Chapter 2
Project Description

This chapter provides a general description of the Phase II project location, surrounding land uses and setting, project components, construction methods, operations and maintenance program, APMs, and a list of the permits and approvals expected for the Phase II project components.

Project Location

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 (Delta) (see Figure 1-1). The site is approximately 6 miles west of Rio Vista and 8 miles southeast of Fairfield.

LGS proposes to construct and operate Kirby Hills II using an underground gas reservoir on a portion of the existing property leased from Kirby Hill Associates (Kirby Property) in Solano County. The underground storage reservoir and proposed additional surface infrastructure will be located primarily on the Kirby Property. The Phase II project components occur within the northern portion of the Kirby Property, immediately along the gravel-based Kirby Hills access road. The project components occur both within and outside the Suisun Marsh Primary and Secondary Management Area (two existing wells occur within the Primary Management Area).

The location of the existing Kirby Hills I area and additional Phase II project area are shown in Figure 2-1.

Surrounding Land Uses and Setting

The Phase II project area is dominated by nonnative annual grasslands that are currently grazed by cattle. Seasonal wetlands occur within this annual grassland, primarily within the area just south of the Kirby Hills access road. To the north of the access road, two existing wells (W2 and W5) occur within the Suisun Marsh Primary Management Area. This portion of the project area is dominated by brackish marsh wetlands.

The project area has been the location of natural gas exploration and development since the 1930s and is within the area designated the Kirby Hills

Gas Field by the California Division of Oil, Gas and Geothermal Resources. Also within the project area and associated with past gas development and production in the region is the closed IT Montezuma Hills hazardous waste disposal facility, located north of the project site along Olsen Road. This 84-acre site accepted liquids, sludge, and solid wastes from oil and gas exploration and production facilities from 1979 through 1986 but is now closed. A post closure permit was issued to the facility in 1998.

General Plan Designation and Zoning

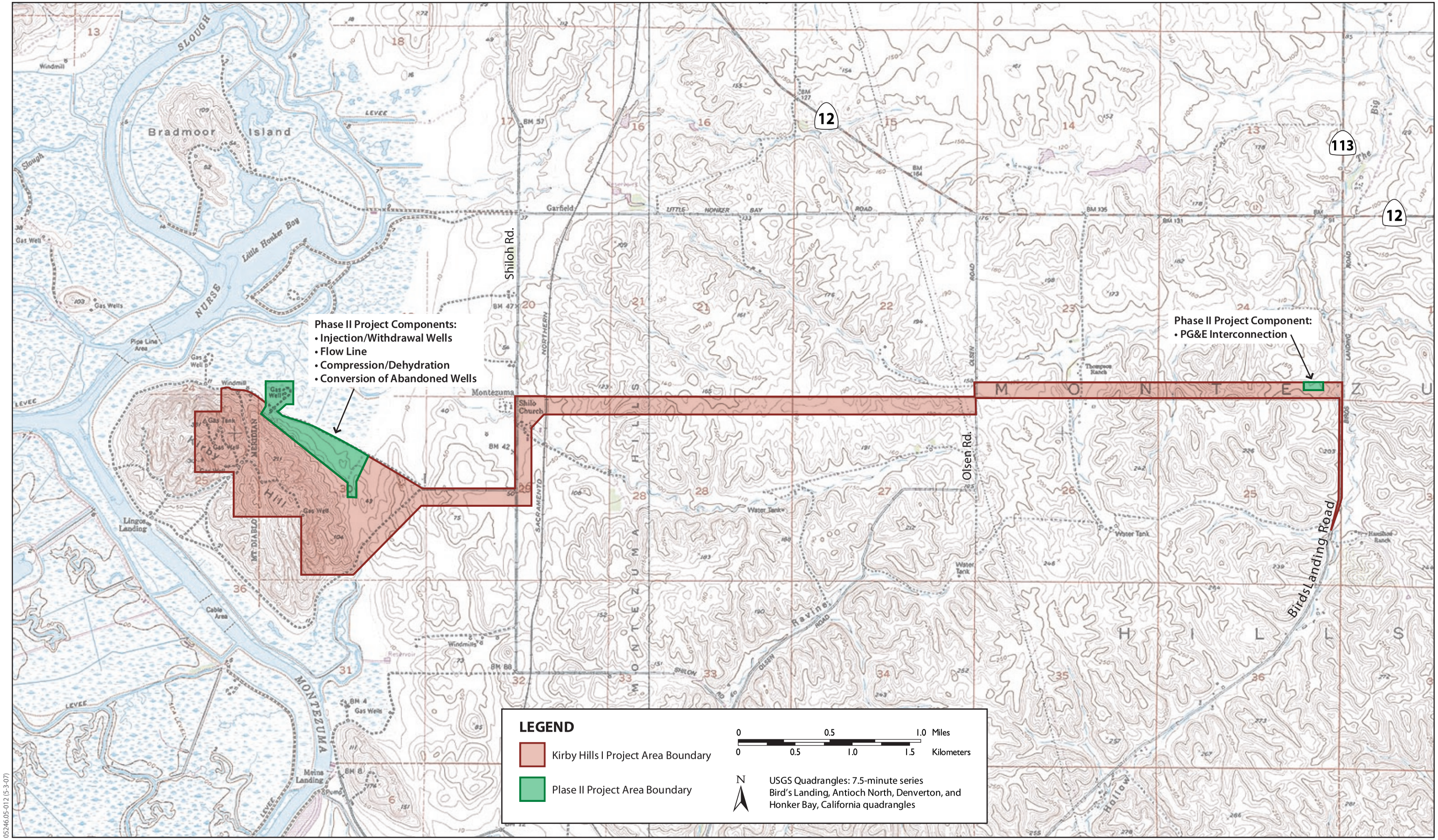
The Montezuma Hills is identified in the current the Solano County General Plan as one of four areas in the county that are "essential agricultural lands." Land use within the Phase II project area is regulated by the Collinsville-Montezuma Hills Area Plan and Program, which was adopted in 1979 as an amendment to the Solano County General Plan. County planning policies seek to preserve the agricultural character of the area by discouraging uses incompatible with agriculture. The Phase II project components are also within the western portion of the Collinsville-Montezuma Hills Wind Resource Area designated by Solano County (County) in 1987 as land suitable for wind energy development.

