2: PROJECT DESCRIPTION

2.1 Introduction

Gill Ranch Storage, LLC (GRS), an Oregon limited liability company formed in 2007, and Pacific Gas and Electric Company (PG&E), a regulated California utility, submitted applications to the California Public Utilities Commission (CPUC) for the purpose of developing the Gill Ranch Gas Storage Project (Project). The applications and accompanying Proponent's Environmental Assessment identified GRS and PG&E's (Applicants') proposed Project.

The Project includes construction, operation, and maintenance of:

- Gill Ranch Gas Storage Field (Storage Field) for storage of natural gas
- Injection and withdrawal (IW) wells at existing and new well pad sites
- Observation and monitoring (OM) wells at existing and new well pad sites
- Central compressor station and associated facilities
- Electric substation
- Natural gas pipeline from the Storage Field to PG&E's existing gas Line 401
- 115-kilovolt (kV) transmission line

Figure 2.1-1 shows the location of Project Elements.

2.2 Project Purpose and Need

The Project has the following objectives:

- Provide flexible, economic natural gas storage services to a variety of customers, which could include gas utilities, electric utilities, independent electric generators, gas marketers, gas producers, industrial gas users, and other wholesale and retail gas customers
- Provide storage services using reservoirs with geologic characteristics suitable for conversion to multiple turn[1] and high-deliverability storage

[1] Storage system that allows the rapid transfer of gas into and out of storage.

- Diversify the location of storage facilities in California by providing centrally-located storage capacity in the southern San Joaquin Valley
- Provide storage services in a geographic area with low intensity present land use and with land use projected to be less intensive over the long term
- Provide storage services at a location with reasonable access to PG&E's gas and electric facilities and make use of existing transportation and utility corridors
- Create additional natural gas storage capacity in California in order to enhance natural gas supply reliability

2.3 Project Description

2.3.1 LOCATION AND LAND USE

The Storage Field would be within the Gill Ranch Gas Field (Gas Field), and would be located near the geographic center of California, approximately 10 miles east of Mendota and approximately 20 miles west of Fresno. The Storage Field would be located in Madera County, while a small portion of the Storage Field south of the San Joaquin River would be located in Fresno County. The major land use in the Project Area is agriculture, including tomato and cotton crops, pistachio orchards, and grapes.

2.3.2 UNDERGROUND NATURAL GAS FIELD

The Gas Field was discovered in 1942. Production from the Starkey Formation, which would be utilized for the proposed storage Project, began in 1957 and ceased in 1996. The Starkey Formation has produced over 24 billion cubic feet (Bcf) of natural gas to date. Forty-four wells have been drilled in the Gas Field area since 1943, and there are currently four active wells producing natural gas from other formations.

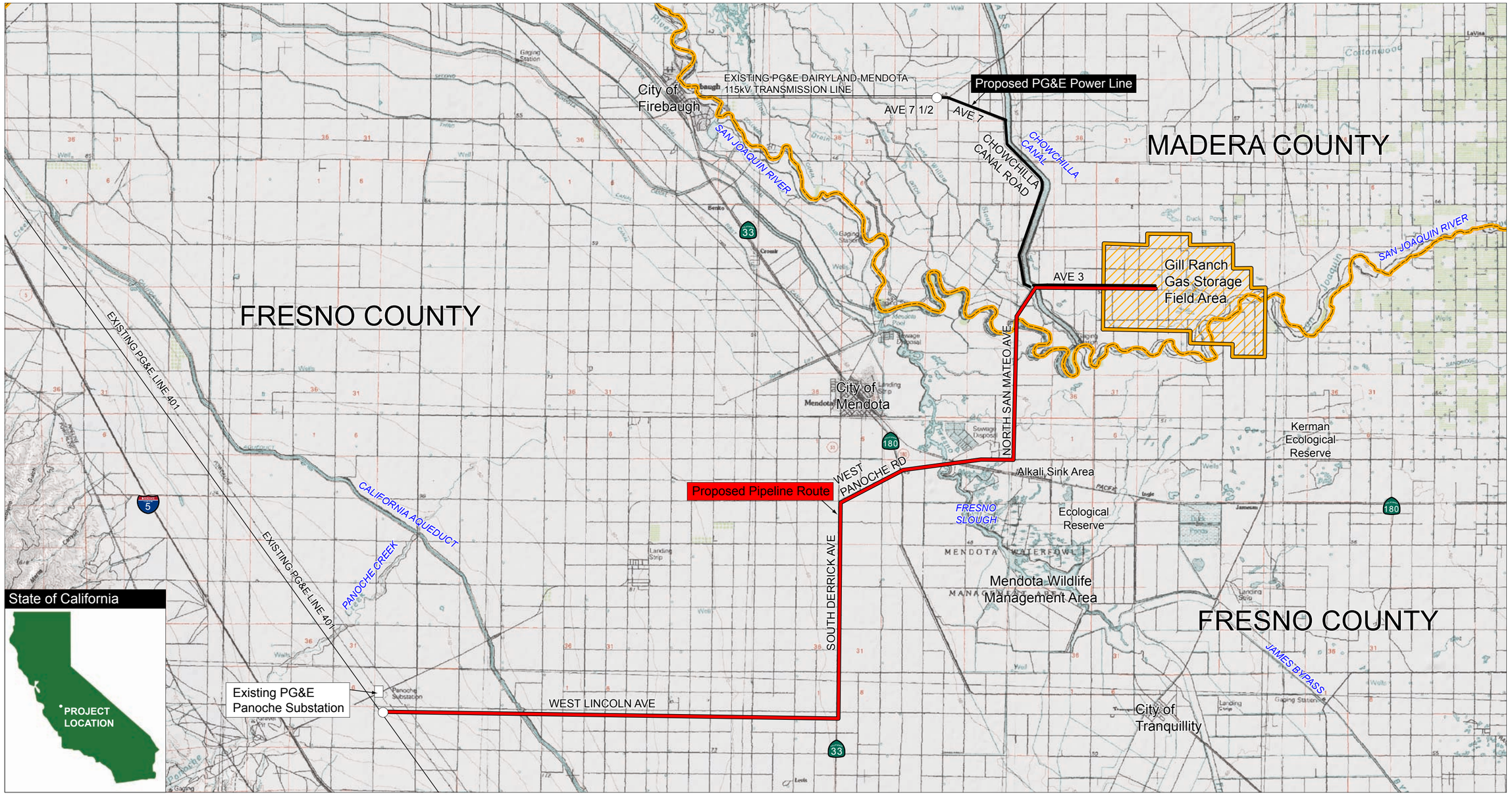
The Gas Field consists of several geologically separate reservoirs, as shown in Figure 2.3-1. The First Starkey and Second Starkey lie at depths of 5,700 to 6,300 feet (ft) below ground surface (bgs), respectively, and contain the depleted reservoirs that are proposed to be developed for Project storage. The shallower Domengine/Kreyenhagen and Moreno formations lie at a depth of about 4,300 to 4,600 ft and 5,570 ft bgs, respectively.

2.3.3 WELLS AND ASSOCIATED FACILITIES

IW and OM wells would be located throughout the Storage Field using existing and new well pad sites. There would also be one salt-water disposal well located at the central compressor station. The total ground disturbance for well pads would be approximately 12 acres (ac). The layout of the proposed wells is shown in Figure 2.3-2.

Site access would be via Avenue 7 – the primary east west connector between Highway 99 to the east and Firebaugh to the west – and Road 16. The existing road network at the Storage Field would provide access to the proposed compressor station and well pads. An approximately 20-ft-wide gravel access road would be built from the nearest existing farm road if a well site is selected that does not already have access. The longest length of an access road that could be built from a farm road to a well pad is approximately 300 ft (for Alternate Well OM-10). All of the other proposed and alternate IW and OM well pad locations are immediately adjacent to existing farm roads.

