid (usually a slurry of clay suspended in water, or "drilling mud") is pumped through the drill bit to remove the soil and rock fragments created by the drilling process. The drilling mud is pumped at a high enough rate to effectively bring the cuttings to the surface.

Under some conditions, the migration of drilling fluid through subsurface materials can result in the inadvertent return of drilling fluids to the surface. This phenomenon is referred to as "frac-out." Drilling fluid can migrate through natural (i.e., existing) pore spaces or fractures in sediments or rock. If excessive pressure is applied during drilling, it is possible for the drilling fluid pressure to hydraulically fracture the subsurface materials adjacent to the boring. Fluid may then flow through the fractures created in the drilling process. Temporary impacts to water quality can occur if inadvertent return of drilling mud escapes through a fissure in the soil/rock structure to the surface. If left uncontrolled, the escaped drilling muds can impact water quality of streams and rivers.

The Applicants will install conductor casing in shallow portions of the HDD boring where there is unconsolidated sediments that may not adequately contain the drilling fluids. In addition, the Applicants will implement a Frac-Out Contingency Plan to address potential impacts of muds that could enter surface waters. Elements of the Frac-Out Contingency Plan are summarized below.

- Monitor the quality and quantity of drilling fluid return and provisions for the abatement of drilling fluid loss;
- Install conductor casing where geotechnical recommendation deems appropriate in unconsolidated sediments and/or intensely weathered and fractured bedrock;
- Visually monitor stream channels and wetlands during drilling of HDD under these features;
- Stop drilling when return of drilling mud slows or ceases or a spill is observed by the driller or biological monitor;
- Contain the spill (by measures such as silt fencing/hay bales);

- Pump drilling mud from the containment area to a drill rig or frac truck; and
- Refrain from drilling until containment is completed.

With the use of conductor casing and incorporation of a Frac-Out Contingency Plan, any impacts to water quality related to inadvertent frac-out during pipeline construction will be less than significant, and no mitigation is required.

### Place housing or other structures within a 100-year flood hazard area or expose people or structures to a significant risk from flooding and/or inundation by seiche, tsunami, or mudflow

**IMPACT HWQ-9: Proposed facilities may be partially located within a 100-year flood hazard zone.** No housing will be installed in connection with the Project. The proposed surface facilities are generally located outside of designated 100-year and other flood hazard zones, except for the wood poles of the power line, and potentially one or more observation and monitoring (OM) wells. Due to the very level terrain, and pending completion of the geotechnical analysis and detailed grading and drainage plans, it is anticipated that normally occurring drainage from adjacent properties will not warrant special measures to protect surface facilities from run-on from adjacent properties. The detailed grading and drainage plan will, if necessary, direct drainage around the compressor station site with ditches or culverts in order to maintain the natural flow without impact to the station.

The compressor station site is designated on FEMA flood maps as "Zone X." The well pads, except for possibly one or more OM wells are also located in Zone X. Areas in this zone are outside of the floodplain and do not normally require special design considerations for floodproofing (e.g., structures will not need to be elevated above existing grade for purposes of flood protection). Existing levees along the north and south sides of the San Joaquin River provide some measure of flood protection to agricultural lands within the Project area. However, integrity of these levees is not known, and levees on the north side of the San Joaquin River are not certified by FEMA. The 100-year flood hazard zone established by FEMA does not presume that 100-year protection is provided by these structures. The compressor site and injection well sites are all outside of both the 100 and 500 year flood zones as currently designated by FEMA. Therefore, the potential for flooding of these structures is low. At this time, pending completion of the geotechnical analysis and detailed grading and drainage plans, the Applicants propose no special flood protection design measures for the compressor station or well pads.

The well pads will be completed at existing grade and will not present a significant obstruction to flood flows. However, two of the alternate sites for observation/monitoring wells (sites OM-11 and OM-12 as shown on Figure 3.1-2 in Section 3.1 Project Location) are located within the 100-year flood hazard zone. If these well sites are constructed, then the well sites could be inundated during a 100-year flood. These facilities will be relatively small and as such, will not affect flood flow hydraulics. Power will be supplied to the site by solar panel battery system and communications accomplished via radio. The equipment will be protected by being raised above the floodplain.

Wood poles of the power line will be placed in the 100-year floodplain, however the placement of the electric power poles in this existing power line corridor are not anticipated to, and have not historically, resulted in hazardous conditions. No wood poles will be placed in the main channel of the Chowchilla Bypass canal and as a result no poles would be affected by high-flow or high current water.

There is one occupied residence on the surface of the Storage Field, on the south side of the San Joaquin River. The Project will not expose this residence or anyone to a significant risk of loss, injury or death involving flooding.

Given historic weather patterns and Project area topography, the Project creates no risk of inundation by seiche, tsunami or mudflow.

Given the location of the Project facilities relative to the FEMA floodplain and the proposed design features for observation/monitoring wells that could potentially be located within the floodplain, any impacts related to flooding and/or inundation by seiche, tsunami, or mudflow will be less than significant, and no mitigation is required.

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# 4.9 LAND USE, PLANNING, AND AGRICULTURE

This section addresses land uses in the vicinity of the Project, including agricultural land uses, and consistency with the Madera County and Fresno County general plans and zoning ordinances.

## 4.9.1 Environmental Setting

### 4.9.1.1 Overview

The Project site is located in an agricultural area within the unincorporated western portions of Madera and Fresno Counties. Agriculture is the major industry in both Counties. Madera County ranks 13th among the California counties in annual agricultural crop value. The 2006 crop exceeded $1 billion (Madera County Agricultural Commissioner 2006 Annual Crop Report). In 2004, the most recent year when data is available, the County had approximately 365,300 acres of Important Farmland (the terms Prime, Unique, Statewide Importance, and Local Importance are defined in Table 4.9-1) as reported by the California Department of Conservation [DOC] 2004 Important Farmland Acreage Summary. Fresno County ranks first among California's counties in annual agricultural crop value. The 2006 crop exceeded $4.8 billion (Fresno County Agricultural Commissioner's 2006 Annual Crop Report). In 2004 Fresno County had approximately 1,391,500 acres of Important Farmland (Acreage Summary, DOC 2004).

**Table 4.9-1 Important Farmland Definitions**

| Farmland Category | Definition |
|---|---|
| Prime Farmland | Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, Prime Farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. |
| Unique Farmland | Unique Farmland is land other than Prime Farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. |

**Table 4.9-1 Important Farmland Definitions (continued)**

| Farmland Category | Definition |
|---|---|
| Farmland of Statewide Importance | This is land, in addition to Prime and Unique Farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Criteria for defining and delineating this land are to be determined by the appropriate State agency or agencies. Generally, additional farmlands of statewide importance include those that are nearly Prime Farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as Prime Farmlands if conditions are favorable. |
| Farmland of Local Importance | In some local areas there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance. Where appropriate, these lands are to be identified by the local agency or agencies concerned. |

*Source:* DOC undated.

The developed communities closest to the Project are the Cities of Mendota and Firebaugh, located in Fresno County approximately 5 and 8 miles west of the proposed central compressor station, respectively, as well as the City of Kerman, located in Fresno County, approximately 5 miles southeast of this site. Figure 1.1-1 in Section 1, and Figure 3.1-1 in Section 3.1 Project Location, show the Project location in relation to nearby communities.

### 4.9.1.2 Land Uses at the Project Site

#### Storage Field and Well Pads

The approximately 5,020-acre Storage Field is within an established gas field, the Gill Ranch Gas Field (Gas Field). Since the 1940s, gas production has occurred throughout the Gas Field. Limited gas production occurs at the Gas Field today. Existing active and inactive gas production well pads, access roads, and related facilities are interspersed throughout the Storage Field. The Storage Field is also in active agricultural production (row crops, orchard, and vineyard). The San Joaquin River passes through the southeastern portion of the Storage Field. The proposed 10-acre central compressor station would be centrally located within the Storage Field, along Avenue 3, approximately 0.25 miles east of Road 16. The compressor station site is presently cultivated with irrigated row crops. Four (4) Injection/Withdrawal (IW) well pad sites and seven (7) Observation and Monitoring (OM) well pad sites have been identified throughout the Storage Field. Figure 3.1-2 shows the Storage Field Boundary, the proposed compressor station site, the proposed well pad sites, and potential alternate well pad sites. Buried gas and water gathering lines are proposed to be located within the existing agricultural roads between the well pads and the central compressor station.

A cluster of homes is located on Road 16 near the entrance to the Storage Field. There is one occupied residence in the southwest corner of the Storage Field. This residence is located along the south bank of the San Joaquin River in the southeastern portion of the Storage Field and is approximately two miles from the compressor station site.

Additional site-specific information regarding existing land uses within and around the Storage Field is shown on the Biological Resource maps in Appendix B.2. Photographs of the existing uses within and around the Storage Field are provided in Section 3.1 Project Location.

### Gas Transmission Pipeline Corridor

The approximately 27-mile 30-inch diameter gas transmission pipeline would be constructed between PG&E's existing Line 401 near Interstate Highway 5 (I5) and the compressor station site. The initial 25 miles of pipeline would be located in Fresno County, and the remaining approximately 2 miles would be located in Madera County. The San Joaquin River forms the Fresno/Madera County boundary in this area. The pipeline would pass approximately 2 miles south of the town of Mendota. Figure 3.1-1 shows the proposed pipeline alignment.

Surrounding land uses along the pipeline corridor are primarily agricultural or agricultural processing facilities. Other land uses near the pipeline corridor include the Mendota Wildlife Management Area (WMA) (between pipeline Mileposts 17.5 and 18.3) and the Alkali Sink Ecological Reserve (between pipeline Mileposts 20 and 21.5). The 11,825-acre Mendota WMA is used for fishing, hunting, camping, boating, and wildlife viewing. The Alkali Sink Ecological Reserve is used for wildlife viewing. The pipeline will avoid construction in these managed areas.

The alignment would cross surface water features including the concrete-lined California Aqueduct (pipeline Milepost 2.7), Fresno Slough (pipeline Milepost 18), and the San Joaquin River (pipeline Milepost 25). The Fresno County General Plan contains a Recreational Trail Corridor Map that shows a future trail following the California Aqueduct for its entire length through the county (Fresno County General Plan 2000). Agricultural ponds, canals, and irrigation ditches are also located at several locations on or near the alignment. One relatively large agricultural water feature is the "Four-Mile" Slough (pipeline Milepost 22.4); this agricultural pond is located approximately 4 miles east of Fresno Slough and is an isolated remnant tributary to the Fresno Slough.

The alignment passes along or crosses several roadways, including Lincoln Avenue (a mostly unpaved private agricultural road (pipeline Milepost 0.0 to 10.2); State Highway 33 (pipeline Milepost 10.2 to 15.3); West Panoche Road (pipeline Milepost 15.3 to 17); and State Highway 180 (West Whitesbridge Avenue; pipeline Milepost 17 to 22.6). Private agricultural roads would be followed between pipeline Milepost 22.6 and the central compressor station.

Residential and commercial uses are very limited along the pipeline alignment. These uses consist of several isolated residences near the pipeline route (e.g., along Lincoln Avenue and Highway 33); several homes along the south side of Highway 180; and a restaurant and boat rental business at Fresno Slough. Agricultural processing facilities include the Spreckels Sugar Plant on the north side of Highway 180; cotton gins; and various other active and inactive agriculture-related industrial uses.

Additional site-specific information regarding existing land uses along the pipeline alignment is shown on the Biological Resource maps in Appendix B.2. Photographs of the existing uses along the pipeline alignment are provided in Section 3.1 Project Location.

#### Electric Power Line

An approximately 9.75 mile electric power line would be constructed between PG&E's existing 115 kilovolt (kV) power line on Avenue 7½ and the central compressor station (refer to Figure 3.1-3 in Section 3.1 Project Location). The power line would be entirely within Madera County, and would be constructed within PG&E franchise areas. The power line would begin at a point on Avenue 7½ located approximately 5 miles east of the town of Firebaugh; follow Avenue 7½ to Avenue 7; turn south along the Chowchilla Canal Road; then span the canal and continue east along Avenue 3 between the canal and the central compressor station.

Existing PG&E electric distribution lines are located along the proposed electric power line route, except for an approximately 1-mile segment along Avenue 7. With the exception of Avenue 7, where no electric distribution line exists, the new power line will be co-located with existing PG&E distribution lines. The surrounding area is in agricultural production. There are no residences or commercial uses along the power line route. Additional site-specific information regarding existing land uses along the power line route is shown on the Biological Resource maps in Appendix B. Photos of the existing uses along the power line route are provided in Section 3.1 Project Location.

### 4.9.1.3 General Plan and Zoning Designations

The Project areas within Madera County are designated Agriculture Exclusive (AE) in the Madera County General Plan (1995) (Figure 4.9-1). This designation provides for agricultural uses, limited agricultural support service uses, agriculturally oriented services, timber production, mineral extraction, airstrips, public and commercial refuse disposal sites, recreational uses, public and quasi public uses, and similar and compatible uses. The minimum parcel size is 36 to 640 acres.

The Project areas within Madera County are zoned Agriculture, Rural Exclusive, 20 and 40 acres (Madera County Code 2007) (Figure 4.9-2). Most permitted uses in these zoning districts are associated with agriculture; mining is also an allowable use with a Conditional Use Permit.

The Project areas within Fresno County are designated Agriculture in the General Plan, except within the Mendota Wildlife Area, which is designated as Open Space (Fresno County General Plan 2000). This area will be avoided by the Project. The Agriculture designation provides for a variety of agricultural activities and certain nonagricultural activities, with a special permit, such as liquefied petroleum gas distribution and storage, mineral extraction, and oil and gas development pursuant to the policies in Section OS-C, Mineral Resources, of the Open Space and Conservation Element.

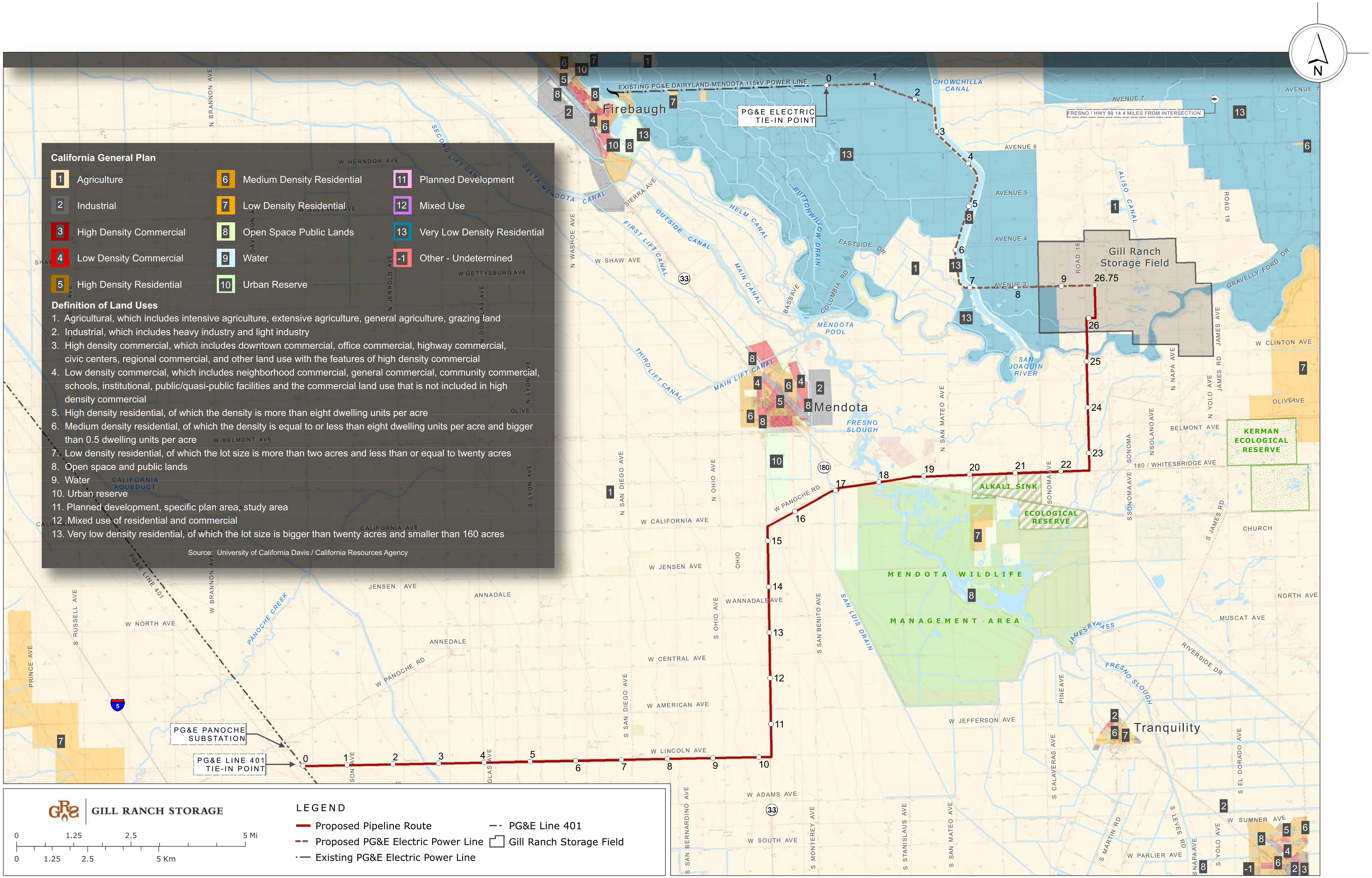


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FIGURE 4.9-1 | GENERAL PLAN LAND USE DESIGNATIONS

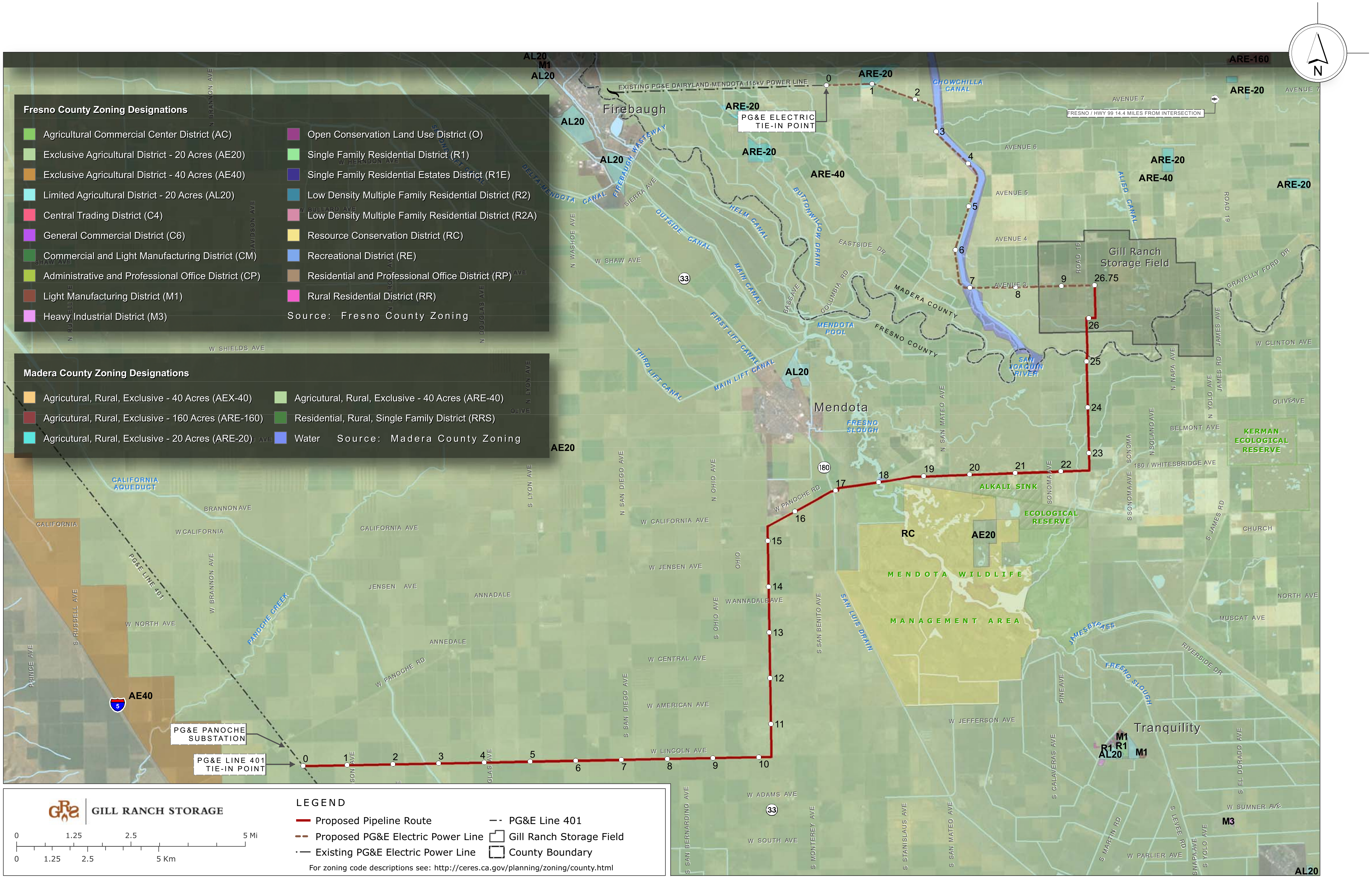


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FIGURE 4.9-2 | ZONING

The Project areas within Fresno County are zoned AE (Fresno County Ordinance Code 2007). The AE District is intended to be an exclusive district for agriculture and for those uses that are necessary and an integral part of the agricultural operation. This District is intended to protect the general welfare of the agricultural community from encroachments of non-related agricultural uses which by their nature would be injurious to the physical and economic well-being of the agricultural district. Liquefied petroleum gas distribution and storage is a permitted use subject to a Conditional Use Permit.

#### 4.9.1.4 Agricultural Soil Classifications

CEQA considers “agricultural land” to be Prime Farmland, Farmland of Statewide Importance, and Unique Farmland, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation (DOC) (PRC Section 21060.1). As shown on Figure 4.9-3, “agricultural land” is present throughout the Project area, including the Storage Field and the proposed pipeline and electric power line corridors. Additionally, several parcels of Farmland of Local Importance are located near the Mendota Wildlife Management Area in Fresno County. Farmland of Local Importance is defined as “All farmable lands within Fresno County that do not meet the definitions of Prime, Statewide, or Unique. This includes land that is or has been used for irrigated pasture, dryland farming, confined livestock and dairy, poultry facilities, aquaculture and grazing land” (DOC 2004).

