Kirby Hills Natural Gas Storage Facility Project Mitigation Monitoring, Compliance, and Reporting Program

Final Report




Prepared by:

Aspen Environmental Group

Aspen Environmental Group **October 2009**

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1. Introduction and Project Overview

The Final Construction Completion Report has been developed to summarize the monitoring activities conducted for the Lodi Gas Kirby Hills Natural Gas Storage Facility Project, Phases I and II. The California Public Utilities Commission (CPUC) as the Lead Agency for the project conducted the environmental review process and granted final approval of both project phases. Aspen Environmental Group implemented the Mitigation Monitoring Program to ensure compliance with project mitigation measures, compliance plans, and permit conditions during all phases of construction. The permitting and construction of Phases 1 and 2 occurred sequentially as presented below.

Phase I

For Phase I, Lodi Gas Storage, LLC (LGS) proposed to use a depleted natural gas reservoir in the Kirby Hills gas field as a storage facility for natural gas transported to the site by its customers. The total storage capacity of the Phase I reservoir is approximately 7 billion cubic feet (Bcf) with a maximum injection and withdrawal capability of 100 million cubic feet per day (MMcf/day) of natural gas. Phase I included the construction of a natural gas receiving Metering Station Site, the installation of approximately six (6) miles of natural gas pipeline, the construction of a Compressor Station Site, and modification and construction of the natural gas storage/withdrawal well sites.

Phase I of the Kirby Hills Project was approved by the CPUC who issued a Certificate of Public Necessity and Need (CPCN) and certified the Final Mitigated Negative Declaration (MND) on January 17, 2006 (Application No. 05-07-018, State Clearinghouse No. 2006012068). The MND was prepared by Aspen Environmental Group under contract to the CPUC in accordance with the California Environmental Quality Act (CEQA) to inform the public and to meet the needs of local, state, and federal permitting agencies in considering the project proposed by LGS.

Phase II

LGS proposed to construct and operate Phase II of the Kirby Hills Project in the northern portion of the existing property leased from Kirby Hill Associates where LGS proposed to expand the Kirby Hills Project to include use of an additional depleted natural gas reservoir, the Wagenet Reservoir. The Wagenet Reservoir has a storage capacity of 18 Bcf, increasing the maximum injection and withdrawal capacity of the Kirby Hills Project from 100 to 350 MMcf/day.

Phase II of the Kirby Hills Project was approved by the CPUC who issued a CPCN and certified the Final MND on February 28, 2008 (Application No. 07-05-009, State Clearinghouse No. 2007082142). The MND was prepared by Aspen Environmental Group under contract to the CPUC in accordance with the California Environmental Quality Act (CEQA) to inform the public and to meet the needs of local, state, and federal permitting agencies in considering the project proposed by LGS. The Phase II facilities were not identified in the original project because the nature and location of the storage reservoir for Phase II (Wagenet Reservoir) had not been fully evaluated.

Final Report Overview

Chapter 1, Introduction/Project Overview, provides a brief overview of the Kirby Hills Project, Phases I and II, and project approvals granted by the CPUC. In addition, Chapter 1 outlines the role and responsibility undertaken by Aspen Environmental Group as the mitigation monitoring team, including preconstruction compliance review. The methods established for addressing non-compliance issues, changes

in the project description or mitigation implementation, and extra workspace requirements are also discussed.

Phase I of the Kirby Hills Project was constructed as four distinct parts: the natural gas receiving Metering Station Site discussed in Chapter 2, the installation of approximately six (6) miles of natural gas pipeline discussed in Chapter 3, and the construction of the Compressor Station and the modification and construction of the natural gas injection/withdrawal well sites discussed in Chapter 4. Rockford was awarded the contract for general contractor of the project. Some of the work was subcontracted out to Asta Construction. The electrical work was subcontracted to Ardent Electric. Much of the work at the Metering Station Site was conducted by PG&E.

Chapter 5 discusses Phase II of the Kirby Hills Project. Phase II was for the construction and operation of additional facilities to support the expansion of the Kirby Hills Natural Gas Storage Facility by adding the Wagenet Reservoir.

1.1 Overview of the Kirby Hills Project

The project site is located in a rural agricultural area in the Montezuma Hills of southeastern Solano County, California, immediately north of the Sacramento–San Joaquin River Delta (see Figure 1-1). The site is approximately six miles west of Rio Vista and 16 miles southeast of Fairfield.

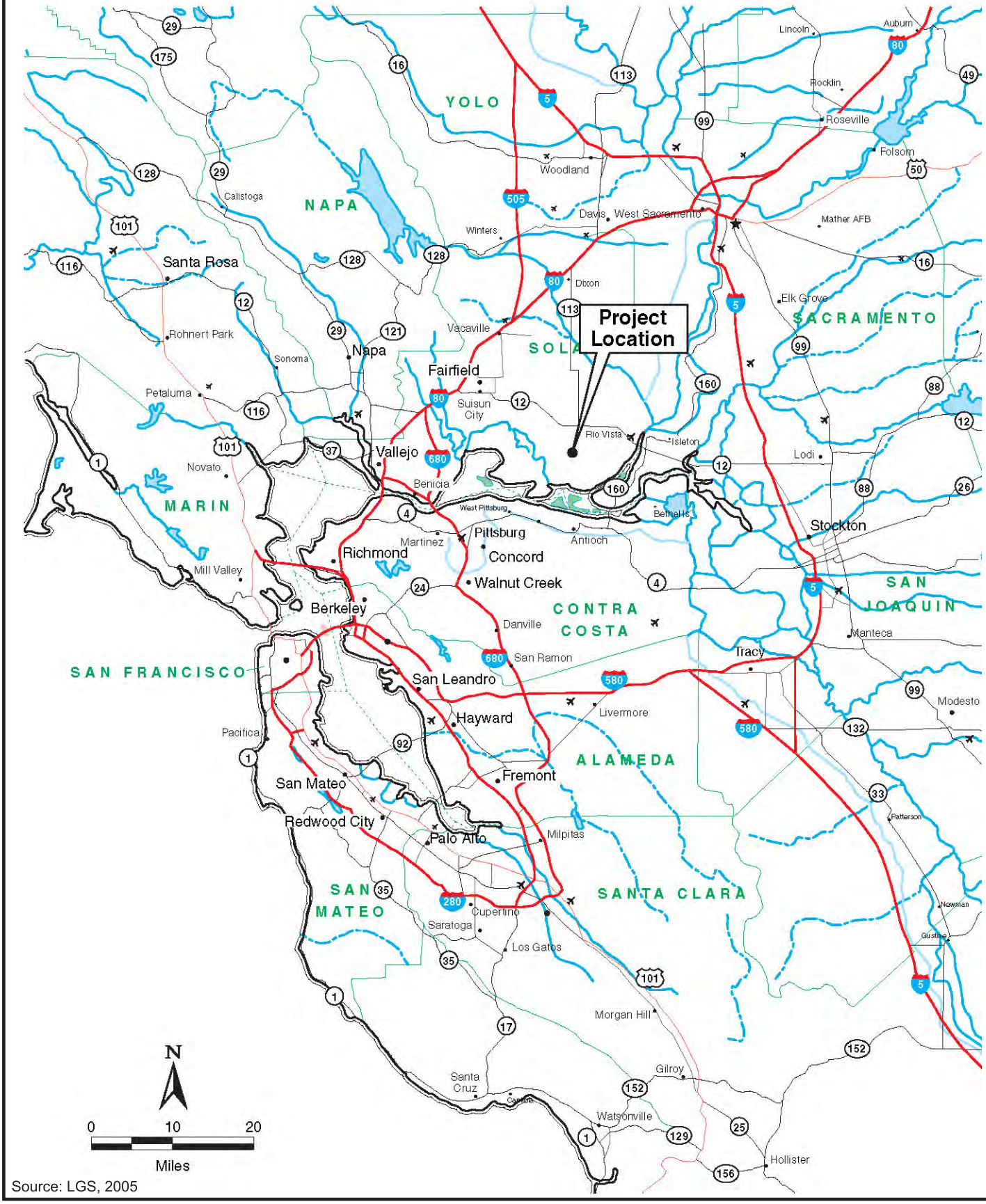
Phase I

Phase I of the project contains two major component locations, connected by an approximately six mile, east-west, pipeline corridor. The eastern project component is a natural gas receiving Metering Station Site, located west of Birds Landing Road, one mile south of its intersection with State Route 12. The western project component is the natural gas Compressor Station Site and the storage/withdrawal well sites located in the Kirby Hills between Montezuma/Nurse Slough on the west and Shiloh Road on the east. The western portion of the project area is also located within the Suisun Marsh Secondary Management Area (see Figure 1-2).

For Phase I, LGS proposed to use a depleted natural gas reservoir in the Kirby Hills gas field as a storage facility for natural gas transported to the site by its customers. The total storage capacity of the reservoir is approximately 7 billion cubic feet (Bcf) and the project has a maximum injection and withdrawal capability of 100 million cubic feet per day (MMcf/day) of natural gas. Project operations involved tapping into the PG&E 400 pipeline near mile 286.65, constructing facilities to convey natural gas from the PG&E 400 pipeline approximately seven miles to the Kirby Hills gas field, storing the gas in the existing natural reservoir, withdrawing the stored gas on demand from LGS customers, and conveying the withdrawn gas to the PG&E 400 pipeline for delivery to those customers.

Phase II

For Phase II, LGS proposed to use a depleted natural gas reservoir, the Wagenet Reservoir, in the Kirby Hills gas field to expand the natural gas storage capacity of the project. The total storage capacity of the Wagenet Reservoir is approximately 18 Bcf, increasing the project maximum injection and withdrawal capability from 100 to 350 MMcf/day of natural gas. Project operations involved tapping into the existing PG&E 400 pipeline near the existing metering station, conveying natural gas from the PG&E 400 pipeline approximately seven miles through the LGS pipeline to the Kirby Hills gas field; storing the gas in an existing natural reservoir; withdrawing the stored gas on demand from LGS customers; and conveying the withdrawn gas to the PG&E 400 pipeline for subsequent delivery to the customers (see Figure 1-3).



Source: LGS, 2005

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General Project Location

Kirby Hills Natural Gas Storage Facility

Figure 1-1

1.2 Role of Aspen Monitoring Team

The purpose of the Mitigation Monitoring, Compliance, and Reporting Program is to ensure effective implementation of the mitigation measures, as well as applicant proposed measures (APMs), adopted by the CPUC for construction of the Project. Aspen was hired by the CPUC in a competitive selection process to ensure that the construction of the Project takes place in a manner consistent with the conditions of approval by the CPUC, and as described in LGS Company's Applications. A.05-07-018 and A.07-05-009.

The Aspen Monitoring Team was composed of the Program Manager (Susan Lee), Project Manager (Vida Strong), and Environmental Monitor (EM – Jody Fessler):

Aspen's Program Manager, Susan Lee, had the authority to commit Aspen Team resources and was responsible for all contractual matters.