Figure 2.1-1: Project Elements



SOURCE: U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 2009 and RMT Inc. 2009

LEGEND

Proposed Pipeline Route; Proposed PG&E Power Line; Gill Ranch Gas Storage Field Area; County Boundary; Tie-In Point

0 1 2 3 4 5 10 Miles

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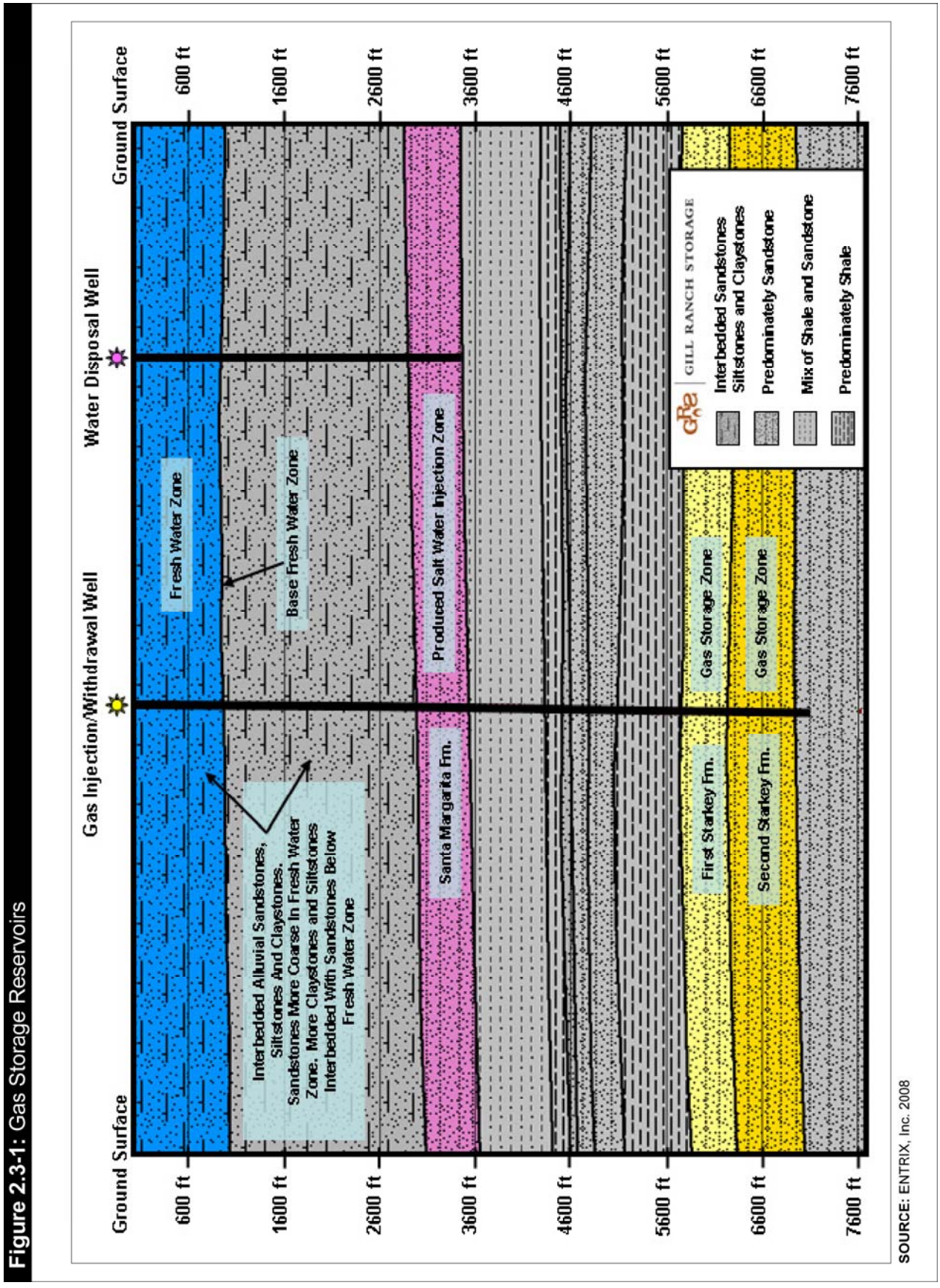


Figure 2.3-1: Gas Storage Reservoirs

SOURCE: ENTRIX, Inc. 2008

Component Description

Injection and Withdrawal Wells

Up to 15 new IW wells, distributed over 4 well pad sites, would be drilled to 3 separate First and Second Starkey reservoirs in order to achieve the design working capacity of the 20 Bcf and the maximum design withdrawal rate of 650 million cubic ft per day (MMcfd). The reservoirs would be operated in a pressure range of 500 to approximately 3,700 pounds per square inch gauge.

Each IW well pad would measure 300 ft by 250 ft (approximately 1.7 ac each). The IW well pads would occupy a total of approximately 6.8 ac on 4 equally sized sites. There are approximately 11 existing well pads (and other developed areas) throughout the Storage Field. The existing well pads are typically less than 1 ac in area. On three of the proposed well pads, the existing developed area would be expanded by approximately 1 to 1.5 ac each to accommodate the necessary drilling equipment and ongoing well operation and maintenance activities. The fourth well pad would be in an area that is presently in agricultural use. An estimated 1.6 ac of this total would be co-located with previously established well pads, or other developed areas, and the remaining estimated 5.2 ac would be in areas presently used for agriculture.

Observation and Monitoring Wells

Up to eight new OM wells would be drilled or recompleted into the storage formations, outside of the active working gas portion of the reservoir. Seven wells would be sited in the Storage Field north of the San Joaquin River. Of these wells, two wells would be on new well pads; three wells would be recompletions of existing abandoned wells in areas that have been converted to agriculture; and, two wells would be recompletions of existing idle wells on existing well pads. One OM well may be drilled south of the San Joaquin River, at a new site. This well would be the only Project reservoir-related facility located in Fresno County, if the well is drilled.

Each OM site would consist of pressure measurement and local data logging equipment enclosed in a 6 ft by 6 ft building. Each of the 5 OM well pads to be constructed in agricultural sites would measure up to 150 ft by 200 ft (approximately 0.7 ac) for a total area of 3.5 ac.

Gathering Lines

High pressure gas gathering lines would transport natural gas from the well head to the compressor station. The 10- and 16-inch (in) gathering lines would follow existing farm roads among the well pads to the central compressor facility. Gathering lines would follow new unpaved roads if well pads locations without existing well pads or access roads are selected. The pipelines would be buried 5 ft below ground along their entire length, except at the wellhead, and within the fence line of the compressor station.

Small-diameter, high-pressure pipelines for conveying water produced from the injection of natural gas would be 3 inches in diameter. The water gathering lines would be co-located with the gas gathering lines.

