2: PROJECT DESCRIPTION

2.1 Introduction

On June 18, 2001, WGSI filed an application (Application 01-06-029) with the CPUC for an amended CPCN. In this application, WGSI requested authorization to expand the permitted storage and operational capacity of the Wild Goose Gas Storage Field located in Butte County. WGSI also sought approval to construct a 25.6-mile pipeline from the WGSI Remote Facility Site (RFS) to the Pacific Gas and Electric Company (PG&E) Line 400/401 transmission pipeline in Colusa County (see Figure 1.1-1).

The application and accompanying Proponent's Environmental Assessment (PEA) identified the Applicant's proposed project, including related facility expansions and pipeline alignments. During the review, the CPUC requested clarification of both the application and PEA, and through a series of responses, the Applicant modified elements of the proposed project.

For the purposes of evaluating the project under the California Environmental Quality Act (CEQA) and CEQA Guidelines, the "proposed project" as identified in this Draft EIR is the project formally presented in WGSI's application and PEA, as modified. As required by CEQA, and as amended, this EIR examines the expected individual and cumulative impacts of the proposed project. This EIR also identifies ways to minimize potential adverse impacts (mitigation measures) and evaluates alternatives to the proposed project, including the No Project Alternative. The CPUC has principal responsibility for approving or denying the CPCN; therefore is the lead agency in preparing this EIR.

This Section of the EIR presents a detailed description of the project so that a reader will gain a basic understanding of the proposed project. The information is presented in the following sequence:

- Project Purpose and Need

- Existing Facilities
- Project Location and Description
- Project Ownership
- Design and Operation Requirements
- Land Requirements
- Construction Staging and Access
- Construction Work Force
- Operation and Maintenance Procedures
- Future Plans
- Permit Requirements

Additional detail about key elements of the proposed project is included in Section 3 of this EIR, to aid in the presentation of environmental analyses.

2.2 Project Purpose and Need

PROJECT OBJECTIVE AND PURPOSE

The objective of the WGSI Expansion Project is to provide highly flexible natural gas storage services to a variety of customers, which could include the following:

- Gas utilities
- Electric utilities
- Independent electric generators
- Gas marketers and producers
- Industrial gas users
- Other wholesale and retail gas customers

The purpose of the Expansion Project is to maximize the storage, injection, and withdrawal capacity of the natural gas storage reservoir with a connection to the PG&E Line 400/401 to meet customer demands into the foreseeable future.

PROJECT NEED

The CPUC's 1993 Storage Decision adopted a "let the market decide" policy with respect to the construction or expansion of new storage facilities.[1] This Decision created a presumptive showing of need. In other words, as long as an applicant was willing to take the financial risk associated with a proposed project, seeking recovery of its investment solely through the rates negotiated with its customers, then it was unnecessary to test the

[1] Re: Natural Gas Procurement and System Reliability Issues. *D. 93-01-013, 48 CPUC 2d 107 (1993).*

need for a new gas storage facility on a traditional resource planning basis. WGSI relied on this presumptive showing of need in obtaining its original CPCN.

In its decision on the Lodi Gas Storage Project,[2] the Commission, however, retreated from the presumptive showing of need established in the Storage Decision and required Lodi to make a more "traditional" needs showing. Based on the record in that proceeding, the Commission concluded that "a general need for competitive gas storage services in California" had been established and that "the benefits of competitive gas storage include (a) increased reliability; (b) increased availability of storage in California; (c) the potential for reduced energy price volatility; and (d) the potential for reduced need for gas transmission service."

Growth in the level of electric generation capacity in the state will necessitate growth in the level of gas infrastructure to support such capacity. The majority of generation plants in development in California at this time are fueled by natural gas. When a natural gas system is constrained during peak periods, increased gas storage capacity allows the system to serve additional load, provided that the adequate off-peak transmission capacity exists to allow the new storage inventory to be full. In this manner, incremental storage can serve the same functions as additions to gas transmission capacity. Benefits of storage to the marketplace are described in further detail, and quantified in WGSI's Application to Amend its CPCN.

2.3 Existing Facilities

HISTORY OF THE FIELD

The Wild Goose Gas Field was discovered in 1951 and produced in excess of 100 billion cubic feet (Bcf) of natural gas from nine primary wells tapping each of the 12 zones. Natural gas from the field was routed to a small compressor at the location of the existing Well Pad Site. From the Well Pad Site the gas was transported through an 8-inch diameter collector pipeline to PG&E's Wild Goose Mixer Station on West Liberty Road. Production ceased at the end of primary reservoir depletion in 1988 and all wells were abandoned in accordance with the California Division of Oil, Gas, and Geothermal Resources (DOGGR) standards.

UNDERGROUND NATURAL GAS FIELD

The Wild Goose Gas Field consists of 12 distinct underground porous rock zones located at depths ranging from 2,550 feet to 3,450 feet below the ground surface (see Figure 2.3-1). The individual zones are separated from each other by impervious rock (shale) formations. These zones have three primary characteristics that make the field structurally suited for natural gas storage:

- The impervious dome-shaped "cap rock," which varies in thickness from 10 to 75 feet, serves as the top of the reservoir and traps the natural gas within the top portion of the dome.

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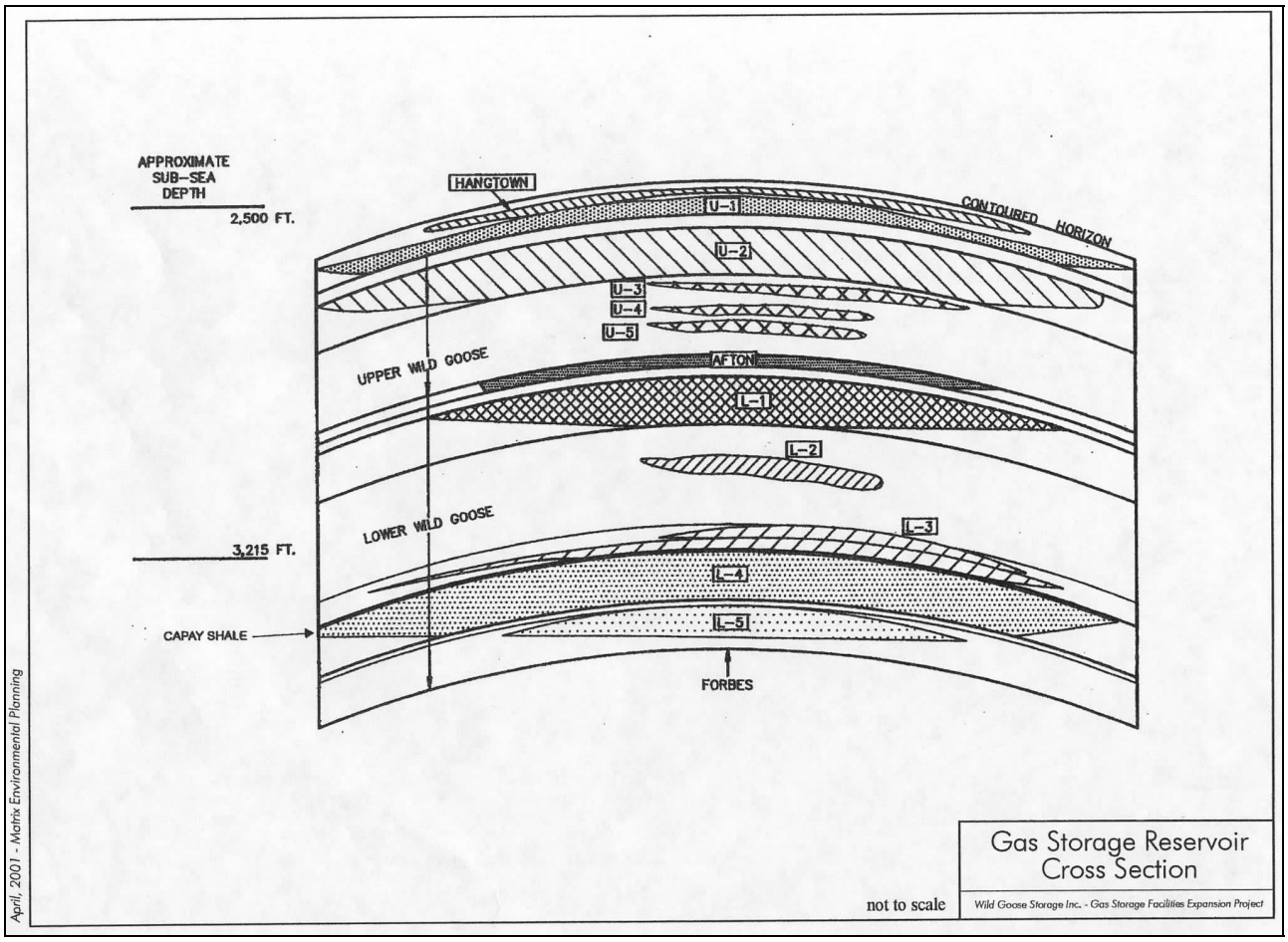
[2] Re Lodi Gas Storage, LLC, *Decision 00-05-048.*

- The reservoir body is composed of highly porous and permeable sandstone rock within which the gas is actually contained.
- The flanks of the reservoir are saturated with water and are in contact with large, deep saline aquifers that provide pressure support – termed "water drive" – during natural gas withdrawal.

Figure 2.3-1: Underground Rock Zones



SOURCE: WGSI 2001

RESERVOIR DEVELOPMENT

Impervious shale layers segregate all 12 zones, allowing individual zones to be converted to natural gas storage independently. Although the field produced over 100 Bcf of natural gas, the working natural gas storage capacity is estimated to be only about 38 Bcf due to reservoir geology and a requisite volume of cushion gas for each zone. Of the 12 zones, the L-1, L-4, U-1, and U-2 Zones were determined to have the optimum combination of permeability and strong water drive, which makes them suitable for conversion to storage service. The L-4 zone (the second deepest) was considered to be the best candidate during the initial project development due to its greater capacity (14 Bcf working gas). Detailed

geologic and engineering analyses were conducted to determine the reservoir's ability to store natural gas. The resultant technical data were included in the Application for Gas Storage submitted to DOGGR prior to initial project development. Simulation studies were used to predict the reservoir pressure response under both injection and withdrawal operations. Operational experience to date confirms that the reservoir response is consistent with that predicted by the simulation studies.

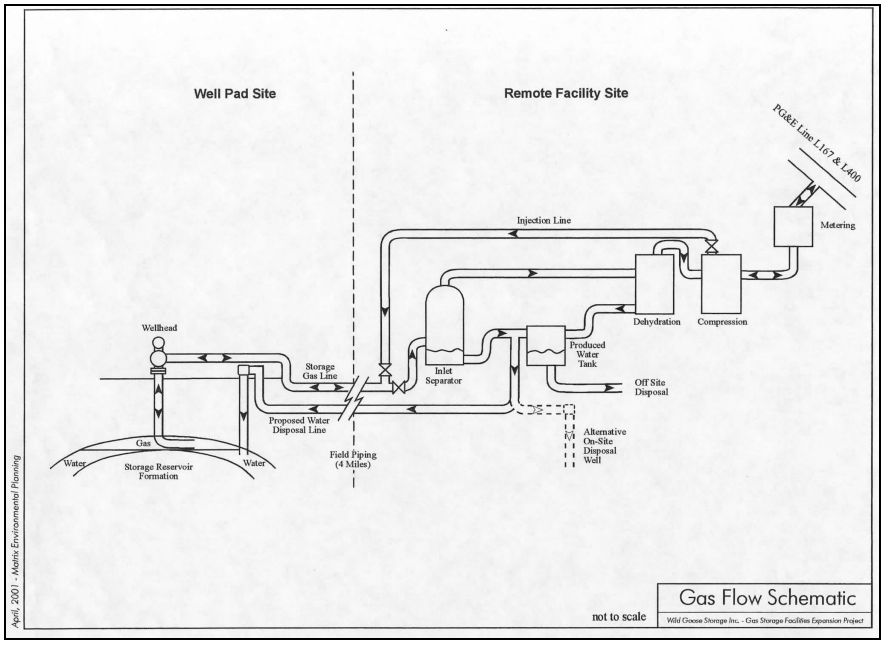
As previously described, the L-1, U-1, and U-2 zones appear to be the most suitable for storage conversion. To the extent that any of the remaining eight zones could provide natural gas deliverability consistent with customer demands, they could also be tapped and developed as part of future expansions.