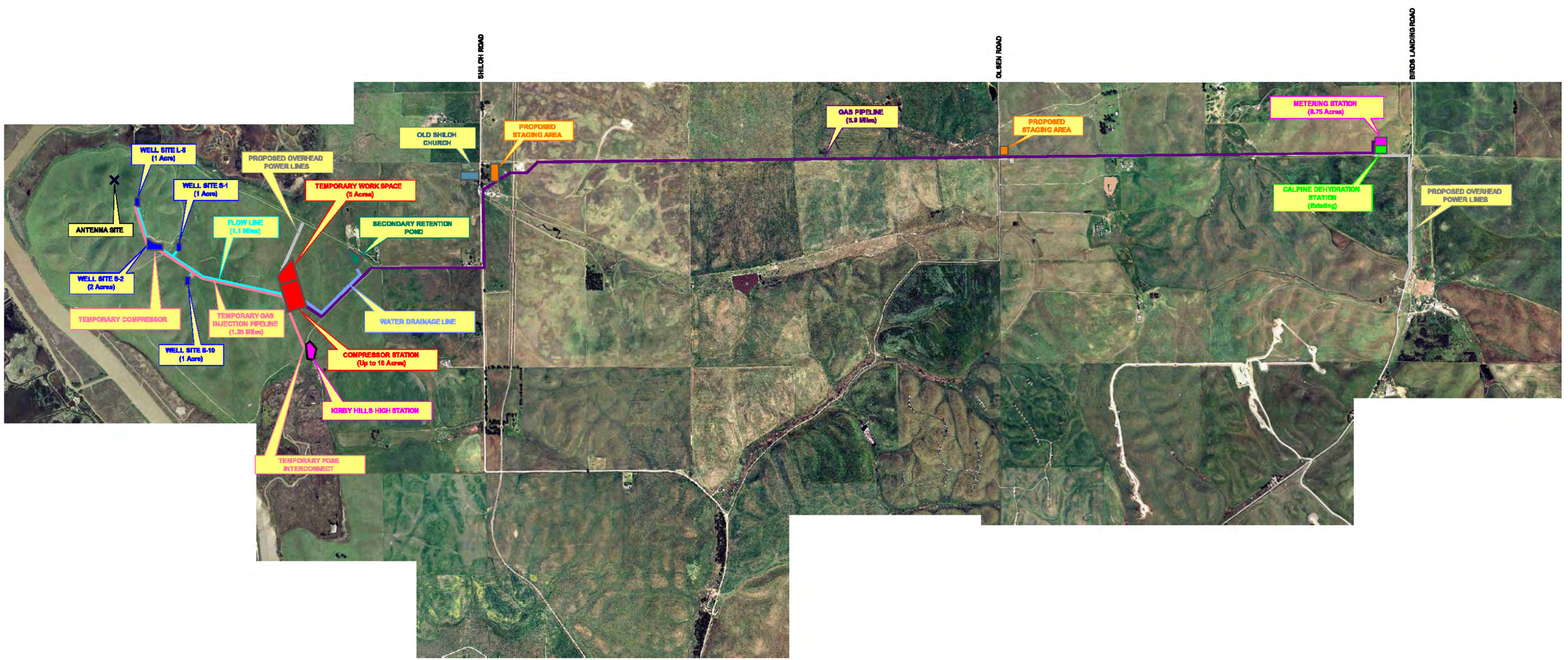
Aspen's Project Manager, Vida Strong, supervised all project monitoring activities. She was responsible for direct communication with the CPUC, including preparation of weekly reports. Other responsibilities included managing the field monitoring team, reviewing non-compliance documentation, overseeing the issuance of Project Memoranda and Non-Compliance Reports, and preparing recommendations for CPUC consideration on Project Notices to Proceed and Variance Requests.

The CPUC EM, Jody Fessler, reviewed pre-construction compliance materials for completeness and performed in-field monitoring for compliance with mitigation measures, approved plans, and agency requirements during all construction activities. In the field, they served as the main point of contact for LGS, as well as for a variety of Federal, State, and local agencies. The CPUC EM prepared and submitted daily and weekly compliance reports to the Aspen Project Manager. The CPUC EM also provided field input on Variance Requests. The CPUC EM has been trained in a number of disciplines including environmental science, biology, ecology, and construction best management practices and is experienced in compliance monitoring. The CPUC EM, Jody Fessler, conducted all of the pre-construction compliance and also the construction monitoring on a part-time basis for the project period.

1.3 Pre-Construction Compliance Review and Notices to Proceed

LGS submitted an Environmental Compliance Monitoring Plan (ECMP), which outlined the Company's approach to implementing the Mitigation Monitoring, Compliance, and Reporting Plan mitigation measures applicable to the Kirby Hills Project. LGS used the same ECMP for Phase II with updated biological resources survey reports. In addition, several specific compliance plans and reports were submitted to satisfy Federal and State agency requirements, including:

- Sensitive Biological Habitat Survey Report
- Burrowing Owl Survey Report
- Migratory Bird and Raptor Nesting Survey Report
- Storm Water Pollution Prevention Plan
- Paleontological Resources Discovery and Management Plan
- Cultural Resources Treatment Plan
- Engineering and Geology Studies and Injection Plan
- Hoover & Keith Noise Report
- Phase II Site Investigation Report
- Worker Environmental Awareness Program Plan



Source: LGS, 2005

PREPARED BY Aspen Environmental Group	Kirby Hills Natural Gas Storage Facility	Location of Phase I Project Components	Kirby Hills Natural Gas Storage Facility Figure 1-2

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PREPARED BY Aspen Environmental Group	Kirby Hills Natural Gas Storage Facility	Location of Phase II Project Components	Kirby Hills Natural Gas Storage Facility Figure 1-3

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- Hazardous Materials Contingency Plan and Health and Safety Plan
- Construction Safety and Emergency Response Plan
- Fire Prevention Plan
- Construction Traffic Plan

These compliance plans were reviewed by Aspen prior to the start of construction to ensure that appropriate environmental protection would take place. In addition, Aspen tracked the necessary permitting requirements to ensure that all the applicable agency permits had been issued prior to construction. Requirements and/or permits issued for the project included:

Federal:

- U.S. Fish and Wildlife Service (USFWS): Federal Endangered Species Act Compliance
- U.S. Fish and Wildlife Service (USFWS): Biological Opinion Requirements (Phase II)
- U.S. Army Corps of Engineers (USACE): Clean Water Act Compliance
- U.S. Army Corps of Engineers (USACE): Section 404 – Nationwide Permit Authorization (Phase II)

State:

- CPUC: MND Certifications; Certificates of Public Convenience and Necessity; Notices to Proceed
- California Department of Fish and Game (CDFG): California Endangered Species Act Compliance
- California Department of Conservation - Division of Oil, Gas and Geothermal Resources: Permit to Conduct Well Operations and Authorization to Inject Produced Water, Permit to Operate Kirby Hills Field as a Storage Field, Permit to Convert Kirby Hills Gas Field, Wagenet Formation to Gas Storage Field (Phase II)
- State Water Resources Control Board (SWRCB): National Pollutant Discharge Elimination System (NPDES) Permit (for construction activities and discharge of hydrotest water)
- Regional Water Quality Control Board: Water Quality Certification (401 of Clean Water Act to support Section 404 Nationwide Permit Authorization for Phase II)

Regional and Local:

- Yolo-Solano Air Quality Management District (YSAQMD): Construction Guidelines Compliance
- Bay Area Air Quality Management District (BAAQMD): Final Permit and Amended Permit for Phase II
- Solano County Department of Resource Management, Planning Division: Use Permit, Marsh Development Permit
- Solano County Division of Building and Safety: Grading Permit
- Solano County Environmental Health Services Division, Technical Services Program: Water Well Permit
- Solano County Department of Building Inspection: Building and Electrical Permits
- Solano County Transportation Department: Encroachment and Transportation Permits
- Solano County Department of Resource Management: Modification to current permits for additional well sites and pipelines for Phase II
- San Francisco Bay Conservation and Development Commission: Marsh Development Permit for Primary Marsh Management Area (Wagenet 5 [W5] Observation Well) for Phase II

As part of the LGS Kirby Hills Project Environmental Compliance Monitoring Plan, all employees working on the project were required to attend an environmental training session before they could begin work. LGS's environmental representatives (Jones & Stokes) presented the training session, which covered environmental and cultural resource issues, state and federal laws, and reporting procedures.

When necessary pre-construction compliance documentation was satisfactorily submitted, recommendations for Notices to Proceed (NTPs) were prepared by Aspen for CPUC consideration. A total of five (5) NTPs for Phase I construction were issued by the CPUC for the Project (see Table 1-1). In addition, seven (7) NTPs were issued for Phase II construction. Once approvals from other agencies were received, construction could commence in accordance with the NTPs for Construction and issued permits.

Table 1-1. NTPS for Construction

NTP No.	Date Issued	Description
		Phase I
#1	5-19-06	Natural Gas Pipeline and Flow Line Portion
#2	5-31-06	Civil (grading) and piping construction of the well sites, and civil (grading) construction of the compressor station
#3	7-05-06	Compressor station and well site construction. Drilling of three new storage wells.
#4	6-20-06	Civil portion only of the natural gas receiving/metering station
#5	9-06-06	Metering station foundation, structural, piping, electrical, and instrumentation construction. County permit pending.
		Phase II
#1	4-21-08	Request authorization from the CPUC to commence with construction activities associated with three new wells (Well Sites 21, 22, and 23), a 2,700-foot-long pipeline (flow line), and access roads and staging areas for Phase II of the Kirby Hills Natural Gas Storage Facility Project.
#2	4-20-08	Request authorization from the CPUC to commence with reentry and conversion of Wells Lambie 6 and Lambie 7 to observation wells for Phase II of the Kirby Hills Natural Gas Storage Facility Project.
#3	5-6-08	Request a NTP from the CPUC for PG&E's hot tapping work at the Kirby Hills Natural Gas Storage Facility meter station, located west of Birds Landing Road in Solano County.
#4	5-7-08	Request authorization from the CPUC to commence with the civil, mechanical, electrical, and instrumentation work at the compressor station facility of the Kirby Hills for Phase II of the Kirby Hills Natural Gas Storage Facility Project.
#5	N/A	Request authorization from the CPUC for extra work space at the corner of Shiloh Road and the access road to Kirby Hills. This work space was already approved under NTP #1 and therefore NTP #5 is not necessary. Wetland areas within the work space will be totally avoided.
#6	6-13-08	Request to install compressor units on foundations at Compressor Station.
#7	12-17-08	Request to conduct modifications at the Metering Station, located west of Birds Landing Road in Solano County.
#8	4-16-09	Request authorization from the CPUC to commence with construction activities at observation well Wagenet 5 (W5).

1.4 Compliance Monitoring

Compliance monitoring by the CPUC EMs was intended to chronicle and document LGS's compliance with project mitigation measures, compliance plans, and permit conditions. Compliance monitoring was implemented to minimize or eliminate potential significant impacts and to protect environmental resources. A Non-Compliance was defined as "any deviation from applicable mitigation measures, applicant-proposed measures and project parameters, permit conditions or requirements, and approved plans." A Project Memorandum was a written warning of a non-compliance activity. Non-Compliance Reports could be issued when chronic non-compliance activity occurred or a blatant disregard for project mitigation measures, compliance plans, or permit conditions was demonstrated. Project Memoranda and Non-Compliance Reports were typically issued after an initial verbal warning. The compliance record for the Kirby Hills Project components is discussed in Chapters 2 through 5.

1.5 Coordination and Communications

In field communications were conducted by the CPUC EM with LGS's Environmental Inspectors and other project personnel. Verbal warnings and written communications (Project Memoranda or Non-Compliance Reports) were utilized to notify LGS and its contractors of non-compliance activities. Field observations were logged daily by the CPUC EM. Weekly reports were submitted to CPUC and other agencies documenting compliance, requested project changes, construction progress, and interactions with other agencies. The Aspen CPUC Project Manager and the Aspen CPUC EM participated in regular conference calls with LGS and its contractors during the pre-construction compliance phase.

1.6 Variance Requests

Variance Requests were submitted by LGS to the CPUC for changes in the approved project description, including changes in construction technique, additional extra workspace needs, or reduction in mitigation requirements. Each Variance Request submitted by LGS was first reviewed by Aspen for completeness. If incomplete, a request for information was prepared by Aspen and sent to LGS. When complete, each request was analyzed, including field verification and resource/local agency consultation, to determine if new impacts or an increase in significant impacts would result. After analysis of the request, Aspen prepared a written recommendation of approval or denial for the CPUC. As appropriate, mitigation measures or other agency conditions were required by the CPUC to avoid, or reduce to a less than significant level, any identified impacts. Table 1-2 presents the 10 Variance Requests submitted and approved for Phase I of the project. Most of the Variances related to extra work space, and minor changes to the project description. No Variance Requests were submitted for Phase II.

Table 1-2. Variance Requests for the Kirby Hills Project, Phase I

Variance No.	Date Requested	Date Issued	Description
#1	6-01-06	6-05-06	Request to trench through ephemeral wetland area approximately 70 ft. west of Olson Road.
#2	5-31-06	6-08-06	Lodi gas would like permission to trench through an area with a CNPS listed plant (pappose spikeweed). CPUC approval contingent upon CDFG concurrence. 6/21 – CDFG feedback provided and forwarded to J&S.
#3	6-16-06	6-16-06	Request to trench through two ephemeral wetland areas west of Shiloh Road.
#4	6-27-06	6-28-06	Request for additional workspace on the west side of Shiloh Road for the Shiloh bore.
#5	6-28-06	6-29-06	Request for removal of two small eucalyptus trees and trenching through the root system of two larger trees.
#6	7-07-06	7-07-06	Request to use additional workspace at the corner of Shiloh Road and the Kirby Hills access road to support large vehicles and equipment being transported to the Kirby Hills site.
#7	7-07-06	7-18-06	Request to relocate a PG&E distribution line around the S-2 well site. CPUC has requested historical resource information on the drilling "dog house" that is near the site. Jones & Stokes submitted information on 7/17/06.
#8	7-07-06	7-07-06	Request to move the 4-inch temporary gas line.
#9	2-21-07	2-23-07	Request to drill an exploratory well outside the approved work area
#10	8-01-07	8-02-07	Request to cut into hill on north side of well site L-5 to expand existing well pad.