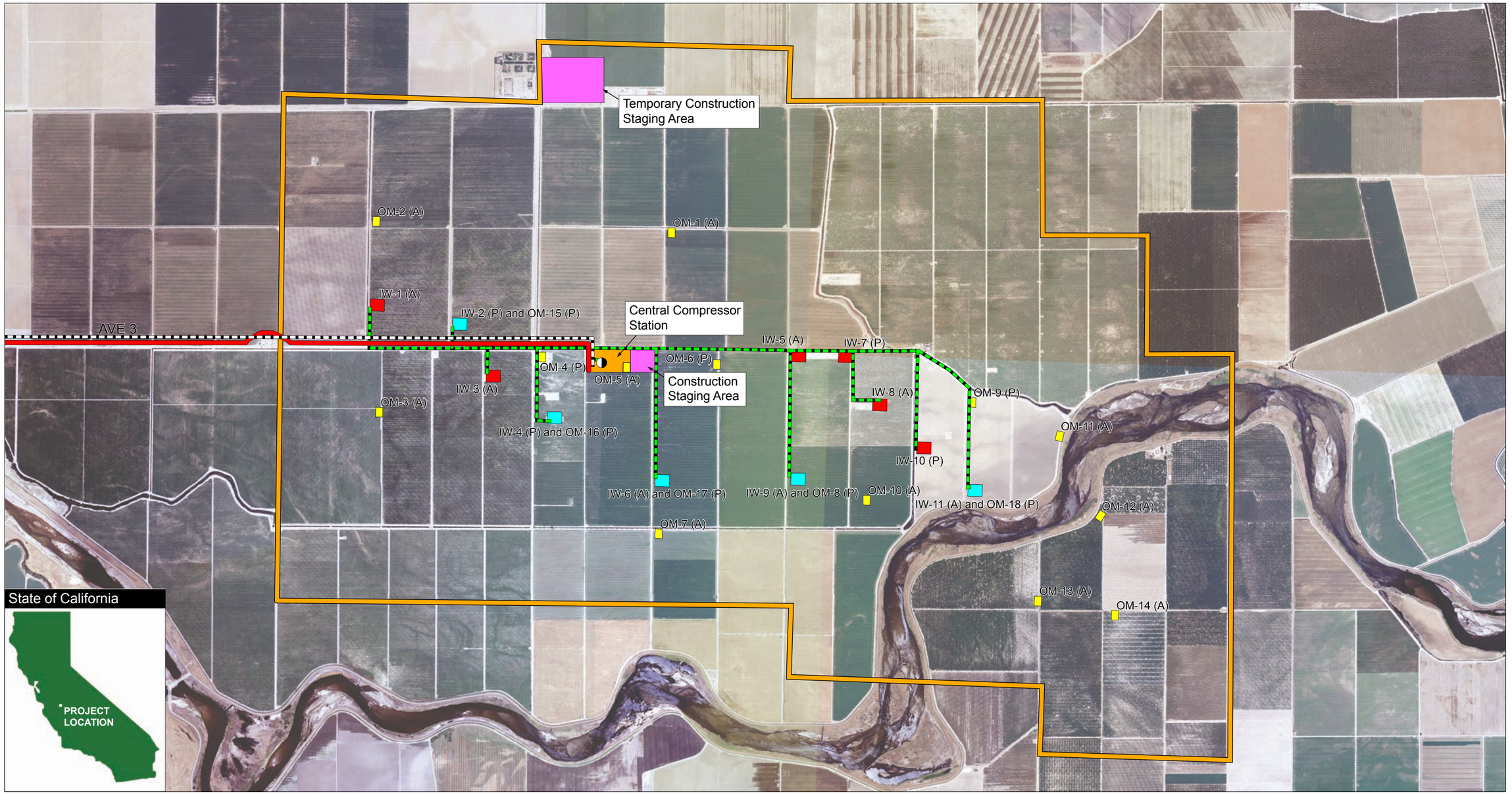
Construction

Well construction consists of three phases:

1) **Well Pad Construction:** Preparation of the well pad site for drilling equipment
2) **Well Drilling:** Drilling new wells and reworking existing wells
3) **Equipment Installation:** Installation of well pad surface facilities and machinery, such as monitoring and safety equipment

High-pressure gas and water gathering lines would also be constructed.

Figure 2.3-2: Project Components in the Gill Ranch Gas Storage Field Area



SOURCE: U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 2009 and RMT Inc. 2009

LEGEND

N, W, E, S

- Proposed Pipeline Route
- Proposed PG&E Power Line
- Proposed Field Gathering Line
- Proposed (P) and Alternative (A) Injection / Withdrawl (IW) Well Pad
- Proposed (P) and Alternative (A) Observation / Monitoring (OM) Well Pad
- Alternative (A) Injection / Withdrawl (IW) and Observation / Monitoring (OM) Well Pad
- Central Compressor Station
- Construction Staging Area
- Salt Water Disposal Well
- Gill Ranch Gas Storage Field Area

0 0.25 0.5 0.75 1 Mile

NOTE: Well Pads not drawn to scale

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Well Pad Construction

Existing facilities would be secured and isolated from the proposed well pad facilities by fencing or other means at the start of construction in coordination with the landowner and facilities owner/operator where proposed well pads have existing infrastructure (e.g., wellheads, well cellars, tanks, and associated piping). The remainder of the well pad would be cleared of surface materials and vegetation and then leveled and graded to accommodate drilling equipment. Site preparation would require removal of the existing agricultural operations (if any); grading and leveling the site; and placement of a gravel road base on the well pad and well pad access where the pad is to be expanded. The proposed well pad sites are level agricultural land and therefore import or export of fill is expected to be minimal. Drainage and runoff would be controlled to allow for onsite percolation through the graveled surface, and to avoid or minimize offsite runoff. Construction of the well pads is estimated to take up to 7 months, subject to weather and equipment delivery.

Well Drilling

Gas storage well drilling is the boring of a new well either vertically or at increasing angles up to horizontal. Setting depth of the well would vary depending on the exact depth of the reservoir at each specific well location. Up to four different well types would be drilled in the Storage Field. These include up to 15 IW wells, up to 7 OM wells, 1 potable water well, and 1 salt water disposal well (described under Central Compressor Station in this chapter). The salt water disposal well site is located at the compressor station site; therefore, drilling activities would also take place at the compressor site. The potable water well could also be constructed at the compressor station site (it would be constructed at another location in the Storage Field if siting the potable water well at the compressor station site is infeasible). Certain existing wells may be reentered for the purpose of ensuring that the well casings are adequately sealed to prevent potential gas migration through the well bores.

A mobile drilling rig and associated equipment and tanks would be driven to the well pad. The type of drilling rig to be used would be self-contained and relocated for each well. Typical equipment associated with the rig includes pipe racks, substructure, mud system, changing quarters, and tool pusher trailer, and power pack.

Drilling activities typically involve the use of the rig's rotary table to turn the drilling bit and attached drill pipe. Additional pipe is added in the pipe segments as the bit advances deeper into the subsurface. Lengths of pipe are taken up from the pipe rack and held in place until the drill operator is ready to attach the new pipe segments. The rotary table is stopped, the drill string is unscrewed, and new lengths are added after conducting safety checks. The system is repressurized and drilling continues. Drilling mud is used to lubricate the bit, bring drill cuttings back to the surface, and control down hole formation pressure. All fluids used in or for the drilling operation would be contained in temporary mobile tanks or 55-gallon drums stored in a containment area. Fluid and mud circulation systems are based on closed-loop designs, which result in no discharge. Ancillary valving, piping, and monitoring equipment is installed and tested once the well is in place.

The drilling rig would operate 24 hours per day, 7 days per week while each well is drilled and completed. Each well would take approximately 20 days to construct. The drilling rig would be relocated to the next well position once the drilling/completion of a well is complete.

Surface Facilities

New surface facilities would be constructed at each well pad site at the completion of drilling. New surface facilities would include the wellhead and production tree, gas water separator, ultrasonic

flow meters, a pre-fabricated control building, miscellaneous piping and valves, methanol storage, and a chemical injection and utility building.

Surface equipment at the OM wells would be limited to the wellhead and a small building that houses a data collection system. Perimeter fencing would be constructed once the surface equipment has been installed. Cleanup and any required restoration would be performed as work on the area is finished.

Gathering Lines

Construction of 10-in and 16-in diameter high-pressure gathering pipelines and the 4-in or less diameter high pressure water gathering pipeline would begin during the last months of the compressor station construction and will take approximately 1 to 2 months, subject to weather and equipment delivery.

The gathering lines would be constructed using similar pipeline construction techniques as for the gas transmission pipeline. The pipeline trench would be approximately 6 to 7 ft deep by 2 ft wide because of the smaller diameter of the gathering lines. No water or major road crossings are anticipated based on the proposed and alternate well pad locations; therefore, no special construction techniques such as horizontal boring methods would be required.

Operation

Site Inspections

The IW and OM well pad sites would be inspected by site personnel at least weekly during no-flow conditions and more frequently during flowing conditions. This activity would include inspection for evidence of vandalism, erosion control, grading and drainage facilities, cathodic protection system, piping, valves, power, site lighting, and well head instrumentation and control equipment. The results of these inspections would be summarized in a monthly report or log and maintained by the operator at the central compressor site.