#### 4.9.1.5 Williamson Act Contract Lands

The proposed Project surface facilities (compressor station, well pads, pipeline valves, and meter station), as well as segments of the proposed pipeline alignment, are located on lands that are presently under Williamson Act contracts (Figure 4.9-4). The Williamson Act, formally known as the California Land Conservation Act of 1965 (Government Code Section 51200–51297.4, as amended), enables local governments to enter into contracts with private landowners that restrict specific parcels of land to agricultural or related open-space use. In return, these landowners receive property tax assessments that are based upon farming and open space uses rather than other potentially higher tax bases (DOC 2007b). An agricultural preserve can consist of no less than the following minimum acreage:

- 10 to 40 acres for prime agricultural land if surrounded by or substantially surrounded by or contiguous to other agricultural preserve lands;
- 40 acres or more for prime agricultural land;
- 40 to 160 acres for non-prime agricultural land if surrounded by or substantially surrounded by or contiguous to other agricultural preserve lands; and
- 160 acres or more for non-prime agricultural land; provided that in order to meet this requirement, two or more parcels may be combined if they are contiguous and if they are in common ownership or use.

The Williamson Act states that a Board or Council, by resolution, shall adopt rules governing the administration of agricultural preserves. The rules of each agricultural preserve specify the uses allowed. Generally, any commercial agricultural use would be permitted within any agricultural preserve. In addition, local governments may identify compatible uses permitted with a use permit. Notwithstanding any determination of compatible uses by a city or county, unless the city or county, after notice and hearing, makes a finding to the contrary, the erection, construction, alteration, or maintenance of gas facilities are specifically determined under the Williamson Act to be compatible uses within any agricultural preserve (see Govt. Code § 51238).

### 4.9.1.6 Farmland Security Zones

Farmland Security Zones (FSZs) are more stringent agricultural preservation contracts between the private landowner and public agency than standard Williamson Act contracts. These preserves are generally at least 100 acres in size and the contract terms are usually set for a minimum term of 20 years. An FSZ contract offers landowners greater property tax reductions and approximately 65 percent of its Williamson Act Valuation. FSZs also have greater restrictions on future annexation for non-agricultural services (DOC 2007c). There are no parcels designated as FSZ within the Storage Field Boundary, or along the proposed Project gas pipeline and electric power line alignments.

## 4.9.2 Regulatory Setting

### 4.9.2.1 Federal

There are no federal regulations related to land use, planning and agriculture that are relevant to this Project.

### 4.9.2.2 State

The State allows local governments to enter into Williamson Act contracts or FSZ contracts in order to preserve agricultural land and provide tax benefits to the landowner, as discussed above.

### 4.9.2.3 Local

Fresno and Madera counties regulate land use through zoning and general plan designations, which specify allowable uses (discussed in Section 4.9.1.3), as well as through general plan policies, described below. With respect to projects developed by public utilities subject to the jurisdiction of the CPUC, California law generally provides that the CPUC has paramount siting authority.

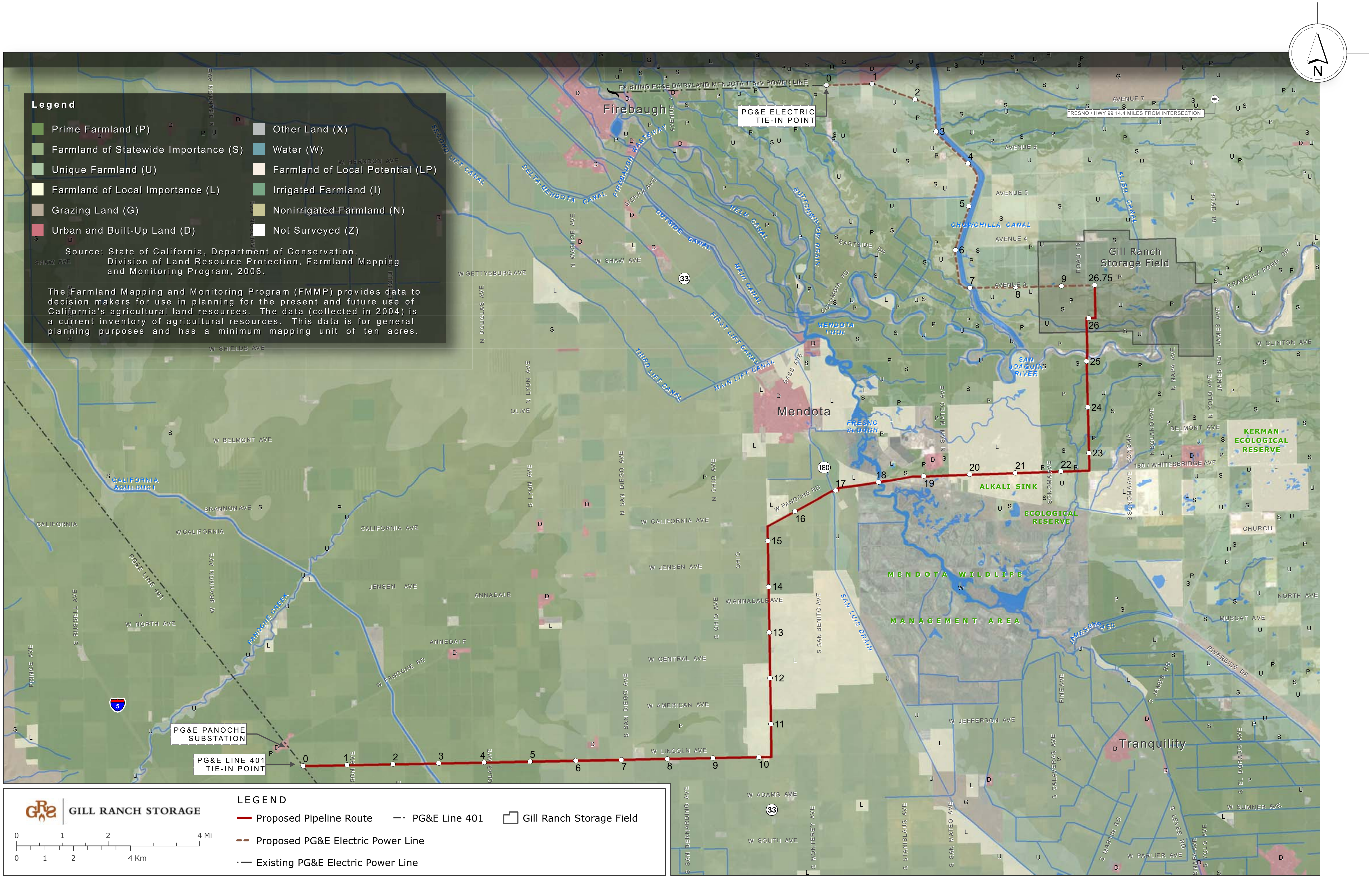


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FIGURE 4.9-3 | FARMLAND

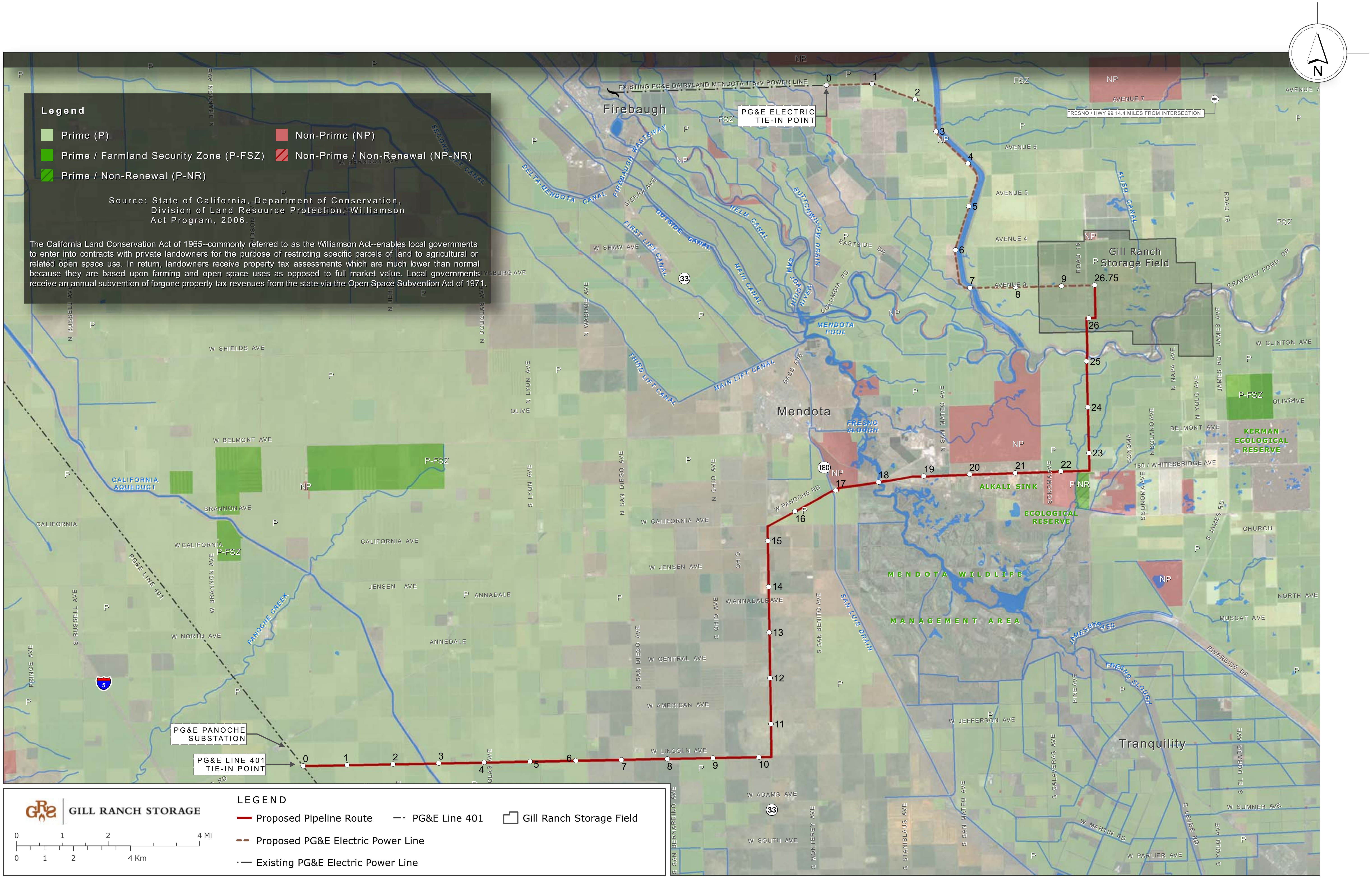


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FIGURE 4.9-4 | WILLIAMSON ACT PROGRAM LANDS

### County of Fresno General Plan

The following policies from the County of Fresno General Plan (2000) pertaining to land use planning and agriculture are relevant to the Project:

- **LU-A.2** The County shall allow by right in areas designated Agriculture activities related to the production of food and fiber and support uses incidental and secondary to the on-site agricultural operation. Uses listed in Table LU-3 (page 2-13 of the General Plan) illustrate the range of uses allowed in areas designated Agriculture. Table LU-3 lists under Agricultural uses allowed by right, "Certain oil & gas development activities pursuant to the policies in Section OS-C, Mineral Resources of the Open Space and Conservation Element; uses allowed by special permit include liquefied petroleum gas distribution and storage and mineral extraction and oil and gas development pursuant to the policies in Section OS-C, Mineral Resources of the Open Space and Conservation Element.

- **LU-A.3** The County may allow by discretionary permit in areas designated Agriculture, special agricultural uses and agriculturally-related activities, including value added processing facilities, and certain non-agricultural uses listed in Table LU-3. Approval of these and similar uses in areas designated Agriculture shall be subject to the following criteria:

    a. The use shall provide a needed service to the surrounding agricultural area which cannot be provided more efficiently within urban areas or which requires location in a non-urban area because of unusual site requirements or operational characteristics;

    b. The use should not be sited on productive agricultural lands if less productive land is available in the vicinity;

    c. The operational or physical characteristics of the use shall not have a detrimental impact on water resources or the use or management of surrounding properties within at least one-quarter (1/4) mile radius; and

    d. A probable workforce should be located nearby or be readily available;

- **LU-A.14** The County shall ensure that the review of discretionary permits includes an assessment of the conversion of productive agricultural land and that mitigation be required where appropriate.

- **OS-C.6** The County shall accept California Land Conservation (Williamson Act) contracts on land identified by the State as containing significant mineral deposits subject to the use and acreage limitations established by the County.

- **OS-C.10** The County shall not permit land uses that threaten the future availability of mineral resources or preclude future extraction of those resources.

- **OS-C.12** Fresno County shall be divided into three areas for the regulation of oil and gas development.

  a. Urban areas including all land within one-fourth mile of the planned urban boundaries shown on adopted community plans.

  b. Established oil and gas fields as determined and updated by the California Division of Oil and Gas, excluding urban areas except where specifically included in these policies.

  c. Non-urban areas including all land not within either established oil and gas fields or urban areas. A non-urban area's designation shall be changed to an established oil and gas field designation upon: (1) its identification by the Division of Oil and Gas as an oil and gas field, and (2) subsequent approval by the County.

- **OS-C.13** The County shall require a special permit for certain oil and gas activities and facilities as specifically noted in the Oil and Gas Development Matrix (Table OS-C.1) due to their potential significant adverse effects on surrounding land or land uses.

**Fresno County General Plan Table OS-C.1**
**Oil and Gas Development Matrix**

| Major Activities and Facilities | Urban Areas | Established Oil and Gas Fields | Non-Urban Areas |
|---|---|---|---|
| **Oil and Gas Exploration, Drilling, and Production** | | | |
| Exploratory and Production Drilling | O | • | O |
| Drill Site and Pumping Equipment | O | • | O |
| Production Tanks and Gauging Facilities | O | • | O |
| Produced Water Treatment Facilities | O | • | O |
| Production Separators (Oil-Gas-Water) | O | • | O |
| Oil Field Service Lines | O | • | O |
| **Oil and Gas Field Operations** | | | |
| Gas Compressor or Absorption Plant | O | O | O |
| Steam Injection Plant | O | O | O |
| Other Secondary and Tertiary Recovery Facilities | O | O | O |
| Oil Cleaning Plant | X | O | O |
| Natural Gas Processing Plants | X | O | O |
| LPG Storage | X | O | O |
| Major Petroleum Transmission and Trunk Lines | X | O | O |
| Tank Farms | X | O | O |
| Pumping Plants | X | O | O |

**Fresno County General Plan Table OS-C.1**
**Oil and Gas Development Matrix**

| Major Activities and Facilities | Urban Areas | Established Oil and Gas Fields | Non-Urban Areas |
|---|---|---|---|
| **Oil and Gas Auxiliary Operations** | | | |
| Offices | X | O | X |
| Shops | X | O | X |
| Laboratories | X | O | X |
| Work Camp Living Facilities | X | O | X |
| Storage Yards and Storage Facilities | X | O | X |
| Oil Well Services | X | O | X |
| Oil Refineries | X | X | X |
| Limited Oil Refining Plants | X | O | O |

• Permitted by Right
O Subject to Special Permit
X Not Permitted

- **OS-C.14** The County shall permit by right, small-scale oil and gas activities and facilities that can be demonstrated to not have a significant adverse effect on surrounding or adjacent land uses in an established oil and gas field, an established oil and gas field in urban areas, or non-urban areas.

- **OS-C.18** The County shall establish procedures to ensure that exploration and recovery of mineral resources, including oil and natural gas, will occur under appropriate locational and operational standards within areas designated Agriculture and Westside Rangeland.

### County of Madera General Plan

The following goals and policies from the County of Madera General Plan (1995) pertaining to land use planning and agriculture are relevant to the Project:

- **5.A.13:** The County shall require development within or adjacent to designated agricultural areas to incorporate design, construction, and maintenance techniques that protect agriculture and minimize conflicts with adjacent agricultural uses.

- **5.A.14:** The County shall continue to enforce the provisions of its Right-to-Farm Ordinance and of the existing state nuisance law.

## 4.9.3 Impact Assessment

### 4.9.3.1 Significance Criteria

Appendix G of the CEQA Guidelines provides guidance for evaluating whether a development project may result in significant effects. Appendix G suggests that a development project could have a significant effect on land use, planning, or agriculture if the project would cause any of the following effects:

- 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, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation to non-agricultural use

- Conflict with existing zoning for agricultural use, or a Williamson Act contract

- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use.

- Conflict with any applicable habitat conservation plan or natural community conservation plan

The following additional guideline is included in Appendix G but is not relevant to the proposed Project:

- Physically divide an established community

The Project is not located in an established community, thus it will not physically divide an established community. Additionally, the gas transmission pipeline will be buried and existing uses may be resumed or new uses developed in the pipeline right-of-way after construction. The compressor station and well pads will be located within an existing state-designated Gas Field. The electric power line will be located within existing PG&E franchise areas along existing roadways and will not impede access to existing land uses along the alignment.

### 4.9.3.2 Impacts and Mitigation Measures

#### 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, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect

**IMPACT LUP-1: The Project will be in substantial conformance with the general plans and zoning designations of Madera and Fresno Counties.** The proposed Project components within Madera County include the Storage Field and associated surface facilities; an approximately 2-mile segment of the gas transmission pipeline; and the approximately 9-mile electric power line. The Storage Field is located within an existing state-designated Gas Field where historic gas production occurred and continues to a limited extent today. Active and inactive gas production and related surface facilities are present in the Storage Field. Agricultural operations surround these Storage Field facilities.

Project facilities would be sited in an area designated AE and zoned Agriculture, Rural Exclusive, 20 and 40 acres. The applicable General Plan policies and zoning ordinances do not specifically address gas storage as either a permitted, conditionally permitted, or excluded land use within these designations. However, the Madera County General Plan allows mineral extraction, including gas, in the agriculturally designated areas, including the area where the Storage Field is located, and the AE zoning designation allows for mining with a Conditional Use Permit. Mineral extraction and mining are similar in some respects to gas storage and related gas facility operations because the facilities utilized in this Project are substantially the same as those utilized for extracting and conveying naturally occurring gas. Most importantly, as is the case with mining, surface facilities required in connection with underground gas storage projects, like the proposed Project, must be sited above the same naturally occurring geologic formations that produce natural gas. Thus, gas storage operations such as the Project can be considered in substantial conformance with the general plans and zoning designations of Madera County. Based on discussions with Madera County staff, the Applicants understand that the proposed use is allowed in the AE zone district, and would normally require a Conditional Use Permit (Jerald James, Madera County Planning, Pers. Com. February 2008). (As noted above, with respect to projects developed by public utilities subject to the jurisdiction of the CPUC, California law generally provides that the CPUC has paramount siting authority.)

The buried pipelines, and related facilities, and the above-ground power lines that will be Project components are typical utility facilities that are permitted in the AE zone district. Thus, the gas pipeline and electric power line are permitted uses in the AE zone district.

The proposed Project components within Fresno County include one or more OM well pads in the southeast corner of the Storage Field; an approximately 25-mile segment of the gas transmission pipeline; and related pipeline appurtenances such as valve stations and a tap and meter station at the PG&E Line 401 tie-in point. The land where these facilities will be located is designated Agriculture and zoned AE.

The Fresno County General Plan allows mineral extraction and oil and gas development pursuant to the policies in Section OS-C, Mineral Resources, of the Open Space and Conservation Element to occur in AE Zones, which include the Project area, with a special permit. Based on Table OS-C.1 of the General Plan Open Space and Conservation Element, the OM wells within the Fresno County portion of the Storage Field are considered drill sites, which are permitted uses within an existing gas field, such as the state-designated Gill Ranch Gas Field. The Agriculture zoning designation allows certain related land uses, such as liquefied petroleum gas distribution and storage as a permitted use subject to a Conditional Use Permit. Thus, the Project is in substantial conformance with the General Plan and zoning designations in Fresno County.

Buried gas pipelines and associated above-ground pipeline facilities are typical utility uses, and are normally permitted in the Fresno County AE zone district with a special use permit.

The local plans applicable to the Project site in each County are limited to the County General Plan and applicable zoning. Neither county has adopted Specific Plans or other regional plans that cover any portion of the Project area or that provide additional local requirements or procedures for avoiding or mitigating environmental effects. With the implementation of Project design features and other mitigation measures that are addressed throughout this PEA, the Project would not result in significant impacts on the environment and would substantially conform to all applicable land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect. Based on a review of the applicable General Plan and zoning designations, the Project substantially conforms to relevant land use plans, policies and regulations. Thus, the Project will not result in land use impacts and no mitigation is required.

### Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance, as shown on maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation to non-agricultural use

**IMPACT LUP-2: Construction of the compressor station and well pads would convert approximately 20.0 acres of Prime or Unique Farmland or Farmland of Statewide Importance to non-agricultural use.**

#### Permanent Impacts

Table 4.-9-2 summarizes the maximum estimated acreage of agricultural land that will be converted to non-agricultural use due to the construction of permanent surface facilities.

**Table 4.9-2 Agricultural Acreage Converted to Non-Agricultural Uses**

| Project Component | Acres Converted | | |
|---|---|---|---|
| | Project Total | Madera County | Fresno County |
| Compressor station | 10.0 | 10.0 | 0.0 |
| IW Well Pads (assume 3 pads will expand existing well pads, and the remaining 1 pad will be entirely in agricultural production) | 4.4 | 4.4 | 0.0 |
| OM Well Pads (assumes up to 5 new pads will be entirely in existing agricultural land, and the remaining 2 pads will be within existing well pads) | 3.5 | 2.8 | 0.7 |
| Access Roads | 1.8 | 1.5 | 0.3 |
| Meter Station (1) | 0.2 | 0.0 | 0.2 |
| Mainline Valves (2) | 0.1 | 0.0 | 0.1 |
| Total | 20.0 | 18.7 | 1.3 |

The proposed Storage Field facilities are located on land classified variously as Prime Farmland, Farmland of Statewide Importance and Unique Farmland (collectively referred to as "agricultural land") (Figure 4.9-4). The central compressor station will convert ten acres of agricultural land to non-agricultural use.