2. Phase I Metering Station

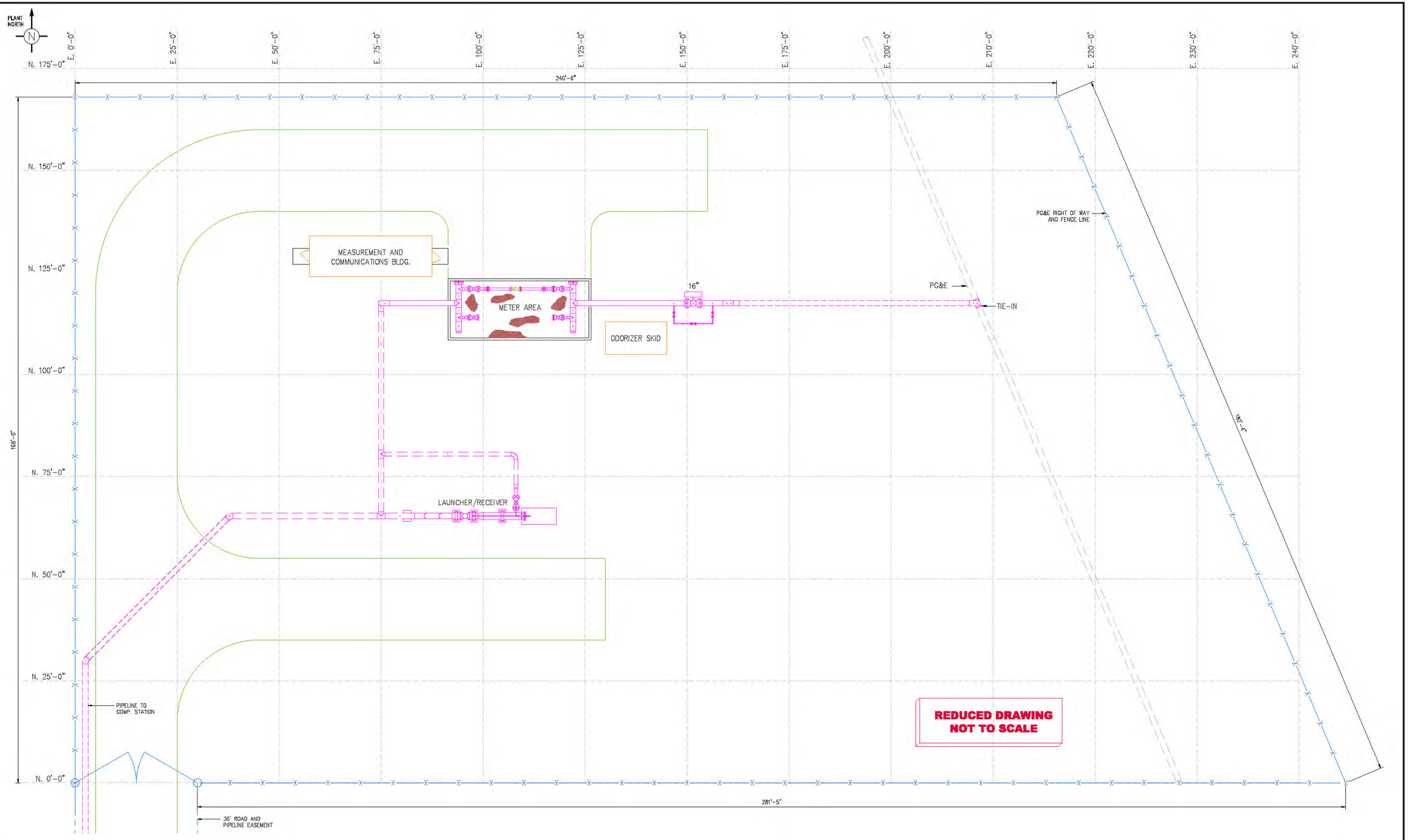
The eastern project component is a natural gas receiving/metering station site, located near the PG&E 400 and 401 pipelines immediately west of Birds Landing Road, one mile south of its intersection with State Route 12. The metering station was constructed on an approximately 0.75-acre site of an existing metering and dehydration station that is part of the Montezuma pipeline system owned and operated by Calpine. The metering station site and existing Calpine facility are within a 160-acre agricultural parcel. Figure 2-1 presents the layout of the Metering Station.

2.1 Description and Construction of Metering Station

The purpose of the metering station is to accurately measure the amount of natural gas withdrawn from and returned to the PG&E pipeline. The new metering station site contains low-lying surface facilities and is graveled and fenced. A new power line was provided by PG&E via undergrounding. Safety measures were installed at the metering station that relate to overpressure protection and remote surveillance. An odorization skid was installed at the metering station to ensure that any gas delivered to PG&E meets the odorization requirement. The facility is remotely monitored and flow controlled from the control room of the existing Lodi Gas Storage facility in Lodi, California.

LGS received their Notice to Proceed (NTP) #4 for the civil portion only of the metering station on June 20, 2006. PG&E started work outside the metering station parameter on the east side on June 19, 2006 excavating around their existing 32-inch gas line that they were tapping into to supply gas to the LGS project. Construction activities for the metering station involved clearing the area of vegetation and grading the site to create a level surface for the movement and of construction vehicles and equipment and to prepare the area for constructing foundations. Construction activities and storage of construction material and equipment was confined to the three-quarter-acre metering station site.

LGS received NTP #5 for construction of the foundations, structural, piping, and electrical and instrumentation portions of the natural gas receiving/metering station on September 6, 2006. PG&E crews prepared their main 32-inch pipeline for the “hot tap”, which was conducted on September 22, 2006 (see Figure 2-2). Pipe fabrication for the metering station also began the same week. Pipe fabrication was conducted at the compressor station. Excavation for the foundations was conducted and backfill material was compacted in place. Foundations began to be poured the week of September 18, 2006. Gas pressure piping at the metering station involved welding, except where connected to flanged components. Piping installed below grade was coated for corrosion protection prior to backfilling, and a cathodic protection system was installed to protect underground piping. Aboveground valves and piping were installed on concrete pipe supports, and protected from external corrosion by paint coatings. Equipment such as the meter runs, odorant injection unit, and meter building were installed on pads or skids (see Figure 2-3). A pig launcher was installed on pads with concrete containment. Prior to placing the metering station into service, the gas piping system (both above and below ground) was hydrostatically tested. Controls and safety devices were checked and tested. Gravelling of the site was done the week of October 30, 2006. The communications building was set on its foundation at the metering station site on November 29, 2006. The access road into the metering station site was also graded and graveled. On January 9, 2007, electrical and instrumentation crews successfully tested fiber optic cable from the metering station site to the compressor station control room. A chain-link fence was installed around the metering station site the week of January 22, 2007. Most of the construction of the metering station was completed in February 2007 with a few punch-list items that were finished in March 2007 (see Figure 2-4).



Source: LGS, 2005

PREPARED BY Aspen Environmental Group	**Kirby Hills Natural Gas Storage Facility**	**Plot Plan Meter Site**	**Kirby Hills Natural Gas Storage Facility** Figure 2-1

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Figure 2-2. PG&E crews working at Metering Station, 9-19-06

Figure 2-3. Metering Station Construction, 10-12-06

Figure 2-4. Completed Metering Station, 4-26-07

2.2 Non-Compliance Events During Metering Station Construction

On June 19, 2006, the CPUC EM observed PG&E working in the vicinity of the metering station and parking their vehicles and equipment on the metering station site. The CPUC EM informed the LGS EI and construction management that work in the area should not continue, if they were to stay in compliance, until nesting bird surveys were completed. Work stopped and nesting bird surveys were completed that afternoon. LGS had also forgotten to request the NTP for the metering station work, which was done immediately.

No Non-Compliance Reports (NCR) or Project Memoranda (PMs) were issued by the CPUC EM for the activities associated with the metering station construction.

2.3 Variances Requested for Metering Station Construction

No variances were requested for the work at the Metering Station.

2.4 Summary of Metering Station Activities

Two NTPs for construction were issued by CPUC for the metering station work. In June 2006, LGS requested authorization to proceed with construction of the civil portion only of the natural gas receiving/ metering station (NTP #4) while additional preconstruction compliance requirements were being satisfied.

In September 2006, LGS requested authorization to proceed with the metering station foundation, structural, piping, electrical, and instrumentation construction (NTP #5). Construction was conducted from June 2006 through February 2007 and involved installation of the metering station that measures the amount of natural gas withdrawn from and returned to the PG&E pipeline.

2.5 Final Inspection of Metering Station

The CPUC EM conducted a final inspection of the metering station in February 2007 and found the site to be in compliance with the Project Description and Mitigation Measures from the approved CEQA document (MND).

3. Phase I Natural Gas Pipeline

A 16-inch pipeline extends through an approximately six-mile corridor that connects the eastern (metering station) and western project components (compressor station and well sites) crosses through rural agricultural lands in large parcels, primarily used for dry farming and grazing. Along Shiloh Road, the pipeline corridor passes in proximity to the rural Shiloh Church and crosses the tracks of the restored main line of the old Sacramento Northern Railroad, now used by the Bay Area Electric Railroad Association for tourist trains. The pipeline corridor also crosses through a large wind power project that has been under construction for several years (see Figure 1-2).

3.1 Description and Construction of the Natural Gas Pipeline

The 16-inch pipeline is bidirectional, allowing natural gas to flow to and from the Kirby Hills gas field. The pipeline's capacity was built to carry approximately 100 million standard cubic feet per day (MMscfd). The anticipated normal flow was to be around 25-50 MMscfd. The pipe was coated with fusion bond epoxy. Field joints were either coated with a heated powder coat or with shrink sleeve wraps. The pipe used for bored or drilling crossings had an additional armor coating applied over the fusion bond epoxy coating. After the pipeline was constructed, a corrosion-inhibiting chemical was used to coat the inside of the pipe. Similar to the metering station, pipeline safety measures related to overpressure protection consist of high-pressure switches (PSH) that will trigger alarm/shutdown of the gas compressors, pipeline valves, and meter station valves as appropriate, and are the primary protection. In addition, pressure safety valves were installed to relieve pressure from the piping in the event the PSH control loop fails.

Several areas within the project impact area and pipeline right-of-way were identified as Environmentally Sensitive Areas (ESA) for environmental resources. These included drainages, ephemeral drainages and wetlands, and an area that is occupied by Parry's spikeweed (*Centromadia parryi* ssp. *parryi*) along the pipeline right-of-way. This species is an annual herb and a recent addition to the CNPS list as a List 1B species (rare, threatened, or endangered in California and elsewhere). Parry's spikeweed is an annual plant that occurs in disturbed areas (disked, graded, mowed, and grazed areas) in the Montezuma Hills. The species was located by a Jones & Stokes botanist during the fall 2005 field surveys. The plants occupy a field located approximately 2,500 feet east of Olsen Road, north of the fence line, and south of an abandoned homestead. In 2005, this area contained approximately 400 live individual plants. Most of the plants in this population were slightly upslope and west of the drainage. This population was mapped as north of the fence in an area that is grazed and periodically disked. Additional populations occur south of the fence line on the adjacent properties. Jones & Stokes conducted a pre-construction survey of the area on May 24, 2006, and identified the species based on vegetative material (the plants were not in flower). The botanist found that the population had expanded. The population now occupies a much larger area and extends into the gas pipeline construction corridor. This increase in the number of plants is probably due to the increase in rainfall during the 2005 and 2006 seasons.

NTP #1 was issued on May 19, 2006 for the approximately 5.9 miles of pipeline. Work began the week of May 21, 2006 at the east end of the pipeline alignment near the metering station heading west. The pipeline right-of-way alignment was first surveyed and identified prior to beginning any construction activity. Alignment identification included staking the centerline of the pipeline, foreign line crossings, and the limits of the construction work area. As part of this preconstruction phase, environmentally sensitive areas (ESA) (e.g., wetlands and special-status species habitat) were flagged and/or fenced with orange ESA fencing (see Figure 3-1). Temporary crossings over drainage swales were constructed so that equipment would not impact these areas. LGS notified other utility companies (via the Underground Service Alert [USA]) to locate and mark existing underground structures along the proposed alignment prior to

Figure 3-1. ESA Fencing Around Parry's Spikeweed East of Olson Road, 5-26-06

construction. The construction easement was 75 feet wide with a permanent easement width of 30 feet. Along Shiloh Road and in areas that contained sensitive biological resources, the pipeline corridor was reduced to avoid direct and indirect effects on adjacent sensitive resources. Once the right-of-way was staked and sensitive areas flagged and/or fenced and underground utilities marked, crews began grading the right-of-way. The topsoil was first stripped from all the areas to be graded and was put to one side of the right-of-way to prevent mixing with other soils. Silt fences and other sediment control devices were installed as necessary around water bodies, roads, and other areas. Water trucks continuously watered the right-of-way for dust control. Trenching involved excavating a ditch for the pipelines using back-hoes, excavators, and trenching machines (see Figure 3-2). The trench was excavated to a depth to provide the appropriate amount of cover, which generally was a minimum of 3 feet cover over the pipeline. Depth of cover was a minimum of 5 feet at road crossings (Shiloh and Olsen Roads) and a minimum of 4 feet at ditches adjacent to roads. The trench spoils were deposited on the spoil storage portion of the right-of-way. The trench width for the pipelines was approximately 4 feet.