Well Workover

Normal gas well maintenance includes periodic cleaning and reconditioning – termed “workover” – to maintain optimum efficiency. Well-drilling equipment would occupy the site, and activities and equipment would be similar to, but less extensive than, that associated with drilling the IW wells described above. The frequency of workover would depend on the IW flows and the integrity of the storage reservoir formation sands, but could occur as often as every 5 years.

Well Pad Site Monitoring and Control

The flow of gas in and out of the storage wells would be metered so that the characteristics and performance of the gas storage reservoir may be properly monitored. Wellheads would be equipped with emergency shutdown valves to close off flow of gas from the well to the central compressor facility under certain preset conditions (fire, excessive flow, abnormal pressure, etc.). A master emergency shutdown valve would be installed on the 10-in and 16-in diameter gathering lines where they enter the well pad sites to facilitate emergency shutdown. All control and safety valves could be actuated via communication with the central compressor facility.

The Applicants would also implement a Gas Monitoring Plan (Appendix G). The Gas Monitoring Plan would allow for detection of natural gas that may migrate to the surface in the future, whether from the storage operation or some other source, so that appropriate corrective measures can be taken. Permanent monitoring and test sites would be located at Project well sites, and leakage surveys would be performed along existing County and private farm roads on a regular basis.

Permanent or temporary gas monitoring probes would be used to monitor existing wells in the Gas Field that are currently or were once open to the Starkey Formation at the depth of gas storage. Standard, industry-approved gas measurement equipment would be utilized by field personnel trained on gas sampling methods and instrumentation. The Gas Monitoring Plan also contains response protocol for taking action (immediate and timed) to repair leaks that may occur.

2.3.4 CENTRAL COMPRESSOR STATION

The central compressor station would be centrally located on a 10-ac site in the Storage Field (Figure 2.3-2). The facilities would include the compressors, salt water disposal well, electric substation, a maintenance facility, a central control room, gas dehydration and processing, flow and pressure metering, and communication equipment.

Site access would be via Avenue 7 – the primary east west connector between Highway 99 to the east and Firebaugh to the west – and Road 16. From Avenue 7, the site is located approximately 4 miles south on Road 16, and then approximately 0.25 miles east on Avenue 3, an unpaved east-west farm road in the Storage Field.

Component Description

Compressors

The compressors would be driven by electric motors and would total approximately 45,000 brake horsepower.

Salt Water Disposal Well

One salt water disposal well would be constructed. It would dispose of water produced from the IW wells during withdrawal operations. A second disposal well may be necessary during early development if the production rate of salt water exceeds the rate at which a disposal well will take waters from the IW wells, plus what can be stored in temporary surface tanks. Disposal of water at an approved offsite disposal site would be conducted in lieu of drilling a second well if the period of higher than normal water production is limited.

Potable Water Well and Onsite Water Storage

One potable water well would be constructed, either at the compressor station site or another location in the Storage Field, preferably on an existing disturbed well pad (if siting at the compressor station site is not feasible). The well would likely draw from the same 200- to 400-ft deep zone as other local water wells, and would pump at a rate of about 300 gallons per day.

Water for firefighting would be stored in one or more dedicated tanks that would be sized to deliver the volume of water required over the duration required according to the California Fire Code and in accordance with the Madera County Fire Marshal's direction.

Electric Substation

An electric substation would be constructed at the compressor station. The substation would reduce the voltage of the electricity from the 115-kV transmission line for use at the compressor station, dehydration facility, and other locations. The substation would have two transformer bays fed from two connections (taps) to the transmission line. The substation has been designed to allow expansion without requiring additional upgrades to the substation.

The substation yard would be approximately 120 by 200 ft (approximately 0.55 ac) and accessed by an existing road. The substation would be secured by a 9-ft-tall chain link fence with razor wire

on top that would enclose the entire substation yard. Substation features would be lower in profile than the compressor building.

Construction

Construction activities would involve:

- Clearing and grading
- Construction of storm water management systems and equipment and building foundations
- Ground surface preparation at access points and in the equipment area
- Erection of structures to house the compressors and associated control equipment
- Installation of equipment and piping
- Construction of perimeter fencing
- Cleanup and restoration of the site

Construction of the central compressor station is estimated to take 12 months, subject to weather and equipment delivery. Construction activities associated with the salt water disposal well and potable water well are described under 2.3.3 Wells and Associated Facilities, Construction.

Operation

General System Monitoring and Control

The control room at the central compressor site would serve as the focal point for Project systems monitoring, control, and operations. The well pad site monitoring and control functions would be connected to the control room computer system via a radio transmission system. Operations personnel would monitor total facility gas flow and gas quality through a Supervisory Control and Data Acquisition Remote Terminal Unit located in the control building. Control and monitoring functions for equipment and operations at the central compressor site associated with IW operations would be via hardwired control systems connected to the control room computer system.

The operator can provide valve line-up and sequencing for gas movement between PG&E's Line 401, the central compressor site, and the well pad sites in addition to storage well selection from the control room. The start-up of major pieces of equipment, such as the dehydrators, would be done manually by an operator from local control panels on the equipment. This would assure that the operators regularly inspect the condition and operation of the equipment and facilities prior to and during start up operations.

The control room would contain personal computers and programmable logic controllers, which provide automation of the control and monitoring functions as well as data collection, recording, and storage. This system would provide continuous monitoring of critical systems parameters and would have the capability for shutdown of either individual areas or the entire operation when specific operating conditions are extreme. The system would be connected to graphic display monitors in the operator's console. One monitor would provide a simplified flow diagram and operating status of the entire system. Another monitor would provide a menu of graphics available to view operating conditions of individual process areas, or specific valve line-up or sequencing required for various operations of the system.

System operating parameters that typically would be monitored include, flow, temperature, and pressure of the gas movement between the PG&E's Line 401, the central compressor site, and the well pad sites. Major valve status or position for pressure control, flow control and emergency

shutdown valves on the pipelines and well heads would be indicated and monitored. The presence of gas in the compressor building would also be monitored. A gas chromatograph to monitor gas composition to measure heating values would be located at the central compressor site. Dew point analyzers would monitor the water content of the gas.

Scheduled Site Maintenance

Scheduled site maintenance of the central compressor station and well pad sites would include maintenance of site access roads, drainage facilities, fencing, site lighting, landscaping, equipment, and aboveground piping painting. Site access roads and surface areas would be regraded and resurfaced as often as necessary to maintain a smooth surface, provide dust control, and promote drainage. Regular mowing and periodic clean-out of ditches and culverts would assure that the drainage systems operate at their design capacities. Site fencing would be inspected regularly and repaired as necessary to prevent unauthorized access to the Project facilities. All equipment, storage tanks and aboveground piping, valves, and fittings would be painted a flat finish neutral color upon completion of construction and would be repainted regularly. The housekeeping and maintenance procedures employed at the Project would provide a clean work environment and assure that the central compressor site and well pad sites perform properly.

Central Compressor Facility Monitoring and Control Systems

Redundant safety systems would be installed at the central compressor facility. Gas and fire sensors would monitor all equipment and would automatically shut down the facility if unusual conditions are detected. The facility would be staffed with a day shift only, 7 days per week. Operations and maintenance personnel would be on-call after normal working hours to address any abnormal conditions. On-call operators would receive call out notices from the station's automated control system. Call-outs would be in the form of text messages that would define the nature of the abnormal condition. Operators would also have remote web access to the control system which will display all critical parameters for the plant if additional information is needed following a call-out. The appropriate service personnel (operator, mechanic, electrician, etc.) would be dispatched once the operator receives the notice and determines the condition.

Salt Water Disposal Monitoring and Control

The salt water disposal well would be metered during operations so that the characteristics and performance of the disposal operations may be properly monitored. The injection facilities would be equipped with emergency shutdown systems to close off the flow of water from the surface storage tanks to the injection well facility and under certain conditions (excessive flow, abnormal pressure, etc.) from the wells to the surface storage tanks.