EXISTING OPERATIONS

Injection Operations

During injection operations, natural gas flows from the PG&E pipeline through the Remote Facility Site compressor and the project's bi-directional Loop Pipeline to the Well Pad Site for injection into the field (see Figure 2.3-2). Typically, natural gas is taken from the PG&E pipeline at pressures ranging from approximately 400 to 1,100 pounds per square inch gauge (psig) and injected into the reservoir to a maximum design surface pressure of 2,000 psig. Current injection capability is 80 million cubic feet per day (Mmcfd).

Figure 2.3-2: Gas Flow Schematic From RFS to Well Pad



SOURCE: WGSI 2001

Withdrawal Operations

During withdrawal operations, natural gas flows from the Well Pad Site back through the Remote Facility Site and into the PG&E system. The wellhead surface pressures under withdrawal conditions typically range from 1,750 psig to approximately 700 psig, and require the use of compression. The volume of daily, weekly, and monthly injections and withdrawals vary with customer demand, and is subject to the volume, deliverability, and injection capabilities of the Field. All injections and withdrawals are operationally dispatched and controlled by project personnel working at the Remote Facility Site. Current withdrawal capability is 200 Mmcfd.

Produced Water

When natural gas is withdrawn from the reservoir, small amounts of water from deep saline aquifers connected to the storage reservoir may also be withdrawn. This water, called "produced water," is high in mineral salt concentration (approximately equivalent to that of sea water) and must be separated and removed from the gas stream with the use of an inlet separator and a dehydration system. Produced water is stored at the Remote Facility Site and hauled away for off-site disposal. A deep injection well for disposal of produced water was approved by DOGGR and the CPUC as part of the initial project development; this injection well has not yet been drilled but may be drilled if excessive amounts of produced water are generated.

Cushion Gas Injection

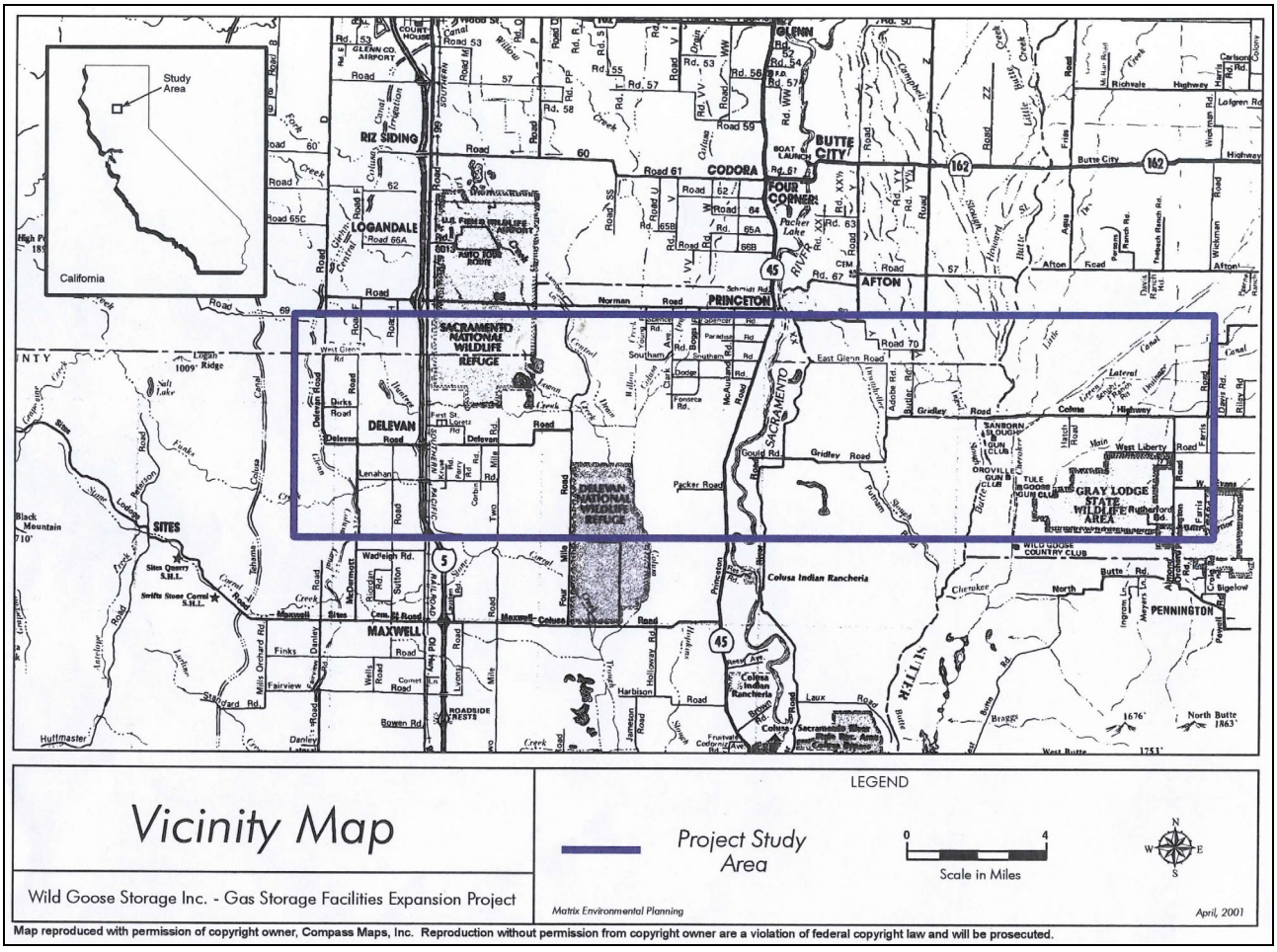
Prior to the initial utilization of Storage Zone L-4, a two- to three-month start-up phase was required, during which cushion gas was injected into the storage reservoir. This re-established the gas saturation, slowly depressed the natural gas/water contact zone in the porous sandstone formations, and established the base field pressure. The cushion gas becomes a permanent component of the reservoir and is not normally withdrawn.

2.4 Project Description and Ownership

PROJECT LOCATION

The proposed WGSI Expansion Project is north of Sacramento in Butte and Colusa Counties (see Figure 2.4-1). Additional project location information is presented later in this section.

Figure 2.4-1: Project Location



SOURCE: WGSI 2001

PROJECT DESCRIPTION

The proposed project would expand WGSI's permitted storage capacity to 29 Bcf, with daily injection and withdrawal rates increased to 450 Mmcfd and 700 Mmcfd respectively (see Table 2.4-1).

Table 2.4-1: WGSI Permitted Maximum Storage, Injection, and Withdrawal Limits

	Existing	**Proposed**
Storage	14 bcf	29 bcf
Injection	80 Mmcfd	450 Mmcfd
Withdrawal	200 Mmcfd	450 Mmcfd

SOURCE: MHA from WGSI 2001

For the expanded storage capacity and the greater rates of injection and withdrawal, four project components have been proposed:

- Expansion of the Well Pad
- Construction of a second Storage Loop Pipeline
- Expansion of the Remote Facility Site
- Construction of the Line 400/401 Connection Pipeline and Delevan Interconnect Facility

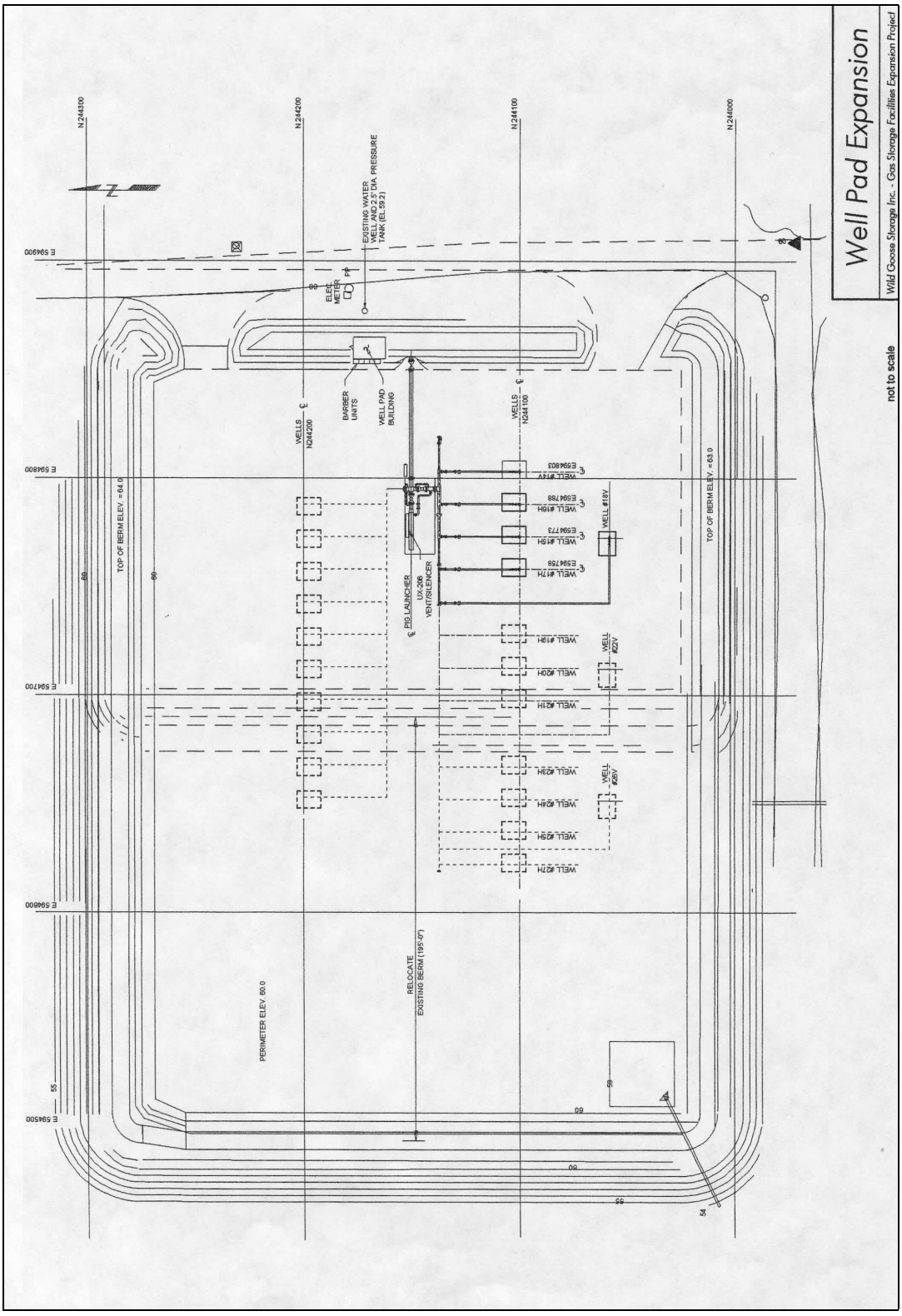
Well Pad Site Expansion

The existing Well Pad Site is located within the boundaries of the Gray Lodge Waterfowl Management Area (GLWMA), near the western jurisdictional boundary of Butte County (see Figure 2.4-2). The 1.5-acre Pad is currently developed with three injection/withdrawal wells and a single observation well. A series of near surface pipes and conduits connect the individual wells to the Loop Pipeline (see a description of the Loop Pipeline below). A relatively short berm that functions as a flood barrier surrounds the Pad.

Expansion of the Wild Goose Gas Field's permitted storage capacity would require expansion of the current injection and withdrawal capacity with additional injection/withdrawal wells. The Applicant has proposed expansion of the Well Pad Site by approximately 1.4 acres in a westerly direction from the existing Pad (see Figure 2.4-2). The Pad expansion would displace approximately 1.4 acres of wetland and require the importation of up to 26,000 cubic yards of structural earth material for construction of the additional Pad area and an additional 1,000 cubic yards of fill for expansion of the existing berm to encircle the expanded Pad.

The additional land area of the expanded Well Pad Site would permit the drilling of up to sixteen (16) new injection/withdrawal and observation wells. The proposed wells would be drilled into the L1, U1, and U2 Storage Zones. The injection/withdrawal wells would be bi-directional, and for both the injection and withdrawal of natural gas. The observation wells would be used for observing and monitoring the Reservoir's characteristics and status.