The Project also includes 12 to 15 IW wells, which will be located on 4 well pads. Three existing well pads will be expanded and one new well pad will be developed. As shown on Figure 3.5-4 in Section 3.5, the typical existing well pad measures 150 x 240 (0.8 acres), and the typical proposed well pad measures 250 feet by 300 feet (1.7 acres). Therefore use of three existing well pads will result in conversion of an estimate 0.9 acres on each of the three sites, for a total of 2.7 acres. The fourth IW well pad site would require conversion of up to 1.7 acres, for a total conversion of 4.4 acres of agricultural land for the IW wells.

It is likely that only four of the seven proposed OM well pads will be located in areas where there are no existing Gas Field facilities. However, because the well pad locations could change, this PEA assumes that up to five out of the seven proposed OM well pads would be located in areas where there are no existing Gas Field facilities, resulting in an additional estimated 3.5 acres of agricultural conversion (based on a typical OM well pad dimension of 150 feet by 200 feet, or 0.7 acres per well pad). Although most of the proposed well pads may be accessed by existing roads, certain well pads may require new roads, and existing roads may need to be widened or lengthened in order to meet the new well pad requirements. The typical well pad access road would likely require no more than 0.1 acres per well pad. However, because the well pad locations could change, this PEA assumes a conservative estimate of an additional 1.8 acres of agricultural land conversion spread among several well pads for new access roads (an average of 0.2 acres well pad spread over nine new well pads).

The gas pipeline would require conversion of approximately 0.3 acres of agricultural land (a combination of orchard and agricultural access roads) for construction of a tap and meter facility in Fresno County at the PG&E Line 401 tie-in point, and for construction and access related to two mainline valves along the alignment. The tap and meter station location is designated as Prime Farmland. The proposed mainline valves along Highway 33 and Highway 180 are designated as Farmland of Statewide Importance (Figure 4.9-4).

The power line would be located in Madera County within existing PG&E franchise areas, and would not require the conversion of agricultural land to non-agricultural use.

In summary, the Project Storage Field facilities will be constructed in an existing state-designated Gas Field. The gas transmission pipeline will require minor acreage for surface facilities. In total, the above ground Project facilities would convert approximately 20 acres of agricultural land in areas designated Prime Farmland, Farmland of Statewide Importance, and Unique Farmland. Of this acreage, approximately 19 acres would be converted in Madera County, and approximately 1 acre would be converted in Fresno County. The placement of these facilities would permanently remove this land from agricultural production. The Project will have no permanent effect on agricultural land surrounding Project surface facilities and will not induce or encourage any urban development of agricultural land.

According to DOC statistics, Madera County has approximately 365,300 acres of Important Farmland (Prime, Unique, Statewide Importance, and Local Importance) (DOC undated). The conversion of approximately 19 acres of agricultural land represents approximately 0.005 percent of this total acreage.

According to DOC statistics, Fresno County has approximately 1,391,500 acres of Important Farmland (DOC undated). The conversion of one acre of agricultural land represents approximately 0.00007 percent of this total acreage.

The conversion of agricultural land is less than significant. Nonetheless, the Applicants propose to reduce this impact further by participating in the land conservation programs that are currently being developed in Fresno and Madera Counties. Madera County's program will create permanent conservation easements to preserve agricultural land and native habitat. Madera County will manage the program and the easements. The Applicants will pay fees into the conservation program to permanently preserve an appropriate quantity of land to fully mitigate Project impacts. Fresno County is developing a similar program that will be administered by a qualified land trust.

The Applicants propose to participate in these pending programs. Specifically, the Applicants will permanently preserve approximately 20 acres of offsite farmland consisting of approximately 19 acres in Madera County and 1 acre in Fresno County. The Applicants will enter into an agreement with each County to fully mitigate the farmland that is actually converted within that County either through acquisition of easements or other real property interests in prime farmland to ensure that the required acreage is permanently retained in productive agriculture. Due to the small amount of acreage involved, in lieu of actually acquiring interests in real property, the Applicants may either pay a fee to the County to fund a County agricultural land preservation program or directly fund a qualified third party approved by the County that will acquire easements or other real property interests in prime farmland. The Applicants will execute the agreement with each County for preservation of farmland prior to the issuance of building permits. All payments of fees or funding for easement acquisition will be completed by the Applicants prior to issuance of occupancy permits.

While the impacts from the farmland conversion are less than significant, participation in the land conservation program in each County will ensure that the Project makes a positive contribution to preserving agricultural land in each county.

### Temporary Impacts

Pipeline trenching would result in temporary loss of agricultural production in various areas along the pipeline corridor. The Applicants propose to implement an Agricultural Impact Mitigation Plan to avoid or minimize any long-term impacts to the affected agricultural land, and to return the disturbed areas to agricultural production after construction. Various pre-construction and post-construction measures will be implemented such as stockpiling of soils prior to trenching and restoration of the site in coordination with the landowners and agricultural operators. Based on similar past projects, row crops would typically be back in production within one year of construction, while orchards and vineyards would typically take three to five years to return to agricultural viability. Because agricultural uses may resume along the pipeline corridor after construction and agricultural land would not be permanently converted to non-agricultural use, the temporary impacts would be less than significant, and will be addressed as provided in the Agricultural Impact Mitigation Plan. No further mitigation is required.

### Conflict with existing zoning for agricultural use, or a Williamson Act contract

**IMPACT LUP-3: The Project would convert approximately 20 acres of land that are under Williamson Act contracts to non-agricultural use.** As discussed above under Impact LUP-1, the Project substantially conforms to relevant agricultural zoning designations. This impact discussion focuses on potential conflicts with Williamson Act contracts.

The proposed Project surface facilities, as well as segments of the proposed pipeline alignment, will be located on lands that are presently under Williamson Act contracts (Figure 4.9-4). As discussed under Impact LUP-2, up to 20 acres of land required for the proposed Project's permanent above-ground facilities would be converted to non-agricultural use. Of this acreage, 19 acres are located in Madera County and the remaining 1 acre is located in Fresno County. The Applicants have been in communication with the California DOC, in its advisory role under the Williamson Act, and with Madera and Fresno Counties, regarding the Williamson Act as it relates to the Project.

#### *SUMMARY OF WILLIAMSON ACT*

The California Land Conservation Act of 1965, otherwise known as the Williamson Act, was adopted by the Legislature for the purposes of promoting the general welfare and the protection of the public interest in agricultural land (Gov. Code § 51220(f)). To accomplish these purposes, any city or county may establish an agricultural preserve to define the boundaries of those areas within which it will be willing to enter into contracts with property owners to restrict the use of their land to agricultural, recreational, or open space uses (Gov. Code § 51240). The California Department of Conservation plays an advisory role in the implementation of the Williamson Act by meeting with and assisting local, regional, state and federal agencies, organizations, landowners, or any other person or entity in the interpretation of the Act (Gov. Code § 51206). In exchange for placing the land under contract with a city or county pursuant to the Williamson Act, the property owner is entitled to preferential tax treatment (Gov. Code § 51243.6(a)).

In adopting the Williamson Act, the Legislature specifically contemplated the possibility that some land would be necessary for a federal, state, or local agency, or other qualified person's public improvement. A "public improvement" means facilities or interests in real property, including easements, rights-of-way and interests in fee title, owned by a public agency or person (Gov. Code § 51290.5). For purposes relevant to this analysis, "person" means one authorized to acquire property by eminent domain (Gov. Code § 51291(a)). Although the Applicants do not expect to use it, the Applicants will have the authority to acquire property by eminent domain upon receipt of a CPCN for the project.[1] The Applicants will, therefore, be persons developing a public improvement for purposes of the Williamson Act.

Any contract entered into under the Williamson Act is deemed automatically void when the underlying land is acquired by a public entity or person for a public improvement (Gov. Code § 51295). The contract shall be deemed void as to the property actually taken or acquired regardless of whether the land acquired is the entire parcel of land subject to the contract, a portion that is less than all the land subject to a contract, or an interest that is less than the fee title of an entire parcel or any portion thereof (Gov. Code § 51295).

Additionally, as noted above, notwithstanding any determination of compatible uses by a city or county, unless the city or county, after notice and hearing, makes a finding to the contrary, the erection, construction, alteration, or maintenance of gas facilities are specifically determined under the Williamson Act to be compatible uses within any agricultural preserve (see Govt. Code § 51238). Thus, even assuming the proposed Project did not involve the acquisition of land for a public improvement, the Project would likely be a compatible use within any agricultural preserve.

*IMPACT ANALYSIS*

The proposed Project surface facilities described above, as well as segments of the proposed pipeline alignment, are located on lands that are presently under Williamson Act contracts (Figure 4.9-2). As discussed under Impact LUP-2, up to 20 acres of land would be converted to non-agricultural use. Of this acreage, 19 acres are located in Madera County and the remaining 1 acre is in Fresno County.

Assuming that the Applicants obtain CPUC approval for the Project, then their acquisition of the 10-acre compressor site and related surface facility sites (including the pipeline tap and meter facility) will by law automatically void the Williamson Act contracts as to those sites (Gov. Code § 51295). The automatic voiding of the portion of each Williamson Act contract applicable to any Project surface facility sites means that the Applicants will not receive preferential tax treatment at these sites. The Applicants have communicated and will continue to communicate with interested agencies regarding the Williamson Act.

Temporary disturbance of agricultural activities would occur during gas pipeline construction, but the pipeline would be located underground, and agricultural use of the right-of-way would resume after construction is completed. Temporary agricultural impacts associated with construction, and resumption of agricultural operations will be addressed in the Agricultural Impact Mitigation Plan, discussed above. There are no conflicts with Williamson Act contracts related to the pipeline alignment, and no mitigation is required for this Project component.

The electric power line corridor will be located in PG&E franchise areas, adjacent to, but not within, lands subject to Williamson Act contracts for the majority of its length. The power line will not interfere with existing agricultural operations or result in conversion of Williamson Act

[1] PG&E presently has authority to acquire property by eminent domain.

lands to non-agricultural use. Therefore, the electric power line will not conflict with Williamson Act contracts, and no mitigation is required for this Project component.

In sum, the Project will not result in impacts under the Williamson Act and no mitigation is required.

### Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use.

Project surface facilities will result in the conversion of a small amount of agricultural land, as described above in Impact LUP-2. The Project will not involve other changes in the existing environment which could result in conversion of farmland to non-agricultural use. As discussed above, the majority of the Project surface facilities will be located within a state-designated Gas Field, where gas production activities have occurred for decades and continue to a limited extent today. Those gas production activities have not interfered with surrounding agricultural uses. Therefore, there will be no impact to the existing environment from other changes resulting from the Project, and no mitigation is required.

### Conflict with any applicable habitat conservation plan or natural community conservation plan

**IMPACT LUP-4. A segment of the proposed pipeline would traverse an area identified for potential future protection in an adopted habitat conservation plan or recovery plan for endangered species.** The proposed Project components are not located within lands currently managed as habitat conservation areas. However, the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS 1998) includes goals to survey, acquire, and manage natural lands within the historical range of several federally-listed species. Lands targeted for protection by the recovery plan include privately-owned parcels located along the proposed pipeline route from MP 19.5 to MP 20.5. Recovery Task No. 2.1.6 (Table 7, Page 198 of the Recovery Plan) describes these lands and desired protection as follows:

> *Private/located between the San Joaquin River, immediately north of the Alkali Sink Ecological Reserve and San Mateo Road on the west, connects Alkali Sink Ecological Reserve to the Chowchilla Canal, an important link in the chain of habitat islands on Valley floor. Acquire title or easements for appropriate parcels from willing sellers.*

The area of proposed disturbance on these parcels is presently used for grazing and a 30 to 40 foot wide area within the proposed pipeline alignment (adjacent to the roadway fenceline) is maintained clear of vegetation as a part of normal agricultural operations. Section 4.4 Biological Resources discusses the existing habitat within this segment of the pipeline alignment, and potential habitat impacts associated with the proposed Project. The proposed gas transmission pipeline would be buried on the subject parcels, and several Mitigation Measures in Section 4.4 Biological Resources will address potential impacts to this area, e.g., by requiring restoration of the disturbed area after construction.

There is no conflict with the San Joaquin Conservation Plan for Upland Species at this time because the subject parcels are privately owned and there is no habitat conservation plan currently in place on these parcels. In the event that the parcels are eventually placed into the plan's management area, the presence of the pipeline would not conflict with implementation of the plan due to the short-term nature of construction, and the required restoration of the disturbance area in accordance with mitigation measures in Section 4.4 Biological Resources. Therefore, any potential land use and biological resource impacts related to habitat conservation plans would be reduced to less than significant, and no further mitigation is required.

The Project also lies within the area addressed by the *Pacific Gas and Electric Company San Joaquin Valley Operations and Maintenance Habitat Conservation Plan* (Jones & Stokes 2007). This plan covers 23 wildlife species and 42 plant species for 33 routine operation and maintenance activities for PG&E's electric and gas transmission and distribution systems within nine counties in the San Joaquin Valley. The Project will have no effect on implementation of this plan. No other habitat conservation plans or natural community conservation plans have been developed for the Project area.

# 4.10 MINERAL RESOURCES

This section assesses the Project's potential impacts on mineral resources.

## 4.10.1 Environmental Setting

This discussion is based on a review of Mineral Land Classification maps (DOC 1999), the Madera County General Plan (1995), and the Fresno County General Plan (2000a) and General Plan Background Document (2000b).

### 4.10.1.1 Mineral Resources

The California State Mining and Geology Board uses the Mineral Resource Zone (MRZ) system to classify California's mineral resources. Within the Project area, these zones are based primarily on the presence of significant aggregate deposits. Aggregates are used in the production of building materials, such as concrete, asphalt, and cement. Locally produced aggregate is a valuable resource for urban regions because the cost of transporting these materials makes remote production cost-prohibitive. MRZs are defined as follows:

- MRZ 1 – Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that there is little likelihood for their presence

- MRZ 2 – Areas where adequate information indicates significant mineral deposits are present or where it is judged that there is a high likelihood for their presence

- MRZ 3 – Areas containing mineral deposits, the significance of which cannot be evaluated from available data

- MRZ 4 – Areas where available information is inadequate for assignment to any other MRZ.

The State has surveyed certain areas of California for minerals resources. A portion of the Project area was surveyed by the Division of Mines and Geology in 1999, but most of it has not been surveyed. The Storage Field is primarily located in a MRZ-3 zone. A small portion of the pipeline is in an MRZ 2 zone, and the rest is in an unclassified area (DOC 1999). Field observations confirmed that although there are various past and present aggregate extraction sites along the San Joaquin River, there are no active mineral extraction operations that would be affected by the Project within Madera County.

Fresno County's General Plan Background Document (2000b) contains a mineral resource location map (Figure 7-7). This map shows the locations of locally important minerals including copper, coal, sand and gravel, gold, limestone, and many others. This map identifies no locally important minerals within the Project area in Fresno County. Field observations confirmed that there are no active mineral extraction operations that would be affected by the Project within Fresno County.

## 4.10.2 Regulatory Setting

### 4.10.2.1 Federal

No federal laws or policies pertaining to minerals are applicable to the Project.

### 4.10.2.2 State

The Surface Mining and Reclamation Act (SMARA) of 1975 serves to ensure the proper reclamation of surface mining operations and to safeguard access to mineral resources of regional and statewide significance in the face of competing land uses and urban expansion. Under the authority of SMARA, the Department of Conservation is responsible for the classification and conservation of the state's mineral resources.

### 4.10.2.3 Local

#### Fresno County General Plan

The following goals, objectives, and policies from the Fresno County General Plan (2000a) pertaining to mineral resources apply to the Project:

- **OS-C.2.** The County shall not permit land uses incompatible with mineral resource recovery within areas designated as MRZ-2.

- **OS-C.10.** The County shall not permit land uses that threaten the future availability of mineral resources or preclude future extraction of those resources.

#### Fresno County Code

**17.08.345, Mineral Resource Zone 2 (MRZ-2).** "Mineral resource zone 2 (MRZ-2)" is the classification that applies to an area where adequate information indicates that significant mineral deposits are now present, or where it is judged that a high likelihood for their presence exists (Ord. 88-007 Section 2).

#### Madera County General Plan

The following policies from the Madera County General Plan (1995) pertaining to mineral resources apply to the Project:

- **5.I.1.** The County shall require new mining operations to be designed to provide a buffer between existing or likely adjacent uses, minimize incompatibility with nearby uses, and adequately mitigate their environmental and aesthetic impacts. The buffer area shall be zoned Agricultural, Rural, Exclusive -20 Acre or -40 Acre (ARE-20 and ARE-40).

- **5.I.6.** The County shall require that all mining operations prepare and implement mining plans and reclamation plans that mitigate environmental impacts and incorporate adequate security to guarantee proposed reclamation.

#### Madera County Code

**18.85.170 and 19.01.170, mineral resource protection.** Mine development is encouraged in compatible areas before encroachment of conflicting uses. Mineral resource areas that have been classified by the State Department of Conservation's Division of Mines and Geology or designated by the State Mining and Geology Board, as well as existing surface mining operations that remain in compliance with the provisions of this chapter, are protected from intrusion by incompatible land uses that may impede or preclude mineral extraction or processing, to the extent possible for consistency with the county's general plan.

In accordance with PRC Section 2762, the county's general plan and resource maps are updated to reflect mineral information (classification and/or designation reports) within twelve months of receipt from the State Mining and Geology Board of such information. Land use decisions within the county are guided by information provided on the location of identified mineral resources of regional significance. Conservation and potential development of identified mineral resource areas will be considered and encouraged. Recordation on property titles of the presence of important mineral resources within the identified mineral resource areas may be encouraged as a condition of approval of any development project in the impacted area. Prior to approving a use that would otherwise be incompatible with mineral resource protection, conditions of approval may be applied to encroaching development projects to minimize potential conflicts (Ord. 614 Section 2(part) 2006).

## 4.10.3 Impact Assessment

### 4.10.3.1 Significance Criteria

Appendix G of the California Environmental Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on mineral resources if the project would:

- 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.

The following additional guideline is included in Appendix G but is not relevant to the Project:

- Result in 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 locally important minerals are identified in the Project area in Fresno County's General Plan or Background Document (2000a, 2000b) or in the Madera County General Plan (1995); thus, no impact would occur under this guideline.

### 4.10.3.2 Impacts and Mitigation Measures

#### 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

**IMPACT MIN-1: Project construction will occur in areas of known mineral resources, but it will not preclude access to those resources.** Based on the surveys conducted by the Division of Mines and Geology, some areas where Project construction will occur could contain significant mineral deposits, such as the portion of the gas pipeline located in an MRZ 2 area. The pipeline, however, will be constructed adjacent to roadways in agricultural areas not used for mining. Moreover, the buried pipeline will not restrict access to mineral resources because it affects only a narrow corridor and mineral extraction will not be precluded in the surrounding areas. The electric power line will also be located along existing roads and will not preclude future mineral extraction land uses.

The central compressor station site and well pads will be located in the Storage Field, which is primarily located in an MRZ 3 area. MRZ 3 areas are areas where the mineral resource significance is undetermined. Agricultural uses and natural gas extraction currently occur within the Storage Field. If the Storage Field were eventually to be used for mining, such mining would not be restricted or precluded by the presence of Project structures. Any impacts associated with the potential for loss of a valuable known mineral resource will be less than significant, and no mitigation is required.

# 4.11 NOISE

This section addresses noise and vibration impacts resulting from Project construction and operation.

## 4.11.1 Environmental Setting

### Fundamental Noise Concepts

Although sound can be characterized by various parameters, the sound pressure level, or energy content of a given sound, has become the most common descriptor used to characterize ambient sound. The decibel (dB) scale is used to quantify sound intensity (loudness). Because sound can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a manageable level. This scale is similar to the Richter scale that measures earthquake intensity.

Another measurement of sound that influences the human interpretation of noise is frequency, or the distance between successive troughs or crests. Frequency is best known as pitch, or how high or low a sound is. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions of loudness in a process called "A-weighting," expressed as "dBA." The dBA refers to a scale of noise measurement that approximates the range of human ear sensitivity to different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. The noise levels presented herein are expressed in terms of dBA, unless otherwise indicated. Table 4.11-1 shows some representative noise sources and their corresponding noise levels in dBA.

Noise attenuates (diminishes in loudness) as a function of the distance between the source and receptor. For sources of noise emanating from a single location (i.e., point sources), noise attenuates at a rate of approximately 6 dBA for each doubling of distance from the source. Roads typically have an attenuation rate of 4.5 dBA per doubling of distance. However, heavily traveled roads with few gaps in traffic are typically characterized as a line source with an attenuation rate of 3 dBA per doubling of distance. This is the "inverse square law." This approach tends to underestimate attenuation and therefore, provides a "worst-case" estimate of noise at the receptor.

Because noise levels can vary over a given time period, they are further quantified using the Equivalent Sound Level ($L_{eq}$). A single number called the equivalent sound level ($L_{eq}$) is used to describe the average noise level over a period of time (i.e., the total sound energy divided by the duration). There are several types of measurements that are useful to understand noise levels in different situations. $L_{eq}$ (24) is the steady-state energy level measured over a 24-hour period. The day-night noise level ($L_{dn}$), an artificial dBA increment added to quiet time noise levels, is used because community receptors are more sensitive to unwanted noise during the evening and at night. This 24-hour noise descriptor adds 10 dBA during the night hours (10 p.m. to 7 a.m.). Another 24-hour noise descriptor, called the Community Noise Equivalent Level (CNEL) is similar to $L_{dn}$, but adds 5 dBA during the evening hours (7 p.m. to 10 p.m.). While both add a 10 dBA penalty to all nighttime noise events between 10 p.m. and 7 a.m., $L_{dn}$ does not add the evening 5 dBA penalty. In practice, $L_{dn}$ and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources. $L_{dn}$ is the more commonly used measurement in local plans and is used below for comparison purposes.