Central Compressor Site Inspections

Inspection of the central compressor site and equipment would occur on a daily basis. The operator would be responsible for walking the site at the start of each shift and noting the condition of fencing, drainage facilities, tanks and containment, piping, valves, instrumentation and control systems, equipment, site lighting, and buildings. Conditions revealed by the inspections would be included in the operator's daily log and summarized in a monthly report.

The plant manager would be notified of any conditions revealed during the inspections that require further inspections, repair, or replacement. The plant manager could cause operations to cease or be reduced to a safe level until the condition is corrected, based upon the severity of the condition.

Parts and Materials

An adequate inventory of service, repair, and replacement parts and materials would be maintained at the central compressor site in storage space available in or near the generator and maintenance buildings in order to service and maintain the Project pipelines, equipment, and facilities. The service and repair inventory would include items not generally available locally on short notice, such as pipe, valves, fittings, repair and overhaul kits, gaskets, electric motors, pumps, instruments, transmitters, rectifiers, wire, specialty hardware, equipment subassemblies, specialty paints, filters, and lubricants. Maintenance and repair items that could readily be obtained locally, such as fencing, standard hardware, paints, concrete, gravel and culverts, would not be warehoused on the site.

2.3.5 GAS PIPELINE

Component Description

Pipeline

A 26.6-mile-long, 30-inch-diameter bi-directional gas transmission pipeline would be constructed between PG&E's existing Line 401 near Interstate 5 and the proposed compressor station site (Figure 2.2-1). The pipeline would transport up to 650 MMcfd. The pipeline would be designed to allow for potential future additional deliverability without expansion of the pipeline capacity.

The pipeline alignment, beginning at PG&E's existing Line 401 near Interstate 5, extends east in agricultural fields and roads along West Lincoln Avenue for slightly over 10 mi to Highway 33. Horizontal directional drilling (HDD) techniques would be used to cross under the California Aqueduct in this area. The pipeline would be bored under Highway 33 and then continue north on the east side of this road for approximately 6 mi along Derrick Avenue to the intersection with West Panoche Road. The pipeline alignment then extends for fewer than 2 mi northeast along West Panoche Road to its intersection with SR 180 and South San Benito Avenue. The pipeline would be bored under South San Benito Avenue to the south side of SR 180 for a short distance and then the line would be bored under SR 180 to the north side of the road.

The pipeline then would extend east on SR 180 to the Fresno Slough, which would be crossed using HDD methods. The route would run north on San Mateo Avenue to the San Joaquin River from the intersection of SR 180 and San Mateo Avenue; cross the San Joaquin River using HDD methods at San Mateo Avenue; run northeasterly to the Chowchilla Canal Road; cross the canal and levees using HDD methods; and then run east to the proposed central compressor station plant along Avenue 3.

The easement for the proposed pipeline is 95 ft wide with a permanent post-construction easement of 50 ft in most places (the construction ROW for the initial 2.2 miles of the alignment would be 60 ft, while the permanent easement would be 30 ft; the construction ROW at MP 17.5 in identified wetland would be 50 ft)). The pipeline would be buried at a minimum depth of 5 ft from the top of the pipe. The pipeline would be constructed under the California Aqueduct, Fresno Slough, San Joaquin River, and Chowchilla Canal using HDD methods. The total area disturbed by temporary pipeline construction activities would be approximately 300 ac. This acreage would be returned to its present uses, with minor exceptions (e.g.., where orchard trees must maintain a 20-ft clear inspection area centered over the top of the pipe) after pipeline construction is completed.

Meter Station

The meter station would be located at the point of connection with PG&E's Line 401. The total area of the meter station would be 0.6 ac.

Construction

Pipeline

The 30-in diameter gas transmission pipeline would be constructed beginning from the PG&E Line 401 near the Interstate 5 corridor to the inlet of the central compression facility, approximately 20 mi northeast of the tie-in point at Line 401. Construction of the pipeline is expected to begin in month 8 of the 12-month construction schedule, and last approximately 5 months depending on weather and equipment delivery.

HDD techniques would be used at several locations. It would be used to cross under the California aqueduct, and to bore under Highway 33. HDD would be used to cross under the Fresno Slough for 2,500 ft, to the east side of the Slough to an exit point north of SR 180 and east of the Union Pacific Railroad rail spur that crosses SR 180 in this area. An additional 700 ft of trenching is planned on the west side of the Slough, and 300 feet of trenching would occur on the east side of the UPRR rail spur, in an agricultural field. The pipeline would cross the San Joaquin River using HDD methods at San Mateo Avenue, and would run northeasterly to the Chowchilla Canal Road, crossing the canal and levees using HDD methods. The pipeline would also be bored under South San Benito Avenue to the south side of SR 180 for a short distance and then the line would be bored under SR 180 to the north side of the road.

Meter Station

Construction of the tap and meter facility is estimated to take 4 months, subject to weather and equipment delivery. It would include vegetation removal, grading, and installation of security fencing.

Operation

Pipeline Inspections

The pipeline would be inspected on a regular basis for ground disturbances along the right-of-way (ROW). These ground surveys would include inspection for encroachments and reduced cover, and the condition of vegetation, warning signs, cathodic protection test stations, and piping. A report summarizing the results of inspections will be prepared and maintained by the operator at the central compressor station.

Pipeline Replacement

Sections of pipe may need to be replaced for several reasons, including third-party damage, acts of nature, normal wear and tear, and pipeline technology improvements. Previously described standard pipeline construction techniques and ROW are used during this activity. The pipe condition requiring replacement is typically concentrated in short sections of the pipe, and only that section would be replaced. Extra workspace may be required contiguous to the pipeline ROW to accommodate boring, stringing, and welding activities and equipment if the pipe segment to be replaced is a bored crossing.

Line Lowering

Lowering of the pipeline may be required when there is insufficient cover to safely protect the pipe from agricultural activity or regrading in public easements. This can occur in agricultural areas when fields are leveled to improve irrigation, or when public roadways are regraded. The pipeline would be installed at a typical depth of 5 ft to the top of the pipe, though it may be necessary to lower the line where fields have not yet been leveled or have been releveled. Such activity involves exposing a sufficient length of pipe, excavating a deeper trench under the supported pipe, and

lowering the pipe into position. The pipe may also be re-coated while it is exposed. The activity requires the standard ROW previously described, and the pipe would remain in operation during the work. Line lowering and pipeline replacement may not be necessary if outside forces do not adversely affect the Project pipelines.

2.3.6 ELECTRIC POWER LINE

Component Description

An approximately 9.3-mi electric power line would be constructed between PG&E's existing Dairyland-Mendota 115-kV transmission line on Avenue 7½ and the Storage Field central compressor station site. The power line alignment is shown in Figure 2.3-3.

Construction

Construction of the power line would include site clearing and grading for new pole sites (if required) and pull and tension sites, pole delivery to each location, soil auguring at each location, assembling the wood pole, installing the pole, stringing the new conductors, and replacing the existing line and hardware on the new pole.

Approximately 4.3 mi of the new power line would be installed by replacing old wood poles with new wood poles in existing PG&E electric distribution line corridors. The existing wood poles are 40 to 50 ft tall and would be replaced with similar, but taller single and wider circuit wood poles that would be 60 to 70 ft tall. Two steel poles would be installed, one on either side of the Chowchilla Canal.

No electric power lines or distribution lines currently exist along approximately 1 mi of the proposed power line route along Avenue 7½. The Project would include construction of the new wood pole power line in public road ROWs where PG&E currently has a franchise authorizing it to operate; however, it may be necessary to acquire additional land rights, pending final engineering. The amount of land disturbance required for the power line has not yet been determined; however, the maximum total final footprint of the power line poles would be approximately 0.015 ac (assuming a maximum footprint of 4 square ft for each of the 162 poles).

Operation

The proposed electric power line would be integrated into PG&E's existing transmission and distribution system.

2.3.7 CONSTRUCTION STAGING

Equipment staging areas would provide lay-down areas for equipment, piping, and other construction related supplies, as well as space for contractor trailers and worker parking. The staging areas are shown on Figure 2.3-4.