Figure 2.4-2: Well Pad Site Expansion



SOURCE: WGSI 2001

Once the wells were drilled, the wellhead and well monitoring equipment at each well would be installed below the adjacent ground surface in concrete lined pits. The pits would be covered over with steel doors, which would open only for service.

In addition to the new wells, the expanded Well Pad Site would also include near-surface pipes and conduits to connect the new wells to the Storage Loop Pipeline and the Remote Facility Site (see a description of the Remote Facility Site below).

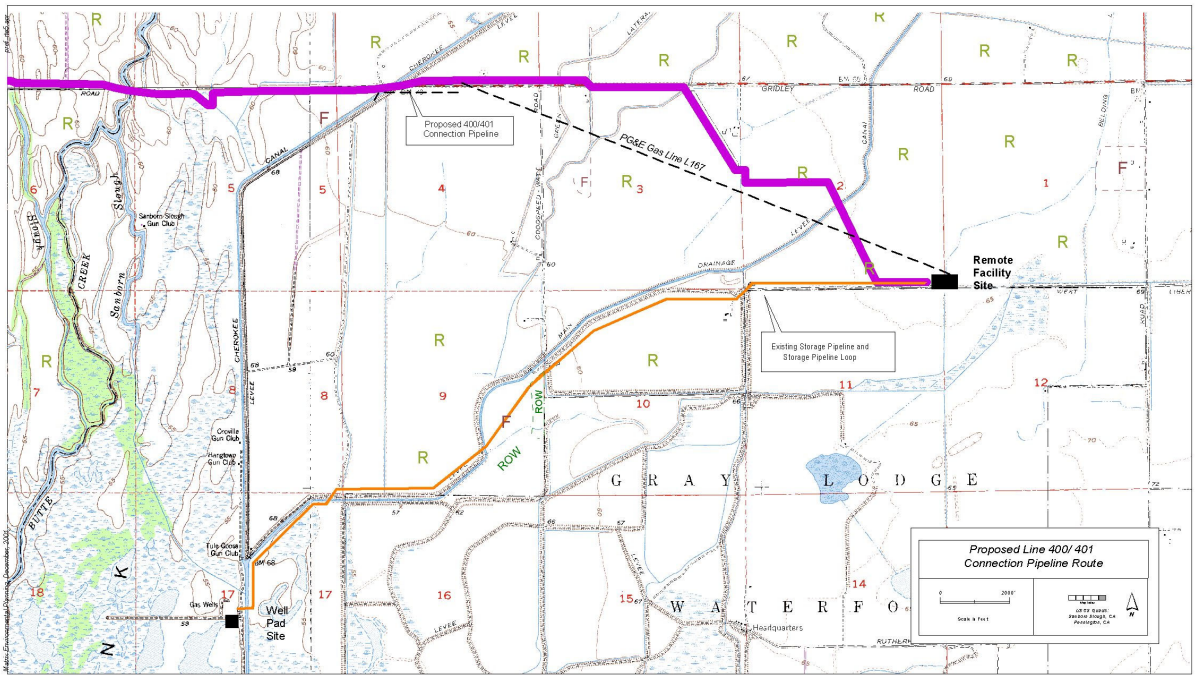
The Well Pad Site is accessed from the south via a private gravel road through the Wild Goose Club. A new access road and bridge were installed across the Cherokee Canal just south of the Wild Goose Club as part of the initial project development.

Storage Loop Pipeline

Gas injection and withdrawal and monitoring of the reservoir is controlled from the Remote Facility Site, located approximately 4.5 miles northeast of the Pad. A Loop Pipeline connects the two sites (see Figure 2.4-3 a). The existing Loop Pipeline is an 18-inch diameter bi-directional subsurface pipe that conveys natural gas between the two facilities. In addition to the Loop Pipeline, there is an existing 3-inch diameter produced-water pipeline that conveys produced water[3] from the Well Pad Site to the Remote Facility Site for processing and disposal.

[3] When natural gas is withdrawn from reservoirs, small amounts of water from deep saline aquifers connected to the Storage Reservoir may also be withdrawn. This water, called "produced water," is high in mineral salt concentration (approximately equivalent to that of sea water), and must be separated and removed from the gas stream with an inlet separator and dehydration system.

Figure 2.4-3a: Proposed Line 400/401 Connection Pipeline Route



SOURCE: MHA 2002

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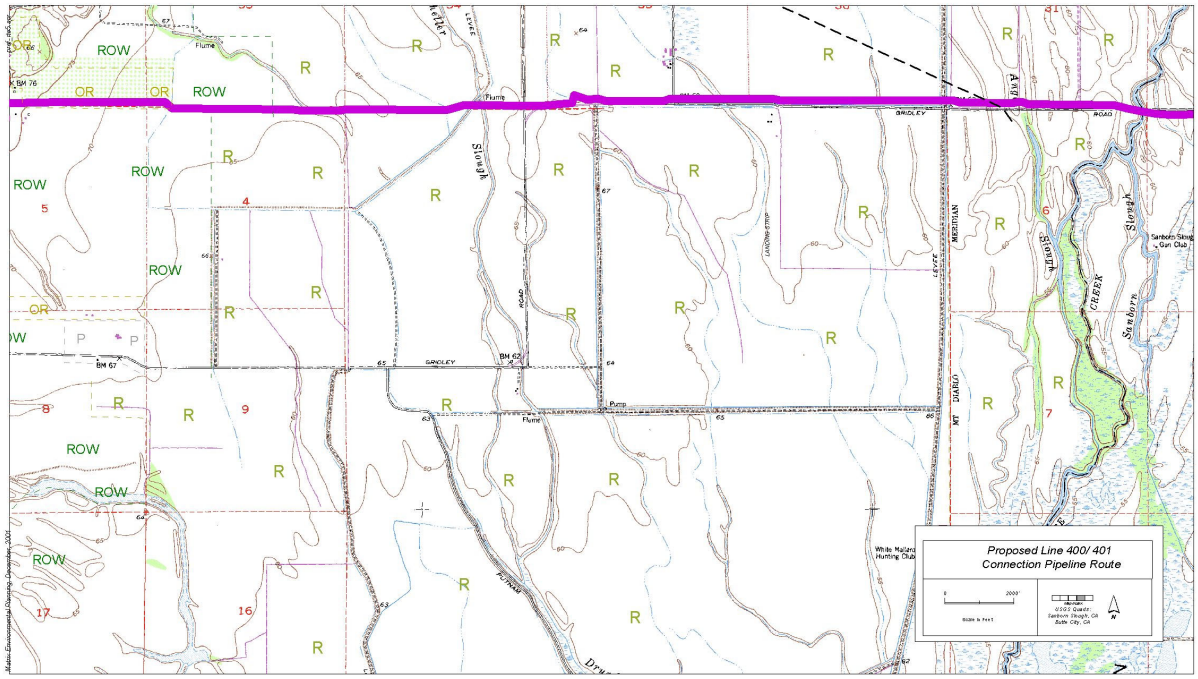
Figure 2.4-3b: Proposed Line 400/401 Connection Pipeline Route



SOURCE: MHA 2002

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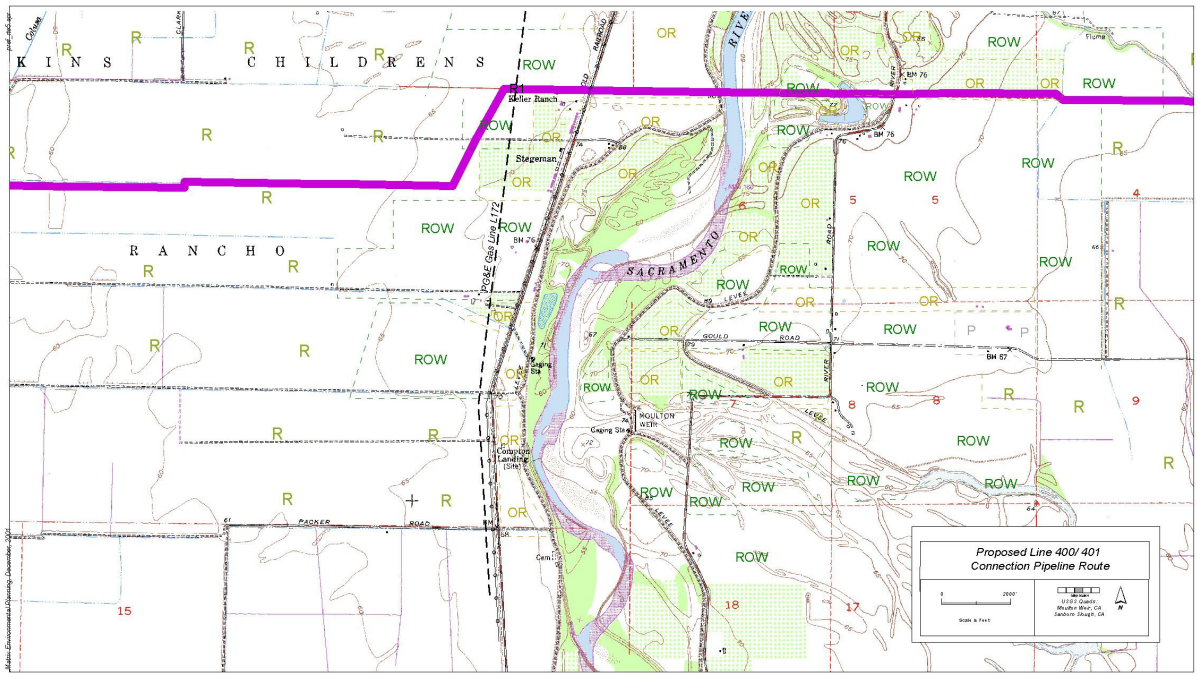
Figure 2.4-3c: Proposed Line 400/401 Connection Pipeline Route



SOURCE: MHA 2002

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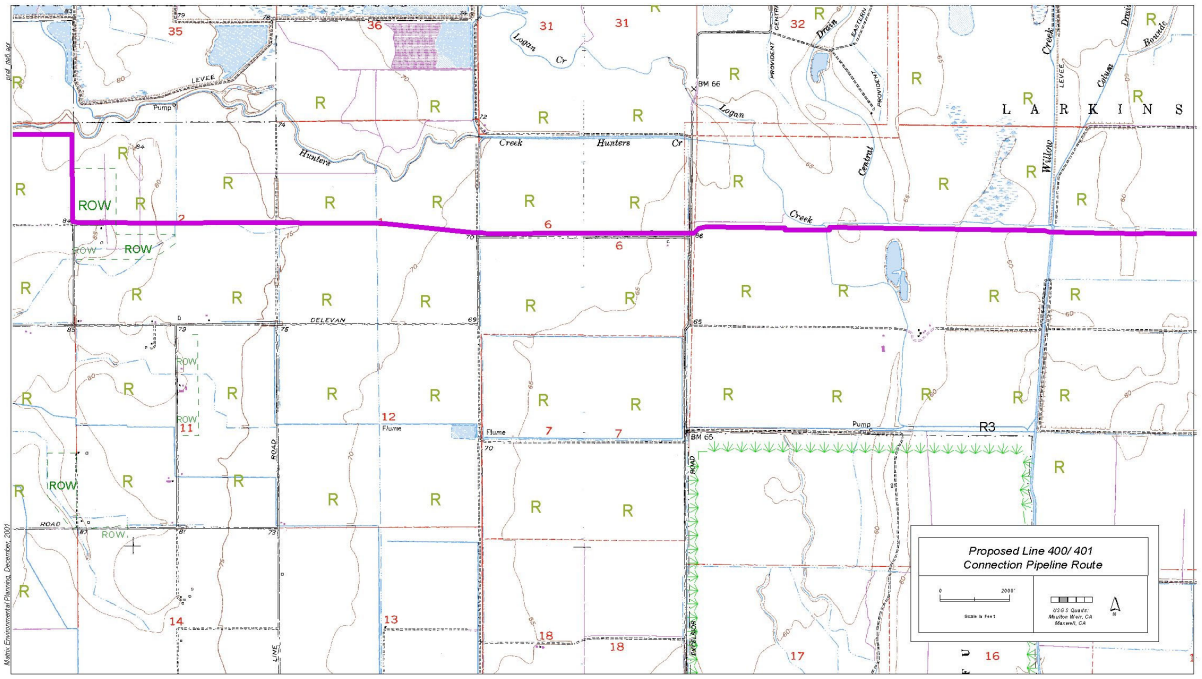
Figure 2.4-3d: Proposed Line 400/401 Connection Pipeline Route