**Table 4.11-1 Typical Sound Levels Measured in the Environment**

| Examples of Common, Easily Recognized Sounds | Decibels (dBA) | Subjective Evaluations |
|---|---|---|
| Near Jet Engine | 140 | Deafening |
| Threshold of Pain | 130 | |
| Threshold of Feeling – Hard Rock Band | 120 | |
| Accelerating Motorcycle (at a few feet away) | 110 | |
| Loud Horn (at 10 feet away) | 100 | Very Loud |
| Noisy Urban Street | 90 | |
| Noisy Factory | 85[1] | |
| School Cafeteria with Untreated Surfaces | 80 | Moderate |
| Near Freeway Auto Traffic | 60[2] | Faint |
| Average Office | 50[2] | |
| Soft Radio Music in Apartment | 40 | Very Faint |
| Average Residence Without Stereo Playing | 30 | |

Notes:

1 Continuous exposure above 85 dBA is likely to degrade the hearing of most people.

2 Range of speech is 50 to 70 dBA.

dBA = A-weighted decibels

Source: U.S. Department of Housing and Urban Development 1985.

People are subject to a multitude of sounds in the urban environment. Many of these sounds are by-products of necessary day-to-day activities. Excessive noise levels of 90 to 110 dBA, which are typical during jet flyovers at 1,000 feet or a diesel truck at 50 feet, commonly result in letters of protest and/or community action. Excessive noise may not only be undesirable, but may also cause physical and/or psychological damage; noise effects can include irreversible hearing damage, interference with speech and other communications, and disruption of sleep, rest, and relaxation. The amount of annoyance or damage to sensitive receptors is dependent primarily upon three factors: 1) the amount and nature of the noise; 2) the amount of ambient noise present before the intruding noise; and 3) the activity of the person working or living in the noise source area.

### 4.11.1.1 Principles of Vibration

Vibrations caused by construction activities are energy transmitted in waves through the soil mass. These energy waves generally dissipate with distance from the vibration source (e.g. pile driving). Since energy is lost during the transfer of energy from one particle to another, vibration that is distant from the source is usually less perceptible than vibration closer to the source. As discussed above for noise, vibration attenuates as a function of the distance between the source and receptor. For sources of vibration emanating from a single location (i.e., point sources), vibration attenuates at a rate of approximately 50 percent for each doubling of distance from the source. However, actual human and structure response to different vibration levels is influenced by a combination of factors, including soil type, distance between the source and receptor, duration, and the number of perceived events.

If great enough, the energy transmitted through the ground as vibration can result in structural damage. To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of peak particle velocity (PPV) in the vertical and horizontal directions (vector sum), typically in units of inches per second (in/sec). A freight train passing at 100 feet can cause vibrations of 0.1 in/sec PPV, while a strong earthquake can produce vibration in the range of 10 in/sec PPV.

### 4.11.1.2 Existing Noise Conditions

The Project is located in a sparsely inhabited agricultural area. The primary sources of noise are distant and local traffic, the Union Pacific Railroad (UPRR), and agricultural activities. Vehicular traffic on heavy traffic roads, such as State Route (SR) 180, is a relatively constant source, while noise from trains using the UPRR corridors occurs only during passbys, at which time they generate approximately 70 dBA at 100 feet from the railway centerline (Fresno County 2000), and when trains are required to sound their whistles when crossing roadways at-grade. Ambient noise levels were characterized by measurements made at four locations within and adjacent to the areas where Project components would be located. Measurements were taken for 15 minute increments at three locations, and at one location (the cluster of residences on Road 16) for a continuous 24-hour period in February 2008. A Larson Davis Model 820 digital sound level meter, serial number 1620, was used under calm wind conditions, with temperatures ranging from 60 to 75 degrees Fahrenheit. The meter was calibrated on February 8, 2008. Table 4.11-2 shows the results of that study, and Figure 4.11-1 shows the monitoring locations.

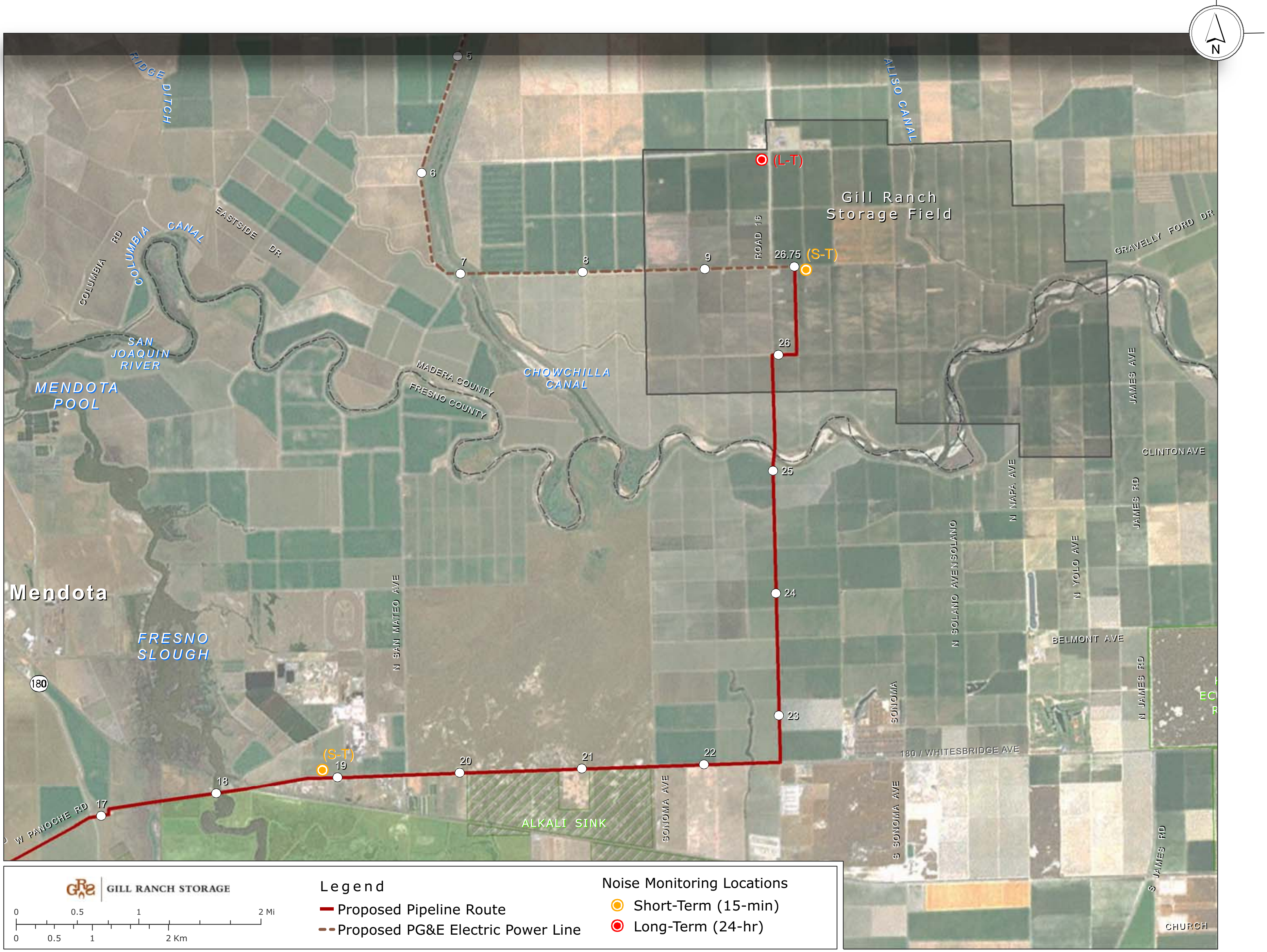
The proposed central compressor station and candidate Injection/Withdrawal (IW) wells would be located in agricultural fields in western Madera County. Up to three Observation/Monitoring (OM) wells would be located in the southeastern portion of the Storage Field south of the San Joaquin River, in Fresno County. The primary sources of ambient noise at these locations are farm equipment, vehicles, and natural sources such as wind. Traffic noise from Avenue 7 and SR 180 is not discernable from within the Storage Field Boundary. Noise measurements taken at the proposed compressor site show hourly average noise levels of 42 dBA $L_{eq}$. The continuous 24-hour noise measurement made adjacent to a residence on Road 16 (1 mile north of the compressor station site) showed noise levels ranging from about 23 to 80 dBA, and an average of about 57 dBA $L_{dn}$. Traffic on Road 16 is the primary source of noise at this residence.

**Table 4.11-2 Noise Measurements Showing Existing Noise Conditions at Key Locations**

| Location | Date and Time of Noise Measurement | $L_{eq}$ | $L_{max}$ | $L_{min}$ | Ldn | CNEL |
|---|---|---|---|---|---|---|
| 1. Proposed compressor site | February 12, 2008<br>7:48 a.m. – 8:05 a.m. | 41.65 | 51.7 | 37.8 | – | – |
| 2. Residence on Road 16, 1 mile north of the compressor site | February 13, 2008<br>12:33 p.m. –<br>February 14, 2008<br>12:40 p.m. | 53.22 | 80.4 | 23.4 | 57.46 | 57.89 |
| 3. SR 180 east of the Mendota Wildlife Management Area | February 12, 2008<br>9:11 a.m. – 9:30 a.m. | 72.99 | 87.8 | 39.2 | – | – |

Notes:
$L_{eq}$ = equivalent sound level
$L_{max}$ = maximum noise level
$L_{min}$ = minimum noise level

The pipeline route follows rural roadways through agricultural development in unincorporated Fresno and Madera counties. Existing noise primarily comes from traffic on SR 180 and SR 33, although some noise along the corridor comes from traffic on local roads and farm equipment. Trains are a source of noise in the vicinity of Fresno Slough, where the UPRR tracks cross SR 180. Noise measurements taken at SR 180 approximately 0.75 miles east of the Fresno Slough showed average noise levels of 73 dBA $L_{eq}$.




ENTRIX

Environmental and Natural Resource Management Consultants

Proponent's Environmental Assessment

GILL RANCH GAS STORAGE

FIGURE 4.11-1 | NOISE MONITORING LOCATIONS

#### 4.11.1.3 Sensitive Receptors

Some land uses are generally regarded as being more sensitive to noise than others due to the types of population groups or activities involved. Section 8.40.040 of the Noise Control Chapter of the Fresno County Ordinance Code (2007) considers single- or multiple-family residences, schools, hospitals, churches, and public libraries to be noise-sensitive receptors. Sections 9.58.010 and 9.58.020 of the Madera County Code (2007) consider residences, schools, courts, churches, hospitals, or public libraries to be noise-sensitive receptors.

The identified sensitive receptors include residential sites within 1,000 feet of the proposed gas pipeline alignment and residences on Road 16, located approximately 1 mile from the proposed central compressor station site. The single occupied residence within the Storage Field Boundary is over 2 miles east of the compressor station. The greatest concentration of residences is located along SR 180, between Fresno Slough and San Mateo Avenue. This segment of the pipeline alignment is an area that already experiences high noise levels from vehicular traffic and occasional train traffic. Other isolated residences along the pipeline alignment are also located along existing roadways that experience regular traffic.

Pipeline construction would occur in the vicinity of the Mendota Wildlife Management Area and the Alkali Sink Ecological Reserve, both located in Fresno County. Based on Fresno County ordinances, these areas are not considered noise-sensitive receptors. Although persons using these areas for recreational or educational/research purposes could have some heightened sensitivity to noise, the northern parts of the Wildlife Management Area and Ecological Reserve, which are in proximity to the proposed pipeline alignment, already experience significant noise from the adjacent highway. Therefore, these areas are not considered particularly noise-sensitive.

### 4.11.2 Regulatory Setting

This section summarizes regulations relating to noise and vibration.

#### 4.11.2.1 Federal

The federal government has no enforceable standards or regulations governing environmental noise levels.

#### 4.11.2.2 State

The State does not promulgate statewide standards for environmental noise but requires each local jurisdiction to include a noise element in its general plan (California Government Code Section 65302(f)).

### 4.11.2.3 Local

Both Fresno County and Madera County have established policies and ordinances that regulate noise within their respective jurisdictions.

#### County of Fresno

*County of Fresno General Plan Noise Element (2000)*

Policy HS-G.7 specifies when a noise increase would be considered significant:

- Where existing noise levels are less than 60 dB $L_{dn}$ at outdoor activity areas of noise-sensitive uses, a 5 dB $L_{dn}$ increase in noise levels will be considered significant;
- Where existing noise levels are between 60 and 65 dB $L_{dn}$ at outdoor activity areas of noise-sensitive uses, a 3 db $L_{dn}$ increase in noise levels will be considered significant; and
- Where existing noise levels are greater than 65 dB $L_{dn}$ at outdoor activity areas of noise-sensitive uses, a 1.5 dB $L_{dn}$ increase in noise levels will be considered significant.

*Fresno County Ordinance Code (2007)*

Section 8.40.040 of the Noise Control Chapter establishes noise level standards that are not to exceeded at an affected single- or multiple-family residence, school, hospital, church, or public library, as shown in Table 4.11-3.

**Table 4.11-3: County of Fresno Exterior Residential Noise Thresholds**

| Category | Cumulative Number of Minutes in Any One-Hour Time Period | Noise Level Standard, dBA Daytime 7 a.m. to 10 p.m. | Noise Level Standards, dBA Nighttime 10 p.m. to 7 a.m. |
|---|---|---|---|
| 1 | 30 | 50 | 45 |
| 2 | 15 | 55 | 50 |
| 3 | 5 | 60 | 55 |
| 4 | 1 | 65 | 60 |
| 5 | 0 | 70 | 65 |

Section 8.40.060 exempts construction from these provisions provided such activities do not occur before 6:00 a.m. or after 9:00 p.m., Monday through Friday, or before 7:00 a.m. or after 5:00 p.m. on Saturday or Sunday.

#### County of Madera

*Madera County General Plan Noise Element (1995)*

Policy 7-A.2 requires that noise created by new transportation noise sources be mitigated so as not to exceed 60 dB $L_{dn}$ within the outdoor activity areas of existing or planned noise-sensitive land uses and 45 dB $L_{dn}$ in interior spaces of existing or planned noise-sensitive land uses.

Policy 7-A.5 requires that noise created by new non-transportation noise sources be mitigated so as not to exceed the noise level standards set forth in Table 4.11-4 on lands designated for noise-sensitive uses.

**Table 4.11-4: County of Madera Maximum Allowable Noise Exposure for Non-Transportation Noise Sources[1]**

| Period | Daytime (7 a.m. to 10 p.m.) | Nighttime (10 p.m. to 7 a.m.) |
|---|---|---|
| Hourly $L_{eq}$ (dB) | 50 | 45 |
| Maximum Level (dB) | 70 | 65 |

Note:

Each of the noise levels specified above will be lowered by 5 dB for pure tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

1 As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers at the property line.

### *Madera County Code (2007)*

Sections 9.58.010 and 9.58.020 state the intent of Madera County to protect persons from excessive levels of noise within or near a residence, school, courts, church, hospital, or public library through the following regulations:

- **Residence**. It is unlawful for any person to make, continue, or cause to be made or continued, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area.

- **Engines and Motor Vehicles**. It is unlawful for any person to cause, permit or allow any disturbing or raucous noises caused off streets or highways by accelerating the engine of any motor vehicle while moving or not moving, willful backfiring of any engine, or screeching of tires.

- The characteristics and conditions which should be considered in determining whether a violation of these provisions exists, include, but are not limited to, the following:

– The evel of noise

– Whether the nature of the noise is usual or unusual

– Whether the origin of the noise is natural or unnatural

– The level of the background noise

– The proximity of the noise to sleeping facilities

– The nature and zoning of the area within which the noise emanates

– The density of the inhabitation of the area within which the noise emanates

– The time of the day or night the noise occurs

– The duration of the noise

- Whether the noise is recurrent, intermittent, or constant
- Whether the noise is produced by agricultural, commercial or noncommercial activity.

- **Disturbing, Excessive or Offensive Noises**. The following acts, including but not limited to those stated, are declared to be disturbing, excessive and offensive noises in violation of Section 9.58.020:

- The use of horns, signaling devices, and like equipment associated with the use or operation of automobiles, motorcycles, or any other vehicle in such a manner as to disturb the peace, quiet and comfort of persons of normal sensitivity.

### 4.11.2.4 Vibration Standards

No single regulatory standard exists for evaluating the potential for structural or cosmetic damage or human disturbance and annoyance from vibration-generating activities. Most local agencies have not established specific criteria for evaluating vibration impacts. In general, cosmetic or threshold damage to residential buildings can occur at peak particle velocities over 0.5 in/sec. Continuous vibration caused by vibratory pile drivers, impact pile drivers, and large vibratory rollers/compactors can cause annoyance but do not cause structural damage if the continuous vibration is less than 0.2 in/sec PPV. Vibratory mechanical equipment may be operated over many minutes several times per day, and the associated response of structures can build up over several seconds due to resonance of the structure, especially during startup and shutdown of vibratory compactors.

## 4.11.3 Impact Assessment

### 4.11.3.1 Significance Criteria

Appendix G of the California Environmental Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on public noise or vibration if the project would:

- Expose persons to or generate 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 generate excessive groundborne vibration or groundborne noise levels

- Create a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project

- Create a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.

The following additional guidelines are included in Appendix G but are not relevant to this Project:

- For a project located within an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.

The proposed central compressor station will be located within 7.5 miles of the Mendota Airport, a general aviation airport on the eastern side of Mendota. The proposed gas pipeline will be located within 1.7 miles of this airport. However, the only people potentially exposed to noise from the airport would be construction workers in the temporarily area. Moreover, noise from periodic aircraft operations will be largely masked by the noise of construction equipment and traffic on SR 180. No impacts would occur. No other Project components will be located within 2 miles of the airport.

- For a project within the vicinity of a private airstrip, expose people residing or working in the Project area to excessive noise levels.

Several private agricultural airstrips are located in the general vicinity of the Project, including one located along Road 16, approximately 1 mile north of the proposed central compressor site. This airstrip is infrequently used and will not expose construction workers or employees to excessive noise levels. No impacts will occur.

### 4.11.3.2 Impacts and Mitigation Measures

The following sections describe the Noise Control Plan that will be implemented by the Applicants, along with the primary sources of noise that will be generated during both Project construction and operations. These sections are followed by an assessment of the significance of the noise impacts, which takes into consideration the measures that are included in the Noise Control Plan.

#### Noise Control Plan

A Noise Control Plan will be implemented during construction to avoid or reduce noise impacts on nearby residents. In particular, construction will comply with applicable local noise regulations. Construction will typically occur during daytime hours on weekdays and Saturdays. In cases where nighttime construction will be necessary (i.e., during well drilling and potentially during horizontal directional drilling [HDD]), measures will be implemented as needed to ensure that construction will comply with applicable nighttime noise standards. The following specific measures will be incorporated into the construction contract specifications to reduce and control noise generated from construction-related activities:

- Stationary construction equipment will be located as far from sensitive receptors as feasible.

- Equipment will be turned off when not in use and not allowed to idle.

- Temporary equipment enclosures or noise barriers will be used where required to avoid exceeding local standards.

- Haul truck trips will be limited to daytime hours.

- Best available noise control techniques (including mufflers, intake silencers, ducts, engine closures, and acoustically attenuating shields or shrouds) will be required for all construction equipment and trucks. The construction contractor(s) will retain an acoustical engineer to design sound abatement measures that will meet the local noise standards if needed.

- If impact equipment (e.g., jack hammers and pavement breakers) is used during construction, hydraulically or electric-powered equipment will be used wherever practical to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust will be used (a muffler can lower noise levels from the exhaust by up to about 10 dB). External jackets on the tools themselves will be used, where feasible, which could achieve a reduction of 5 dB. Quieter procedures, such as drilling rather than impact equipment, will be used whenever practical.

- Stationary noise sources (e.g., pumps, generators, and compressors) will be located as far from sensitive receptors as possible. If such equipment must be located near receptors, adequate muffling, enclosures and/or barriers will be used as needed to ensure that local noise standards are met. Enclosure openings or venting will face away from sensitive receptors. Enclosures will be designed by a registered engineer regularly involved in noise control analysis and design. Operation of any stationary equipment beyond the time limits specified will meet applicable noise ordinance noise limits.

- Proposed jack and bore and HDD pits will be located as far from sensitive receptors as technically feasible.

- Material stockpiles and maintenance/equipment staging will be located as far as possible from residences within the designated staging areas.

- A seven-day advance warning will be provided to all nearby residents.

- A contact person will be designated for responding to construction-related issues, including noise. The name and phone number of the liaison will be conspicuously posted at construction areas and on all advance notifications. This person will take steps to resolve complaints, including periodic noise monitoring, if necessary.

### Overview of Construction Noise Sources

Table 4.11-5 presents noise levels associated with typical construction equipment that may be used for Project construction, both with and without noise controls. Additionally, the drill rig used for Horizontal Directional Drilling (HDD) will generate about 47 dBA at 100 feet (Pers. Comm., B. Nicholson 2008). Drilling the OM and IW wells will generate between approximately 72 and 77 dBA $L_{eq}$ at 100 feet (The Acoustics & Vibration Group 2006).

**Table 4.11-5: Noise Levels and Abatement Potential of Construction Equipment Noise at 25, 50, and 100 Feet (dBA)**

| Equipment | Noise Level at 25 Feet | | Noise Level at 50 Feet | | Noise Level at 100 Feet | |
|---|---|---|---|---|---|---|
| | Without Controls | With Controls[1] | Without Controls | With Controls[1] | Without Controls | With Controls[1] |
| Earthmoving | | | | | | |
| Front Loaders | 85 | 81 | 79 | 75 | 73 | 69 |
| Backhoes | 86 | 81 | 80 | 75 | 74 | 69 |
| Dozers | 86 | 81 | 80 | 75 | 74 | 69 |
| Tractors | 86 | 81 | 80 | 75 | 74 | 69 |
| Graders | 91 | 81 | 85 | 75 | 79 | 69 |
| Trucks | 97 | 81 | 91 | 75 | 85 | 69 |
| Materials Handling | | | | | | |
| Concrete Mixers | 91 | 81 | 85 | 75 | 79 | 69 |
| Concrete Pumps | 88 | 81 | 82 | 75 | 76 | 69 |
| Cranes | 89 | 81 | 83 | 75 | 77 | 69 |
| Derricks | 94 | 81 | 88 | 75 | 82 | 69 |
| Stationary | | | | | | |
| Pumps | 82 | 81 | 76 | 75 | 70 | 69 |
| Generators | 84 | 81 | 78 | 75 | 72 | 69 |
| Compressors | 87 | 81 | 81 | 75 | 75 | 69 |
| Impact | | | | | | |
| Jack Hammers | 94 | 81 | 88 | 75 | 82 | 69 |
| Pneumatic Tools | 92 | 86 | 86 | 80 | 80 | 74 |
| Other | | | | | | |
| Saws | 84 | 81 | 78 | 75 | 72 | 69 |
| Vibrators | 82 | 81 | 76 | 75 | 70 | 69 |

1 Estimated levels can be obtained by selecting quieter procedures or machines and implementing noise control features that do not require major redesign or high cost (e.g., improved mufflers, equipment redesign, or use of silencers, shields, shrouds, ducts, and engine enclosures).