Injection and Withdrawal Wells and Observation and Monitoring Wells

Construction of wells would be accomplished in the proposed well pad areas and immediately surrounding areas (in cases where expansion of the existing pad is necessary). Additional material staging for well pad drilling and facility construction would be available at other existing well pads that are not proposed for further development in connection with the Project, along roadside areas in the Storage Field, and potentially at other developed sites at the Storage Field, such as the agricultural storage yard described below Any areas that may be used for staging along roadside areas in the Storage Field would be outside of the roadway. The intent is to use existing prepared sites that would not require additional site preparation.

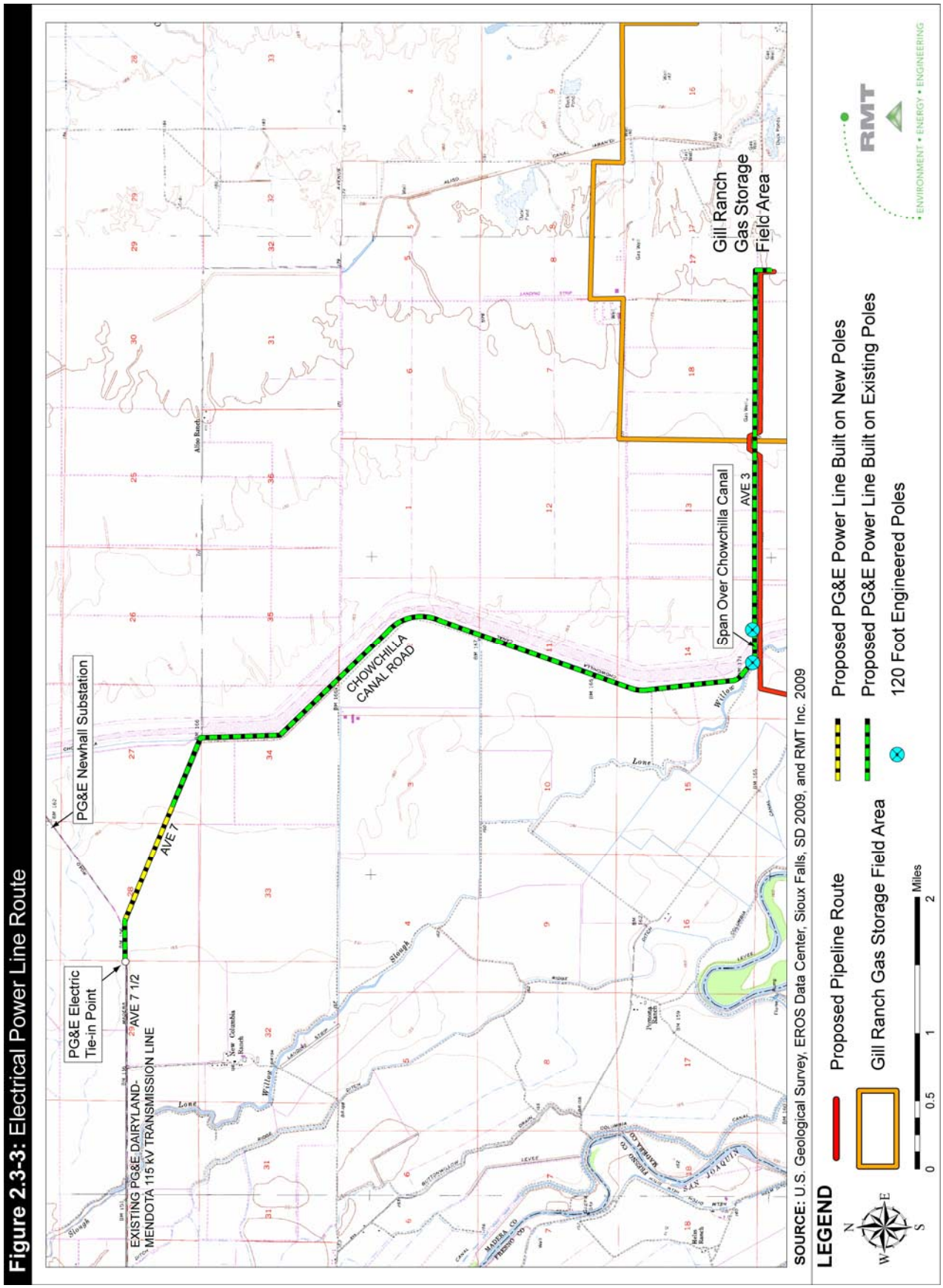
Figure 2.3-3: Electrical Power Line Route
PG&E Electric Tie-in Point
EXISTING PG&E DAIRYLAND-MENDOTA 115 kV TRANSMISSION LINE
AVE 7 1/2
PG&E Newhall Substation
AVE 7
CHOWCHILLA CANAL ROAD
Span Over Chowchilla Canal
AVE 3
Gill Ranch Gas Storage Field Area
SOURCE: U.S. Geological Survey, EROS Data Center, Sioux Falls, SD 2009, and RMT Inc. 2009
LEGEND
Proposed Pipeline Route
Gill Ranch Gas Storage Field Area
Proposed PG&E Power Line Built on New Poles
Proposed PG&E Power Line Built on Existing Poles
120 Foot Engineered Poles
Miles
0
0.5
1
2
N
E
S
W
RMT
ENVIRONMENT • ENERGY • ENGINEERING