The week of May 21, 2006, a staging area for the pipeline construction off Shiloh Road was also cleared and graded. The staging area was used for the staging of materials, vehicles, equipment, and contractor office trailers, and welding/pipe fabrication activities.

After the construction right-of-way had been prepared and the trench excavated, pipe and associated support timbers (skids) would arrive and be off-loaded onto the right-of-way. Crews would place joints of pipe end-to-end parallel to the trench, supported by skids with pad material to protect the coating.

Figure 3-2. Excavating of Pipeline Trench, 5-26-06

Pipe ends (bevels) were cleaned prior to welding by means of filing or wire brushing to remove rust, scale, and dirt. A side-boom crawler tractor lifted each joint of pipe to abut and align with the bevel of the previous joint, and a suitable space for welding was made. Qualified welders qualified then welded the sections of pipe together (see Figure 3-3). Welds were radiographically or ultrasonically inspected for defects. After passing quality control checks, the weld areas (field joints) were coated with either a powdered epoxy applied to induction-heated weld areas; with a liquid epoxy; or with a mastic sleeve that would shrink to form a snug fit on the pipe when heated and the mastic would become viscous to eliminate air pockets and provide adhesion.

Pipeline sections were installed into the trench using nylon straps or wheeled "cradles" suspended from side-boom tractors or other hoisting equipment (see Figure 3-4). Where rock was encountered, the bottom of the trench was padded with sand or fine-grained soils. After the last handling, an electrical coating tester attached to a girth spring was passed along the entire length of pipe, alerting by audible signal the presence of defects in the pipe coating.

A fiber optic line was also placed in the trench connecting the metering station to the compressor station.

After the pipe was placed in the trench, the trench was backfilled with the previously excavated material. The subsoil was backfilled first and then the topsoil was replaced. A soil mound was left over the trench to allow for soil settlement, unless otherwise required by the landowner.

Figure 3-3. Crews Welding Pipe, 6-01-06

Figure 3-4. Trench ROW Looking West, 6-09-06

Several locations along the pipeline right-of-way were crossed using a horizontal boring method (jack-and-bore): an unnamed seasonal drainage, Shiloh Road, Olson Road, three ephemeral drainages/seasonal wetlands, and the railroad corridor. This method involves the excavation of bore pits on each side of the crossing to a depth below the invert elevation of the pipe. An augering machine was then lowered into the bore pit and a hole was then augered along the alignment and a pilot pipe was jacked forward, behind the auger head. When the auger reached the bore pit on the opposite side, the carrier pipe was pulled or jacked through as the pilot pipe was removed. Three ephemeral drainages at the eastern end of the pipeline alignment were bored and pipe pulled back through the week of May 29, 2006 (see Figure 3-5). The bore under Olson Road was conducted the week of June 5, 2006. The bore under the railroad corridor began the week of June 19, 2006. The bore under the unnamed seasonal drainage that crosses under Shiloh Road was bored the week of June 26, 2006. Horizontal directional drilling (HDD) method using pressurized bentonite and water liquid mix was discussed as a possible method for these crossings, but was not used on the project.

The installation of the 16-inch pipeline was completed the week of July 24, 2006 except where it connected with the metering station and compressor station.

After construction of the pipeline and prior to placing it in service, the completed pipeline was hydrostatically tested in accordance with the requirements of federal pipeline safety regulations, LGS testing specifications, and applicable permits. Approximately 350,000 gallons of water were used for the hydrostatic testing. All hydrotest water was obtained from the Rio Vista municipal water supply and was brought on site by water trucks. The pipeline was dewatered into the compressor station detention pond. The water was then used for dust control. After the dewatering was completed, drying pigs were run through the line and the line was then prepared for the caliper pig.

Pipeline right-of-way clean-up was completed August 12, 2006. The work included installing cathodic protection posts, repairing fence gaps and H posts along the right-of-way, and installing aerial markers and line markers.

Crews demobilized equipment and materials from the staging area off Shiloh Road for the pipeline portion of the project by August 12, 2006. The area was tilled per the landowner's request.

3.2 Non-Compliance Events During Natural Gas Pipeline Construction

On June 13, 2006, the CPUC EM noted a couple of oil leaks from equipment and informed LGS's Environmental Inspector (EI). Several crew members were also observed disposing of their cigarette butts improperly. These issues were discussed during the Thursday conference call.

On June 16, 2006, the CPUC EM and LGS EI discovered a Western meadowlark's nest near the entrance to the Kirby Hills property near the pipeline alignment. There were four dead young and one live young. The live bird was immediately taken to the Suisun Wildlife Center by the CPUC EM for care. The CPUC EM reminded the LGS EI that the necessary resource agency notifications needed to be made.

On June 22, 2006, the CPUC EM walked the right-of-way with the LGS EI from the creek bore south of the abandoned house southwest of the staging yard adjacent to Shiloh Road. The CPUC EM noted that several trees would be impacted by trenching activities within the right-of-way. The CPUC EM also observed a great-horned owl using one of the eucalyptus trees, a fledgling logger-head shrike using a California buckeye tree, two barn owls using the abandoned house for roosting, and barn swallows nesting in the abandoned house (see Figure 3-6). The CPUC EM informed the LGS EI and construction management that nesting bird surveys would need to be completed and submitted to the CPUC and

Figure 3-5. Excavating Bore Pits at Drainage, 6-01-06

Figure 3-6. Abandoned House Used by Nesting and Roosting Birds, 6-22-06

CDFG for review and approval prior to construction in the area. Also, the CPUC EM informed the LGS EI and construction management that a Variance Request would need to be submitted to the CPUC for impacts to any trees. On June 23, 2006, the CPUC EM observed an excavator moving trash and debris into a dumpster approximately 40 feet away from the eucalyptus tree and California buckeye tree where the great horned owl and the fledgling logger-head shrike had been observed the day before. The CPUC EM informed the LGS EI that the work was too close to the trees and that a 300-foot buffer needed to be maintained until further approval from the CPUC and CDFG were issued.

Orange ESA fencing was installed during the week of June 26, 2006, around the old abandoned house and some eucalyptus trees to the southwest of the staging yard adjacent to Shiloh Road per CDFG's request to protect owls and nesting birds.

No Non-Compliance Reports (NCR) or Project Memoranda (PMs) were issued by the CPUC EM for the activities associated with the natural gas pipeline construction.

3.3 Variance Requests for Natural Gas Pipeline Construction

Five Variances were requested for the construction of the approximately 6-mile long pipeline (see Table 1-2). Variance #1 was requested for trenching through an ephemeral wetland area approximately 70 feet west of Olson Road. Based on the annual land use of the area (agriculture), the variance request was approved on June 5, 2006. Variance #2 was requested for trenching through an area with a CNPS listed plant (Parry's spikeweed). CPUC approval for this variance was contingent upon CDFG concurrence, which was given June 21, 2006. Variance #3 was requested for trenching through two ephemeral wetland areas west of Shiloh Road. Based on the annual land use of the area (agriculture), the variance request was approved on June 16, 2006. Variance #4 was requested for additional workspace on the west side of Shiloh Road for the Shiloh bore. The additional work area was needed to temporarily stockpile pipe for the bore. No sensitive resources were located in the area and the variance request was approved on June 28, 2006. Variance #5 was requested for the removal of two small eucalyptus trees and trenching through the root system of two larger trees. Removal of the trees did not result in direct impacts on biological resources. The non-native trees were not protected under any local, state or federal regulations or laws. Barn owls, great-horned owls, and loggerheaded shrikes had been observed in the immediate area. CDFG was consulted regarding these bird species utilizing the area and required conditions to minimize impacts. Variance #6 was requested for additional workspace at the corner of Shiloh Road and the Kirby Hills access road along the pipeline right-of-way to support large vehicles and equipment being transported to the Kirby Hills site. No sensitive resources occurred at the site and the field was regularly tilled for agricultural purposes.

3.4 Summary of Natural Gas Pipeline Activities

Mainline construction of the natural gas pipeline between the metering station and the compressor station and well sites took place May 2006 through August 2006. NTP #1 was issued on May 19, 2006 for the approximately 5.9 miles of pipeline. Work began the week of May 21, 2006 at the east end of the pipeline alignment near the metering station heading west. Five Variances were submitted and approved for the pipeline activities (Variances #1, #2, #3, #4, and #5). The right-of-way was flagged and fenced for sensitive resources and underground utilities were marked. The right-of-way was graded. Topsoil was stockpiled along the right-of-way separate from the sub-soil. Trenching for the pipeline trench was conducted to the appropriate level. The pipeline was set adjacent to the trench and was welded together in sections. Sections of pipe were then lowered into the trench and joined together with other sections of pipe. Final welding and coating of the pipeline was performed. The trench was then backfilled, the grade restored, and the topsoil replaced. Hydrostatic testing of the pipeline was completed before the pipeline went into use.

3.5 Final Inspection of Natural Gas Pipeline

The CPUC EM conducted a final inspection of the natural gas pipeline right-of-way in mid August 2006 and found it to be in compliance with the Project Description and Mitigation Measures from the approved CEQA document (MND).

4. Phase I Compressor Station and Well Sites

The western project component is the natural gas storage/withdrawal site located in the Kirby Hills between Montezuma/Nurse Slough on the west and Shiloh Road on the east. The compressor station and injection/withdrawal wells are located on two large agricultural parcels used for grazing that combined are approximately 1055 acres in size. This area is within the Kirby Hills Gas Field and includes several existing pads for producing gas wells connected by gathering lines to the Montezuma pipeline system. This area borders the Suisun Marsh on the west, the largest remaining wetland near San Francisco Bay, with approximately 85,000 acres of tidal marsh, managed wetlands, and waterways in southern Solano County. The compressor station is located on an approximately 10-acre site at the eastern base of Kirby Hills. The site is behind a low hill and is generally screened from view (see Figure 1-2).

4.1 Description and Construction of Compressor Station and Well Sites

Compressor Station

The natural gas-driven compressors were built to have a combined total of 7,200 horsepower (hp) coupled to reciprocating gas compressors. Two compressor units are housed in a building designed to control noise by appropriate insulation, baffling of air vents, directing air vents away from nearby residences, and appropriate muffling equipment. The building was designed to meet all relevant Solano County noise ordinances. The compressor station was built to have a maximum injection and withdrawal capability of 100 million cubic feet (MMcf) of natural gas per day. The compressors provide sufficient pressure to push the natural gas into the storage reservoir and boost the pressure of the gas withdrawn from the storage reservoir to that it can be delivered into the PG&E line 400 pipeline. Fire and gas detection equipment was installed in the compressor building to alarm and/or shut down and blow the system in the event gas or fire is detected. These systems are tied-in to the control system. The safety measures at the site are related to overpressure protection for pressure vessels and piping, over fill protection for tanks, and remote surveillance.

As part of this project component, LGS installed an underground electrical power line, constructed a retention pond, installed a water well, and improved existing access roads.

LGS received NTP #2 on May 31, 2006 for the construction of the compressor station and the civil and piping construction of the well sites. NTP #2 also included several modifications to the proposed Kirby Hills facility that deviate from the project description in the Final MND. In all cases, the modifications resulted in less impact than the originally proposed installation, and resulted in no new impacts. These project modifications included the following:

- **Facility Access Road.** There are existing at the Kirby Hills Site two main access roads, one of which runs along the northern edge and the other runs to the south. The original layout contemplated upgrading an existing two track road from the north access road for use as a permanent access road to the compressor station (described under the heading "Access Road Improvement" on page B-26 of the MND). After further review, the layout was revised to provide for permanent access to the compressor station from the south access road. The reason for the modification is that the compressor station is much closer to the south access road. By entering the compressor station from the south access road, approximately 425 feet of road will need to be constructed, as opposed to approximately 1,750 feet of road to build to the access road to the north.
- **Power Line Routing to the Compressor Station:** In the original layout, Lodi Gas proposed to construct an overhead power line approximately 1,200 feet from a point along the north access road to the compressor station to supply power to the facility. The method has now been optimized to get

power to the compressor station and to comply with the County's request that all electrical power lines run underground from an existing power pole near the entrance to Kirby Hills, in the ditch with the 16" pipeline to the compressor station. This modification will result in eliminating an overhead power line and will result in fewer impacts since the power will now be routed in the ditch with the 16" pipeline.