Source: U.S. Environmental Protection Agency (USEPA) 1971 and FTA 2006.

The USEPA has estimated that noise levels from the construction of public works types of projects with all equipment present generate between 78 and 89 dBA depending on the construction phase (USEPA 1973), although as noted above, drilling operations associated with the Project will generate less than these levels. Moreover, given that noise controls will be required of construction equipment and trucks as part of the Noise Control Plan, Project construction noise levels would be lessened.

### Overview of Operational Noise Sources

The following features have been incorporated as part of the Project design to reduce noise generated by operations equipment:

- Install electric motor drivers rather than internal combustion engines wherever practical;
- Uniform distribution of noise from heat exchangers by selection of vertical air flow orientation;
- Minimize heat exchanger noise levels by selecting equipment with increased surface area but reduced fan speeds;
- Enclose the compressors within a building; and

Additionally, planned equipment blowdowns will be scheduled during normal daylight hours.

Noise from operations will be generated primarily at the central compressor station, and the compressors are the largest noise source. When operating, the equipment will run 24 hours a day for variable periods of time. During some times of the year, equipment could operate about 10 days per month; at other times, it could operate for two or more months at a time.

Estimated worst-case noise levels for uncontrolled individual equipment components at the central compressor station are shown on Drawing 12361-1300-100, in Appendix A. A single unenclosed compressor would generate up to 110 dBA at approximately 15 feet (5 meters), and up to five compressors would be operational at one time during certain operational phases. Based on standard noise principles, the cumulative noise levels generated by the five units is expected to be about 7 dBA higher than the individual unit, for a maximum noise level of 117 dBA at 15 feet (FHWA 1995). The compressors will be enclosed in a single metal building, which will reduce exterior noise levels from the combined compressors. Assuming minimal noise insulation from this building, the compressor noise would be reduced by about 10 dBA due to the enclosure, for an adjusted exterior noise level of 107 dBA at 15 feet (FHWA 1995).

Other equipment, such as the disposal pump, pipeline pig launcher and receiver, valves, air coolers, variable frequency drive (VFD), and dehydration equipment will generate various noise levels at close range. For example, the air coolers will generate up to 90 dBA at 3 feet (1 meter); and the pipeline valve will generate up to 97 dBA at 3 feet (1 meter) if no controls or enclosures are used. Other noise sources within the central compressor station include truck loading and unloading operations; uncontrolled truck noise can generate about 97 dBA at 25 feet, as indicated in Table 4.11-5 (a similar estimate of 100 dBA at about 15 feet [5 meters] is shown on Drawing 12361-1300-100). The VFDs, emergency generator, and 480V switchgear will be enclosed with individual weather enclosures, reducing noise from each by about 10 dBA**.**

Based on the estimated noise levels for the individual equipment components, and the enclosure of certain components, a conservative estimate of maximum composite noise levels within the compressor station fenceline is 107 dBA at 15 feet from the compressors.

Noise also will be generated at the IW wells. Predicted noise levels will be less than 35 dBA $L_{eq}$ at 620 feet from the source (The Acoustics & Vibration Group 2006).

### Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

**IMPACT NOI-1: Construction will generate noise but will comply with Fresno and Madera county standards.** Impacts in Fresno and Madera counties are described individually because each County has established its own standards.

#### Fresno County Impacts

The IW and OM wells will be drilled continuously for a 24-hour period, and up to three of the OM wells could be located in Fresno County, as shown on Figure 3.1-2. Should these well sites be used, they would be located over 2.75 miles from the nearest occupied residences, and the drilling noise would not be perceptible at this location.

Most of the pipeline will be located in Fresno County. Section 8.40.060 of the County Code exempts construction from noise thresholds shown in Table 4.11-3 provided such activities do not occur 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. The pipeline generally will be constructed within these time periods, and thus will comply with Fresno County standards.

At some locations within Fresno County, including the California Aqueduct, Fresno Slough, and San Joaquin River, HDD may take place for 24 hours a day when pipe is being pulled through the bore. This would take no more than one day. No noise sensitive receptors are present at the California Aqueduct or San Joaquin River HDD locations, and thus no impacts will occur at these sites. Residences are, however, located across Highway 180, approximately 100 feet from the proposed HDD exit point. Most noise-generating equipment, including mud cleaning equipment, will be located at the entry point, however, which is about 1,300 feet away. At this distance, noise would be reduced by about 30 dBA given the distance involved and the intervening structures and topography. As noted above, the drill itself would generate only about 47 dBA at 100 feet, and other equipment is anticipated to generate no more than 78 dBA because equipment such as jack hammers and pile drivers would not be required (USEPA 1973). Equipment operating on the exit side will be used only after the pilot hole is drilled. Construction noise will be somewhat attenuated by the land contours between the construction site and the residences (i.e., the raised elevation of the roadway that forms a barrier between the two locations). Given the implementation of the measures included in the Noise Control Plan, nighttime construction at this HDD location will not generate noise in excess of the Fresno County exterior nighttime noise threshold of 50 dBA because equipment will be appropriately muffled and enclosures or barriers will be provided as needed.

The proposed staging areas near the Spreckels Sugar Plant are located on the north side of SR 180, and adjacent to an industrial facility. Construction related noise from these staging areas will occur during daytime hours with the possible exception of the times when pipe was pulled during the night. This would only occur for several days out of the year-long construction period, however, and noise would be largely masked by the traffic on SR 180, which is a heavily traveled roadway (refer to Section 4.14, Transportation and Traffic). Based on the distance from existing residences, the existing land uses and noise levels, the intervening roadway that serves as a partial barrier, and the element of the Noise Control Plan that specifies that material stockpiles and maintenance/equipment staging will be located as far as possible from residences, noise impacts from staging activities at these location will be less than significant, and no mitigation is required.

### Madera County Impacts

The central compressor station, wells, and a 2-mile segment of the gas pipeline will be located in Madera County, as will the power line, staging areas, and all but three of the potential well sites.

Construction at the compressor station site will use conventional equipment, and noise levels from this construction effort are conservatively anticipated to be comparable to the USEPA estimates noted above (i.e., between 78 and 89 dBA depending on the construction phase), although as noted, actual levels likely will be less due to the use of best available noise control practices. Construction activities at the compressor site will be located over 1 mile from the nearest residences, located along Road 16. Based on this distance, construction noise will be reduced by approximately 45 dBA at this distance, resulting in a maximum average noise level of about 44 dBA, which is less than the existing average ambient noise level at this location. The standards specified in Table 4.11-4 will not be exceeded. Any noise impacts from construction at the compressor station site will be less than significant, and no mitigation is required.

The 2-mile pipeline segment within Madera County will be located even farther from these residences than the compressor station. The standards specified in Table 4.11-4 will not be exceeded. Any noise impacts from pipeline construction in Madera County will be less than significant, and no mitigation is required.

Well pads OM-1 and OM-2 will be at least 2,000 feet from the nearest residences on Road 16, and noise will be reduced to about 45 dBA at this location, even during the noisiest construction activities. This does not exceed the Madera County nighttime noise standard of 45 dBA (hourly $L_{eq}$) or the maximum level of 65 dBA. Any impacts from well drilling will be less than significant, and no mitigation is required. The nearest IW wells (IW-1 and IW-2) are located more than 1 mile from the nearest residence.

The power line is over 2.5 miles from the nearest residence, and construction activities will not be perceptible from this distance. No impacts will occur.

The proposed staging area along Road 16 could be as close as 200 feet from the low-density cluster of residences, depending on the portion of the property that is used for staging. Staging activities will be limited to daytime hours and will last approximately 12 months. For the purpose of evaluating potential noise impacts, the Madera County Code (2007) Sections 9.58.010 and 9.58.020 requires consideration of factors such as the density of the inhabitation of the area within which the noise emanates, the time of the day or night the noise occurs, and the duration of the noise. Given the low density of homes in this area, and the daytime limitation, and the element of the Noise Control Plan that specifies that material stockpiles and maintenance/equipment staging will be located as far as possible from residences, noise impacts from staging activities at this location will be less than significant, and no mitigation is required.

Rail loading and staging activities could also occur at an existing railyard facility in Mendota. Potential noise impacts from this activity are considered less than significant because Project activities would be consistent with current and ongoing activities at this facility.

**IMPACT NOI-2: Operations will generate noise, but facilities will be designed to comply with local standards.** The central compressor station is surrounded by agricultural fields. The nearest sensitive receptor is a cluster of residences located over 1 mile north of the facility, on Road 16. Ambient noise at this residential location was measured at approximately 57 dBA $L_{dn}$.

Based on the distance to the nearest sensitive receptor, and the estimated maximum noise levels from the compressor station (107 dBA adjacent to the compressor station building), compressor station noise levels will be reduced to approximately 50 to 55 dBA at this residential site. These noise levels are less than the average ambient level. Therefore, potential noise levels are not expected to exceed the Madera County daytime noise thresholds specified in Table 4.11-4.

Based on the conservative noise level estimates presented above, noise from the compressor station could exceed the maximum hourly nighttime noise level standard of 45 dBA at the nearest residences, as specified in Table 4.11-4. The estimated Project noise level is conservative because it assumes there is no noise attenuation at the residences from other structures between the residences and the compressor station (i.e., compressor station structures; and buildings near the residences). Therefore, as a component of the Applicants' proposed Noise Control Plan an acoustical engineer will measure actual sound levels at receptor sites and design sound abatement features, if necessary, to ensure that long-term operations meet or exceed the local ordinance limits. Additional design features could include use of quieter equipment or further insulation of noise-generating equipment. With the implementation of the Noise Control Plan, any long-term noise impacts from the central compressor station will be less than significant, and no mitigation is required.

Maintenance activities along the pipeline will cause only periodic and incidental noise, primarily from vehicle trips. Given the remote location of the pipeline and short duration of maintenance activities, noise impacts from pipeline maintenance will be less than significant, and no mitigation is required.

### Expose persons to or generate excessive groundborne vibration or groundborne noise levels

**IMPACT NOI-3: Construction activities will cause minimal vibration at sensitive receptors.** Construction activities that generate considerable vibration, such as pile driving and blasting, will not be required given the nature of the construction and soil types that are present. Trucks and other types of construction equipment will generate some vibration, but vibration attenuates rapidly (approximately 50 percent for each doubling of distance from the source).

Most construction will occur in areas that are well removed from sensitive receptors, and no impacts will occur. Some residences and other structures are located near the pipeline corridor on SR 180, but the amount of vibration generated by the equipment needed to construct the pipeline will be negligible in comparison to that generated by truck traffic that currently uses this heavily traveled roadway. Project-related truck traffic will use designated truck routes, and the addition of a maximum of about 22 truck trips per day for a two-month period will not generate excessive groundborne vibration. Any vibration impacts will be less than significant, and no mitigation is required.

Operations will not cause vibration impacts due to the nature of the operation and distance to other structures.

### Create a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project

**IMPACT NOI-4: The Project will cause a permanent increase in noise, but the impact will not be substantial due to appropriate design.** Permanent noise increases will result from compressor station operations (discussed above under Impact NOI-2), periodic heavy truck trips to and from the compressor station and well pads, and periodic maintenance activities. Designated truck routes will be used, and the periodic use of these roads will not affect ambient noise levels. As shown in Table 4.11-2, the noise measurement taken along SR 180 showed the existing noise level to be approximately 73 dBA during morning hours. In moderately noisy environments such as occurs along the area's truck routes ($L_{eq}$ averaging 70 dBA), it would take a doubling of traffic to increase average noise levels by 3 dBA, and only a negligible increase will occur as a result of the Project, as discussed in Section 4.14, Transportation and Traffic. No perceptible changes in noise will result from periodic truck trips during operations. Maintenance activities will cause only periodic and incidental noise, primarily from vehicle trips, and will not substantially increase noise levels. Any noise increases during Project operations will be less than significant, and no mitigation is required.

### Create a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project

**IMPACT NOI-5: The Project will cause a temporary increase in noise during construction that is not substantial.** As discussed above, construction activities will generate an estimated maximum of 78 to 89 dBA depending on the construction phase (USEPA 1973). Most construction will occur in areas that are unpopulated, and no impacts will occur. As discussed under Impact NOI-1, construction of the power line will have no impacts on noise-sensitive receptors, and impacts from construction at the central compressor station and well pads will be less than significant. Most of the pipeline will not be constructed in proximity to residences. Several residences are located on the south side of SR 180 in the area between Fresno Slough and San Mateo Avenue; and six other residences are located close to the pipeline alignment, generally near SR 33. All pipeline construction will occur during the daytime, except for occasional nighttime construction during HDD, and construction will proceed rapidly; therefore, pipeline construction noise will be temporary in any one location. The Noise Control Plan also contains measures that will ensure that construction complies with all applicable standards. Additionally, the ambient noise levels along SR 180 are already high (approximately 73 dBA). Given the short-tem nature of construction activities, and the relatively high ambient noise levels along existing roadways, any potential noise impacts from the Project will be less than significant, and no mitigation is required.

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# 4.12 POPULATION AND HOUSING

This section addresses potential impacts on population growth and housing supply and demand from Project construction and operations, including the potential for the Project to induce growth directly (e.g., by requiring the relocation of substantial numbers of workers) and indirectly (e.g., by removing an obstacle to growth).

## 4.12.1 Environmental Setting

The Project will likely draw workers from Madera and Fresno counties. Workers may also come from the Bakersfield / Kern County area, Sacramento, and the Bay Area. The Project is accessible from these areas via Interstate 5 and Highway 99. The following sections describe salient characteristics of the local counties' population, labor force, and housing stock.

### 4.12.1.1 Population

Fresno County had a population of approximately 891,800 in 2006 (U.S. Census Bureau 2006a). The county is projected to grow by over 27 percent between 2006 and 2020 (California Department of Finance [DOF] 2001). Madera County had a population of approximately 146,345 in 2006 (U.S. Census Bureau 2006b) and is projected to grow by nearly 57 percent between 2006 and 2020 (DOF 2001). Table 4.12-1 shows growth trends and projections for Fresno and Madera counties.

**Table 4.12-1: Growth Trends in Fresno and Madera Counties**

| | Fresno County | | | Madera County | | |
|---|---|---|---|---|---|---|
| | 2000 | 2006 | 2020 | 2000 | 2006 | 2020 |
| Total Population | 799,407 | 891,756 | 1,134,600 | 123,109 | 146,345 | 229,200 |
| Change from 2000 Population | 0 | +92,349 | +335,193 | 0 | +23,236 | +106,091 |

Source: DOF 2001; U.S. Census Bureau 2006a, 2006b.

### 4.12.1.2 Employment

Fresno County's total work force is approximately 373,500 (Council of Fresno County Governments undated). As of 2006, there were approximately 23,000 construction jobs in the county (Employment Development Department [EDD] 2007a). Fresno County's unemployment rate (8.0 percent in 2006) has been consistently higher than the rate for the State of California (4.9 percent in 2006), but has dropped steadily from 11.7 percent in 2003 (EDD 2007a).

Madera County's total work force is approximately 45,400 (EDD 2007b). As of 2006, there were approximately 2,900 jobs in the category "natural resources, mining, and construction" (EDD 2007b). Madera County's unemployment rate of 7.0 percent in 2006 has been consistently higher than the rate for the State of California (4.9 percent in 2006), but has dropped steadily from 10.6 percent in 2002 (EDD 2007b).

#### 4.12.1.3 Housing

The total number of housing units in Fresno County was 299,578 in 2006. Of the occupied housing units in the County, about 55 percent are owner-occupied and 45 percent are renter-occupied. The total vacancy rate for all Fresno County housing units was 7.5 percent in 2006 (U.S. Census Bureau 2006a).

The total number of housing units in Madera County was 47,671 in 2006. Of the occupied housing units in the County, about 61 percent are owner-occupied and 39 percent are renter-occupied. The total vacancy rate for all Madera County housing units was 11.6 percent in 2006 (U.S. Census Bureau 2006b).

### 4.12.2 Regulatory Setting

#### 4.12.2.1 Federal

There are no federal laws or regulations related to population, employment, and housing that are applicable to the Project.

#### 4.12.2.2 State

There are no state laws or regulations related to population, employment, and housing that are applicable to the Project.

#### 4.12.2.3 Local

##### Madera County General Plan

The Madera County General Plan does not contain policies related to population and housing that are applicable to the Project.

##### Fresno County General Plan

The following policy from the Economic Development Element of the Fresno County General Plan (2000) pertaining to population and housing is applicable to the Project:

- **Policy ED-A.8**. The County shall encourage the location of new industry within cities, and unincorporated communities. The County, in cooperation with the cities will identify circumstances for locating industrial uses in other unincorporated areas consistent with the cities' economic development strategies and taking into account opportunities offered by variations in local environmental conditions.

## 4.12.3 Impact Assessment

### 4.12.3.1 Significance Criteria

Appendix G of the California Environmental Quality Act Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on population and housing if the project would:

- 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).

The following additional criteria are included in Appendix G but are not relevant to the Project:

- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

The Project will be located in a rural area, and no existing housing will be displaced or substantially affected by construction or operations.

- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

The Project will be located in a sparsely populated rural area, and no people will be displaced by Project construction or operations.

### 4.12.3.2 Impacts and Mitigation Measures

#### Induce substantial population growth in an area, either directly or indirectly

**IMPACT PH-1: The Project will require temporary construction workers and new permanent employees, but it will not induce substantial population growth, either directly or indirectly.**

#### Temporary Construction Workers

The Project will create temporary construction-related jobs over an approximately 12-month period. The workforce will vary from month to month, and the work will take place in different locations (i.e., a segment of the workforce will be located in the central compressor station area, and other work areas will be located along various segments of the pipeline). During the first seven months, the average daily workforce will peak at approximately 125 workers. During months 8 through 10, the average daily workforce will peak at approximately 350 workers. During months 11 through 12, the workforce is expected to decline to less than 100 workers.
It is anticipated that approximately 40% of the temporary construction labor force will be drawn from the surrounding communities in both Madera and Fresno counties. The remainder will comprise workers with relevant technical expertise from outside the Project area (e.g., from the Bakersfield/Kern County area or the Bay Area). It is anticipated that these workers will reside

in the local Project area only temporarily during the 12-month construction period because the construction industry differs from most other industry sectors in several ways, including the following:

- Construction employment has no regular place of business. Rather, construction workers commute to job sites that may change several times a year.
- Many construction workers are highly specialized (e.g., crane operators, steel workers, welders) and move from job site to job site, dictated by the demand for their skills.
- The work requirements of most construction projects are also highly specialized, and as a result, workers are employed on a job site only as long as their skills are needed to complete a particular phase of the construction process.

It is therefore unlikely that a significant number of construction workers will permanently relocate their place of residence as a consequence of working on the Project. In other similar projects, many workers temporarily relocate to the local project area and reside either in hotels or in their own portable trailer homes (where designated trailer space is available), and then leave the area when the project is completed. Numerous hotels, trailer parks, and recreational vehicle parks are present in both Madera and Fresno counties and have sufficient capacity to house construction workers from outside of the area; therefore, no new or expanded services or infrastructure are necessary to accommodate the temporary construction workforce. Accordingly, Project-related construction workers will not induce substantial population growth in Madera and/or Fresno counties. Any impacts on population and housing associated with temporary construction workers will be less than significant, and no mitigation is required.

### Permanent Positions

The Project will create approximately ten permanent and part-time employment positions. Operations and maintenance personnel will be present at the Project during normal daytime workday hours. Typical staffing levels during normal operations are expected to consist of two or three operators, one mechanic and one or two instrumentation/electrical personnel; these personnel will be on shift and supervised by an on-site Operations Manager. Part-time clerical, purchasing, and other administrative support also will be onsite during normal business hours. Infrequent non-routine activities will require additional contractor personnel onsite for two to four weeks at a time.

It is likely that most of these new employees will be drawn from the surrounding communities. To the extent that some of these employees relocate from other locations, the addition of up to ten workers and their families will not constitute a substantial increase in population growth. Any slight increase in the local workforce resulting from the Project will result in limited local economic benefits and help reduce local unemployment and vacancy rates, but these benefits will not be sufficient to trigger additional population growth. No new or expanded services or infrastructure are necessary to accommodate the permanent positions required by the Project. Accordingly, Project-related permanent positions will not induce substantial population growth in Madera and/or Fresno counties. Any impacts on population and housing associated with permanent workers will be less than significant, and no mitigation is required.

### Other Factors Affecting Population Growth

During the operation phase, the Project will contribute flexibility and operating efficiency to the natural gas supply system by storing gas for use during high demand periods. It will not provide new gas supplies, nor is it an infrastructure project that will provide natural gas to an area that was previously unable to receive natural gas, thereby allowing for more construction in the Project area. Here, it is possible that none or very few of the customers who store gas in the Project will be located in the Project area. (By contrast, as noted in the CEQA Guidelines, a major expansion of a wastewater treatment plant might allow for more construction in the plant's service areas.) The Project will not have an indirect growth-inducing effect because it will not remove an obstacle to growth. Additionally, it is located in a sparsely populated rural area and will not encourage or facilitate other activities that could significantly affect the environment, either individually or cumulatively. It also will not require the construction of new community service facilities that could cause significant environmental impacts.

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# 4.13 PUBLIC SERVICES / UTILITIES AND SERVICE SYSTEMS / RECREATION

This section addresses three resource issues included in the environmental checklist in Appendix G of the California Environmental Quality Act (CEQA) Guidelines: public services, utilities and service systems, and recreation. Public services include fire and police protection, schools, parks, and other public facilities. Utilities and service systems include water and wastewater treatment, storm water drainage, water supplies, and solid waste disposal. Recreational resources include parks and other recreational facilities.

## 4.13.1 Environmental Setting

### 4.13.1.1 Fire Protection

The Project is located in both Madera and Fresno counties; therefore, fire protection services are provided by both the Madera County Fire Department (MCFD) and Fresno County Fire Protection District (FCFPD). A mutual aid agreement exists between these two departments and other fire departments in the region to provide additional support as needed.