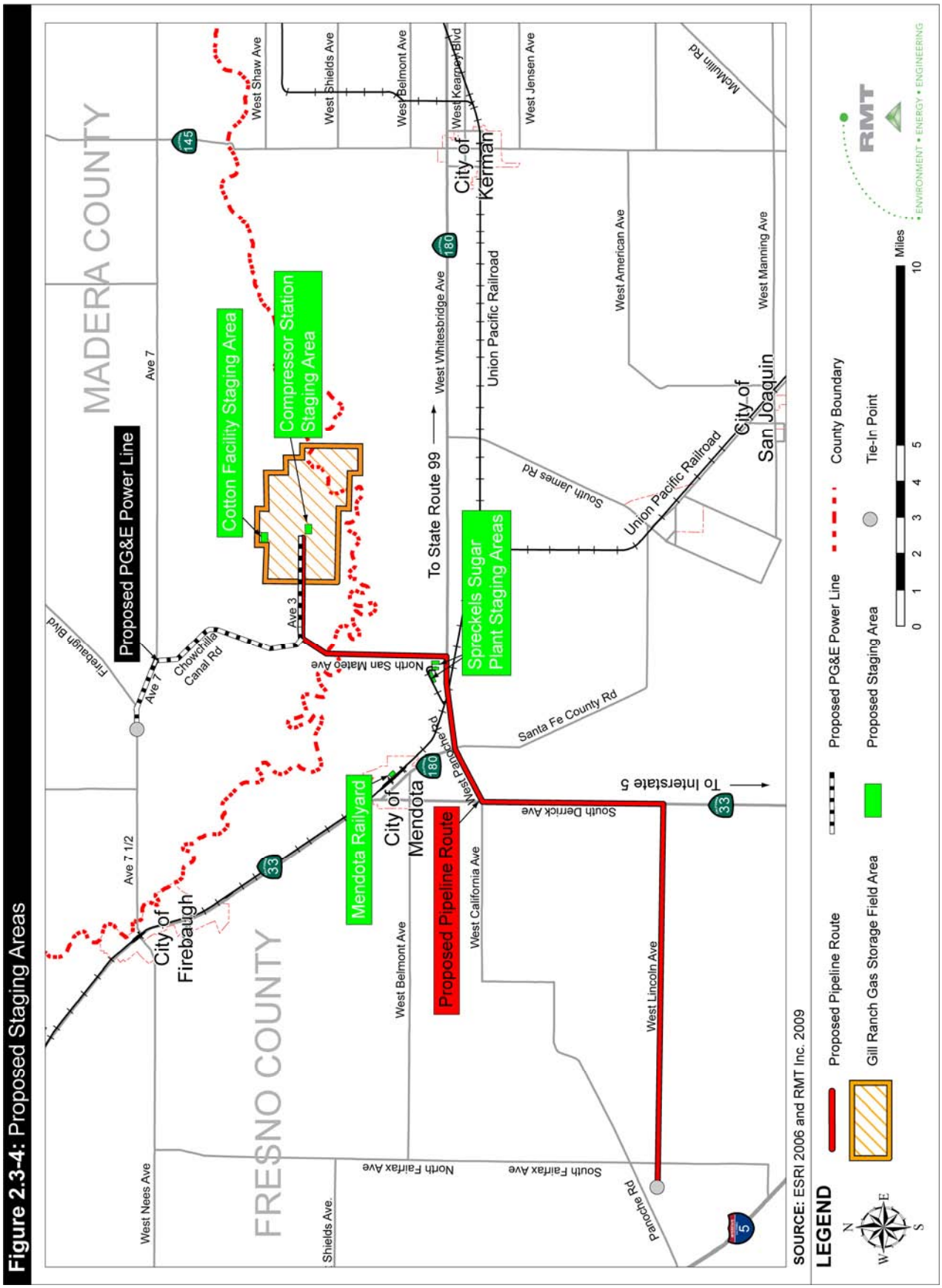

Figure 2.3-4: Proposed Staging Areas

The farm immediately adjacent to the east of the proposed compressor station has also been identified as a potential site for construction staging activities. It is anticipated that the 7-acre staging site adjacent to the compressor station would be cleared of surface materials and vegetation, graded and prepared to provide a location that could be used during all seasons. This site preparation would likely entail placement of a geotech fabric (to create a barrier from the native soil and to reduce the amount of imported material), and then placement of sand and crushed rock. These site preparation procedures are similar to procedures described for well pad preparation. Imported materials would be removed and the area returned to agricultural use at the completion of construction.

Compressor Station, Well Pads, and Pipeline in the Storage Field

An approximately 20-ac agricultural storage yard site north of the San Joaquin River in Madera County has been identified as the staging area for the compressor station, well pads, and pipeline The site is located along Road 16, along the northern perimeter of the Storage Field. This staging site is currently graded and level, and was formerly used for cotton processing. It would require little to no additional preparation (e.g., minor pothole repairs may be needed), and staging activities would be limited to areas that are already suitable for staging activities. An approximately 10-ac portion of this site would be selected in coordination with the landowner.

Gas Pipeline Outside of the Storage Field

Equipment and material staging areas for the pipeline construction, including the HDD operations, would be accommodated in the proposed 95-ft construction ROW, except where temporary use areas must extend outside this area (e.g., to accommodate a turn in the pipeline). Temporary use areas would generally be located on field crops and developed areas, but were located to avoid sensitive resources. Temporary use areas along the pipeline alignment are shown in Appendix B.

Two potential construction staging sites have been identified at the Spreckels Sugar Plant property, located on San Mateo Avenue near SR 180. The first site would be located on a 16-ac site at the Beet Receiving Yard at the Spreckels Plant, 0.2 mi north of SR 180 and 0.1 mi east of San Mateo Avenue. The site is developed, and located in a gated and secured area. Access is via the existing main plant access road on San Mateo Avenue.

The second site is located in the northwestern portion of the Spreckels Plant operational area, in an area that is already used for staging. It is approximately 5 ac in area. Material and equipment deliveries arriving via rail would be transported directly to the staging area via the rail spur associated with the Spreckels facility. If additional area is needed for staging, then the existing roadway shoulder located parallel to and south of the rail spur would be used. This area is currently undeveloped and has been previously used for staging.

Another construction staging site has been identified at the Mendota Railyard, where equipment arriving via rail would be off-loaded and transported to construction staging sites. The Mendota Railyard is an industrial railroad facility with several storage yards. It is surrounded by residential and commercial uses.

Minimal site preparation, such as placement of new gravel and filling of potholes, may be needed on the new selected staging areas.

Designated truck routes in the Mendota area provide access between the staging area and the pipeline alignment. Staging would not interfere with seasonal grazing operations near the Spreckels facility.

2.3.8 ACCESS ROADS

Component Description

Storage Field and Facilities

The existing road network in the Storage Field would provide access to the proposed compressor station site and well pads. However, an approximately 20-ft-wide graveled access road would be built from the nearest existing farm road if a well site is selected that does not have access from an existing road.

Gas Pipeline

There are numerous roadway intersections near the pipeline alignment and no new permanent road improvements are anticipated for pipeline alignment access. Work vehicles would enter and exit the pipeline alignment in a one-way pattern using the existing roadway intersections that are in proximity to the specific work area. In limited cases, vehicles would need to enter and exit at the same location in order to avoid sensitive resources or land conflicts. The proposed metering station at the interconnection to PG&E Line 401 is located adjacent to Lincoln Avenue, and no new access roads would be needed for this site.

Electric Power Line

The electric power line would be located adjacent to existing roadways and no new access roads would be required in order to obtain an electric service hook-up from PG&E. The pipeline and surface facilities would be accessed from existing roads for long-term maintenance and inspections.

Operation and Maintenance

Project personnel conducting operations and maintenance activities at several of the Project components would use existing farm access roads. GRS would maintain these roads to keep them usable during the time of year when they are needed, as well as passable for the types of equipment used for maintenance or operations. Site access roads and surface areas would be regraded and resurfaced as often as necessary to maintain a smooth surface, provide dust control, and promote drainage.

2.3.9 GENERAL MAINTENANCE AND OPERATION

Injection Cycles

The project is designed to provide up to four-turn storage service. This means that the surface facilities and wells have been designed to cycle the entire working gas volume of the Storage Field 4 times in 1 year. A complete injection cycle would require 49 days and a complete withdrawal cycle could be accomplished in 36.5 days at design flow rate. The maximum withdrawal flow rate would be 650 MMcfd (plus or minus 10% on an hourly basis). This rate would step down as the reservoir pressure declines. The maximum injection flow rate would be 475 MMcfd, which would decrease as the reservoir pressure increases. The actual injection and withdrawal cycle would be based on market demand.

Facility Inspection and Survey

The regular inspection of the pipelines, equipment, wells, instrumentation, control and support systems is critical to the safe, efficient and economical operations of the Project. Early identification of items in need of maintenance, repair or replacement ensures continued safe operation of the gas storage systems. Written procedures for the operation, inspection,

maintenance, and repair of the Project pipelines, equipment and facilities would be established in an Operating and Maintenance Plan as required by the Department of Transportation (49 CFR, Part 192, Subparts L and M). The Project would meet or exceed the minimum requirements of this code.

Maintenance and Repair Procedures

Maintenance of the sites, equipment, facilities and pipelines will be part of the daily operations of the Project. Minimum requirements for maintenance, repair or record keeping of gas pipelines, pressure regulating and relief valves and compressor stations are established by 49 Code of Federal Regulations, Part 192, Subparts L and M, and would be included in the Operating and Maintenance Plan.

Normal maintenance, repair, overhaul, and testing of equipment assemblies and subassemblies would be conducted by site personnel at the maintenance shop located at the central compressor site. Major equipment assemblies and subassemblies that require extensive repair, rebuilding and testing beyond the capabilities of the onsite shop's equipment would be removed from service and shipped off-site for repair at the manufacturer or a qualified service center. The Project would either operate at reduced capacity, in only one mode (injection or withdrawal), or be completely out of service during equipment repairs. The implementation of scheduled maintenance and refurbishment of the equipment reduces the chances of complete system downtime by scheduling major repairs during non-operational periods.

Ongoing General Maintenance

Ongoing general maintenance activities, which are routine for natural gas facilities, would be conducted either on a regular schedule or as-needed. Many maintenance activities could normally be scheduled for periods that do not conflict with agricultural operations or sensitive biological periods, and the surface would be restored after maintenance where appropriate. Affected property owners would be given sufficient advance notice of maintenance activities. The scheduled maintenance would be coordinated with the landowners to minimize or preclude potential conflicts with the existing land use or activity.