SOURCE: MHA 2002

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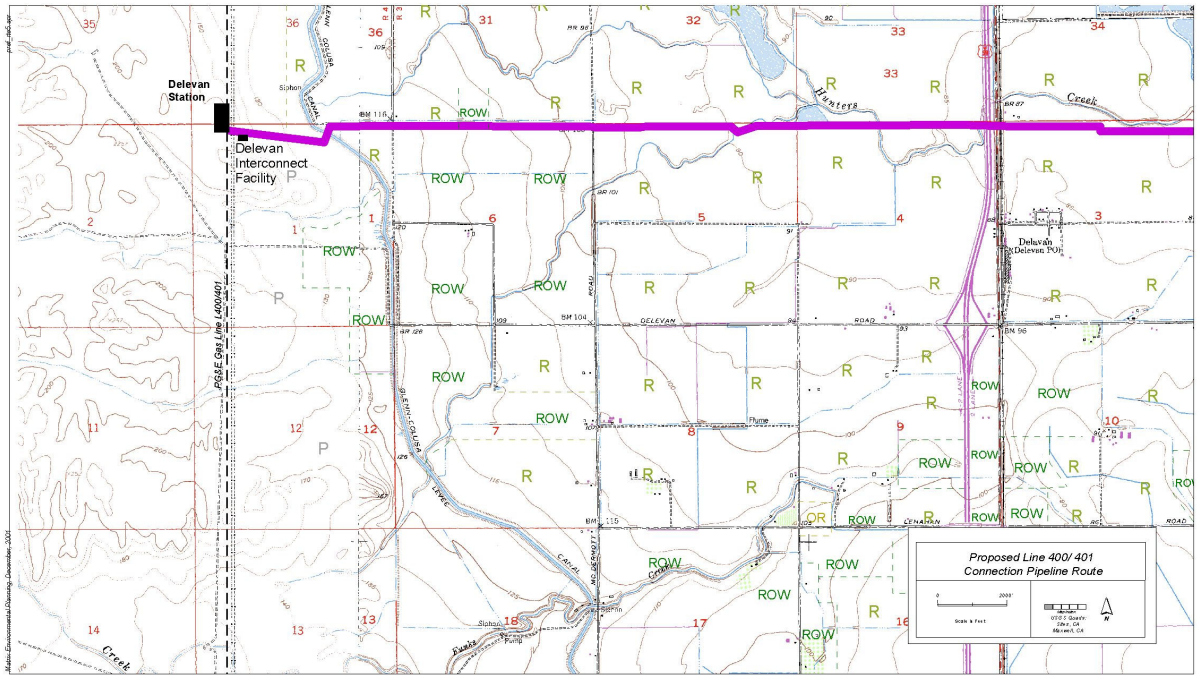
Figure 2.4-3e: Proposed Line 400/401 Connection Pipeline Route



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The Applicant has proposed the installation of a second Storage Loop Pipeline between the Well Pad Site and the Remote Facility Site, to convey the additional volume of natural gas. The second Storage Loop Pipeline would be a maximum of 24-inches in diameter and would be installed within the existing Storage Loop Pipeline's permanent easement. The exception to the second Pipeline's alignment would be if the existing Pipeline is located along a county road that, due to other pipelines in the area, does not have sufficient room for the proposed second Pipeline. In that location, the second Pipeline would be installed along the edge of an existing rice field.

Remote Facility Site

The proposal to increase the permitted operational capacities of the Wild Goose Gas Field includes expansion of the Remote Facility Site. The existing Remote Facility Site is located approximately 4.5-miles northeast of the Well Pad, off of West liberty Road (see Figure 2.4-3 a).

The existing 6.1-acre Remote Facility Site (RFS) serves as the hub for WGSI's operation of the Storage Field. The metering, processing, and compression of natural gas for injection into the Field and its withdrawal is controlled from the RFS. The RFS also serves as the current point of entry and departure for natural gas into Pacific Gas and Electric Company's (PG&E) Line 167. The major existing components at the RFS include the following:

- Three compressors housed within a sound insulated building
- A control room/office
- A glycol regeneration system
- A mechanical building
- A stand-by generator
- Compressor gas coolers
- Process water tanks
- Produced-water tanks

The Applicant has proposed expansion of the RFS to accommodate the added field capacity. The Site would be physically expanded by 5.8-acres, to a total of 11.9-acres. The proposed expansion of the Site would impact approximately 5.8-acres of existing rice field.

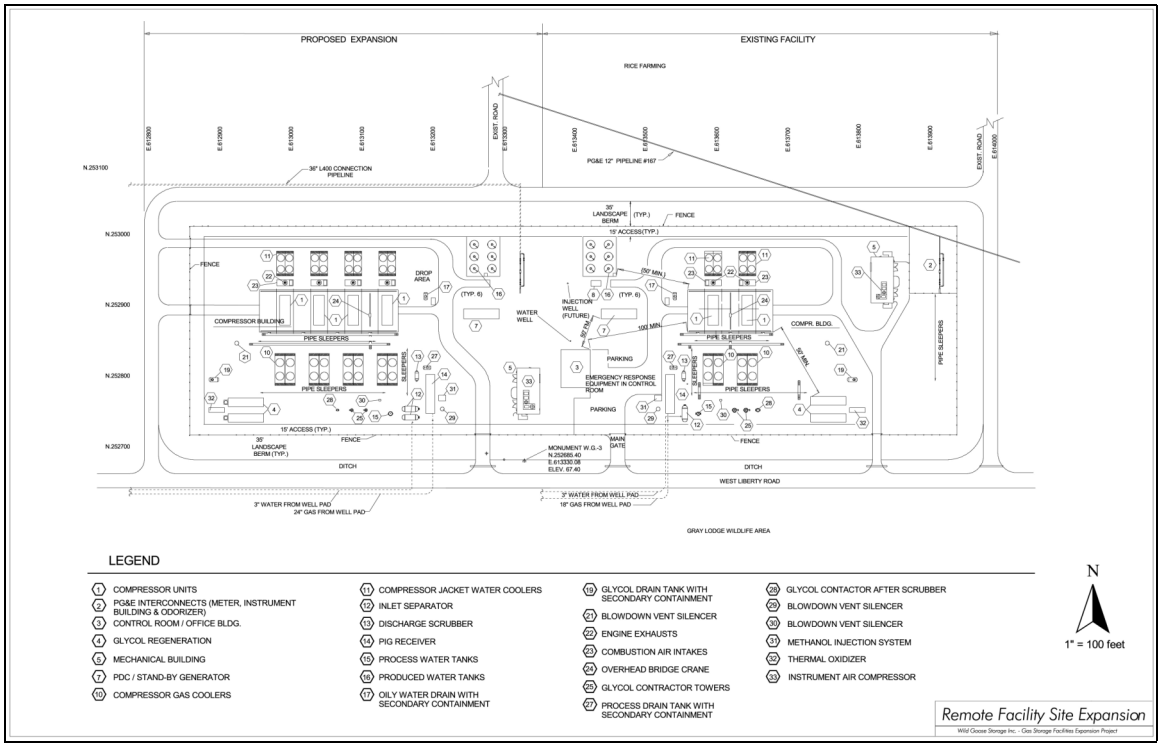
The additional equipment that would be installed at the expanded RFS would include:

- Three additional natural gas-fueled engines and compressors producing up to 14,400 horsepower
- Up to six additional produced-water storage tanks with a total capacity of 200,000 gallons
- Dehydration units and reboilers
- Natural gas coolers
- A relief vent for pressure relief from the compressor station piping

- A new 1,000-gallon glycol supply/drain tank
- A standby generator

See Figure 2.4-4 for a depiction of the existing and expanded RFS and listing of all existing on-site facilities.

Figure 2.4-4: RFS Expansion and On-Site Facilities



SOURCE: WGSI 2001

All project staff are stationed at the RFS. The Facility is staffed seven days a week with a day shift to meet customer injection or withdrawal needs. Evening and weekend call-out duties would rotate among the staff. The existing positions include:

- Plant Superintendent/Manager
- Operations Staff
- Electrical/Instrumentation Maintenance Technicians
- Mechanical/Equipment Maintenance Technicians

The present complement of four operations and maintenance staff would be supplemented with up to four additional staff during full project expansion.

Line 400/401 Connection Pipeline and Delevan Interconnect Facility

Natural gas currently enters and departs the WGSI facilities via the PG&E Line 167. In turn, Line 167 connects to the PG&E gas distribution system. Line 167 has a limited capacity not capable of accommodating the volume of gas proposed to be injected, stored, and withdrawn in the Wild Goose Gas Field. The network to which Line 167 belongs also reaches a limited user base.

The applicant has proposed the construction of a 25.6-mile pipeline to connect the WGSI facilities to the PG&E Line 400/401 (see Figure 2.4-3 a-e). The proposed Connection Pipeline route begins at the Remote Facility Site and follows a general westerly route, crossing agricultural lands, wetlands, the Sacramento River, and Interstate 5 prior to termination at the PG&E Delevan Compressor Station. The Connection Pipeline would pass the town of Delevan along the route's western edge and the Town of Gridley to the east. The Line 400/401 Connection Pipeline would be up to 36-inches in diameter and would have a minimum of 5 feet of cover.

In addition to the Connection Pipeline, two fiber-optic cables would also be installed to provide operational control of valves and other monitoring equipment along the Pipeline and throughout the proposed Delevan Interconnect Facility.

In compliance with federal safety requirements, one or more sectionalizing block valves would be installed in fenced and graveled lots measuring approximately 50 feet by 50 feet. The number and location of these valve lot(s) on the Connection Pipeline alignment would be determined in cooperation with the property owners, would be consistent with the federal requirements, and would preferably be sited near an existing access road to minimize interference with agricultural operations.

These lot(s) would contain aboveground valves and a pipe vent to de-pressurize (termed "blowdown" in natural gas pipeline vernacular) the Pipeline for emergency situations or for the very infrequent pipeline maintenance activity that requires de-pressurization. Site lighting would be provided for security. An electrical service connection to the valve lot(s) may be required from the existing PG&E 12 kV local distribution system running along local roads.

The proposed Delevan Interconnect Facility would connect the Connection Pipeline to the PG&E Line 400/401. The Interconnect Facility would occupy about 0.37 of an acre of land adjacent to Line 400/401 at the Delevan Compressor Station. The Interconnect Facility site would include a small pre-engineered metal building, which would house the equipment for controlling and monitoring the flow of gas between the WGSI system and Line 400/401.

PROJECT OWNERSHIP

WGSI is a subsidiary of Alberta Energy Company Ltd. (AEC), Canada's largest natural gas producer. Through a recent application with the CPUC, WGSI received the necessary authorization to transfer 100% of its issued shares from AEC Oil & Gas (USA) Inc. to AEC Storage and Hub Services, Inc. This effectively transferred controlling interest in WGSI to a company that is knowledgeable in natural gas storage issues. Currently, the WGSI system is interconnected with one of the PG&E local transmission systems (Line 167). Pursuant to the Gas Storage Service Rules adopted in the CPUC's Storage Decision, PG&E is required, upon request, to interconnect its transmission facilities with an independent

storage provider such as the WGSI. Pursuant to CPUC regulations, PG&E must provide accessibility to consumers receiving natural gas originating from an independent storage facility, in this case the Wild Goose system. The service provided by the WGSI facility must be equivalent in quality to the natural-gas service provided by PG&E-owned facilities.

2.5 Project Land Requirements

The proposed project would require land both for temporary construction use and for permanent components as described below. Temporary use areas would need to be constructed immediately adjacent to the proposed components and at several material laydown and construction staging areas nearby. Permanent land rights would be required in the form of easements for the pipelines and either long-term leases or fee purchase for the other aboveground components. Except for the main line block valve lot(s), the easement areas would be returned to their previous use, while the lease or fee purchase areas would be permanently dedicated to the particular project use. The proposed project would result in the temporary and permanent disturbance of land as depicted in Table 2.5-1.