The MCFD provides fire protection services and emergency medical aid to all unincorporated areas of Madera County. Madera County's General Plan policies encourage local fire protection agencies to maintain the following minimum standards for average first-alarm response times: 10 minutes in urban areas; 15 minutes in suburban areas; and 20 minutes in rural areas (Madera County 1995). The MCFD maintains 15 stations throughout the county and has 19 career fire suppression personnel, 185 paid call firefighters and 11 support personnel. The closest station is Station 1, located at 14225 Road 28 in Madera, approximately 16 miles from the central compressor station (MCFD 2007; Pers. Comm., P. Cline 2007).

The FCFPD provides fire protection, rescue services and emergency medical aid to all unincorporated regions of Fresno County and several incorporated communities. Fresno County's General Plan policies encourage local fire protection agencies to maintain the following minimum standards for average first-alarm response times: 5 minutes in urban areas; 15 minutes in suburban areas; and 20 minutes in rural areas (Fresno County 2000). The FCFPD maintains 15 staffed stations and four volunteer stations throughout the county and has 89 career fire suppression and 250 volunteer personnel. The two closest stations are Station 95, located at 25101 W. Morton Road in the town of Tranquility, and Station 96, located at 101 McCabe Avenue in the City of Mendota. These stations are located within 7 miles of the proposed gas pipeline and central compressor station, respectively (FCFPD 2007; Pers. Comm., M. Bowman 2007).

### 4.13.1.2 Police Protection

Police protection services are provided in the Project area by the Madera County Sheriff's Department (MCSD) and the Fresno County Sheriff's Department (FCSD). The MCSD has a staff of 82 sworn personnel and 34 general employees (MCSD 2007). In 2006, the MCSD responded to 36,000 calls for service and had an average response time for emergency calls of four minutes (Pers. Comm., M. Salvador 2007). MCSD Headquarters is located at 14143 Road 28 in Madera, approximately 16 miles from the central compressor station.

The FCSD has a staff total of 1,205 personnel divided into four geographic areas. The Project is located in Area 1, which comprises over 2,400 square miles of western Fresno County. The Area 1 station is located in the City of San Joaquin, approximately 13 miles south of the central compressor station. The Area 1 personnel compliment consists of 1 lieutenant, 8 sergeants, 1 office assistant, 4 community service officers, and 34 deputy sheriffs. Services provided by the Area 1 station include 24-hour patrol, detective services, and crime prevention. The Fresno County Sheriff is also the contract law enforcement for the city of Mendota. Its response time goal is to provide service for life-threatening or critical incidents within three minutes of notification (MCSD 2007, Pers. Comm., S. Ruppel 2007, Pers. Comm., M. Banuelos 2007).

#### 4.13.1.3 Schools

The Project area is served by five school districts: Firebaugh Las Deltas Unified School District (USD), Kerman USD, Golden Plains USD, Mendota USD, and Madera Unified USD.

The Firebaugh Las Deltas USD includes two elementary schools, one middle school, one high school, and two alternative or continuing education schools. In 2006, the District enrolled 981 elementary, 493 middle school, 756 high school, and 19 alternative or continuation students (Firebaugh Las Deltas USD 2007, California Department of Education [CDOE] 2007).

The Kerman USD includes three elementary schools, one middle school, one high school, and three alternative education schools. In 2006, the District enrolled 2,268 elementary, 673 middle school, 1,113 high school, and 15 alternative or continuation school students (Kerman USD 2007, CDOE 2007).

The Golden Plains USD includes four elementary schools, one high school, and one continuing education school. In 2006, the District enrolled 1,371 elementary, 458 high school, and 32 alternative or continuation school students (Golden Plains USD 2007, CDOE 2007).

The Mendota USD includes two elementary schools, one middle school, two high schools, and one alternative education school. In 2006, the District enrolled 1,431 elementary, 396 middle school, 1,506 high school, and 18 alternative or continuation school students (Mendota USD 2007, CDOE 2007).

The Madera USD includes 12 Kindergarten (K) through 6th grade (K-6) elementary schools, 4 K-8 country schools, 3 middle schools, 2 high schools, 3 alternative education centers, and 1 charter school. In 2006, the District enrolled 9,259 K-6 elementary, 1,694 K-8, 2,441 middle school, 4,463 high school, 573 alternative education, and 213 charter school students (CDOE 2007).

#### 4.13.1.4 Parks and other Recreational Facilities

The Project is located in a remote agricultural area that does not contain developed parks. The city and county parks closest to the Project area are the City of Mendota's Rojas Pierce Park and Fresno County's Mendota Pool Park; both located more than 6 miles from the compressor station site. The Mendota Wildlife Area is located just south of the pipeline alignment, across Highway 180, between pipeline Mileposts 17.5 and 18.3. Recreational activities at the 11,825-acre site include fishing, hunting, camping, boating, and wildlife viewing. The nearby Alkali Sink Ecological Reserve is used for wildlife viewing and scientific education and research. Construction would not occur in these areas.

#### 4.13.1.5 Other Public Facilities

The Madera County Library system maintains five libraries. The closest library to the Project Area is the main library located at 121 North G Street in Madera. The Fresno County Public library system, which is part of the San Joaquin Valley Library System, maintains 35 libraries and a community bookmobile. The library closest to the Project Area is the Mendota Library, located at 1246 Belmont Avenue in Mendota.

#### 4.13.1.6 Storm Water Drainage

The Project is located in a sparsely developed, relatively level, agricultural area that does not have municipal storm water drainage facilities. Rainwater and irrigation runoff typically flows from fields and enters agricultural ponds, canals, and irrigation ditches located at several locations on or near the Project alignment.

#### 4.13.1.7 Water Supplies

In Fresno County, most of the domestic water supply comes from groundwater, which is accessed through public and private wells. The Fresno County Community Health Department permits, monitors, and inspects small public and state water systems through its Water Surveillance Program.

The part of the Project that is within Fresno County is located within the Westlands Water District (WWD) between the PG&E Line 401 tie-in point and Highway 180 near the Mendota Wildlife Management Area (from pipeline Milepost 0.0 to approximately Milepost 18). WWD provides agricultural water supply and encompasses more than 600,000 acres of farmland in western Fresno and Kings counties. The District serves approximately 600 family-owned farms that average 900 acres in size. Water is delivered to Westlands through the Central Valley Project (CVP), a federal water project that stores water in large reservoirs in Northern California for use by cities and farms throughout California. After it is released from CVP reservoirs, the water is pumped from the Sacramento-San Joaquin Delta and delivered 70 miles through the Delta-Mendota Canal to San Luis Reservoir. During the spring and summer, the water is released from San Luis Reservoir and delivered to Westlands farmers through the San Luis Canal and the Coalinga Canal. Once it leaves the federal project canals, water is delivered to farmers through 1,034 miles of underground pipe and more than 3,300 water meters (WWD 2008).

Madera County has 45 water districts that are responsible for water supply, water quality, and water and wastewater treatment. Two districts, Hidden Lake and Sumnar Hills, use surface water as their source, and the rest use groundwater. Hidden Lake, or Maintenance District 1, receives its water from Millerton Lake and is permitted to withdraw a maximum of 200 acre-feet of water per year. Sumnar Hills receives its water from the San Joaquin River and is permitted through the Bureau of Reclamation (Pers. Comm., K. Ham 2007).

There are no other water districts along the remainder of the pipeline alignment, or within the Project area within Madera County. A segment of the electrical power line passes through the Columbia Canal Company, a water district that encompasses land west of the Chowchilla Canal and north of the San Joaquin River, in Madera County.

#### 4.13.1.8 Non-Hazardous and Recyclable Solid Waste

Four active solid waste disposal sites are located within Fresno and Madera counties: the City of Clovis Landfill in Clovis, the Coalinga Disposal Site in Coalinga, the American Avenue Disposal Site in Tranquility, and the Fairmead Solid Waste Disposal Site in Chowchilla. Additionally, the Cedar Avenue Recycling & Transfer Station and the Rice Road Recyclery & Transfer Station, both in the City of Fresno, and the Mammoth Recycling Facility and Transfer Station in Chowchilla provide construction and demolition waste recycling services (California Integrated Waste Management Board [CIWMB] 2007). Table 4.13-1 describes these facilities, including their permitted disposal rates and remaining capacities.

**Table 4.13-1: Solid Waste Disposal Facilities in Fresno and Madera Counties**

| Facility | Landfill Classification[1] | Permitted Disposal Rate (tons per day) | Remaining Capacity (cubic yards) |
|---|---|---|---|
| City of Clovis Landfill | Class III | 600 | 6,600,000 (as of June 2006) |
| Coalinga Disposal Site | Class III | 200 | 1,930,000 (as of July 2005) |
| American Avenue Disposal Site | Class II and III | 2,200 | 29,359,000 (as of July 2005) |
| Fairmead Solid Waste Disposal Site | Class III | 1,100 | 5,553,000 (as of January 2004) |
| Cedar Avenue Recycling & Transfer Station | Not Applicable | 3,100 | Not Applicable |
| Rice Road Recyclery & Transfer Station | Not Applicable | 400 | Not Applicable |
| Mammoth Recycling Facility and Transfer Station | Not Applicable | 500 | Not Applicable |

*Source*: CIWMB 2007

[1]A Class III landfill is licensed to receive non-hazardous municipal solid waste. A Class II landfill is licensed to receive both non-hazardous municipal solid waste and limited types of hazardous solid and liquid wastes.

### 4.13.1.9 Hazardous Waste

Chemical Waste Management, a subsidiary of WMX Technologies, operates the Kettleman Hills Hazardous Waste Facility, a 1,600-acre chemical waste disposal and treatment facility located 55 miles southwest of Fresno. Of these 1,600 acres, 499 acres have been approved to receive solid, semi-solid, and liquid hazardous and extremely hazardous wastes. This portion of the landfill has a remaining capacity of 7.3 million cubic yards (California Department of Toxic Substances Control 2007).

## 4.13.2 Regulatory Setting

### 4.13.2.1 Federal

Enacted in 1972, the Federal Clean Water Act (CWA) and subsequent amendments outline the basic protocol for regulating discharges of pollutants to waters of the U.S. It is the primary federal law regulating water quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. Enforced by the U.S. Environmental Protection Agency (USEPA), it was enacted "…to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA authorizes states to adopt water quality standards and includes programs addressing both point and non-point pollution sources. It gives the USEPA the authority to implement pollution control programs, such as setting wastewater standards for industry and water quality standards for surface waters, and established the National Pollutant Discharge Elimination System (NPDES). Under Section 402, a discharge of pollutants to navigable waters is prohibited unless the discharge is in compliance with an NPDES permit.

The USEPA determined that California's water pollution control program has sufficient authority to manage the NPDES program under State law in a manner consistent with the CWA. Therefore, the California State Water Resources Control Board (SWRCB), and the nine Regional Water Quality Control Boards (RWQCB) would implement and enforce the NPDES program. These agencies also implement the Waste Discharge Requirements (WDR) Program, which regulates discharges of waste to land or groundwater under the California Water Code.

Issued in 1972, the NPDES regulations initially focused on municipal and industrial wastewater discharges, followed by storm water discharge regulations, which became effective in November 1990. NPDES permits for wastewater and industrial discharges specify discharge prohibitions, effluent limitations, monitoring, and reporting.

### 4.13.2.2 State

Construction activities that involve 0.5 or more acres of land disturbance must comply with the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ), which regulates storm water originating from construction activities. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Section A of the Construction General Permit describes the elements that must be contained in a SWPPP. These elements include a site map(s) that shows the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list the Best Management Practices (BMPs) the discharger will use to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The SWRCB is in the process of reissuing the Construction General Permit and released a preliminary draft of the new permit on March 2, 2007 (SWRCB 2007). A revision to the draft was released in March 2008. When adopted, this permit will replace the 1999 Construction General Permit and, as proposed, would require the permittee to implement additional minimum BMPs. The revised draft permit also requires specific analytical procedures to determine whether the BMPs are preventing further impairment due to sediment and preventing non-visible pollutants from violating water quality objectives. The new requirements would require monitoring (i.e., sampling and testing) of the quality of storm water discharges at most sites. In addition, all sites would be required to meet new development and redevelopment performance standards to minimize or mitigate hydrologic impacts.

The Construction General Permit references federal NPDES provisions (40 CFR 122.26(a)(2)), which “exempt construction activities at oil and gas sites from the requirement to obtain an NPDES permit for storm water discharges except in very limited instances.” These provisions apply to disturbances to the ground from oil and gas exploration, production, processing, and treatment operations or transmission facilities including gathering lines, flow-lines, feeder lines, and transmission lines. The Project generally meets the provisions for the exemption of oil and gas operations. Recent legal developments related to the exemption will be monitored and applicability of the exemption from the General Construction Permit will be confirmed through discussions with the Central Valley RWQCB.

The Project is subject to Title 14 of the California Code of Regulations, which outlines standards for solid waste handling and disposal.

The Regional Integrated Waste Management Act (Assembly Bill [AB] 939), enacted in 1989, established an integrated waste management planning hierarchy to provide guidance to a governing board on solid waste source reduction, recycling and composting, and environmentally safe transformation and land disposal. It required cities and counties to adopt a Source Reduction and Recycling Element, and to divert 50 percent of solid waste generated in the city or county from landfills or transfer facilities by the year 2000.

The California Department of Toxic Substances Control issues permits for the transport of hazardous wastes.

### 4.13.2.3 Local

#### Fresno County

The Public Facilities and Services Element of the Fresno County General Plan (2000) contain a number of policies pertaining to public services and utilities that are relevant to the Project. These policies are intended to ensure that adequate public services and utilities are available to serve new development; encourage the use of water conservation practices; protect existing canals and natural channels; prioritize the American Avenue Landfill for municipal waste disposal; and maintain adequate law enforcement and fire protection services (representative policies include PF A.1, A.2, A.4, E.13, E.20, E.21. F.7, G.2, H.2, and H.8). Other policies in this section seek to provide safe access to schools, maintain acceptable levels of service, and ensure adequate funding for new school and library facilities. Related policies are included in Section PF-B, Funding. The Open Space and Conservation Element also includes a number of policies in Section H, Parks and Recreation, that seek to enhance recreational opportunities in the county by encouraging the further development of public and private recreation lands, and requiring development to help fund additional parks and recreation facilities. Related policies are included in Section LUC, River Influence Areas; Section OS-I, Recreational Trails; and Section OS-K, Scenic Resources.

*Fresno County Ordinance Code*

Fresno County has adopted the following ordinances that are applicable to solid waste disposal:

- **Chapter 8.25 Construction and Demolition Debris Disposal Ban.** This ordinance bans the disposal of construction and demolition debris at the American Avenue Disposal Site and the Coalinga Disposal Site. Exceptions to this ban include cases where the debris is pre-processed at a construction and demolition debris processing facility and where loads contain more than 50 percent of construction and demolition debris and there is no adequate local market infrastructure.

- **Chapter 8.28 Industrial Wastes.** This ordinance requires a permit for the disposal of all industrial waste. An inspection of the facility by a Health Officer is required to determine if the facility would create a hazard to public health is required before a permit will be issued.

#### Madera County

The Madera County General Plan (1995) also provides a number of policies pertaining to public services and utilities that are relevant to the Project. These policies are intended to ensure that adequate public services and utilities are available to serve new development; require the use of existing water systems where available; restrict high water demand uses in areas with severe water table depression; protect water quality from storm water runoff; encourage the use of water conservation practices; promote solid waste reduction and recycling; promote compliance with the County's Integrated Waste Management Plan; and maintain adequate law enforcement and fire protection services (representative policies include General Plan policies 3.A.1, 3.C.2

through 3.C.6, 3.D.2, 3.E.5, 3.F.2, 3.F.6, 3.H.2, 3.H.4, 3.5.2, and 3.J.3). Other policies are intended to require new development to make adequate provisions for schools and parks.

*Madera County Code*

Madera County has adopted the following ordinances that are applicable to solid waste disposal:

- **7.24.070 Depositing hazardous material.** This ordinance requires that hazardous materials not be deposited in any approved dumpsites or any other property without first obtaining the permission from the Health Officer.

- **7.24.140 Disposal site--Methods of disposal.** This ordinance requires that all waste be disposed of in designated landfills or in a method that is acceptable to the Health Department and County Engineer.

- **7.24.160 Agricultural or industrial waste.** This ordinance requires that any agricultural or industrial waste be kept or disposed of in a sanitary condition such that no health problems or nuisances are created.

- **7.24.200 Use of county dump site by nonresidents.** This ordinance prohibits the use of any County dumpsite for disposal of waste that was generated outside the county line.

- **7.24.220 County dump site--Permit required.** This ordinance requires a permit to deposit, leave, or distribute waste at or near the County dump site.

## 4.13.3 Impact Assessment

### 4.13.3.1 Significance Criteria

Appendix G of the CEQA Guidelines provides guidance for evaluating whether a development project may result in significant impacts. Appendix G suggests that a development project could have a significant impact on public services, utilities and service systems, and recreation if the project would:

- Result in substantial adverse physical impacts associated with the provision of or 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: fire protection, police protection, schools, parks, or other public facilities.

- Have insufficient water supplies available to serve the Project from existing entitlements and resources, or require new or expanded entitlements.

- Be served by a landfill with insufficient permitted capacity to accommodate the Project's solid waste disposal needs.

- Fail to comply with federal, state, and local statutes and regulations related to solid waste.

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facility would occur or be accelerated.

The following additional guidelines are included in Appendix G but are not relevant to the Project:

- Exceed wastewater treatment requirements of the Central Valley Regional Water Quality Control Board.

The only wastewater generated by the Project will be associated with the limited number of onsite personnel (approximately ten full-time and/or part-time employees). The sanitary disposal system at the central compressor station will include a tank that periodically will be serviced, and the sanitary waste will be disposed of at an appropriate offsite facility. No wastewater will be generated that would exceed wastewater treatment requirements; therefore, no impacts will occur.

- 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 new municipal water or wastewater treatment facilities will be required, nor will the Project result in the expansion of existing facilities. The Project will require a one-time use of locally available water during construction to test the integrity of the pipeline. This water will either be returned to the water purveyor, or treated onsite, if necessary, prior to disposal in compliance with applicable regulations. (Applicable regulations for handling of hydrotest water are addressed in Section 4.8 Hydrology and Water Quality). No increased demand at water treatment facilities will occur as a result of this one-time use. During operations, groundwater will be provided to the central compressor station through a new well in the Project area and treated onsite. The limited number of onsite personnel (approximately ten permanent full-time and/or part-time employees) employees will be served by an onsite sanitary disposal system that includes a tank; the tank will be periodically be cleaned and wastes will be disposed at an appropriate offsite facility. The small volume of wastewater will not require new or expanded treatment facilities. Salt water that is generated during gas withdrawal operations will be reinjected into a new onsite salt water disposal well to a safe depth well below fresh water aquifers and will not require treatment. No impacts will occur.

- 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 storm water drainage systems are present in the vicinity of the Project, other than natural and man-made channels. Based on the conceptual design plans for the Project, approximately 3 acres of impervious surfaces will be created. Major structures at the central compressor station include the operations, compressor, and generator buildings; air coolers; water tank; and paved surface roads. Impervious surfaces at the well pads and pipeline surface facilities will be limited to the wellhead areas and minor equipment components associated with the wells. The creation of 3 acres of impervious surfaces will not cause excessive amounts of runoff in this level, largely undeveloped agricultural area. Three acres represents 0.06% of the total area of the Storage Field, and any minor runoff would be absorbed by the surrounding farm roads or agricultural lands. In addition, the facilities would be constructed in compliance with all applicable requirements, including those administered by the Central Valley Regional Water Quality Control Board and those that are the responsibility of Fresno and Madera counties. The construction of new storm water drainage facilities will not be required. (Applicable regulations and preliminary design plans for handling of storm water runoff are addressed in Section 4.8 Hydrology and Water Quality). No impacts will occur.

- 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.

As discussed above, the only wastewater generated by the Project will be associated with the limited number of onsite personnel; that wastewater will be stored and disposed of offsite at an appropriate facility.

- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The Project does not include recreational facilities or require the construction or expansion of recreational facilities. No impacts will occur.

### 4.13.3.2 Impacts and Mitigation Measures

#### Result in substantial adverse physical impacts associated with the provision of or 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: fire protection, police protection, schools, parks, or other public facilities

**IMPACT PS-1: The Project will result in a minimal increased demand for fire and police services.** The Project will not result in increased demand for schools, parks, or other public facilities because it will not result in a long-term increase in population growth (refer to Section 4.12, Population and Housing). The Project could result in increased demand for fire and police services during construction and operations in the event of accidents requiring emergency response. This would be within the capabilities of the local and regional emergency response providers, and no new governmental facilities would be required to support the proposed development. Moreover, the Applicants would be required to pay development fees to Fresno and Madera counties that would be used, in part, to support public services, such as fire and police protection and offset any increased demands from that development. Any impacts associated with the need for new or physically altered governmental facilities will be less than significant, and no mitigation is required.

### Have insufficient water supplies available to serve the Project from existing entitlements and resources; require new or expanded entitlements

**IMPACT PS-2: The Project will use water from existing entitlements and/or local resources and will not require new or expanded entitlements.** The Project area is experiencing water shortages that affect the agricultural operations and other water uses regionally; any new groundwater extraction could exacerbate this water shortage. The Project will require a one-time use of locally available water during construction to test the integrity of the pipeline. As discussed in Section 4.8 Hydrology and Water Quality, hydrostatic testing will require up to an estimated 4.6 million gallons of water. It is likely that less than this amount would actually be needed because the pipeline would be tested in at least three segments, and the water from one segment would be reused, if feasible, in one or more of the other two segments. Potential hydrotest water sources include local purveyors, local groundwater, or municipal sources. If water were obtained from a local purveyor, it would be returned to the purveyor upon completion of the test. If groundwater were used, it would be treated and reinjected upon test completion. If water from municipal sources were trucked to the pipeline site, it would not be returned, but water from this source would only be used if adequate supplies were available. In all cases, impacts on water supplies during construction will be less than significant, and no mitigation is required.