- **Temporary Compressor Relocation:** The original proposal contemplated locating the temporary compressor on well site S-2. The current plan is to locate the temporary compressor on well site S-10. No additional area at well site S-10 is needed to accommodate the temporary compressor. The purpose of moving the temporary compressor from well site S-2 to S-10 is that it will allow Lodi Gas to eliminate building the 4-inch temporary pipeline up to the well sites from the compressor station. With the temporary compressor located at site S-10, the permanent flowline can be used for early injection of gas in to the reservoir, without constructing the additional line up the hill. To confirm that locating the temporary compressor at site S-10 would not create additional or significant noise impacts, Lodi Gas engaged Hoover and Keith to perform an acoustical analysis incorporating the change in location of the temporary compressor. The analysis eliminates any noise concerns related to the relocation.

Civil construction activities began at the compressor station the week of June 5, 2006. Construction of the compressor station began with surveying and staking of the site. Crews then began clearing vegetation and grading the area to create a level surface for the movement of construction vehicles and to prepare the area for constructing foundations (see Figure 4-1). Water trucks were used regularly for dust control. Construction activities and storage of construction material and equipment were confined to the 10-acre compressor station site and the adjoining temporary workspace area. Excavating required for the foundations was conducted and backfill material was compacted in place. Excess soil was used on site.

LGS received NTP #3 on July 5, 2006 for the civil/structural construction of the compressor station and well sites for the Project. LGS requested that NTP #3 include all construction activities related to the compressor station and well sites, including piping, electrical, and instrumentation. LGS also requested authorization to proceed with drilling of three new storage wells.

Per Mitigation Measure HZ-1, an independent, third party design review was required to be conducted of the Applicant's construction drawings and specifications. Project construction was also required to be independently monitored to ensure compliance with all applicable laws, ordinances, regulations, and standards. Prior to LGS receiving authorization to proceed with foundations, piping, electrical, and instrumentation construction of the compressor station and well sites, including the installation of equipment and buildings, drawings had to be reviewed and approved by the third party engineer on behalf of CPUC. Once a subject drawing was approved by the third party engineer and an approved stamped copy was received at the jobsite, LGS could then perform the work shown on the drawings.

Foundation work began July 5, 2006, after LGS received NTP #3. Once the excavations for foundations occurred, crews built and installed foundation forms and rebar. Cement was then poured in the foundation forms and allowed to set before the forms were removed.

The compressors arrived on site on July 18, 2006 and were set on their foundations once completed. The compressor cooling units arrived on site on July 19, 2006. The MCC building arrived on site on July 20, 2006 (see Figure 4-2).

Gas pressure piping at the compressor station involved welding, except where connected to flanged components. Piping fabrication was conducted on site. Piping installed below grade was coated for corrosion protection prior to backfilling, and a cathodic protection system was installed to protect underground piping. Aboveground valves and piping was installed on concrete pipe supports, and protected from external corrosion by paint coatings (see Figure 4-3).

Figure 4-1. Compressor Station Site and Flowline ROW to Well Sites, 6-09-06

Figure 4-2. Compressors Delivered to Compressor Station Site, 7-21-06

Figure 4-3. Piping Work at Compressor Station, 9-21-06.

Compressor building construction began after the compressor/engine skids were installed on concrete foundations. Concrete pouring for the compressor station foundation began September 22, 2006. The steel frame of the building was erected, followed by installation of the roof, exterior casing, and insulation (see Figures 4-4 and 4-5).

Equipment such as the glycol dehydration units, reboilers, and coolers were installed on pads or skids. Pig launchers ("pigs" are devices used to clean the line) and receivers were installed on pads with concrete containment. The aboveground storage tanks were installed within secondary containment. Prior to placing the compressor station into service, the gas piping system (both above and below ground) was hydrostatically tested. Controls and safety devices, such as the emergency shutdown system, relief valves, gas and fire detection facilities, and other protection and safety devices, were checked and tested. The compressor station was graveled the week of December 11, 2006. The extra workspace area adjacent to the compressor station on the north side was revegetated. Most of the work at the compressor station was complete by February 2007 with only a few punch-items remaining, which were completed in March 2007 (see Figure 4-6).

Flow Line

A 12-inch flow line was installed from the compressor station to the injection/withdrawal wells at the top of Kirby Hills. The flow line is approximately 1.1 miles long and was installed approximately 36 inches deep. The purpose of the flow line is to convey natural gas from the compressor station to the

Figure 4-4. Compressor Station Building, 1-23-07

Figure 4-5. Inside the Compressor Building, 1-23-07

Figure 4-6. Compressor Station, 1-23-07

injection/withdrawal wells for injection into the geologic formation and storage. The line also conveys the withdrawn gas from the wells to the compressor station so that it can be compressed to sufficient pressure for injection into the PG&E 400 pipeline.

NTP #1 was issued by the CPUC on May 19, 2006 for the flow line and the pipeline connecting the metering station and the compressor station. Clearing, grading, and trenching of the flow line toward the well sites began the week of June 12, 2006 (see Figure 4-7). Pipeline was installed between well sites the week of July 24, 2006.

The 12-inch flow line construction process was the same as the 16-inch natural gas pipeline that runs between the metering station and the compressor station (see Section 3.1).

Injection/Withdrawal Wells

Ten new injection/withdrawal wells were constructed on four existing well pad sites. The injection/withdrawal wells sites had previously been graded and contained existing wells and related facilities. The wells are identified in Figure 1-2 as Well Sites S-1, S-2, S-10 and L-5. Well Sites S-1, S-2, and S-10 were completed first (see Figure 4-8). Well Site L-5 was not worked on until August 2007. The wells were completed into the storage formation, which will store up to 7 bcf of natural gas. The wells were directionally drilled from the well pads into the storage formation.

Figure 4-7. Flowline ROW from Compressor Station to Well Sites, 6-15-06

Figure 4-8. View of Well Sites S-1, S-2, and S-10 from L-5,

Existing dirt and gravel roads were improved in order to provide construction and future maintenance access to the well sites.

LGS received NTP #2 on May 31, 2006 for the civil and piping construction of the well sites and construction of the compressor station. Work began at the well sites on June 1, 2006.

Construction activities at the well sites began with clearing surface materials and vegetation and then grading the work areas, if necessary, to accommodate drilling equipment. The pads were graded flat, with drainage and runoff contoured to a collection point in order to control stormwater discharge. Pipe trenches were excavated and piping installed between the well sites.

LGS received NTP #3 on July 5, 2006 for the civil/structural construction of the well sites and compressor station for the Project. LGS requested that NTP #3 include all construction activities related to the well sites and compressor station, including piping, electrical, and instrumentation. LGS also requested authorization to proceed with drilling of three new storage wells.

Once the site was prepared and contoured, the mobile drilling rig and associated equipment and tanks were driven to the pad. Usually a work-over drill rig would set up first to do "Frac and Pack" activities. On September 19, 2006, a small drilling rig for the pilot hole and drilling preparation was set up at Well Site S-2 (see Figure 4-9). Drilling operations began on September 26, 2006 at Well Site S-2 (see Figure 4-10). This work involved shooting engineered sand down into the well with a high pressure hose. The sand creates fracs in the natural substrate so gas can flow more freely and also protects the well from smaller particles from exiting the substrate. The type of drilling rig used was self-contained and was relocated for each well. Equipment associated with the rig included pipe racks, substructure, mud system recycling, changing quarters, a "doghouse" and tool pusher trailer, and power pack. The drilling rig was then moved to well site S-1 and drilling began October 18, 2006. The large drilling rig operated 24 hours per day, seven days per week while each well was drilled and completed. There were two 12-hour personnel shifts each day. After the drilling of a well was complete, the drilling rig would be relocated to the next well position. Equipment and materials were typically delivered during daylight hours. Erosion controls at the well sites were installed the beginning of October 2006 (see Figure 4-11).

Drilling activities involved the use of the rig's rotary table to turn the drilling bit and attached drill pipe. As the bit advances deeper into the subsurface, additional pipe is added to the "drill string." Lengths of pipe are taken up from the pipe rack and held in place until the "driller" is ready to attach the new lengths. After conducting safety checks, the rotary table is stopped, the drill string unscrewed, and new lengths added. The system would then be re-pressurized and drilling would continue. Drilling mud was 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 were contained in temporary mobile tanks stored within a containment area. Fluid and mud circulation systems are based on closed-loop designs, which result in no discharge. Once the well was in place, ancillary valving, piping, and monitoring equipment was installed and tested.

The final depth of the wells varied depending on the exact depth of the reservoir at each specific well location. The wellheads are about 10 feet in height and are connected to a section of above-ground flow line containing the valves, flow control valves, flow meters, and pressure gauges. The flow line system connects the wellheads to the compressor station.

Gravel was installed at the well sites and access roads the week of February 5, 2007. Final piping, lighting, fencing, electrical and instrumentation work was completed in February 2007 (see Figure 4-12).

Figure 4-9. Small Drill Rig at Well Site S-2, 9-19-06.

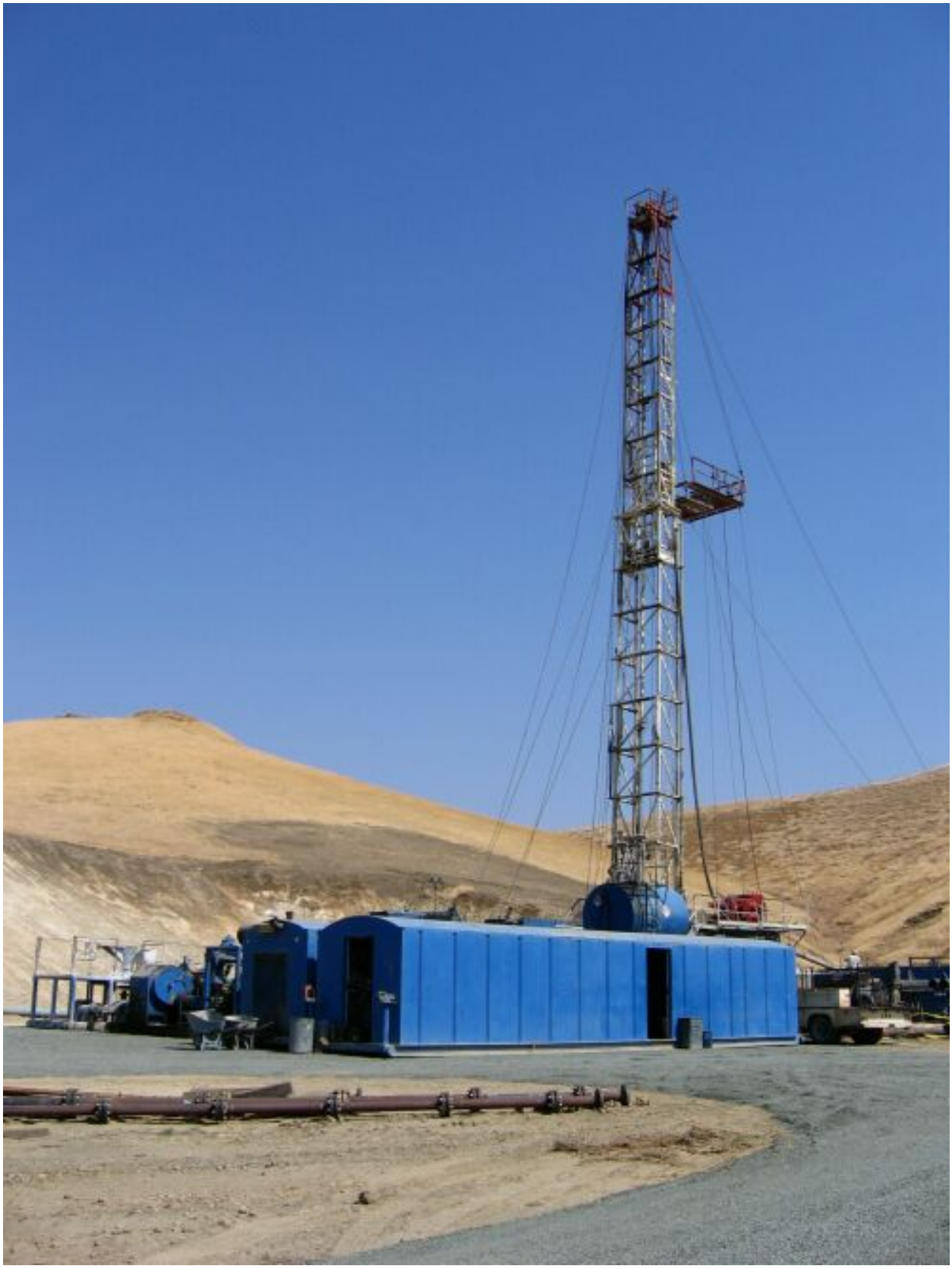

Figure 4-10. Large Drilling Rig at Well Site S-2, 9-26-06

Figure 4-11. Erosion Controls Being Installed at Well Site S-2, 10-05-06

Figure 4-12. Well Site S-2, 4-26-07

LGS requested a variance (Variance #9) for a test well that was drilled in May 2007 and continued through mid-June 2007 (see Section 4.3). LGS requested a variance (Variance #10) for work at Well Site S-5, which was not worked on until August 2007 through mid-October 2007.