Vegetation Management

Regular mowing and periodic clean-out of ditches and culverts will assure that the drainage systems operate at their design capacities.

2.3.10 FUTURE PLANS

Storage Expansion

The Joint Project Agreement between GRS and PG&E anticipates that there may be a future expansion of the Storage Field. The Applicants estimate that, based on current information, expansion could add between 20 and 25 Bcf of working gas capacity to the Project if expansion is chosen in the future. The Applicants each have the option to participate in any future expansion, as outlined in the Joint Project Agreement for the proposed project. Possible future expansion would take place in formations other than the Starkey Formation, most likely the Domengine Formation, and may include land use outside of the Storage Field. The gas pipeline, as defined and analyzed in this document, is sized to accommodate potential future expansion. The Applicants have not made such plans and will not have the technical or demand information necessary to reasonably foresee whether to pursue an expansion until the Project has been developed and is operating. In addition to the currently unknowable physical and technical information that would impact whether or not future expansion occurs, prior to any future expansion, a development plan would be required which would be voted upon by the project's

management committee. Only after such a vote, could the permitting process begin. Future expansion is not addressed in this document, and all future expansion would be subject to the approval of the CPUC, and would be subject to additional CEQA review, consistent with applicable requirements at the time any future expansion may be proposed.

Decommissioning

There are currently no plans for decommissioning the facilities associated with the Project. The pipeline would either be abandoned in place or removed and salvaged according to the practices appropriate at the time of decommissioning should decommissioning occur in the future. Pipe installed under water crossings and roadways would generally be abandoned in-place. Pipe abandoned in-place would be capped in compliance with regulatory requirements. The pipeline crossing the San Joaquin River would be abandoned according to a detailed procedures and work plan approved by the State Lands Commission. The surface above the pipeline would be restored in areas where segments of the pipeline are removed.

Closing out the well pads would be accomplished through adherence to Department of Oil, Gas, and Geothermal Resources (DOGGR) requirements for well abandonment. The sites would be restored according to County requirements. The buildings and equipment at the central compressor station would be dismantled and salvaged and the site restored according to Madera County ordinance requirements in effect at the time if decommissioning occurs in the future. Concrete and pavement would be broken up and disposed of at an approved disposal area, recycled, or left in place. Impacts from decommissioning are not discussed in this document because decommissioning is not part of the proposed Project. Decommissioning, if it occurs in the future, would be subject to future analysis under CEQA, consistent with applicable requirements at the time any decommissioning may occur.

2.3.11 PROJECT PERSONNEL

Construction

The Project would create temporary construction-related jobs over an approximately 12-month period. The workforce would vary month to month, and the work would take place in different locations (e.g., a segment of the workforce would be located at the compressor station area and other work spreads would be located along various segments of the pipeline). The average daily workforce would peak at approximately 125 workers during the first 7 months of construction. The average daily workforce would peak at approximately 350 workers during months 8 through 10. The workforce is expected to decline to fewer than 100 workers during months 11 and 12.

Operation

The operation and maintenance phase of the Project would create a total of approximately 10 permanent and part-time employment positions. Operations and maintenance personnel would be present at the Project during normal daytime workday hours. Infrequent, non-routine activities would require additional contractor personnel onsite for 2 to 4 weeks at a time. PG&E operations and maintenance personnel would maintain the new power transmission line as a part of their regional transmission and distribution system operations.

2.3.12 PROJECT SCHEDULE

Construction

Construction activities associated with most Project components would generally occur Monday through Saturday in compliance with local requirements, except for drilling, which would occur 24 hours per day during active well drilling.

The Applicants intend to begin construction during the summer of 2009 and complete construction during the summer of 2010 so that the Project may begin operation in time to meet traditionally higher fall and winter demand. This schedule is contingent upon receipt of necessary Project approvals.

An estimated 12 months is required to construct the Project components. Construction of the various Project components would be logically sequenced to minimize the overall construction timeframe. The construction timing sequence would also ensure that the total construction emissions will not exceed the San Joaquin Valley Air Pollution Control District's (SJVAPCD) construction emissions threshold.

Operation

A facility life of 30 years has been used for certain project assumptions discussed in this Initial Study; however, the facility could operate for considerably longer with proper maintenance. There are currently no plans to abandon any part of the proposed facilities.

2.4 Permits and Approvals

2.4.1 DEPARTMENT OF OIL, GAS, AND GEOTHERMAL RESOURCES

The DOGGR is responsible for wells drilled into an underground gas storage facility. The Applicants would submit for approval the necessary Notice of Intent forms to drill, rework, redrill or plug and abandon wells as required.

The Applicants would also complete engineering and geology studies and an injection plan and submit them to DOGGR for approval. These studies would meet the appropriate DOGGR requirements and describe:

- Planned well drilling and abandonment program
- Reservoir characteristics
- Casing diagrams
- All geologic units
- Aquifers
- Oil and gas zones

The studies would further include an isopach map[2] of each injection zone and a geologic cross section through the injection well. The injection plan would include:

- A map showing injection facilities
- Anticipated injection pressures and rates
- A description of the monitoring system to insure that injected gas is confined to the intended zone

All required data would be submitted to the appropriate DOGGR District Deputy for the Project. A bond would be posted with DOGGR to ensure proper completion or abandonment of any well drilled. Additional DOGGR requirements are listed in Table 2.4-1 below.

[2] A map that uses contours (isopachs) to show the extent and the changes in thickness of subsurface sedimentary layers.

2.4.2 OTHER PERMITS AND APPROVALS

The permits or approvals that would be required for the proposed project are shown in Table 2.4-1.

Table 2.4-1: Required Permits and Approvals for the Proposed Project

Project Approvals	Issuing Agency	Purpose/Covered Activity
Federal		
Clean Water Act Section 404/Rivers and Harbors Act	US Army Corps of Engineers	Utility line activities in waters of the US
Section 7 Consultation (in connection with Nation Wide Permit [NWP] 12): Incidental take Permit	US Fish and Wildlife Service	Endangered Species Act compliance
NHPA Section 106 Consultation (in connection with NWP 12): Memorandum of Agreement	State Historic Preservation Office	Compliance with national Historic Preservation Act
Water Quality Certification (required as condition of NWP 12)	Central Valley Regional Water Quality Control Board	Compliance with water quality standards and plans
State		
Water Quality Certification (required as condition of NWP 12)	Central Valley Regional Water Quality Control Board	Compliance with water quality standards and plans
Notice of Intent to Comply with General Order No. 5-00-175 (or its replacement) for Dewatering and Other Low Threat Discharges	State Water Resources Control Board	Construction activities and discharge of hydrostatic water
Encroachment Permit	Department of Water Resources	Pipeline aqueduct crossing
General Lease/Right of Way Use	State Lands Commission	Pipeline river crossing
Permits to Conduct Well Operations	Division of Oil, Gas, and Geothermal Resources	Well drilling and operation
Authorization to Inject Produced water	Division of Oil, Gas, and Geothermal Resources	Injection well drilling and operation
Encroachment Permits	Department of Transportation	Pipeline highway crossings
PRC Section 1601 Streambed Alteration Agreement	Department of Fish and Game	Pipeline river crossing
Authority to Construct/Permit to Operate	San Joaquin Valley Air Pollution Control District	Compressor emissions
National Pollutant Discharge Elimination System General Permit for Discharge of Construction Related to Storm Water	Central Valley Regional Water Quality Control Board	Management of storm water during construction
Local		
Building and Occupancy Permits	Madera County	Compressor site facilities
Grading Permit	Madera County	Compressor site improvement
Nondiscretionary Permit	Madera County	Accessory project facilities
Encroachment/Other Permits	Madera County/Fresno County	Road crossings
Domestic Well Permit	Madera County	Compressor site domestic water supply
Other		
Encroachment Permit	Union Pacific Railroad	HDD under railroad tracks