During operations, adequate water supply will be available from the local groundwater sources, and no new or expanded entitlements or resources will be required. An estimated volume of 300 gallons per day (gpd) will be supplied from a new well to be installed within the Storage Field. This water will be used for minor industrial processes and as potable water for personnel and minor landscaping, if landscaping is installed. This water demand is low relative to other industrial, commercial and agricultural applications in the region, and conservation measures, such as low-flow toilets and drought-tolerant landscaping, if landscaping is installed, will be implemented. Any impacts on groundwater supplies will be less than significant, and no mitigation is required.

### Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has inadequate capacity to serve the Project’s projected demand in addition to the provider’s existing commitments.

**IMPACT PS-3: The Project will generate minimal amounts of wastewater during operations.** The Project will not be directly served by a municipal wastewater treatment provider. As noted above, the small number of employees at the central compressor station will generate minimal amounts of wastewater, which will be periodically trucked from the site and disposed of in an appropriate facility. The minimal amounts of wastewater that will be generated will not exceed the capacity of existing treatment facilities. Any impacts associated with wastewater treatment will be less than significant, and no mitigation is required.

### Fail to comply with federal, state, and local statutes and regulations related to solid waste

**IMPACT PS-4: The Project will generate solid waste requiring disposal in area landfills.** Most of the solid waste generated by Project construction will be excavated materials, such as soils, sand, rocks, and other earth debris, although lesser amounts of asphalt, concrete, and brick could also require disposal. Non-hazardous solid waste generated will be accommodated by several sites depending upon the material. Asphalt and concrete will be hauled to the nearest appropriate recycling facility. Dirt spoils will be reused for backfill or hauled to a disposal facility, or to locations requesting fill materials. Removed vegetation will be mulched on site and spread along the pipeline right-of-way, or otherwise disposed, as required by individual landowners in accordance with the Project-specific agricultural mitigation plan discussed in Section 4.9, Land Use, Planning, and Agriculture. All other non-hazardous solid waste, such as brick, fines, rock, sand, and stone, will be accommodated at the landfills and recycling facilities listed in Table 4.13-1.

As discussed in Section 4.7, Hazards and Hazardous Materials, there is limited potential for encountering hazardous wastes during construction. If hazardous wastes are encountered, these wastes can be disposed of at an appropriate facility, such as the Kettleman Hills Hazardous Waste Facility in nearby Kern County.

Small amounts of debris, trash and other non-hazardous solid wastes will be generated during routine operations, and during major maintenance activities. There is considerable remaining capacity in the four nearby landfills (over 43 million cubic yards), and materials will be recycled or reused to the extent feasible. Given the remaining landfill capacity and with the implementation of these measures, any impacts on area landfills will be less than significant, and no mitigation is required.

**IMPACT PS-5: The Project will comply with all applicable regulations regarding solid waste disposal.** In particular, both Fresno and Madera counties are legally obligated to maintain a 50-percent diversion rate under AB 939. As discussed under IMPACT PS-4, solid waste will be recycled or reused to the extent feasible in compliance with this requirement. Any impacts associated with compliance with statutes and regulations related to solid waste will be less than significant, and no mitigation is required.

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

**IMPACT PS-6: Minor, temporary increases in the use of local recreational facilities could occur during construction.** The Project will create temporary construction-related jobs over an estimated 12-month period. The workforce will vary from month to month. During the first seven months, the average daily workforce will peak at approximately 125 workers. During months 8 through 10, the average daily workforce will peak at approximately 350 workers. During months 11 through 12, the workforce is expected to decline to less than 100 workers. It is anticipated that approximately 40 percent of the temporary construction labor force will be drawn from the surrounding communities in both Madera and Fresno counties. The remainder will comprise workers with relevant technical expertise from outside the Project area (e.g., from the Bakersfield/Kern County area or the Bay Area). It is anticipated that these workers will reside in the local Project area only temporarily during the 12-month construction period (refer to Section 4.12, Population and Housing for additional details). The short-term increase in construction workers will not increase the use of parks or other recreational facilities to the point where deterioration would occur due to the relatively low numbers involved (a maximum of 210 construction workers from outside of the local area for no more than three months), the brief duration of their stay, and the fact that would likely reside in multiple communities, thereby minimizing potential impacts in any one area. The Project operations will not cause a permanent increase in the use of parks or other recreational facilities, resulting in their deterioration, because it will only require up to ten new employees, and will not otherwise result in a long-term increase in population growth (refer to Section 4.12, Population and Housing). Any impacts associated with the use of recreational facilities will be less than significant, and no mitigation is required.

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# 4.14 TRANSPORTATION AND TRAFFIC

This section addresses transportation and traffic issues related to the Project and consistency with associated transportation policies and regulations. The study area includes roadways along the proposed gas pipeline alignment, power line alignment and construction corridor, including access to the meter and tap facility and the central compressor station site. The likely haul routes that will be used to transport equipment during Project construction, and worker commuting routes, are also included in the study area. Local jurisdictions in the Project vicinity include the cities of Kerman, Mendota and Firebaugh, and the counties of Fresno and Madera.

## 4.14.1 Environmental Setting

### 4.14.1.1 Roadway Network

The Project is located in a rural area, surrounded by primarily agricultural development with some associated residential use and limited commercial and industrial use. Two state highways (SR 33 and SR 180), County Roads, and local farm roads provide access to the gas pipeline alignment, electric power line alignment, tap and meter facilities, well pad sites and compressor station site. SR 99 (commonly referred to as Highway 99) (to the east) and Interstate 5 (I-5) several miles to the west also provide access to the Project area from surrounding communities and larger cities. SR 145 (Madera Avenue) traverses north-south between the cities of Madera and Kerman, and connects SR 180 and Avenue 7, east of the proposed Storage Field.

West Panoche Road provides access to the western portion of the proposed gas pipeline alignment with direct connections to I-5 approximately 2 miles west of the alignment's western terminus at PG&E's Line 401. The pipeline alignment continues on the local, unpaved West Lincoln Avenue for over 7 miles until it reaches Derrick Avenue (SR 33). The pipeline alignment continues north for 6 miles until it changes direction to the northeast along West Panoche Road. At this junction, Panoche Road connects to the local circulation network of the adjoining cities of Mendota and Firebaugh to the north, Kerman to the east, and Fresno further east. Panoche Road transitions eastbound on West Whitesbridge Avenue (SR 180) towards SR 99 in Fresno. Approximately 5.5 miles after West Panoche Road transitions into SR 180, the pipeline alignment continues north on a farm road which becomes Road 16 north of the San Joaquin River. The pipeline terminates at the compressor station on Avenue 3, an unpaved farm road in the central area of the Storage Field and one-quarter mile east of Road 16. Injection/withdrawal wells and observation/monitoring well sites will be interspersed among similar farm roads east and west of Road 16.

The proposed electric power line corridor will begin at a point on Avenue 7½ located approximately 5 miles east of the town of Firebaugh; follow Avenue 7½ to Avenue 7; turn south along the Chowchilla Canal Road; and then span the canal and continue east along Avenue 3 between the canal and the central compressor site.

Primary access roads to the Project area include West Panoche Road, SR 33, SR 180, Avenue 7, and Interstate 5 (I-5) and 99. (See Figure 4.14-1).

Below is a description of each of these primary access roads, including average traffic volumes:

- West Panoche Road in Fresno County is a two-lane road between the Mendota Wildlife Area in the east and I-5 in the west. This road connects the local farm road and commuter traffic with the cities of Mendota and Firebaugh to the northeast, Kerman and Fresno to the east, and other communities to the south via SR 33. In the Project vicinity, average traffic volumes on West Panoche Road range from 23 to 440 vehicles per day (COG 2007).

- SR 33 in Fresno County (South Derrick Boulevard and Dos Palos Road) is a two-lane route that starts at SR 152 to the north and ends at Interstate 5 (I-5) to the south. In the Project vicinity, average traffic volumes on SR 33 range from 100 to 4,856 vehicles per day (COG 2007).

- SR 180 in Fresno County (West Whitesbridge Avenue) is a two-lane route that starts in the city of Mendota and continues east to the city of Fresno. In the Project vicinity, average traffic volumes on SR 180 range from 2,449 to 4,381 vehicles per day (COG 2007).

- Avenue 7 in Madera County is a two-lane route that starts as Avenue 7 ½ in the City of Firebaugh in the west and continues as Avenue 7 to SR 99 in the east. In the Project vicinity, average traffic volumes on Avenue 7 range from 1,405 to 1,928 vehicles per day (MCTC 2007).

- I-5 is a four-lane highway that carries inter-regional traffic through western Fresno County. In the Project vicinity, average traffic volumes on I-5 range from 33,000 to 36,500 vehicles per day. (Caltrans 2006)

- SR 99 is a four-lane primary inter-regional commute corridor in and through Madera and Fresno counties and has major regional significance in the area. Within the Project Area, average traffic volumes on SR 99 range from 40,000 to 130,000 vehicles per day. (Caltrans 2006)

Existing traffic count information for the key roadways in the vicinity of the Project is summarized in Table 4.14-1.

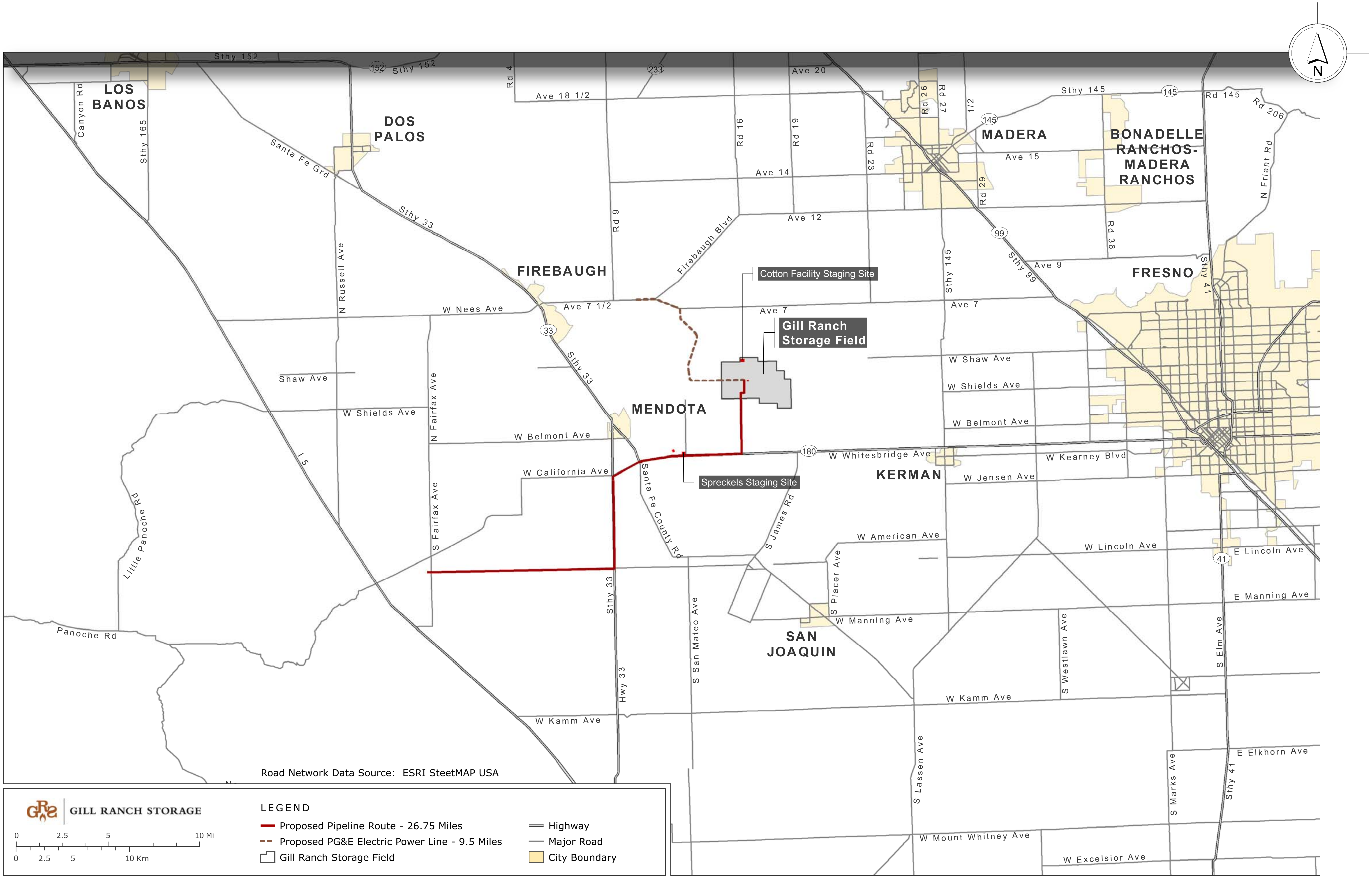


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FIGURE 4.14-1 | TRANSPORTATION ROUTING IN PROJECT AREA

**Table 4.14-1: Traffic Counts for Key Roadways in the Vicinity of the Project**

| Roadway | Location | Peak Hour1 | Average Daily Traffic2 |
|---|---|---|---|
| Interstate 5 | Junction Rte 33 North | 5,200 | 33,000 |
| SR 33 | W California Avenue | 250 | 2,400 |
| SR 33 | Firebaugh, 12th Street/Ness Avenue | 1,400 | 13,400 |
| SR 33 | SR 180 East | 620 | 6,000 |
| SR 180 | SR 33 North | 700 | 8,400 |
| SR 180 | Belmont Avenue | 570 | 6,500 |
| SR 180 | West Panoche Road | 590 | 7,500 |
| SR 180 | James Road | 590 | 6,300 |
| SR 99 | Junction Rte. 180S | 6,600 | 55,000 |
| SR 99 | Shaw Avenue | 5,700 | 63,000 |
| SR 99 | Avenue 7 | 5,900 | 65,000 |
| Avenue 7 ½ | Road 9 | 6003 | 6,000 |
| Avenue 7 | Firebaugh Blvd. | 3003 | 3,000 |
| Avenue 7 | SR 99 | 3803 | 3,800 |

Notes:
SR = State Route
[1] Peak hour values indicate the volume in both directions
[2] Indicates traffic in both directions for a 24-hour period
[3] Actual counts not available; peak hour estimated at 10% of ADT based on other locations in Project area
Sources: Caltrans 2006, COG 2007

### Air and Rail Transportation Network

The closest airport to the Project area is Mendota Airport, approximately 1.5 miles north of the intersection of SR 180 and SR 33. The Union Pacific railroad (UPRR) track runs between the cities of Firebaugh, Mendota, San Joaquin, Kerman, and Fresno.

## 4.14.1.2 Public Transportation

Bus lines within the Project area include Amtrak, Westside Transit, and San Joaquin Transit. Amtrak and Westside Transit have routes on SR 180 between the cities of Fresno and Firebaugh. San Joaquin Transit has a network of routes that connect nearby cities, including Kerman, Mendota, San Joaquin and Tranquillity, using SR 180, SR 33, SR 145 and local roads. However, there are no bus stops or stations within the Project area (FCRTA 2008). Also, there are no Madera County public transportation services within the Project area.

### Bicycle and Pedestrian Network

Within Fresno County, there are existing or planned bikeways along SR 180 and SR 33. In addition, there are Conceptual Recreation Trails planned along the California Aqueduct and SR 33 between Firebaugh and Mendota (Fresno County 2000). Within Madera County, Avenue 7 is designated as a Class III bike route, where bicycles share the road with vehicles (Madera County 2004).

## 4.14.2 Regulatory Setting

### 4.14.2.1 Federal

There are no federal laws or regulations that address potential transportation impacts that are relevant to associated with the Project.

### 4.14.2.2 State

The California Department of Transportation (Caltrans) has authority over the state highway system, including mainline facilities, interchanges, and arterial state routes. Caltrans approves the planning and design of improvements for all state-controlled facilities. Both Caltrans and local jurisdictions generally assess the impact of long-term, not short-term, traffic conditions. Plans and policies related to transportation seek to plan for and accommodate future growth and the vehicular, transit, pedestrian, and bicycle demand associated with that growth.

### 4.14.2.3 Local

#### Fresno County

The Fresno County General Plan Transportation and Circulation Element (2000) includes the following applicable policy related to the Project:

**Policy TR-A.2:** The County shall plan and design its roadway system in a manner that strives to meet a minimum Level of Service (LOS) D on urban roadways within the spheres of influence of the cities of Fresno and Clovis and LOS C on all other roadways in the county.

LOS is a qualitative measure of roadway operating conditions, ranging from LOS A, which represents the best range of operating conditions, to LOS F, which represents the worst. Basic definitions are presented in Table 4.14-2. LOS can be estimated based on volume-to-capacity (V/C) ratio (the ratio of the number of vehicles actually traveling on a roadway to the number of vehicles it was designed to convey), or based on the average delay experienced by vehicles on the facility.

**Table 4.14-2: Volume to Capacity Ratio and Traffic Flow Conditions for Level of Service Designations**

| LOS | Description |
|---|---|
| A | Free Flow: Almost no platoons of three or more cars. Driver delayed no more than 30% by slow-moving vehicles. |
| B | Free Flow: Some platoons form. Driver delayed no more than 45% by slow-moving vehicles. |
| C | Stable Flow: Noticeable increase in platoon formation and size. Drivers delayed no more than 60% by slow moving vehicles. |
| D | Approaching Unstable Flow: Heavy platooning. Passing becomes more difficult. Drivers delayed no more than 75% by slow-moving vehicles. |
| E | Unstable Flow: Intense platooning. Passing is virtually impossible. Drivers delayed more than 75% by slow-moving vehicles. |
| F | Forced Flow: Queues form behind breakdown points. |

*Note:* Traffic platooning is the grouping or clumping of moving vehicles along public roadways.
*Source:* U.S. Transportation and Research Board 2000.

## Madera County

The Madera County General Plan Transportation and Circulation Element (1995) includes the following applicable policies related to the Project:

**Policy 2.A.8**: The County shall develop and manage its roadway system to maintain a minimum Level of Service of D on all state and county roadways. For planning applications, Level of Service shall be measured for roadway segments and shall be based on the capacities shown in Table 4.14-3. The County may also require analysis of specific intersections when intersections are deemed critical for specific projects or locations.

**Table 4.14-3: Capacities (number of trips) Per Hour Per Lane for Various Highway Facilities**

| LOS | Freeways | Two-Lane Rural Highway | Multi-lane Rural Highway | Express - way | Arterial | Collector |
|---|---|---|---|---|---|---|
| A | 700 | 120 | 470 | 720 | 450 | 300 |
| B | 1,100 | 240 | 945 | 840 | 525 | 350 |
| C | 1,550 | 395 | 1,285 | 960 | 600 | 400 |
| D | 1,850 | 675 | 1,585 | 1,080 | 675 | 450 |
| E | 2,000 | 1,145 | 1,800 | 1,200 | 750 | 500 |

Note:
LOS = level of service

**Policy 2.A.9:** To identify the potential impacts of new development on traffic service levels, the County shall require the preparation of traffic impact analyses for developments determined to be large enough to have potentially significant traffic impacts.

**Policy 2.A.13**: Through-traffic shall be accommodated in a manner that discourages the use of neighborhood roadways, particularly local streets. This through-traffic, including through truck traffic, shall be directed to appropriate routes in order to maintain public safety and local quality of life.

## 4.14.3 Impact Assessment

### 4.14.3.1 Significance Criteria

Appendix G of the CEQA Guidelines provides guidance for evaluating whether a development project may result in significant effects. Appendix G suggests that a development project could have a significant effect on transportation and traffic if the project would cause any of the following effects:

- An increase in traffic that is substantial in relation to the current 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);
- Exceed, either individually or cumulatively, an LOS standard established by the county congestion management agency for designated roads or highways;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

The following additional guidelines are included in Appendix G but are not relevant to the proposed Project:

- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks, etc.).

The Project will not conflict with adopted policies, plans, or programs supporting alternative transportation because no bus lines, bike lanes, or other forms of alternative transportation are present in the Project area. Moreover, the Project operations will not increase transit demand due to the low number of new permanent employment positions that will be generated, and the remote, sparsely populated location of Project facilities which would not justify expansion of alternative transit systems. Short-term construction workers and long-term employees will drive to the site because alternative transportation is not available.

- 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.

The Project will not result in changes in air traffic patterns. The nearest municipal airport is located in Mendota, approximately 10 miles west of the proposed Storage Field surface facilities. The tallest proposed structures are related to the electric power line and include two approximately 120-foot tall, engineered tubular steel poles and 70-foot tall wood poles in an existing power line corridor. There will be two approximately 60-foot wood poles at the central compressor station electrical substation and buildings within the compressor station site. These permanent structures will not require a change in air traffic patterns, result in substantial safety risks, or constitute an obstruction to air traffic. Short-term use of a drilling rig may require notification to the Federal Aviation Administration (FAA) due to the height of the drill rig (approximately 150 feet).

- Result in inadequate parking capacity.

Project construction will occur in a rural agricultural area. Construction vehicles and equipment, including worker vehicles, will be parked within the construction zone or at the designated off-road staging areas. No existing on-street or off-street parking facilities will be affected. Therefore, the Project will have no impact on parking capacity.

### 4.14.3.2 Project-Related Traffic

#### Overview of Construction Traffic

Project construction is scheduled to last 12 months. Construction-related traffic will consist of commuting construction workers and transfer and staging of equipment, piping and other construction related materials. Equipment staging and delivery trips will be spread over the course of the work day, and workforce commuter trips will occur at the start and end of construction each day.

Construction staging areas have been identified and these sites will be used for worker parking as well as staging of equipment. Figure 3.7-2 in Section 3.7 Construction shows the location of these proposed equipment and material staging areas, and the traffic haul routes to and from these areas. The greatest concentration of construction traffic will be to and from these staging areas. In general, construction workers will park their personal vehicles at the designated staging areas and be bused to and from their designated work site each day, except in cases where a worker's vehicle is needed on the work site.

Compressor station and pipeline construction in the Storage Field area will be staged at the staging areas near the compressor station site, north of the San Joaquin River in Madera County. Access to these staging areas from the east is via the SR 99 / Avenue 7 interchange in Madera County, and Road 16. Access to this area from the east is via SR 33 in Fresno County to Avenue 7 ½ at Firebaugh, to Avenue 7, and then to Road 16.

Pipeline construction in Fresno County will be staged at one of the two potential sites that have been identified at the Spreckels Sugar Plant property, located on San Mateo Avenue near SR 180. The first site is located at the corner of SR 180 and San Mateo Avenue. The second site is located behind the Spreckels facility, and adjacent to a rail spur. Access to both sites is via SR 180 and San Mateo Avenue.