Temporary Gas Injection System

The purpose of the temporary gas injection system was to inject natural gas into the storage reservoir while the permanent facilities were under construction. The storage reservoir was nearly depleted and required the injection of natural gas prior to offering normal storage operations. By injecting gas during the construction of the permanent facilities, the storage facility would then be ready to provide storage services as soon as the permanent facilities were complete. The temporary gas injection system was designed to inject up to 10 million standard cubic feet per day (scfd) of natural gas into the reservoir. The temporary gas injection system included a temporary PG&E interconnect at the Kirby Hills High Station, a 4-inch-diamter temporary gas injection pipeline, and a temporary compressor.

Temporary PG&E Interconnect. The temporary gas injection system provided a temporary interconnect with the PG&E 182 Line at the Kirby Hills High Station (located on the Kirby Hills Ranch, just south of the proposed compressor station) and a temporary skid-mounted meter. Clearing, grading, and trenching began for the 4-inch temporary gas injection pipeline the week of June 12, 2006. This temporary meter was removed after the permanent facilities were put into operation. LGS submitted a variance request to the CPUC for the 4-inch temporary line to be moved slightly from the original alignment (see section 4.3). The segment from the temporary PG&E interconnect and meter to the compressor station was abandoned in place after the permanent facilities were operating.

Temporary Gas Injection Pipeline. As part of this system, a 4-inch-diameter temporary gas injection pipeline was planned to be installed approximately 1.35 miles from the temporary PG&E interconnect and meter along the flow line pipeline through the compressor station and connected to Well Site S-2. This plan was eliminated with the "Project Modifications" approved under NTP #2.

Temporary Compressor. The temporary compressor was a natural gas-fired, reciprocating engine-driven compressor that was approximately 1,000 hp. The compressor was a skid-mounted unit and was not enclosed in any type of building. The temporary compressor was set at Well Site S-10 the week of June 19, 2006 per the "Project Modifications" approved under NTP #2. The installation of the temporary compressor and piping was completed July 21, 2006 at Well Site S-10 and was placed into service on July 25, 2006 (see Figure 4-13). It was connected to Well Sites S-1, S-2, and S-10, and was used to inject natural gas into the storage reservoir. After the permanent facilities were put into operation, the temporary compressor was removed.

4.2 Non-Compliance Events During Compressor Station and Well Sites Construction

On June 13, 2006, an oil spot was observed by the CPUC EM on the access road near well site S-2. The CPUC EM informed LGS' EI as well as construction management about the oil spot and was told it would be cleaned-up right away.

On June 27, 2006, the CPUC EM observed dump trucks dumping spoils from the Kirby Hills site on a levee road in an adjacent wetland area. The CPUC EM requested to review permits for this activity. The landowner provided LGS with the 2006 Annual Application for the USACE Wetlands Maintenance, a copy of a letter from the USACE to the Suisun Resource Conservation District dated May 31, 2006, and a letter from the Suisun Resource Conservation District to the landowner dated June 5, 2006.

Figure 4-13. Temporary Compressor Installed at Well Site S-10, 7-21-06

The CPUC EM reviewed these documents and concluded that the work activities were in compliance with the USACE approval. The CPUC EM issued a Project Memorandum reminding LGS that all permits for construction activities related to the Kirby Hills Natural Gas Storage Facility project need to be submitted and approved by the CPUC. Also, if changes to project activities as described in the MND occur, a Variance Request shall be submitted.

On July 31, 2006, a small grass fire was accidentally started by a grinder spark at Well Site S-1 (see Figure 4-14). The spark traveled approximately 75 feet from the source to dry grass. The fire was quickly extinguished as a water truck was nearby. The burned area was approximately 110 square feet. The area was soaked extensively with water and the LGS EI contacted the CPUC EM, the local fire department, and the landowner as stated in the Fire Prevention Plan.

On August 16, 2006, the CPUC EM noted that the dumpster at the compressor station site was very full and that some trash was blowing out due to the high winds. The CPUC EM spoke with LGS's EI and he informed the contractor that the dumpster needed to be emptied or covered with a tarp. The dumpster was covered with a tarp.

On September 26, 2006, the CPUC EM noted an oil spill on the ground near the east side of the drilling rig at Well Site S-2. The CPUC EM informed LGS's EI and he spoke with construction management. The spill was cleaned up that day.

No Non-Compliance Reports (NCR) were issued by the CPUC EM for the activities associated with the compressor station and well sites construction.

Figure 4-14. Area Where Fire Burned Near Well Site S-1, 8-10-06

4.3 Variance Requests for Compressor Station and Well Sites Construction

LGS submitted Variance Request #7 on July 7, 2009 to relocate an existing PG&E distribution line around the S-2 well site. The location of the distribution line and gathering line was unknown during the design phase of the project and was therefore not included in the application. The lines interfered with the installation of the flow line and well site piping and construction at the S-2 well site. LGS proposed to take the gathering line out of service and remove it during grading operations and replace it once the final contour had been established. The PG&E line was an 8-inch distribution line that was routed around the perimeter of S-2 well site in order to grade the S-2 well site area per the project design. The relocation of the PG&E line did not interrupt service because the line was rerouted and activated prior to removing the section that cross the S-2 well site area. The piping work was done by PG&E and the ditching work done by LGS contractors. Variance #7 was approved on July 18, 2006.

LGS submitted Variance Request #8 on July 7, 2006 requesting a minor reroute of the 4-inch temporary pipeline. The entire pipeline was shown within the defined temporary workspace, south of the compressor station. No figures or the description of the MND showed any detail regarding the approach of this line into the metering skid. The construction drawing (305652-02-T101) showed the line approaching the metering skid from the west. The proposed route approached the metering skid directly from the north. Other minor changes included enclosing the entire metering skid pad area inside a barbed wire

fence instead of chain link fence, and utilizing two guard posts instead of three. The variance to the routing reduced the amount of trenching, welding, and space required for the 4-inch temporary line. No sensitive resources occurred in the workspace and none were affected by the variance activities. The reroute was entirely within the previously surveyed and cleared area south of the compressor station. Variance #8 was approved on July 7, 2006.

LGS submitted Variance Request #9 on February 21, 2007 for permission to install a temporary well pad for purposes of drilling an exploratory well/stratigraphic test well for collecting geologic data and core samples. The temporary well pad was 200 feet by 200 feet and access to the well pad area was via an existing road on Kirby Hills Ranch. A temporary access road between the well pad and the existing road on Kirby Hills Ranch was constructed. The temporary access road was 20 feet wide by 75 feet long. The exploratory well was for the purpose of collecting geologic data and a core sample that could not be done from existing well pads because the bottom hole location of the proposed well could not be reached from existing well pads. No sensitive resources occurred within the proposed temporary well pad or access road. Several seasonal wetlands and sensitive botanical species occurred along the edge of the existing Kirby Hills access road, to the southeast and northwest of the site, which were flagged and avoided. NTP #9 was approved on February 23, 2007. Work at this site began in May 2007 and was completed in mid-June 2007.

LGS submitted Variance Request #10 on August 1, 2007 for permission to cut into the hill on the north side of the well site S-5 to expand the existing well pad. Approximately 10,800 cubic yards was removed with an affected area of approximately 29,086 square feet. As proposed, the removed soil was transported to a location on the southwest section of the Kirby Hills Ranch (disposal site), as designated by the landowner. NTP #10 was approved on August 2, 2007. Work at this site began in August 2007 and was completed in October 2007.

4.4 Summary of Compressor Station and Well Sites Activities

Mainline construction of the compressor station site and the well sites took place from May 2006 through February 2007. NTP #1 was issued by the CPUC on May 19, 2006 for the flow line and the pipeline connecting the metering station and the compressor station. LGS received NTP #2 on May 31, 2006 for the construction of the compressor station and the civil and piping construction of the well sites. NTP #2 also included several modifications to the proposed Kirby Hills facility that deviate from the project description in the Final MND. In all cases, the modifications resulted in less impact than the originally proposed installation, and resulted in no new impacts. LGS received NTP #3 on July 5, 2006 for the civil/structural construction of the compressor station and well sites for the Project. Four Variances were submitted and approved for the compressor station and well site activities (Variances #7, #8, #9, and #10). Civil construction activities began at the compressor station the week of June 5, 2006. The compressor station site was surveyed, staked, cleared of vegetation, and graded. Foundation work included excavating for foundations, building foundation forms, installing rebar, and pouring cement. Piping work included the excavation of trenches, fabrication of piping, installation of piping, and coating and testing of piping. Many components were installed at the compressor station including the compressors, coolers, MCC building, and electrical and instrumentation equipment. Once all the equipment and piping was installed, the area was graveled and fenced.

Work began at the well sites on June 1, 2006 for the civil and piping portion of the work. The existing well pads were graded and expanded. Trenches were excavated for pipe installation. Drilling operations began on September 26, 2006 at Well Site S-2. After the drilling of a well was complete, the drilling rig would be relocated to the next well position. Once the well site activities were complete, the sites were graveled and fenced.

LGS requested a variance (Variance #9) for a test well that began drilling in May 2007 and continued through mid-June 2007. Well Site S-5 was not worked on until August 2007 through mid-October 2007.

4.5 Final Inspection of the Compressor Station and Well Sites Activities

The CPUC EM conducted a final inspection of the compressor station and well sites in February 2007 and found it to be in compliance with the Project Description and Mitigation Measures from the approved CEQA document (MND). Monitoring of the test well under Variance #9 was conducted as well as the work at Well Site S-5.

5. Phase II Project Components

5.1 Description and Construction of Phase II

For Phase II, LGS proposed to use a depleted natural gas reservoir, the Wagenet Reservoir, in the Kirby Hills gas field to expand the natural gas storage capacity of the project. The total storage capacity of the Wagenet Reservoir is approximately 18 Bcf, increasing the project maximum injection and withdrawal capability from 100 to 350 MMcf/day of natural gas. Project operations involved tapping into the existing PG&E 400 pipeline near the existing metering station, conveying natural gas from the PG&E 400 pipeline approximately seven miles through the LGS pipeline to the Kirby Hills gas field; storing the gas in an existing natural reservoir; withdrawing the stored gas on demand from LGS customers; and conveying the withdrawn gas to the PG&E 400 pipeline for subsequent delivery to the customers (see Figure 1-3).

Several areas within the project impact area and pipeline right-of-way were identified as Environmentally Sensitive Areas (ESA) for environmental resources. These included drainages, ephemeral drainages and wetlands, an area near the new well sites and along the existing access road that is occupied by bearded popcorn-flower (*Plagiobothrys hystriculus*) (see Figure 5-1) and an area along the access road that is occupied by Parry's spikeweed (*Centromadia parryi* ssp. *parryi*). These areas were flagged or fenced with ESA fencing and avoided during construction. The primary marsh area where Wagenet 5 was reworked also had the potential for salt marsh harvest mouse. The work in the primary marsh area was covered under the USFWS Biological Opinion.

Figure 5-1. Bearded Popcorn-Flower, 4-30-08

PG&E Interconnection and Metering Station Construction

The PG&E interconnection adjacent to the metering station built as part of the Kirby Hills Project I west of Birds Landing Road needed to be expanded to 350 MMcf/d from the original 100 MMcf/d to support the Phase II project components. PG&E replaced an existing "hot tap" on the Line 400 with a larger tap. Additional piping and a meter and flow control valve also had to be installed at the existing metering station (see Figure 5-2).