Table 2.5-1: Surface Disturbance (acres[1])

Land Use	Rice		Row Crop		Pasture/ Fallow		Wetland/ River		Other[2]
Project Component	**Temp**	**Perm**	**Temp**	**Perm**	**Temp**	**Perm**	**Temp**	**Perm**	**Temp**
Well Pad Site							1.4	1.3	
Storage Loop Pipeline[4]	17.2		0.7		2.9		8.4		
Remote Facility Site		5.8							5.5
L167 Relocation[3]	0.8	0.5							
Line 400/401 Connection Pipeline	155.6	66.7	37.6	16.1	5.6	2.4	10.1	4.3	5.0
Delevan Interconnect Facility					0.5	0.5			
Total	173.6	73.0	38.3	16.1	9.0	2.9	19.8	5.7	10.5
Total Temporary Use	251.1 acres								
Total Permanent Use	113.6 acres								

Notes:

1. All acreage values are estimated and are approximate
2. "Other" is previously disturbed areas as described in 2.0 Project Description
3. Assumes construction staging for L167 will be provided in the Remote Facility staging area(s)
4. Assumes construction staging for the Storage Pipeline Loop will use the same area as the Line 400/401 Connection Pipeline

SOURCE: Wild Goose Storage, Inc. 2001

WELL PAD SITE

The expansion of the Well Pad Site would require an additional 1.4 acres, making the total pad area 2.9 acres within a 8.5-acre lease tract. The 8.5-acre lease tract was secured from the Wild Goose Club prior to initial project development. Approximately 1.3 acres of laydown and staging area would be temporarily used during construction along the west and north sides of the pad expansion area.

STORAGE LOOP PIPELINE

The second Storage Loop Pipeline would use the existing 30-foot wide permanent easement occupied by the existing Storage Loop Pipeline, but would require approximately 29 acres of 60-foot-wide temporary construction working area, including temporary workspace required at each bore site (see Construction Methods). During initial project development, the 45-foot wide temporary working strip was found to be too narrow for the condition of the trench spoils in this high groundwater area. Temporary laydown and staging would occur at the same location as the Line 400/401 Connection Pipeline at the Gray Lodge parking lot.

REMOTE FACILITY SITE

During initial project development, the 6.1-acre Remote Facility Site tract was obtained under a long-term lease, and 3.9 acres were fenced for operation of the existing aboveground facilities. The remainder was retained as a buffer area for the landscaped berm and farm access road. To accommodate the facilities and equipment associated with the proposed expansion, the lease area would be extended to the west to coincide with the existing rice field layout. The proposed expansion area would increase the lease area an additional 5.8 acres, for a total of 11.9 acres. The fenced operations area would increase by 4.5 acres, for a total of 8.4 acres. The perimeter landscaped berm and the farm access road would be relocated to the west edge of the lease area as part of the expansion. Laydown and staging for the Remote Facility Site would temporarily use approximately 5.5 acres of previously disturbed land. To accommodate the relocation of the PG&E Line 167 around the site perimeter, approximately 0.5-acre of new 30-foot wide easement would be required, and just under one acre would be required for the temporary construction working strip.

LINE 400/401 CONNECTION PIPELINE AND DELEVAN INTERCONNECT FACILITY

The Line 400/401 Connection Pipeline would require approximately 100 acres of permanent easement (30 feet wide) and 219 acres of temporary construction working strip (75 feet wide). This area includes the temporary workspace required at each bore site (see Construction Methods). The main line block valve lot(s) would measure approximately 50 feet by 50 feet, overlapping the permanent pipeline easement. Material laydown and worker staging may be temporarily required at three separate locations along the pipeline route, totaling approximately five acres.

The Delevan Interconnect Site would permanently occupy about 0.5 acre, and there would be a 0.5 acre laydown and staging area adjacent to the site during construction.

2.6 Construction Staging and Access

WGSI has developed a plan for project staging and access. The plan described below is based on the Applicant's experience with initial project development and similar storage projects. WGSI would prepare a detailed construction access plan and a Transportation Management Plan prior to construction. The plans would be submitted to the CPUC and other appropriate agencies for review and approval.

CONSTRUCTION STAGING

Well Pad Site

Construction at the Well Pad Site would occur in two stages. The Well Pad Site would be constructed first prior to well drilling. If the schedule allows for concurrent Well Pad Site expansion and drilling, a safety buffer would be established between the two activities.

During Well Pad Site expansion, construction equipment would use a 100-foot-wide access area for staging and parking on the area surrounding the north and west sides of the existing Well Pad Site and expansion area. Vegetation in this access area would be mowed to ground level prior to construction. Equipment operators would park their personal vehicles along existing roads, adjacent to the existing Well Pad Site facilities, or near the Wild Goose Club compound. This staging and parking area would be restored to pre-construction condition after completion of the Well Pad Site expansion.

The equipment associated with the drilling activity would occupy the entire existing Well Pad Site area. The only area needed outside the existing pad would be an upland area just outside the northeast corner of the existing Well Pad, to be used for parking office and accommodation trailers. These trailers would be occupied by technical staff that must remain onsite during the entire drilling operation, 24 hours per day, with downtime only when the drill rig is moved to the next well location. This upland site was used for this purpose during well drilling for the initial project development. Non-potable water would be provided from the existing well at the east side of the pad. Power would be provided from the electrical service panel at the water well pump. Sewage from the trailers would be collected in plastic tanks and pumped by a local septic tank pumping service. Potable water would be provided in bottles.

Storage Loop Pipeline

A portion of the large parking area at the entrance to the Gray Lodge would be used for construction worker, equipment, and material staging for the Storage Loop Pipeline. The agricultural landing area just west of the Remote Facility Site may also be used for Storage Loop Pipeline construction staging. Workers would report to this staging area and be transported by bus or van to their work site on the Storage Loop Pipeline. The contractor may have office trailers at this location as well. The staging area may be fenced for security.

Remote Facility Site

A primary staging area would be created on the agricultural landing area just west of the Remote Facility Site. This 5.5-acre area would be used for worker parking and equipment

and material storage. A second access driveway to West Liberty Road may be installed to improve access to this site. A portion of the staging area may be fenced for security. Construction office trailers may be located either near the existing control building or at the staging area. Temporary construction electrical service connections would be made from the existing PG&E electric distribution line along West Liberty Road as needed. Contractors and their forces would drink bottled water use portable toilets.

Line 400/401 Connection Pipeline and Delevan Interconnect Facility

The Gray Lodge Wildlife Management Area manager has agreed to allow pipeline construction staging on a portion of the Gray Lodge Wildlife Management Area (Gray Lodge) parking lot along Pennington Road, as was done during initial project development. A Pipeline staging area may also be provided along River Road and/or State Route 45 at or near the bore set-up sites on either or both sides of the Sacramento River. For the portion of the Pipeline west of the Sacramento River, a suitable staging area on Road 99 in the vicinity of Delevan may be identified and arranged with the property owner. Workers would report to the staging area and be transported by bus or van to their work site on the Pipeline. The construction staging areas would typically be previously disturbed areas such as agricultural processing, equipment parking areas, landing areas, former commercial or industrial storage yards, or fallow agricultural fields. The contractors may establish their office trailers at these locations. The staging areas may be fenced for security or other security arrangements would be made.

A construction staging area may be established adjacent to Delevan Interconnect Facility site for worker parking, a construction office trailer, and/or material laydown. The staging area may be fenced for security. The contractor may have an office trailer at this location as well.

CONSTRUCTION ACCESS

In general, construction traffic would use existing public and private paved and unpaved roadways to access construction sites. Details on construction access requirements are discussed in Section 3.15, Traffic and Transportation.

2.7 Construction Schedule

The construction schedule for the proposed expansion (see Figure 2.7-1) assumes initiation of the maximum scope expansion immediately following project approval. The schedule includes the following specific construction constraints imposed by environmental and land use issues in the project area:

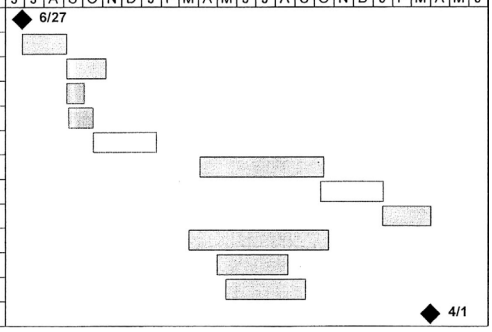
- As mitigation to avoid impact to the giant garter snake, surface-disturbing activities in potential snake habitat generally cannot occur during the months of October through April while the snake is hibernating. Potential habitat includes all rice fields, wetlands, and both agricultural and natural waterways.
- As mitigation to avoid increased impacts to wetland vegetation and soils in the Butte Sink area, construction should occur during the dry season – typically from early-June through late August.

- As mitigation to avoid impacts to the waterfowl management and hunting activities in the area, outside noise-producing construction activities should not occur during the hunting season, which typically runs from mid-October through late-January. The construction schedule provides a split construction period for the mechanical work at the Remote Facility Site to reflect this constraint. Limited indoor activities or quiet outdoor activities such as electrical and instrumentation work may take place during hunting season. If schedule variables make it necessary to continue full outdoor construction activities into the beginning of hunting season, or to resume full outdoor construction activities before the end of hunting season, WGSI will negotiate appropriate mitigation with the adjacent hunting lessees and the Gray Lodge manager to compensate for the lost hunting opportunities.
- As mitigation to avoid harming sensitive bird species during their breeding and nesting season, construction activities may be delayed in the vicinity of active nests until the chicks have fledged.
- As mitigation to avoid impacting winter-run Chinook salmon by a subsurface fracture when boring the Sacramento River, the bore will be scheduled between April 15 and June 15. To avoid impacting the spring run Chinook salmon and steelhead, the bore under Butte Creek will be scheduled for between June 15 and October 15.

Figure 2.7-1: Construction Schedule

Proposed Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
1	CPUC Hearing/Project Decision	0 days	Thu 6/27/02	Thu 6/27/02	
2	Finalize other project permits	10 wks	Fri 6/28/02	Thu 9/5/02	1
3	Line 400 Connection P/L - ROW Isolation	9 wks	Fri 9/6/02	Wed 11/6/02	2
4	WPS Civil - Fill Placement	4 wks	Fri 9/6/02	Thu 10/3/02	2
5	RFS Site Preparation and Civil	6 wks	Mon 9/9/02	Thu 10/17/02	
6	*Waterfowl Hunting Season*	14.2 wks	Fri 10/18/02	Fri 1/24/03	5
7	RFS Mechanical/Electrical Phase 1	28 wks	Fri 4/4/03	Wed 10/15/03	
8	*Waterfowl Hunting Season*	14.2 wks	Sat 10/11/03	Fri 1/16/04	
9	RFS Mechanical/Electrical Phase 2	11 wks	Fri 1/16/04	Thu 4/1/04	
10	Pipeline Construction	32 wks	Mon 3/17/03	Thu 10/23/03	
11	WPS Well Drilling & Piping	16 wks	Thu 5/1/03	Wed 8/20/03	
12	Delevan Interconnect Site	18 wks	Thu 5/15/03	Wed 9/17/03	
13	**Project Operational**	0 days	Thu 4/1/04	Thu 4/1/04	



SOURCE: WGSI 2001

Construction would typically occur up to 13 hours per day, 5 to 7 days per week depending on progress or the particularities of the task. Wells would be drilled 24 hours a day, 7 days a week, with down-time only when moving the drilling rig to the next well position. To maintain the schedule, a night shift may be temporarily implemented for the mechanical and piping work at the Remote Facility Site. Such a shift was implemented during initial project development with the cooperation of the adjacent hunting lessees and state and federal resource agencies, but stringent noise and night lighting mitigation measures had to be taken.

2.8 Construction Work Force

Assuming the schedule depicted in Figure 2.7-1, approximately 300 total workers would be involved in the construction of the proposed project components as detailed in Table 3.12-2. The work force necessary for construction of the proposed facilities would be composed of:

- Pipe fitters
- Welders
- Electricians
- Instrument personnel
- Equipment operators
- Carpenters
- Iron workers
- Laborers

The mix of local and out-of-area labor will depend on the specific project component to be constructed, and is further discussed in Section 3.13, Socioeconomics and Pubic Services.

2.9 Construction Methods

WELL PAD

Pad Construction

After the Pad expansion area has been cleared of vegetation down to mineral soil, up to 26,000 cubic yards of fill would be placed and compacted to elevate the expansion area by approximately five feet. The fill would be taken from the on-site Giant Garter Snake Habitat Enhancement area or trucked in from an off-site agricultural field leveling project or one of the commercial quarries on the Sutter Buttes.