### Workforce Commuter Trips

The number of construction workers and associated worker vehicle trips will vary over the 12-month construction period, and workers will access different areas of the work site at different periods of the work sequence, and at different times of day depending on the construction in progress at any one time. In order to understand the potential impacts to Project area roadways, the worst-case number of daily worker vehicles was estimated based on a review of the preliminary Project construction work sequence and schedule (provided in Appendix A), and the estimated number of workers during each month of construction, as shown in Figure 3.7-1 in Section 3.7 Construction.

The San Joaquin River lacks road crossings that would be suitable for commuting workers, and thus forms a barrier to general worker vehicle traffic between the Project areas north and south of the river. Consequently, worker vehicle trips and equipment deliveries would be distributed to one of two general locations over different roadways: either to the Storage Field work area in Madera County (north of the river), or to the pipeline staging areas in Fresno County (south of the river). As noted above, different roadway networks will be used to access these areas, depending on where the work will take place.

Based on the preliminary work sequence and schedule, the peak workforce in the Storage Field area will be during Month 8, with an estimated 270 workers during the month. Of this total, an estimated 75 percent of all workers during this month, or approximately 200 workers, will commute to the Storage Field in Madera County via the roadways described and shown in Figure 3.7-1. Assuming one vehicle per worker, the peak number of worker vehicles commuting to the Storage Field staging areas would be 200 vehicles during Month 8.

Using a similar approach for the Fresno County staging area, the preliminary work sequence and schedule indicates that a peak workforce of 360 workers will be at the various Project worksites during Month 9. Of this total, an estimated 75 percent of all workers, or 270 workers, will commute to the Spreckels staging areas in Fresno County via the roadways described and shown in Figure 3.7-2. Assuming one vehicle per worker, the peak number of worker vehicles commuting to the Spreckels staging area would be 270 vehicles during Month 9.

The distribution and timing of these trips over Project area roadways is difficult to predict because workers will travel from different directions and use different roads depending on their point of origin. For example, workers traveling to the Storage Field staging sites and other work areas in Madera County from the west, northwest or southwest (e.g., from Mendota and Firebaugh or other communities in Western Fresno County) would likely use a combination of SR 33 and Avenue 7½ through Firebaugh to Avenue 7 and Road 16. Workers approaching from the east, northeast, or southeast (e.g., from Kerman or the Fresno/Madera area) would likely use a different combination of roads including SR 99, SR 180, SR 145 (Madera Avenue) and Avenue 7.

Similarly, workers accessing the Spreckels staging site or other pipeline work sites in Fresno County from the west, northwest or southwest would likely use a combination of SR 33, West Panoche Road, and SR 180 to San Mateo Avenue. Workers approaching Spreckels from the east, northeast, or southeast would likely use a different combination of roads including SR 99, SR 145, and SR 180 to San Mateo Avenue.

Consequently, some road segments would experience more traffic than others. In general, it is anticipated that more workers would commute from the east, southeast, and northeast, as compared to worker trips originating in the west, southwest, and northwest, due to the relatively higher population centers to the east. The following assumptions were used in order to very conservatively estimate the Project's potential contribution to peak hour traffic conditions on Project area roadways:

- The peak month estimate of 360 workers will travel to the work locations, and all workers are assumed to drive their own vehicle to the staging area.
- Half of all workers are assumed to commute during peak hours (180 peak trips).
- Based on the general location of population centers, worker trips are distributed such that up to 50 percent of commuter vehicles would travel over road segments that approach the work sites from the southwest, west, and northwest (i.e., 90 trips on each of these road segments); and up to 75 percent of commuter vehicles would travel over road segments that approach the work sites from the east, northeast and southeast (i.e., 135 trips on each of these road segments).

These assumptions are conservative because workers would normally arrive and depart before or after AM and PM peak hours (which is customary for construction projects of this nature); many workers would likely carpool to the work place, particularly if they are commuting from distant communities, or if they are residing in the same temporary worker housing location; and it is reasonable to expect that most of the Project area road segments would experience significantly less than the estimated peak hour trips on any given day. The peak construction period is anticipated to last 2 to 3 months. During the balance of the construction period, construction traffic will be significantly lower than the estimates used in this analysis.

The results of this analysis are shown in Table 4.14-4. Project-related traffic was added to existing peak hour traffic conditions on the Project area roadway segments, and the resulting traffic counts were compared to either the Fresno County or Madera County thresholds of acceptability, as appropriate. Madera County uses LOS D as a threshold of acceptability for roadway and intersection operations (Madera County 2000), and Caltrans and Fresno County use LOS C as the threshold of acceptability for roadway and intersection operations (Fresno County 2000). I-5 is under the jurisdiction of Caltrans, and SR 33, SR 180, and portions of SR 99 are located in Fresno County; therefore, LOS C is the appropriate threshold. SR 99 at Avenue 7 and Avenue 7½ and 7 are in Madera County; therefore, LOS D is the appropriate threshold for these roadways.

As shown in Table 4.14-1, existing traffic on certain roadway segments already exceeds LOS C or D during peak hours. These roadway segments include:

- SR 33 at Firebaugh Blvd and West Nees Avenue
- SR 99 southbound at the junction with SR 180
- SR 99 at Shaw Avenue

The addition of peak hour Project construction vehicle trips would contribute additional trips to these roadway segments that already exceed LOS C or D.

Based on the above assumptions regarding Project construction vehicle distribution, no additional roadway segments that presently operate within the acceptable LOS levels would exceed those levels during the peak construction period as a result of Project traffic.

As discussed further below, the Applicants propose to implement a Traffic Control Plan that would require workers and other Project-related traffic to avoid peak hour trips at the intersections that already exceeds the applicable LOS, as well as at other intersection that may be used in connection with Project construction trips, to the extent feasible.

### Other Construction Trips

In addition to workforce commuter traffic, equipment staging and delivery traffic will be generated from truck trips to and from the work sites to deliver construction-related equipment and supplies. These include delivery of pipe from the Spreckels staging area to the work site; transport of drilling mud to and from the well drilling sites in the Storage Field; delivery of oversized loads to the central compressor station; and delivery of miscellaneous construction equipment, materials and wastes to and from the various work sites. The type and quantity of equipment required for each major component of construction are shown in Tables 3.7-2 through 3.7-7, in Section 3.7 Construction.

Pipe needed for pipeline construction will arrive by rail to one of two locations: the Mendota Railyard in Mendota, or the Spreckels Sugar Plant staging area via a rail spur adjacent to the plant. Pipe will be shipped in approximately 40-foot sections. Assuming 26.8 miles of pipeline, an estimated 141,504 lengths of pipe are needed for pipeline construction. A single truck can carry four (4) 40-foot pipe sections; therefore an estimated 884 truck trips will be needed to transport pipe from the rail off-loading point to the staging areas. Haul routes between the Mendota Railyard and the staging areas (both north and south of the San Joaquin River) are shown in Figure 3.7-2 in Section 3.7 Construction. The haul route between Mendota Railyard and the Storage Field staging areas will follow a designated truck route in Mendota north to SR 33, to Avenue 7½ at Firebaugh, east to Avenue 7, and then south on Road 16. The haul route between Mendota Railyard and the Spreckels staging areas will follow a designated truck route in Mendota south to SR 33, then continue east on SR 180 to San Mateo Avenue. Other haul routes are also shown on Figure 3.7-2. These include the same roadways noted above, but from origins other than the Mendota Railyard.

**Table 4.14-4: Project Impact on Key Roadways—During Peak Construction Months (Months 8 and 9)**

| Roadway | Location | Existing Peak Hour Traffic (all lanes)1 | Project Traffic | Total Peak Hour Traffic (all lanes) | No. of Lanes | Capacity per Lane (LOS C)2 | Capacity all Lanes (LOS C) | Capacity per Lane (LOS D)2 | Capacity all Lanes (LOS D) | Exceed Applicable LOS without Project? | Exceed Applicable LOS with Project? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I-5 | Junction Rte 33 North | 5,200 | 90 | 5,290 | 4 | 1,550 | 6,200 | – | – | No | No |
| SR 33 | W California Avenue | 250 | 90 | 340 | 2 | 395 | 790 | – | – | No | No |
| SR 33 | Firebaugh, 12th Street/Ness Avenue | 1,400 | 90 | 1,490 | 2 | 395 | 790 | – | – | Yes | Yes |
| SR 33 | SR 180 East | 620 | 90 | 710 | 2 | 395 | 790 | – | – | No | No |
| SR 180 | SR 33 North | 700 | 90 | 790 | 2 | 395 | 790 | – | – | No | No |
| SR 180 | Belmont Avenue | 570 | 90 | 660 | 2 | 395 | 790 | – | – | No | No |
| SR 180 | West Panoche Road | 590 | 90 | 680 | 2 | 395 | 790 | – | – | No | No |
| SR 180 | James Road | 590 | 135 | 725 | 2 | 395 | 790 | – | – | No | No |
| SR 99 | Junction Rte. 180S | 6,600 | 135 | 6,735 | 4 | 1,285 | 5,140 | – | – | Yes | Yes |
| SR 99 | Shaw Avenue | 5,700 | 90 | 5,790 | 4 | 1,285 | 5,140 | – | – | Yes | Yes |
| SR 99 | Avenue 7 | 5,900 | 135 | 6,035 | 4 | – | – | 1,585 | 6,340 | No | No |
| Avenue 7½ | Road 9 | 600 | 90 | 690 | 2 | – | – | 675 | 1,350 | No | No |
| Avenue 7 | Firebaugh Blvd. | 300 | 135 | 435 | 2 | – | – | 675 | 1,350 | No | No |
| Avenue 7 | SR 99 | 380 | 135 | 515 | 2 | – | – | 675 | 1,350 | No | No |

Notes:

SR = State Route

[1] Peak hour values indicate the volume in both directions

[2] Based on values established by Madera County (Table 4.14-3)

Sources: Caltrans 2006, COG 2007

After the pipeline is staged, it will again be transported to the various pipeline alignment locations as construction progresses. Based on the preliminary work sequence, the pipe segments will be transported from the staging areas to the alignment during an initial 40-day period of pipeline construction. Based on the estimated total number of truck trips required to deliver the pipe to the alignment, an estimated 22 truck trips per day will be needed to transport the pipe segments to various locations along the pipeline alignment during this period. These truck trips are anticipated to occur in Months 9 and 10, and trucks will use the haul routes shown on Figure 3.7-2 (SR 180, SR 33, Avenue 7½-7, and Road 16). The estimated vehicle trips noted above for worker vehicles are sufficiently conservative to account for these truck trips and equipment deliveries.

Various construction materials, equipment components, and oversized loads will be delivered to both the compressor station area and to the pipeline corridor throughout the construction period, with peak activities in Months 8 and 9. The estimated vehicle trips noted above for worker vehicles are sufficiently conservative to account for these truck trips and equipment deliveries.

Electric power line installation and related construction vehicle traffic is anticipated to occur between Months 6 and 10, and will be concurrent with peak periods of construction at the central compressor station and pipeline. An estimated 20 workers would access the power line work sites using the roadway networks described above for the Storage Field, except that workers would primarily use Chowchilla Canal Road instead of Road 16 to access this segment of the power line alignment. Access to power line construction along Avenue 3 in the vicinity of the central compressor station would likely be via Road 16. The number of worker vehicle and equipment deliveries related to power line construction would be substantially less than what is anticipated for the compressor station (i.e., an estimated 20 worker vehicles; various utility trucks and a limited requirement for heavy equipment such as a backhoe, cement trucks, and a dump truck [Table 3.7-6 in Section 3.7 Construction]). Power line construction would likely overlap with the peak month of compressor station activity (Month 8). The estimated vehicle trips noted above for worker vehicles are sufficiently conservative to account for these equipment deliveries.

### Project Operations Traffic

Project operations traffic will not cause exceedances of Level of Service on roadways in the Project area. The Project will create an estimated 10 permanent employment positions, resulting in an estimated 20 worker vehicle trips per day. Routine deliveries to and from the central compressor station during normal operations would generate additional daily trips; these trips will vary from day to day, and would likely not exceed an additional 20 trips per day, except during infrequent periods of major maintenance and repair.

Worker vehicles and routine deliveries to and from the central compressor station will access the site via Avenue 7 and Road 16, consistent with the construction routing described above.

Routine inspections and periodic maintenance at the well sites and power line corridor will generate additional infrequent trips to these Project areas.

Routine pipeline inspections will typically involve a single utility vehicle driving on or near the permanent right of way, and generally on farm roads off of the main roads except where turning movements are needed to access the right-of-way from local roadways.

### 4.14.3.3 Impacts and Mitigation Measures

#### Cause an increase in traffic that is substantial in relation to the current 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)

**IMPACT TRANS-1. The Project will add traffic to local roadways, primarily during construction**. As discussed above, the Project will generate traffic primarily during construction. The amount of traffic generated during normal operations and maintenance will be negligible, and any impacts on local roadways during operations will be less than significant.

As shown in Table 4.14-4, during the peak months of construction (Months 8 and 9) the daily construction worker trips will likely be distributed over a number of road segments and intersections. Additional trips will be generated by trucks and small vehicles during routine construction activities throughout the day. An estimated 22 truck trips per day will be required during the peak construction period to haul pipe from the staging area to the pipeline corridor. An estimated 20 worker trips, and limited equipment trips, will be required for electric power line construction. The estimated vehicle trips for worker vehicles are sufficiently conservative to account for these truck trips and equipment deliveries and electric power line construction.

Based on the existing traffic conditions and the established significance criteria, the anticipated construction traffic volumes will not result in a substantial increase in traffic in relation to the current traffic load and capacity of the street system. For example, at intersections where the existing traffic volumes are low (e.g., SR 33 at W. California Avenue), traffic volumes will continue to be well under the roadway capacity with the addition of peak month construction traffic. At intersections where traffic volumes are already high, (e.g., SR 33 at Firebaugh, 12th Street/Ness Avenue), the Project's traffic contribution could result in a short-term (2 to 3 month) increase in traffic volumes. The Applicants propose to implement a Project-specific Traffic Control Plan, described below. Implementation of the Traffic Control Plan will minimize impacts on these locations during the peak months of construction by restricting the use of these road segments by construction vehicles to non-peak hours to the extent feasible. Impacts will be less than significant, and no mitigation is required for Project construction traffic.

A Traffic Control Plan will be developed prior to Project construction. To the extent applicable, the Traffic Control Plan will conform to the State's Manual of Traffic Controls for Construction and Maintenance Work Areas (Caltrans 2003). As applicable, elements of the Traffic-Control Plan will include, but not necessarily be limited to, the following:

- Circulation and detour plans will be developed to minimize impacts on street circulation. Flaggers and/or signage will be used to guide vehicles through or around the construction zone.

- Sufficient staging areas for trucks accessing construction zones will be provided to minimize disruption of access to adjacent land uses, particularly at entries to on-site pipeline construction near residences.

- All access restrictions expected to occur during construction will be identified. A plan for notifying the affected businesses, homes, emergency services, and other facilities and for ensuring adequate access at all times will be developed and implemented.

- Construction vehicle movements will be controlled and monitored through the enforcement of standard construction specifications by on-site inspectors.

- Along roads with V/C ratios corresponding with LOS C or poorer during peak traffic hours, worker vehicles and truck trips will be scheduled outside the peak morning and evening commute hours to the extent feasible.

- Lane closures during peak hours will be limited or avoided to the extent feasible. Outside allowed working hours or when work is not in progress, roads will be restored to normal operations, and any open trenches on roadways or access ways will be covered with steel plates.

- Where possible, pipeline construction work in roadways will be limited to a width that, at a minimum, maintains alternating one-way traffic flow past the construction zone. If the work zone width will not allow a 10-foot-wide paved travel lane, then the road will be closed to through-traffic (except emergency vehicles), and detour signing on alternative access roads will be used.

- All equipment and materials will be stored in designated contractor staging areas on or adjacent to the worksite in a manner that minimizes traffic obstructions.

- Parking areas for construction workers will be identified, either within the construction zone or, if necessary, at a nearby location, with transportation provided between the parking area and the worksite.

- Roadside safety protocols will be implemented in consultation with local jurisdictions. Advance "Road Work Ahead" warning signs and speed control (including signs informing drivers of State-legislated doubled fines for speed infractions in a construction zone) will be provided to achieve required speed reductions for safe traffic flow through the work zone.

- Roadway rights-of-way will be repaired or restored to their original conditions or better upon completion of construction.
- Project-related information signs at each construction spread will contain a contact number for the public to call to report traffic problems at construction sites to applicable local jurisdictions and to a Project phone number that is staffed 24 hours a day, seven days a week.

With the anticipated distribution of construction traffic over a number of roadways and implementation of the Traffic Control Plan, Project-related traffic would not cause an increase in traffic that is substantial in relation to the current traffic load and capacity of the street system (i.e., there will not be a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections). Therefore, Project-related traffic impacts will be less than significant, and no mitigation is required.

### Exceed, either individually or cumulatively, an LOS standard established by the county congestion management agency for designated roads or highways.

**IMPACT TRANS-2. The Project will add traffic to local roadways, primarily during construction, but will not cause an LOS standard to be exceeded.** As indicated in Table 4.14-4, certain road segments already exceed the applicable LOS during peak hours. Because construction-related Project trips will be distributed over a number of local roadways, and with implementation of the Traffic Control Plan, the Project will not cause LOS standards to be exceeded at other road segments in the Project area. Implementation of the Traffic Control Plan described under Impact TRANS-1 will minimize Project traffic impacts during the peak months of construction by restricting the construction vehicle trips to non-peak hours to the extent feasible. Impacts will be less than significant, and no mitigation is required for Project construction traffic.

The addition of an estimated 40 trips per day during normal operations (worker trips and deliveries) will not cause any LOS standards to be exceeded; impacts will be less than significant, and no mitigation is required for Project operations.

### Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.

**IMPACT TRANS-3. Project construction may require temporary lane closures or other hazardous traffic conditions.** The Project does not include any design features that will affect traffic circulation or cause substantial new traffic hazards. The pipeline will be buried; the compressor facilities, wells, and ancillary structures will be sited in remote areas removed from public roads; and the proposed electric power line will be constructed mostly along an existing electric distribution line corridor.

However, since construction activities could temporarily interfere with the normal function of roadways, the potential exists for increased traffic safety hazards during Project construction from:

- Conflicts between construction vehicles (with slower speeds and wider turning radii than autos) and vehicles, bicyclists, or pedestrians using the roadways;
- Conflicts between the movement of traffic and construction activities, particularly where traffic is routed into the travel lane adjacent to the work zone;
- Confusion of drivers during one-lane, two-way traffic operation; and
- Distraction of drivers related to construction activities.

Figure 3.7-2 in Section 3.7 Construction shows several key intersections at major roads along the project haul routes, as well as turn-off locations from these roads onto agricultural roads or minor County roads (e.g., SR 33 at Lincoln Avenue, and SR 180 at San Mateo Avenue).

Construction of Project facilities within the Storage Field will be well-removed from public roads and will not cause a traffic hazard.

Designated truck routes will be used to haul pipe, electrical power equipment, and other Project materials. As needed, flaggers and other traffic control measures will be used to facilitate the safe turning movements of trucks from Avenue 7 onto Road 16, and from other Project area roadways onto the pipeline and power line work areas.

Pipeline construction involves the use of three different construction methods: trenching, conventional boring, and Horizontal Directional Drilling. Conventional boring will be used to cross roads, including SR 33, West Panoche Road, SR 180 (Whitesbridge Avenue), San Mateo Avenue, and the Union Pacific Railroad tracks. Based on the proposed alignment and construction methods under and near roadways, it is not anticipated that temporary lane closures will be required during pipeline installation. In the unlikely event that a lane closure is required, then at least one lane will remain open at all times, and other measures outlined above in the Traffic Control Plan will be implemented, such as the use of flaggers to safely direct traffic around the closure, and notifications of detours if needed. Given the Project design, and with the implementation of the proposed Traffic Control Plan, potential impacts related to traffic safety hazards will be less than significant, and no mitigation is required.

Result in inadequate emergency access.

**IMPACT TRANS-4. Pipeline construction may require temporary lane closures and restrict access to adjacent properties.** The Storage Field is located in a remote area, and neither construction nor operations will affect emergency access. The electric power line will be located along existing roadways and will not affect emergency access. The gas pipeline will be buried, and will have no long-term impacts on emergency access. As discussed in Impact TRANS-3, temporary lane closures are not anticipated, but could be required during construction. In this event, at least one lane will remain open at all times and other provisions of the proposed Traffic Control Plan will be implemented as appropriate.

Although most of the area along the pipeline corridor is used for agriculture or is in open space, a limited number of residences and commercial/industrial developments are located along the Project roadways, and pipeline construction could temporarily restrict access to adjacent properties. The Traffic Control Plan will include provisions to notify adjacent property owners and emergency service providers in advance of the construction where access to nearby property will be blocked. The Traffic Control Plan will include measures to ensure that access to emergency vehicles will be available at all times, such as plating over excavations, short detours, and alternate routes. The construction contractor will provide copies of the Traffic Control Plan, including details regarding emergency services coordination and procedures, to all relevant service providers. Given the implementation of these measures, impacts will be less than significant, and no mitigation is required.

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## 4.15 CUMULATIVE IMPACTS

This section discusses potential cumulative impacts related to the Project. CEQA requires a discussion of the cumulative effect of the project when added to other closely related past, present, and probable future projects. The Project will not result in any cumulative environmental impacts because there are no reported projects that are closely related to the Gill Ranch Storage Project.

According to the CEQA Guideline sections 15130 and 15355, a project could have a significant cumulative impact if a change in the environment resulted from the incremental impact of the Project when added to other closely related past, present and probable future projects. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time.

To determine the potential for cumulative impacts, the Applicants contacted the appropriate personnel in Fresno County, Madera County, and the cities/towns of Kerman, Firebaugh, and Mendota. To date, those entities have provided information regarding projects within their jurisdictions. To date, no entity has reported the existence of a project that is closely related to the Gill Ranch Storage Project. A list of the relevant projects identified in response to the Applicants' inquiries is attached hereto as Appendix B.7. The Applicants will continue to seek input from the governmental agencies with jurisdiction over the areas surrounding the Project. The Applicants will advise the Commission in the event any closely related projects are determined to exist.

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