Figure 5-2. Metering Station Work Complete, 7-09-09

New Well Sites

LGS proposed to develop three new well pad sites containing 15 injection and withdrawal wells along the northern boundary of the Kirby Hills project area (Well Sites 21, 22, and 23; see Figure 5-3). These new wells access the Wagenet Sand located in the Wagenet Reservoir, which is over 2,000 feet below the Domengine Sand formation used for the Kirby Hills I storage. The Wagenet Sand, which varies in thickness from 90 to 200 feet, is found at a depth between 4,632 and 5,376 feet below mean sea level. A 1,500-foot-thick layer of hard shale lies directly above the Wagenet Sand. This shale cap trapped the gas originally found there. The Wagenet Sand provides the storage capacity for the injection of additional gas for Kirby Hills Phase II. The surface extent of the Wagenet Sand covers approximately 160 acres located beneath the Kirby Property and the Wohn Parcel. The underground reservoir is accessed from the three new well pad sites. The 15 new injection/withdrawal wells were drilled, some directionally, from these pads into the storage formation. The surface facilities consist of well heads and piping.

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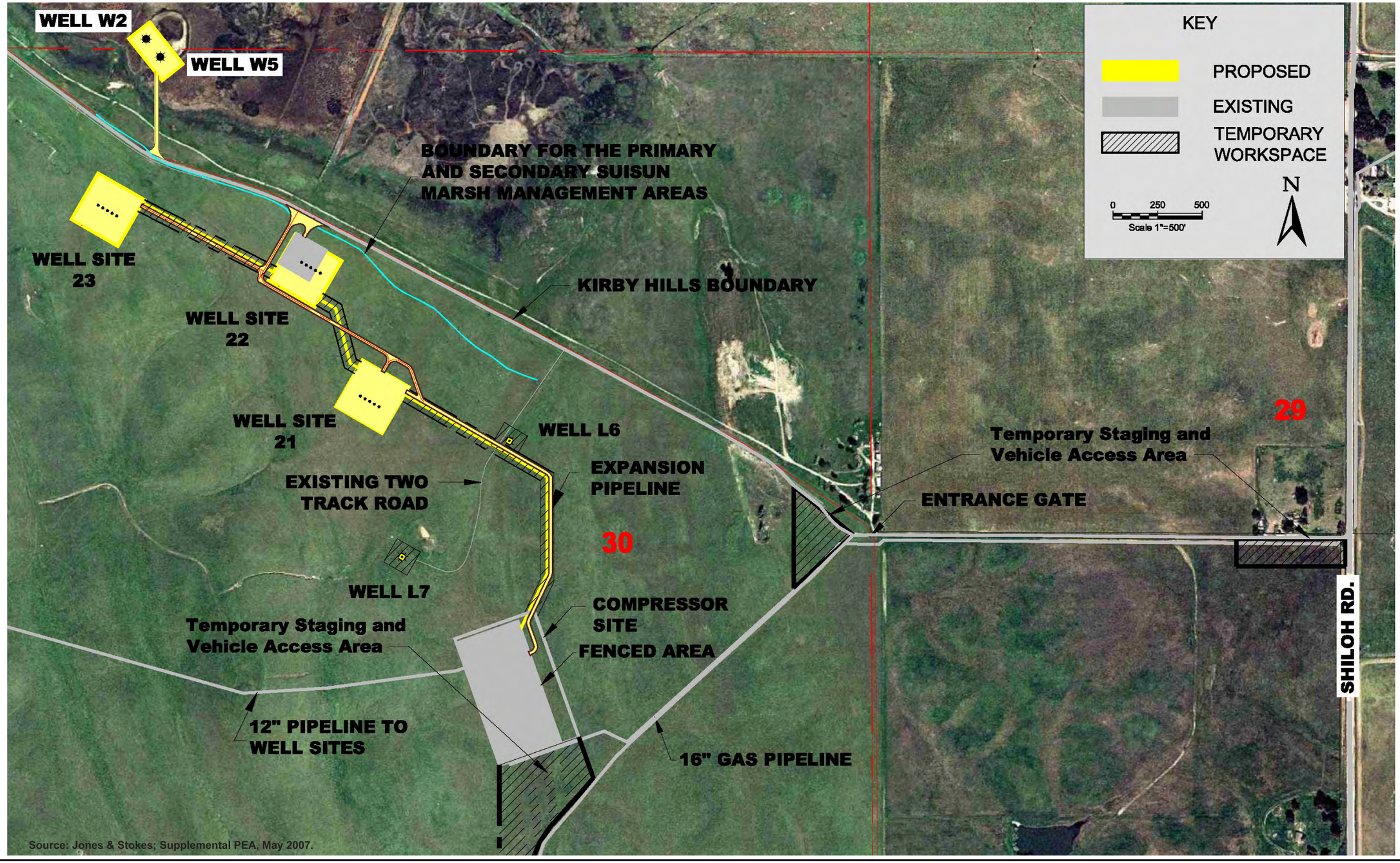

Source: Jones & Stokes; Supplemental PEA, May 2007.

PREPARED BY Aspen Environmental Group	Kirby Hills Natural Gas Storage Facility	Phase II Project Components	Kirby Hills Natural Gas Storage Facility Figure 5-3

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The well pad sites were first cleared of surface material and vegetation, then leveled and graded to accommodate drilling equipment. The pad sites were contoured to drain to a collection point in order to control stormwater drainage. Once the pad site was prepared, a mobile drilling rig and associated equipment and tanks were driven to the pad. Drilling operations were the same as described in Section 4.1.

LGS requested a NTP from the CPUC on April 11, 2008 to commence construction activities associated with the new wells (Well Sites 21, 22, and 23), the flow line, and access roads and staging areas for Phase II construction. NTP #1 was issued on April 21, 2008. The authorized temporary well pad for the test well that was developed under the Kirby Hills I project (Variance #9) was expanded and used as the pad for Well Site 22. On May 5, 2008, Asta Construction started work at Well Site 22 removing topsoil around the existing well pad and temporarily stockpiling the topsoil. Grading work then began at the site. Vegetation removal and grading work at Well Site 23 also began on May 5, 2008. During the week of May 5, 2008, a wetland area near Well Site 23 was fenced-off and had silt fencing installed on the upslope side so potential erosion from Well Site 23 would not enter the wetland area (see Figure 5-4).

On May 16, 2008, drilling operations began at Well Site 22 and continued through early July 2008. Asta Construction began clearing and grading work at Well Site 21 on May 29, 2008. On June 16, 2008, crews began installing well cellars and conductor pipes for the new wells at Well Site 21. Erosion controls were installed in June 2008 at the new well pad sites. During the week of June 9, 2008, crews completed grading and installing rock at Well Sites 21 and 23.

On July 15, 2008, crews began drilling operations at Well Site 21 (see Figure 5-5). Workover rigs were set up at Well Site 22 at the end of July and continued through mid-September 2008.

On September 5, 2008, drilling began for Well Site 23 (see Figure 5-6). During the week of September 14, 2008, workover rigs were moved from Well Site 22 to Well Site 21 well pad and continued to work there until mid-October 2008. A crew began hydroseeding the slopes around the well pads on November 4, 2008. On November 5, 2008, drilling was completed at Well Site 23. Once drilling was completed at the well sites, crews excavated trenches, fabricated and installed well site piping, coated underground pipe and fittings, conducted piping system assembly, backfilled trenches, conducted form work for pipe support piers, poured concrete for pipe support piers, and conducted electrical and instrumentation work.

During the month of March 2009, crews installed lighting at the well sites. During the week of May 25, 2009, crews conducted electrical loop checks, final tubing, and switched from temporary remote metering to permanent at the well sites. Graveling and fencing of the well sites was completed in mid-August 2009 (see Figure 5-7).

Flow Line. A 12-inch, bi-directional steel flow line was installed underground to connect the injection and withdrawal wells to the existing compressor station (see Figure 5-3). The flow line is approximately 3,700 feet long. The purpose of the flow line is to convey natural gas between the compressor station to the injection/withdrawal wells for injection into and withdrawal from storage. The withdrawn gas is compressed to a pressure sufficient for injection into the PG&E 401 pipeline. An access road along the flow line right-of-way was constructed between the compressor station and the well sites.

The 12-inch flow line construction process was the same as the 16-inch natural gas pipeline that runs between the metering station and the compressor station (see Section 3.1).

LGS requested a NTP from the CPUC on April 11, 2008 to commence with construction activities associated with the new wells (Well Sites 21, 22, and 23), the flow line, and access roads and staging areas for Phase II construction. NTP #1 was issued on April 21, 2008. During the week of June 9, 2008, crews began clearing the right-of-way for the flow line pipeline. During the week of July 14, 2008, crews

Figure 5-4. Fencing Around Wetland Near Well Site 23, 5-06-0

Figure 5-5. Drill Rig Set-up at Well Site 21, 7-18-09

Figure 5-6. Drill Rig Set-up at Well Site 23, 9-12-08

Figure 5-7. Well Site 22, 8-20-09

began pipeline excavation began outside the northern compressor station fence. During the week of July 21, 2008, crews began stringing pipe for the pipeline and installed orange safety fence along the pipeline right-of-way between the compressor station area and Well Site 21. Crews then began excavation of the pipeline trench between the compressor station and Well Site 21. On August 1, 2008, welding and installation of the pipeline began (see Figure 5-8). On August 14, 2008, crews installed the HDPE pipe and fiber optic cable in the pipeline trench and began shading (first phase of backfill) the pipeline between the compressor station and Well Site 21. During the week of September 8, 2008, crews began excavating for the pipeline from Well Site 21 to Well Site 22. Crews also worked on constructing the road between the compressor station and Well Site 21. During the week of September 29, 2008, a geotextile fabric and rock was installed along the access road between the compressor station and Well Site 21. On September 30, 2008, crews completed the pipeline right-of-way grading between Well Sites 21 and 22. Trench was excavated and pipe installed. On October 30, 2008, crews seeded the pipeline right-of-way from the compressor station to Well Site 22. During the week of November 10, 2008, crews removed topsoil for the flow line between Well Sites 22 and 23, excavated for the pipeline, conducted pipe welding, and lowered the pipeline in the trench. Crews finished installing the pipe between Well Sites 22 and 23 the following week and backfilled the pipeline trench. During the week of December 8, 2008, crews completed restoration of the pipeline right-of-way between Well Sites 22 and 23. Hydrostatic testing of the pipeline was conducted in February 2009.

Figure 5-8. Pipeline Installation Between Compressor Station and Well Site 21, 8-08-08.

Conversion of Abandoned Wells

LGS proposed to convert four abandoned wells to observation wells at the Kirby Hills facility. Two were former production wells (Wagenet 2 [W2] and Wagenet 5 [W5]) located on the Wohn Parcel. The other two wells (Lambie 6 [L6] and Lambie 7 [L7]) are located on the Kirby property (see Figure 5-3). All four wells needed to be reworked to convert them to observation wells. A permanent well pad encompassing both the W2 and W5 wells was planned to be constructed on the Wohn Parcel and an access road built from the Kirby Hills property to the well pad. LGS decided to not do the W2 well work at this time and reduced the size of the well pad to just encompass W5 well.

The conversion work consisted of reentering the well bore, cleaning out all the cement plugs, re-perforating the Wagenet Formation, and testing the reservoir for fluid type and pressure. The wells were then completed with a packer and tubing to isolate the perforated interval from the rest of the well bore. A "Christmas Tree" wellhead was set on the well to finish the completion. The wells are used to monitor the reservoir fluid and pressure. Wells L6 and L7 were accessed using the existing Kirby Hills access road off of Shiloh Road and an existing two track road off of the Kirby Hills access road.

LGS requested a NTP from the CPUC on April 11, 2008 to commence with reentry and conversion of Wells Lambie 6 (L6) and Lambie 7 (L7) to observation wells for Phase II of the Project. NTP #2 was issued on April 20, 2008. During the week of May 5, 2008, work began at Well L6 and Well L7. Temporary well pads were cleared and graded and crews exposed the plugged and abandoned wells using a backhoe. A workover drill rig was then brought to Well L6 and then moved to Well L7. Drill work at the observation wells took approximately three weeks. On November 25th, 2008, Asta Construction installed 20 foot-square pads and began fence installation around Wells L6 and L7.

LGS requested a NTP from the CPUC on April 7, 2009 to commence with construction activities at observation well Wagenet 5 (W5). NTP #8 was issued on April 16, 2009. This well occurs in the Suisun Marsh Primary Management Area (PMA) and conversion activities resulted in the placement of fill material into waters of the United States. Therefore, Lodi Gas Storage obtained the appropriate state and federal permits to conduct this work.

The work associated with W5 involved restoring a degraded well pad and access road to Well W5 to their original condition. Lodi Gas Storage then drilled out the existing plugs in Well W5 and converted it to an observation well. This activity resulted in the discharge of 0.40 acres of fill material into waters of the United States (previously disturbed brackish marsh and mud flats formed on fill material), of which 0.10 acres was temporary. As part of the Wetland Habitat Mitigation and Monitoring Plan (ICF Jones & Stokes 2008), Lodi Gas Storage restored 0.90 acres of disturbed wetlands on-site to compensate for the 0.30 acres of permanent fill material that was deposited on-site as part of the Well W5 conversion activities.