The on-site Giant Garter Snake Habitat Enhancement Plan (Appendix F) would include selective scraper excavation along pre-determined alignments to create channels and gently sloping banks that would be subject to regulated water introduction into the habitat. After stripping and stockpiling the topsoil, the scrapers would deliver the excavated subsoil to the Pad expansion area. Loaders and graders would place the fill in 6- to 12-inch lifts, watering and compacting each successive lift with a sheep's foot or wobbly-wheeled roller prior to placing the next lift.

The Well Pad Site would be covered with compacted aggregate. The final grade of the fill and gravel surface would be sloped to provide a drain according to the WGSI grading and drainage plan. Once the Pad reaches the optimal design compaction, grade, and elevation, the well-drilling operation would commence. A similar construction sequence would be followed if the fill material is trucked in from off-site. All facilities to be installed at the Well Pad Site would be designed to withstand periodic inundation.

The perimeter berm, consisting of material stripped during initial site clearing and/or imported topsoil, would be placed at a 2.5-to-1 side slope. The berm would measure three feet high on the west and south sides. On the north side the berm would measure four feet high to provide giant garter snake hibernacula.

Well Drilling

The well-drilling rig(s) would operate 24 hours per day, 7 days per week while each well is drilled. The rig(s) would operate continuously except for downtime for moving the drilling rig to the next well position. Fluids used in the drilling operation would be contained in rig tanks. Fluid circulation systems would be closed, resulting in no discharges. A licensed hauler would dispose of the off-site drilling mud solids; this material would be disposed of at an approved landfill disposal site, as is common practice in natural gas and oil field operations. Mervin G. Clark Construction of Sutter provided local disposal during initial project development, with disposal at the Fulton Reclamation Facility in Orland. All drilling activities would be in compliance with the permit issued by DOGGR.

Once the wellheads are installed in their subsurface vaults, the ancillary piping, valves, and monitoring equipment would be installed and tested. All monitoring equipment for the new wells would be positioned at the existing metering/monitoring building at the site.

STORAGE LOOP PIPELINE AND LINE 400/401 CONNECTION PIPELINE

Both the Storage Loop Pipeline and the Line 400/401 Connection Pipeline would be constructed using a combination of trenching, traditional boring, and directional drilling. The Right-of-Way (ROW) for the 36-inch-diameter Line 400/401 Connection Pipeline would be 100 feet wide. All construction activity would be confined to this corridor.

The ROW for the 24-inch Storage Loop Pipeline would be 90 feet wide. While the 18-inch-diameter Loop Pipeline was constructed using a 75-foot-wide ROW during initial project development, this width was found to be insufficient given the surface and subsurface conditions.

Wherever possible, one edge of the ROWs would be aligned along existing field edges or farm access roads. Where an irregularly shaped field edge or other site-specific situation results in a narrow band of agricultural field between the edge of the ROW and the field edge and/or farm road, the ROW would be widened to incorporate this narrow band and extend fully to the field edge and/or farm road. In some cases this would result in a ROW width slightly greater than 90 feet.

Additional ROW space would be required at directionally drilled stream, canal, and river crossings. The drill rig setup, mud tanks, and power units would require up to 100 feet by 100 feet of additional space adjacent to the ROW. On the exit side of the directional drilling, an additional 50-foot-wide strip, approximately 1.2 times the length of the crossing, would be needed to string, weld, and coat the pipe section that would be pulled through the drilled crossing.

Pipeline construction in the rice fields –considered to be giant garter snake habitat – poses significant scheduling challenges. The construction window in snake habitat is May

through September, while rice fields are usually flooded by May 1 and may not be harvested until the end of September. In order to construct the Pipeline in the rice fields during the active farming period, the ROW would need to be isolated from the adjacent fields and not flooded. While installation of the temporary rice dikes would ideally be performed during normal field preparation activities around late March or early April, depending on field conditions, these time periods are earlier than the authorized construction season for giant garter snake. Depending on the weather, harvest timing, and property owner cooperation, the Pipeline construction schedule may be split into two parts.

ROW Isolation

Prior Fall. The ROW may be isolated after harvest the fall season (likely September and early October) prior to construction to resolve the schedule conflict described above. A new, temporary rice dike 90 or 100 feet (or slightly longer along irregular field edges) from, and parallel to, the field edge, would be installed. The temporary dike may be constructed by pushing up soil to form the dike as is traditionally done, or by using the topsoil removed from the trench to create a dike.

Where irrigation flows must be maintained across the ROW, rigid culverts may be installed across the full width of the ROW as part of the preconstruction work. Sand bags would be used to seal the ends of the culvert, isolating the flowing water from the work area while the crossing is trenched.

By having the ROW isolated the prior fall, pipeline construction could begin on May 1 (or as soon as the field is sufficiently dry) without interfering with the rice field preparation, planting, and flooding schedule.

Spring. If ROW isolation the prior fall is not feasible, WGSI would work with the farmers to install the dikes during their field preparation in the spring. This may require delaying field flooding until the dikes are installed or securing special authorization from the United States Fish and Wildlife Service (USFWS) for dike installation prior to May 1, as was done during initial project development.

Pipeline Installation

Clearing and Grading. Clearing and grading prepares the ROW by removing obstacles or debris. Clearing would be kept to a minimum, and vegetation in non-agricultural areas would be cut or trimmed whenever possible rather than scraped clean.

Trenching. Trenching is conducted by tracked backhoes or ditchers, beginning with removal of the topsoil from over the trench and segregating it on the edge of the ROW for replacement following construction. In rice fields, this windrowed topsoil pile may be compacted and used as the isolation dike. The excavated subsoil is maintained in a separate windrow to be used as trench backfill following installation of the pipe.

The trench for the Line 400/401 Connection Pipeline would be a minimum of 54 inches wide (1.5 times the pipe diameter) and about 6 feet deep to ensure 3 feet of cover over the pipeline, or about 8 feet deep where at least 5 feet of cover is needed. The Storage Loop Pipeline trench would be a minimum of 36 inches wide and at least 5 feet deep to allow 3 feet of cover, or at least 7 feet deep where 5 feet of cover is needed. Where culverts are

used to convey irrigation flow across the ROW, backhoes would excavate under the culverts, and the culvert would span the trench until the trench is backfilled and the culverts are removed.

Stringing. To complete the pipe stringing, pipe lengths would be trucked to and along the ROW and unloaded with a crane or bulldozer and a side boom onto wooden supports.

Pipe Installation. Pipe installation includes bending for horizontal or vertical angles in the alignment, welding the pipe segments together, and applying an epoxy-based coating to the joint areas to prevent corrosion. The pipe would not be pushed or dragged into the trench, but would be lowered from the wooden supports into the trench by side booms. One or more main line block valves would be installed along with the Pipeline. Concrete thrust blocks would be poured around the pipe at angle points. The trench at these locations would be excavated to the necessary shape and size, and concrete would be poured around and over the pipe to create the thrust block. Concrete trucks would access these locations using the same route as the other construction equipment.

Backfilling. Backfilling the trench involves replacing the excavated subsoil in the appropriate layers. The topsoil would be re-spread to return the surface to its original grade. In areas where hardpan is excavated during trenching, that material would be replaced and compacted before the subsoil. The backhoe bucket would be used to compact the backfill in the trench. In addition, when all the subsoil has been replaced, the tracks of the backhoe may be driven along the trench to further ensure adequate subsurface compaction. The topsoil would be replaced last to re-establish the preconstruction soil profile. In non-agricultural areas, the topsoil may be mounded slightly over the trench to accommodate any future settling of the trench backfill.

Backfilling would occur within 72 hours of pipeline installation to preclude potential impacts to wildlife that may fall into the trench. At the conclusion of each day's trenching activity, the end of the trench would be left ramped at an approximate 2-to-1 slope to allow any such wildlife to escape. Since bores and thrust blocks are done by different crews on separate schedules, a short portion of the trench would be left open at these locations until that work is complete. A wildlife escape ramp would be maintained at the bore tie-in as well as at thrust block sites where backfilling would not be completed at the same time as the pipeline.

Hydrostatic Testing. Hydrostatic testing would include filling the pipeline with water, increasing the pressure to a minimum of 125 percent of the maximum operating pressure, and holding the pressure for a period of time in accordance with pipeline safety regulations and codes. Following testing, the pipe is typically flushed to remove dirt and other debris. The test and flushing water would be drawn from local sources and returned to these sources as described in Section 3.5, Hydrology. An energy dissipation basin, consisting of hay or straw bales, would be assembled to control the water discharged from the pipeline following hydrostatic testing and flushing. The Line 400/401 Connection Pipeline would be tested and flushed in several segments as determined by the contractor, so a separate basin would be assembled at each discharge point. All discharges to waterways would be conducted in compliance with the National Pollution Discharge Elimination System (NPDES) General Permit requirements administered by the Regional Water Quality Control Board.

Cleanup. Cleanup and restoration of the surface along the ROW and temporary workspaces would involve removing construction debris, final grading to the finished contour, and re-vegetation, if needed. Any cross-ROW irrigation culverts would be removed. The Delevan Interconnect Site and main line block valve lot(s) would be covered with gravel and enclosed with a chain link security fence.

Commissioning. Commissioning would involve drying the inside of the pipeline, purging the air, and filling the pipeline with natural gas.

ROW Restoration

Temporary rice checks and rigid culverts installed to segregate the ROW from flooded rice fields would be removed after the fields have been drained in late August or September following construction. Where needed, the fields would then be laser-leveled to their preconstruction levels and contour. This could also be done as part of field preparation the following spring. Restoration of non-agricultural lands would be addressed in a Restoration and Monitoring Plan as described in Section 3.4, Biological Resources.

Bores

All water crossings – irrigation ditches, canals, creeks, sloughs, or other natural water bodies – would be bored unless an irrigation flow culvert has been installed during ROW isolation or if the crossings can be dried out at least 14 days prior to construction. Water bodies in the project study area provide significant fish and wildlife habitat; therefore, boring under these conditions would substantially reduce potential environmental impacts. All water crossings along both the Storage Loop Pipeline and the Line 400/401 Connection Pipeline routes would be bored or a culvert bypass would be installed. In addition, State Route 45, Interstate 5, the railroad tracks, and paved county roads would also be bored. The additional workspace required for this activity is described in Construction Methods, Storage Loop Pipeline and Line 400/401 Connection Pipeline. Either directional or traditional bores would be used on the project.

REMOTE FACILITY SITE

The existing Remote Facility Site would be extended to the west to match the width of the south end of an existing rice field. The expansion area would be stripped of topsoil and organic material, and the area for building foundations would be over-excavated. The excavated material would be stockpiled and used as part of the fill needed to create the perimeter berm. The foundation areas would be filled with structural fill and compacted to support the anticipated weight of concrete foundations and equipment. The remainder of the fenced-in area would be filled, leveled, and compacted with approximately 18 inches of clean and structural fill to bring the subgrade up to the elevation of the adjacent rice field dikes.

Fill material would likely be obtained from one of the two quarries on the Sutter Buttes to the south. Aggregate would be spread and compacted over the subgrade to create a stable surface for construction activities. Drainage structures would be installed, the final grade of the gravel surface would be sloped to drain, and perimeter fencing would be installed.

Site development would continue with the civil, foundation, and structural work; mechanical and piping work; building erection and fabrication; electrical and

instrumentation work; and finally, berm installation, landscaping, and cleanup. During foundation excavation, forming, and concrete pouring/setting, sump pumps would be used to dewater the foundation areas. This groundwater would be pumped, filtered, and discharged into the drainage ditch running along West Liberty Road consistent with the applicable NPDES permit.

2.10 Operation and Maintenance Procedures

The proposed facilities would be integrated into WGSI's existing procedures for safety measures, operational controls, and the maintenance and monitoring described below.

GENERAL SYSTEM MONITORING AND CONTROL

The control room at the Remote Facility Site serves as the focal point for existing project systems monitoring, control, and operation. A fiber-optic communication system connects the Well Pad, Pipeline, valve, PG&E interconnect monitors and control functions to the control room computer system. In addition, PG&E monitors the flow and quality of natural gas throughout the total facility using equipment located in its metering building at the Line 167 connection point.

Control and monitoring functions for equipment and operations within the Remote Facility Site associated with injection and withdrawal operations are accomplished via hardwired connections to the control room computer system. The fiber-optic cables that would be installed with the Line 400/401 Connection Pipeline may be used for remote data gathering and control with Delevan Interconnect Site facilities and valves.