A Biological Opinion (BO) was issued by USFWS on December 11, 2008 for the project and the effects on the endangered salt marsh harvest mouse (*Reithrodontomys raviventris*) and the endangered California tiger salamander (*Ambystoma californiense*). The BO required wildlife exclusion fencing to be installed around the W5 well site area to prevent the harvest mouse from entering the work area. A restoration and revegetation plan was also required under the BO. A pre-construction survey salt marsh harvest mouse was conducted by Dr. Howard Shellhammer on April 3, 2009. During his field visit, Dr. Shellhammer saw no evidence of small mammal activity (tracks, holes, burrows, or nests) in the survey area. He indicated that the pad and a 100-foot buffer around the pad are highly unlikely to support salt marsh harvest mice on any regular basis.

On April 5, 2009, the landowner installed a temporary electric fence around the work area to discourage cattle from entering the construction area. On April 9, 2009, hand harvesting of specified plants was conducted in the disturbance area per the restoration and revegetation plan. Two species of plants (pickle weed and salt marsh grass) were moved outside of the disturbance area and marked with pink and yellow flags. Crews transplanted 1425 plants under the supervision of Jones & Stokes biological monitors. On April 15, 2009 crews began installing the wildlife exclusion fence per Dr. Shellhammer's recommendations and the USFWS BO. A small trencher was first used to dig a trench so that the fence could be easily keyed in. The trencher then got stuck and crews had to dig a trench by hand and key-in the fence. Crews finished installing the fence on April 16, 2009, and conducted weed-eating around the perimeter of the fence as directed by Dr. Shellhammer. Crews also installed a work exclusion fence along the access road to the well pad area. On April 17, 2009, Wagenet 5 well casing was exposed. On April 20, 2009, crews started building up the access road and well pad area with soil, which was then compacted. On April 21, 2009, crews finished adding soil to the well pad area and began to install gravel on top of the compacted soil (see Figure 5-9). Drilling operations began to install the week of April 27, 2009 at W5 (see Figure 5-10). During the week of June 15, 2009, drilling was completed to the necessary depth and the drill pipe removed from the hole. Crews then installed the casing and the drill rig and equipment moved off of the well pad on June 23, 2009. A workover rig moved onto the well pad June 30, 2009, and the perforation of the well piping was performed. The work was completed in a couple of days and the rig moved off of the well pad at the end of the week. Removal of temporary portions of the well pad and restoration of the marsh area were completed at the beginning of July 2009 and the area was flooded (see Figure 5-11).

Figure 5-9. Well Pad Installation at Wagenet 5, 4-21-09

Figure 5-10. Drilling at Wagenet 5, 5-6-09

Figure 5-11. Wagenet 5 Observation Well, 8-20-09

Compressor Station Construction

LGS proposed to build a new compressor building adjacent to the existing compressor building at the compressor station to house two new compressors, with a combined total of 5,900 horsepower. Equipment allowing for an additional 250 MMcf/d of dehydration capacity were also installed within the compressor station fenceline (see Figure 5-12). Construction activities for the Phase II work were confined to the existing compressor station site and the adjoining temporary workspace. These areas were cleared and graded as part of Kirby Hills I construction in 2006. Limited additional grading was necessary to prepare an area within the fenced site for constructing foundations for the equipment and new building.

The same type of construction methods were used for Phase II as was used for Kirby Hills I at the compressor station. The new components and equipment installed at the compressor station were the same (or similar) to what was installed for Kirby Hills I (see Section 4.1).

LGS requested a NTP from the CPUC on April 29, 2008 to commence with the civil, mechanical, electrical, and instrumentation work at the compressor station facility of the Kirby Hills Project for Phase II. NTP #4 was issued on May 7, 2008. The work area was accessed using the existing compressor station access road off of the Kirby Hills access road. All construction equipment was staged at and around the compressor station in the approved extra work space areas.

LGS requested a NTP from the CPUC on May 23, 2008 for extra work space at the corner of Shiloh Road and the access road to Kirby Hills. This extra work space was already approved under NTP #1 and was not necessary. No additional NTPs were issued for this extra work space.

On July 8, 2008, crews began stripping vegetation from the temporary work space area. They then began relocation of surplus material to prepare for berm area expansion. Crews also began to mobilize equipment and materials to the compressor station site.

LGS requested a NTP from the CPUC on June 6, 2008 to install the compressor units on foundations at the compressor station. NTP #6 was issued on June 13, 2008. Construction activities for the setting of the compressor units on concrete foundations/pedestals were confined to the existing compressor station site and the adjoining temporary workspace. These areas were cleared and graded as part of Phase I construction in 2006 and also approved under NTP #1.

Construction activities began at the compressor station mid-July 2008 and continued through the end of June 2009 (see Figures 5-13 and 5-14). At the beginning of December 2008, the disturbed temporary work area/staging area on the north side of the compressor station was seeded and revegetated well.

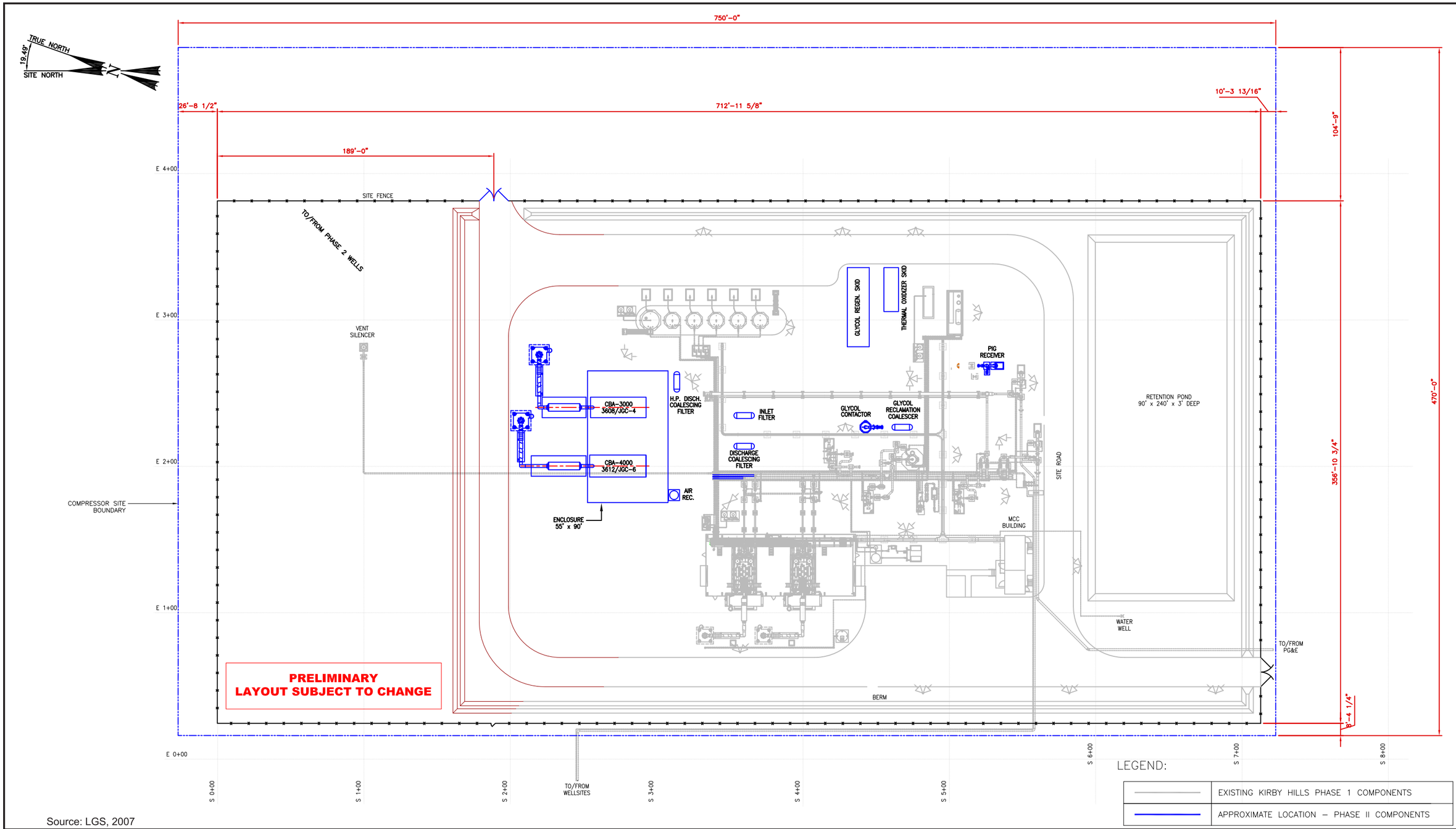
5.2 Non-Compliance Events During Phase II Construction

On July 18, 2008, the CPUC EM noted a couple of oil spots at Well Site 22 and discussed this with LGS's EI. LGS's EI informed the CPUC EM that the oil spots would be cleaned-up.

No Non-Compliance Reports (NCR) or Project Memoranda were issued by the CPUC EM for the activities associated with the Kirby Hills Project Phase II construction.

5.3 Variance Requests for Phase II Construction

No Variance Requests were submitted to the CPUC for Phase II of the Kirby Hills Project.



Source: LGS, 2007

PREPARED BY Aspen Environmental Group	Kirby Hills Natural Gas Storage Facility	Compressor Station Plot Plan	Kirby Hills Natural Gas Storage Facility Figure 5-12

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Figure 5-13. Foundation Work at Compressor Station, 10-03-08

Figure 5-14. Completed Compressor Station for Phase II, 8-20-09

5.4 Summary of Phase II Activities

For Phase II, LGS used a depleted natural gas reservoir, the Wagenet Reservoir, in the Kirby Hills gas field to expand the natural gas storage capacity of the project. PG&E replaced an existing "hot tap" on the Line 400 with a larger tap. Additional piping and a meter and flow control valve also had to be installed at the existing metering station. LGS developed three new well pad sites containing 15 injection and withdrawal wells along the northern boundary of the Kirby Hills project area (Well Sites 21, 22, and 23). LGS proposed to convert four abandoned wells to observation wells at the Kirby Hills facility. Two were former production wells (Wagenet 2 [W2] and Wagenet 5 [W5]) located on the Wohn Parcel. The other two wells (Lambie 6 [L6] and Lambie 7 [L7]) are located on the Kirby property. LGS decided not to convert W2 to an observation well at this time. LGS constructed a new compressor building adjacent to the existing compressor building at the compressor station to house two new compressors, with a combined total of 5,900 horsepower. Equipment allowing for an additional 250 MMcf/d of dehydration capacity were also installed within the compressor station fenceline.

Seven (7) NTPs were issued for Phase II construction. NTP #1 was issued on April 21, 2008 for the three new well sites, a 2,700-foot-long pipeline (flow line), and access roads and staging areas. NTP #2 was issued on April 20, 2008 for conversion of Wells L6 and L7 to observation wells. NTP #3 was issued on May 6, 2008 for PG&E's hot tap work on their Line 400 adjacent to the metering station. NTP #4 was issued on May 7, 2008 for the civil, mechanical, electrical, and instrumentation work at the compressor station facility. NTP #5 was not applicable. NTP #6 was issued on June 13, 2008 for installation of the compressor units on their foundations at the compressor station. NTP #7 was issued on December 17, 2008 for modification work at the metering station. NTP #8 was issued on April 16, 2009 for construction activities at observation well Wagenet 5 (W5). No Variance Requests were submitted for Phase II construction.

5.5 Final Inspection of Phase II Activities

The CPUC EM conducted a final inspection of the Kirby Hills Project Phase II on August 20, 2009 and found it to be in compliance with the Project Description and Mitigation Measures from the approved CEQA document (MND).

6. Conclusions and Recommendations

The intent of this section is to identify the shortcomings of mitigation and permit requirements approved for the Kirby Hills Natural Gas Storage Project and recommend solutions to these shortcomings for future projects.

Agency Consultation

There were chronic problems on the part of LGS and their subcontractors in their willingness to consult with applicable resource agencies (i.e. CDFG, USFWS) regarding potential impacts to resources. It was only after CPUC prodding and direct notification of the applicable resource agencies by the CPUC EM that consultation occurred. It is recommended that the mitigation measures regarding resources be clarified to require agency consultation if there are resource questions or uncertainties regarding interpretation of resource presence, and until such consultation is conducted, no work shall occur in the area. Further, if resources are encountered in the field, mitigation measures should be clarified to reflect "immediate" notification of the resource agencies and CPUC EM.