WELL PAD SITE MONITORING AND CONTROL

All storage wells would be metered during operations so that the characteristics and performance of the natural gas storage reservoir can be properly monitored. These data are supplemented by information collected from the vertical monitoring well. The storage wells would be equipped with emergency subsurface safety shutdown valves to close off the flow of natural gas from the wells to the Remote Facility Site under certain pre-determined conditions (fire, excessive pressure, etc.). In addition to the well emergency shutdown valves, a manual master shutdown valve was installed on the Loop Pipeline where it enters the Well Pad Site. All safety valves would be actuated via the Remote Facility Site controls.

REMOTE FACILITY SITE MONITORING AND CONTROL SYSTEMS

Redundant safety systems were installed in the existing facilities at the Remote Facility Site. Natural gas, fire, and vibration sensors monitor all equipment and will automatically shut down the facility if unusual conditions are detected. The facility is currently staffed with a day shift only, seven days a week. Automatic call-out to the operators would occur under any unusual circumstances at other times. When paged by the automatic call-out system, the on-call operator, using a laptop computer, dials up the telephone modem at the control room. Once the connection is made, the operator has the same graphic displays on the laptop computer as in the control room and can make all the same operations and

equipment adjustments and changes. This system would be expanded to include the proposed project facilities.

CONTROL ROOM TECHNOLOGY

The control room would be modified to incorporate the proposed project facilities. At the heart of the control room, personal computers and Programmable Logic Controllers provide automation of the control and monitoring functions as well as data collection, recording, and storage. This system provides continuous monitoring of critical parameters of all facilities and allows for the shutdown of individual areas or the entire operation, when specified conditions are detected. The system is connected to two graphic display monitors in the operator's console. One monitor provides a simplified flow diagram and operating status of the entire system. The second provides views into the operating conditions of individual process areas. It also provides views of the specific valve line-up or sequencing required for various system operations.

System operating parameters that typically would be monitored include flow, temperature, the Remote Facility Site, the Well Pad Site, and pressure of the natural gas movements within the PG&E system. In addition, the system allows the monitoring of major valve status or position for pressure control, flow control, and emergency shutdown valves on the Pipelines and wellheads. This system would be used for the proposed project facilities.

EQUIPMENT OPERATION

From the control room, the operator is able to provide valve line-up and sequencing for natural gas movement between the PG&E system, the Remote Facility Site, and the Well Pad, in addition to storage well selection. An operator does the manual start-up of major pieces of equipment such as compressors, coolers, and dehydrators from local control panels in the equipment building. This assures that the operators regularly inspect the condition and operation of the equipment and facilities. These procedures would be followed for the proposed project.

FACILITY INSPECTION AND SURVEY

The proposed project would include regular inspection of the pipelines, equipment, wells, instrumentation, control, and support systems. WGSI's operation includes early identification of items in need of maintenance, repair, or replacement to ensure continued safe operation of the natural gas storage systems. WGSI policies include written procedures for the operation, inspection, maintenance, and repair of the project pipelines, equipment, and facilities. The policies have been established by WGSI in an Operating and Maintenance Plan as required by the DOT in 49 CFR, Part 192, Subparts L and M. The project would meet or exceed the minimum requirements of this code.

PIPELINE INSPECTIONS

Ground inspections and leak surveys of the existing Loop Pipeline right-of-way are conducted more frequently than required by 49 CFR, Subpart M. Leak surveys are conducted twice each year and the ROW patrol is conducted 6 to 12 times per year. The cathodic protection system is tested 6 to 12 times per year during the patrols. These

inspections also include checking for encroachments and reduced cover, as well as assessing the condition of vegetation, warning signs, and piping. A report summarizing the results of the inspections is prepared and maintained by WGSI at the Remote Facility Site. This procedure would be implemented for the proposed project.

WELL PAD SITE INSPECTIONS

Site personnel inspect the Well Pad Site at least weekly during no-flow conditions and more frequently during flowing conditions. The inspection includes looking for evidence of vandalism. The areas inspected include erosion control features, grading, drainage facilities, cathodic protection system, piping, valves, power, wellhead instrumentation, control equipment, and landscaping. The WGSI portion of the proposed Delevan Interconnect Site would be inspected in a similar manner.

REMOTE FACILITY SITE INSPECTIONS

Inspection of the Remote Facility Site and equipment presently occurs on a daily basis. The operator is responsible for walking through the site at the start of the shift and noting the condition of fencing, drainage facilities, tanks and containment, piping, valves, instrumentation and control systems, equipment, site lighting, and buildings. In a daily log, the operator makes note of the conditions revealed by the inspections and summarizes them in a monthly report.

The Plant Manager is notified of any conditions revealed during the inspections that require further inspection, repair, or replacement. Based on the severity or reduced project safety of the condition, the Plant Manager can cease operations or reduce the condition to a safe level until the condition is corrected. In addition, the operational blowdown valves and the emergency shutdown valves are inspected and tested annually in compliance with 49 CFR, Part 192, Subpart M.

The proposed project would incorporate the same inspection procedure.

MAINTENANCE AND REPAIR PROCEDURES

Maintenance of the sites, equipment, facilities, and pipelines is a daily part of the operations of this type of project. Minimum requirements for the maintenance, repair, and record keeping of natural gas pipelines, pressure regulating and relief valves, and compressor stations are also established by 49 CFR, Part 192, Subparts L and M, and have been included in the Operating and Maintenance Plan.

Site personnel at the Remote Facility Site conduct normal maintenance, repair, overhaul, and testing of equipment assemblies and subassemblies. Major equipment assemblies and subassemblies that require extensive repair, rebuilding, and testing beyond the capabilities of the on-site equipment will be removed from service and shipped off-site for repair by the manufacturer or a qualified service center. During equipment repairs, the project would either operate with the backup or redundant equipment, at reduced capacity, in only one mode (injection or withdrawal), or be completely out of service. 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. During the injection season, equipment associated with the

withdrawal cycle is serviced, and vice versa. As such, a complete plant shutdown for maintenance is usually not necessary.

These maintenance and repair procedures would be expanded and continued for the proposed project.

SCHEDULED SITE MAINTENANCE

Scheduled site maintenance of the aboveground facilities includes site access roads, drainage facilities, fencing, site lighting, landscaping, and painting of equipment, and aboveground piping. Site access roads and surfaced areas are regraded and resurfaced as often as necessary to maintain a smooth surface and promote drainage. Regular mowing and periodic cleanout of ditches and culverts assures that the drainage systems operate at their design capacities. Site fencing is inspected regularly and repaired as necessary to prevent unauthorized access to the facilities. The site landscaping is watered and maintained regularly. All equipment, storage tanks, and aboveground piping, valves, and fittings are painted a neutral color upon completion of construction and repainted regularly.

The current site maintenance activities would be expanded to incorporate the proposed project.

PARTS AND MATERIALS

To better service and maintain the project pipelines, equipment, and facilities, an inventory of service, repair, and replacement parts and materials is warehoused at the Remote Facility Site. The service and repair parts inventory includes 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 can readily be obtained locally such as fencing, standard hardware, paints, concrete, gravel, and culverts are not warehoused on the site.

This system would be continued for the proposed project.

ONGOING GENERAL MAINTENANCE

Ongoing general maintenance activities, which are routine for natural gas utilities, are conducted either on a regular schedule or as-needed. Line lowering and pipeline replacement may not be necessary if outside forces do not adversely affect the project pipelines. These maintenance activities can normally be scheduled for periods that do not conflict with agricultural operations or sensitive biological periods; the surface would be restored where appropriate. Affected property owners would be given sufficient advance notice. The scheduled maintenance would be coordinated with the landowners to minimize or preclude potential conflicts with the existing land use or activity.

Vegetation Management

WGSI manages the vegetation on the pipeline ROW to prevent damage to the system, facilitate inspections, and comply with regulations; the company would continue to do so with the proposed project. In addition, WGSI regularly maintains the landscaping and

irrigation systems on the berms surrounding the Well Pad Site and Remote Facility Site to ensure the vigorous growth needed to meet visual mitigation requirements. The WGSI vegetation management program is designed to:

- Eliminate weeds, brush, and trees around equipment and facilities for fire hazard reduction, security, safety, and maintenance access
- Eliminate noxious weed seed sources
- Eliminate deep-rooted vegetation directly over the pipeline
- Maintain landscape plantings at the Well Pad and Remote Facility Sites to provide a visual screen from adjacent properties and/or the county road
- Maintain the irrigation systems at the Well Pad and Remote Facility Site, including replacing or moving sprinkler heads and drip emitters as needed to ensure adequate irrigation coverage

Vegetation along access roads would also be maintained to permit vehicular passage for routine operations patrols. Trees and brush that interfere with these patrols may require periodic removal. A 5-foot-wide passage centered on the pipelines is sufficient for leak detection monitoring. Local fire districts may periodically require WGSI to abate weeds typically annual grasses, around permanent aboveground facilities to maintain a fuel break. For the pipelines, WGSI would identify areas within the ROW that need vegetation removal during the annual ground inspections.

Access Road Maintenance

Project personnel conducting operations and maintenance activities at several of the project components use existing wetland management and farm access roads. WGSI must maintain these roads, or help to maintain them, 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. In addition, it may be required to maintain the entrance roads into the Remote Facility Site and around its perimeter. Maintenance consists of periodic grading to smooth the surface and remove ruts, then topping with additional gravel as needed.

Major maintenance may occasionally be required in the case of winter storm damage or general road deterioration. Additional engineered road base fill and/or rock material may then be imported to stabilize the sub-base and return the road to its original shape and elevation. Periodic cleaning of drainage culverts may also be required, involving the mechanical removal of accumulated vegetation and silt around the inlet and outlet and within the culvert. Where culverts or other drainage structures have been damaged beyond repair, they may be removed and replaced by excavating across the road.

Electric Test System Installation

Six Electric Test System (ETS) stations were installed as part of the cathodic protection system during construction of the existing Loop Pipeline in response to the anticipated corrosion potential of the soil. ETS stations would also be installed along the proposed second Storage Loop Pipeline and Line 400/401 Connection Pipeline when the pipelines

are installed. Depending on actual operations experience, additional test stations may need to be installed after the pipes are operational.

Installation consists of exposing an approximately three- to five-foot section of pipe, attaching the leads with liquid weld, and re-covering the pipe. Because of the five- to six-foot pipeline depth, surface disturbance typically involves an area of about 40 feet by 30 feet to provide adequate space for construction equipment. This excavation would be large enough to allow workers to safely access the pipe and stockpile the excavated soil. Topsoil would be segregated from subsoil during excavation.

All sites are generally accessible by existing access roads, but a short temporary access route from an existing road may be required. Vegetation will be mowed close to the ground for the access route and the work area. Groundwater encountered in the excavation would be pumped into adjacent farm canals or wetland management ditches in compliance with Regional Water Quality Control Board standards. A narrow trench may need to be excavated for placement of the test lead wires to the edge of the existing access road where the test post can be installed outside the plowed or managed area. Once the test leads are connected, the pipe and trench excavation would be backfilled and compacted with native subsoil, and then the topsoil and the surface would be restored.

Anode Bed Replacement

Because the pipeline's protective epoxy coating slowly degrades over time, it would require increased cathodic protection to prevent corrosion. This increase in cathodic protection current results in a more rapid consumption of the sacrificial anode beds, decreasing their effectiveness. Consequently, existing anode beds may eventually need to be replaced. Minor surface disturbance may result from the use of a small drilling rig that creates the small-diameter holes in which the anodes are installed. Once the anodes are installed, they are connected to the pipeline by an underground cable. Anode bed location criteria are fairly flexible; they typically allow the beds to be placed where they would not adversely affect the existing land uses.

Line Lowering

Lowering of a natural-gas pipeline may be required where there is insufficient cover to safely protect the pipe from agricultural plowing and ripping. This typically occurs in agricultural areas when fields are leveled to improve irrigation. While WGSI installed the existing Loop Pipeline, and is proposing to install the second Storage Loop Pipeline and Line 400/401 Connection Pipeline with a minimum of five feet of cover to compensate for agricultural plowing and ripping practices, it may be necessary to lower the line where fields have not yet been leveled or have been re-leveled. 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.

Pipeline Replacement

Sections of pipe may need to be replaced for several reasons, including third-party damage and acts of nature. Previously described standard pipeline construction

techniques and ROW are used during the activity. The pipe condition requiring replacement is typically concentrated in a short section of the pipe, and only that section would be replaced. If the pipe segment to be replaced is a bored crossing, extra workspace may be required contiguous to the pipeline ROW to accommodate the boring, stringing, and welding activities and equipment.

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, those associated with drilling the injection/withdrawal wells described above. The frequency of workover would depend on the injection and withdrawal flows and the integrity of the storage reservoir formation sands, but would likely occur about every two years.

2.11 Future Plans

The proposed level of development described above constitutes full project development of the high and medium deliverability reservoirs in the natural gas storage field, based on WGSI's current understanding of the Field's capabilities. The scope of the proposed expansion should allow WGSI to meet the maximum foreseeable market demands for natural gas storage services. Future development beyond the proposed scope is too speculative to determine and discuss with any degree of confidence.

ABANDONMENT

WGSI currently has no plans to abandon any part of the existing or proposed facilities. For certain project assumptions discussed in this EIR, a facility life of 30 years has been used, but with proper maintenance the facility would last considerably longer.

Should the pipelines ultimately be abandoned, the pipe would either be abandoned in-place or removed and salvaged according to the practices appropriate at the time of abandonment. Pipe abandoned in-place would be capped in compliance with regulatory requirements. Pipe installed under water crossings and roadways would generally be abandoned in-place. The pipeline crossing under the Sacramento River would be abandoned according to a detailed procedures and work plan approved by the State Lands Commission. Should segments of the pipelines be removed, the surface above the pipe would be restored.

The buildings and equipment at the Remote Facility Site would be dismantled and salvaged and the site restored according to Butte County ordinance requirements in effect at the time. Concrete and pavement would be broken up and disposed of at an approved disposal area, recycled, or left in place. Abandoning the wells according to DOGGR requirements would close out the Well Pad. The site would be restored according to Wild Goose Club requirements at the time.

2.12 Regulatory Requirements

The proposed WGSI Expansion Project considered in this EIR must conform to the safety and environmental standards of numerous agencies that have oversight responsibility for the design, construction, and operation of gas storage, gas pipelines, well drilling, and related facilities. The most pertinent of these regulatory processes are described below.

FEDERAL REGULATIONS

U.S. Department of Transportation – Office of Pipeline Safety

The U.S. Department of Transportation (DOT) Office of Pipeline Safety regulates the design, construction, testing, operation, and maintenance of natural gas pipelines and associated facilities (separation, compression, dehydration, valve, and interconnect facilities) in accordance with published regulations (49 CFR 192). These regulations require the following:

- Materials for the pipe and components for use in pipelines must maintain structural integrity under temperature and other environmental conditions that may be anticipated and must be chemically compatible with any gas to be transported.
- The pipe must be designed with sufficient wall thickness or must be installed with adequate protection to withstand anticipated external pressures or loads.
- Each component of a pipeline must be able to withstand operating pressures and other anticipated loadings without impairment of its serviceability.
- Welding must be performed by a qualified welder in accordance with welding procedures set forth in 49 CFR 192, Subpart E.
- The pipeline must be constructed in accordance with comprehensive written specifications or standards that are consistent with 49 CFR 192, Subpart G.
- The pipeline must be inspected to ensure that it has been constructed in accordance with 49 CFR 192, Subpart G.
- The pipeline must be protected from external corrosion by an external protective coating and a cathodic protection system.
- A new, repaired, or relocated pipeline must be tested to substantiate the maximum allowable operating pressure and to ensure that all leaks have been located and eliminated before it can be placed into service.
- The operator shall prepare and follow a manual of written procedures for conducting operations and maintenance activities, responding to emergencies, and handling abnormal conditions.
- The operator shall establish a continuing education program to enable customers, the public, appropriate government agencies, and persons engaged in excavation-related activities to recognize a gas pipeline emergency and report it to the operator and/or the appropriate public officials.
- The program must be conducted in English and in other languages commonly understood by a significant portion of the non-English speaking population.

- The operator shall have a patrol program to observe surface conditions on and adjacent to the pipeline right-of-way for indications of leaks, construction activity, and other factors affecting safety and operation.
- Pipeline that is abandoned in-place or deactivated must be disconnected from all sources of gas, purged of gas, and sealed at the ends.

U.S. Environmental Protection Agency

The proposed project requires the use and storage of potentially hazardous materials and wastes. The following acts govern the handling of these materials.

Resource Conservation and Recovery Act (RCRA). RCRA enables the U.S. Environmental Protection Agency (EPA) to administer a "cradle-to-grave" regulatory program that includes all aspects of hazardous materials exposure, from generation and transportation to treatment, storage, and disposal, at all facilities and sites within the nation.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA (known as Superfund) was passed to facilitate cleanup of the nation's toxic waste sites. In 1986, Superfund was amended by the community right-to-know laws (42 U.S. Government Code 1100 et seq.), which stated that past and present owners of land contaminated by hazardous substances can be liable for the entire cost of the cleanup, even if the material was illegally dumped when the property was under previous ownership.

STATE REGULATIONS

California Division of Oil, Gas, and Geothermal Resources (DOGGR)

California Division of Oil, Gas, and Geothermal Resources (DOGGR) regulates drilling, production, injection, and gas storage operations in accordance with Title 14, Chapter 4 of the California Code of Regulations (CCR). In general, it is required that:

- Each well has a casing designed to provide anchorage for blowout prevention equipment and to seal off drilling fluids and segregate them to protect all gas, oil, and freshwater zones.
- Blowout prevention and related well-control equipment shall be installed, tested, used, and maintained in a manner that prevents uncontrolled flow of gas from the well.
- All surface equipment, including but not limited to production safety systems, wellheads, separators, pumps, manifolds, valves, and pipelines used for the production of gas and wastewater, shall be maintained in good condition at all times to safeguard life, health, property, and natural resources.

Approval must be obtained from DOGGR before any subsurface injection or disposal project can begin. The operator must provide data that are pertinent and necessary for the proper evaluation of the proposed project. The data required include, but are not limited to:

- An engineering study that includes the reservoir characteristics for each injection zone; reservoir fluid data; well casing diagrams; and a well, drilling, plugging, and abandonment plan;
- A geologic study that includes a structural contour map; a map of each injection zone; a geologic cross-section; characteristics of the cap rock; gas reserves of the storage zones before the start of injection; and a representative electric log identifying all geologic units, formations, freshwater aquifers, and oil or gas zones; and
- An injection plan that includes a map of the facilities; maximum surface injection pressure; daily rate of injection per well; monitoring system or method to be used to ensure that no damage is occurring and that injection fluid is confined to the intended zone or zones of injection; method of injection; proposed cathodic protection measures for plant, lines, and wells; proposed surface and subsurface safety devices, tests, and precautions taken to ensure safety of the project; treatment of water injected; and source and analysis of injection fluid.

California Regional Water Quality Control Board (RWQCB) – Central Valley Region National Pollutant Discharge Elimination System General Industrial Storm Water Discharge Permit

In 1990, the California State Water Resources Control Board adopted a General Industrial Storm Water Discharge Permit, which requires facility operators to file a Notice of Intent to discharge stormwater runoff to waters of the United States from specified industrial activities, including mining and oil and gas facilities (40 CFR Section 122.26[b][14]). The permit requires dischargers to eliminate non-stormwater discharges to stormwater systems, develop and implement a stormwater pollution prevention plan, perform inspections of stormwater pollution prevention measures, and monitor water quality.

California Environmental Protection Agency – Department of Toxic Substances Control Hazardous Materials Release Response Plan and Inventory Act of 1985

The Hazardous Materials Release Response Plans and Inventory Act of 1985 (known as the Business Plan Act) requires that any business using hazardous materials must prepare a plan describing its facilities, inventories, emergency response plans, and training programs. State regulations in Chapter 6.96 of the California Health and Safety Code and Title 19 of the CCR identify detailed planning and management requirements to ensure that hazardous materials are handled, stored, and disposed of properly to reduce risks to human health and the environment.

Hazardous Waste Control Act

The Hazardous Waste Control Act describes the requirements for proper management of hazardous wastes, including criteria for:

- Identification and classification of hazardous wastes;
- Generation and transportation of hazardous wastes;
- Design and permitting of facilities that recycle, treat, store, and dispose of hazardous wastes;
- Treatment standards;
- Operation of facilities and staff training; and

- Closure of facilities and liability requirements.

California State Lands Commission (SLC)

The State of California owns all tidelands and submerged lands and beds of navigable waterways. The SLC regulates the use of these lands for the benefit of all the people of the state (statewide public trust purposes), including waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. The SLC requires that detailed engineering plans be prepared and approved before a lease is granted for a project to cross state lands. The engineering plans must include:

- A boring plan for each crossing, including descriptions of the drilling unit, hole diameter, depth of cover, directional survey and control plan, mud system, additives, and mud pumping pressures;
- Information about pipeline construction methods (e.g., pipe diameter, wall thickness, American Petroleum Institute grade, weight per foot, tensile strength, rating, yield pressure), detailed information about welding procedures and repair of defective welds, and radiographic inspection plans;
- A pipeline hydrostatic testing program that identifies the testing contractor, method of testing, test duration, and temperature measurement plan;
- A pipeline installation plan, with pulling tension control plans and drill mud recovery plans; and
- A bore abandonment contingency plan.

LOCAL REQUIREMENTS

Butte and Colusa Counties

The Tanner Act (Assembly Bill 2984) requires that each county develop a hazardous waste management plan that includes information on current and projected hazardous waste generation, including household hazardous waste, an inventory of contaminated sites and hazardous waste treatment, storage, and disposal facilities, and administrative policies and implementation measures. In addition, the county is responsible for enforcing many state regulations governing hazardous materials management, including waste generation, minimization, and storage. The County Office of Emergency Services (OES) oversees the preparation of emergency plans and inventories by businesses that handle hazardous material. The OES requires businesses that use specific hazardous substances to prepare a comprehensive plan to reduce the risk of an accident.

The counties are responsible for administering applicable provisions of their locally adopted General Plans, zoning ordinance, and building codes.

2.13 Permit Requirements

The California Public Utilities Commission is the lead state permitting agency and the U.S. Army Corps of Engineers is the lead federal agency responsible for review of the project. In addition to the permits from these two agencies, the project would be required to obtain permits from several other federal, state, and local agencies, as shown in Table 2.13-1.

Table 2.13-1: Permit Requirements

Permits	Agency	Jurisdiction/Purpose
Federal		
Section 404 Individual Permit	U.S. Army Corps of Engineers	Dredge and fill waters of the U.S. and NEPA lead agency
Section 401	U.S. Army Corps of Engineers/Regional Water Quality Control Board	Water quality certification
Section 7 Consultation (through Corps permit process)	U.S. Fish and Wildlife Service & National Marine Fisheries Service	Threatened and Endangered Species Biological Opinion and Take Authorization
Section 106 Review (through Corps review process)	Advisory Council on Historic Preservation	Protection of Cultural Properties/Historic Properties Management Plan
State		
Certificate of Public Convenience and Necessity	California Public Utilities Commission	Overall project approval and CEQA lead agency
Land Lease	State Lands Commission	Pipeline crossing of the Sacramento River
Encroachment Permit	Caltrans	Pipeline crossing State Route 45 and Interstate 5
Gas and Disposal Well Installation	Division of Oil, Gas & Geothermal Resources	Natural gas storage wells
NPDES General Permits and Section 401 Certification	Regional Water Quality Control Board	Construction storm water, hydrotest water discharge, and water quality certification
Stream Crossing Agreements	Department of Fish & Game	Waterways and wildlife habitat areas
Section 2081(b)/2080.1 Permit	Department of Fish & Game	Endangered Species Take Authorization
Cultural Resource Consultation (through CPUC CEQA review)	State Historic Preservation Office	Cultural resources protection and management
Encroachment Permits	Department of Water Resources, State Reclamation Board	Pipeline crossing under levees along the Sacramento River and Cherokee Canal
Local		
Land Use Permit	Colusa County Planning	Main line block valve lot(s) and Delevan Interconnect Site
Road Encroachment Permits	Butte and Colusa County Public Works	Pipeline crossing of county maintained roads
Building Permits	Butte and Colusa County Development Services	Building permits for structures and buildings

Permits	Agency	Jurisdiction/Purpose
	Development Services	and buildings
Authority to Construct/Operate	Butte County Air Quality Management District	Combustion emission reduction and monitoring for compressor engines
Encroachment Approval	Reclamation Districts 816, 833, 1004, and 2047	Pipeline crossing of District canals and ditches

SOURCE: WGSI 2001