The Phase II project area is within the Suisun Marsh Primary and Secondary Management Areas. Facilities for the production and storage of natural gas are conditionally permitted uses and require a use permit. A Marsh Development Permit is also required by the County and/or the San Francisco Bay Conservation and Development Commission in this zoning district to ensure consistency of the proposed use with the Suisun Marsh Protection Plan and local marsh protection ordinances**.**

Overview of the Phase II Project

The proposed Kirby Hills II facility will have a total working capacity of up to 12 Bcf. There will be approximately 6 Bcf of cushion gas capacity. The maximum firm injection and withdrawal capacity will be 250 MMcf/d.

Kirby Hills II will utilize a previously operational natural gas production reservoir (Wagenet Reservoir) that underlies the Kirby Property and an adjacent private parcel of land (the Wohn Parcel). The Wagenet Reservoir in the Kirby Hill Gas Field was discovered by Shell Oil Company in 1947. Production continued until 1976 when the field was depleted. Gas production during this period totaled 22.7 Bcf. Development of Kirby Hills II is covered under the existing surface and storage lease with Kirby Hill Associates, pursuant to Kirby Hills I. In addition, in 2006 LGS (subsequently assigned to Lodi Development LLC, a subsidiary of LGS) acquired the consent from the owner of the mineral rights on an adjacent private parcel of land (Wohn Parcel) that overlies a portion of the Wagenet Reservoir. In 2007 Lodi Development L.L.C. acquired the



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Jones & Stokes

Figure 2-1
Kirby Hills I and Kirby Hills Phase II Project Area Boundaries

storage rights beneath the Wohn Parcel as well as surface access required in order to convert two existing abandoned production wells to observation wells.

The proposed Kirby Hills II facility will use the existing pipeline interconnection and compressor station site constructed for Kirby Hills I. The Kirby Hills II facility will add three new well pad sites containing fifteen injection and withdrawal wells that will be developed along the northern boundary of the Kirby Property. These new wells will access the Wagenet Reservoir that is over 2,000 feet below the Domengine Sand formation used for Kirby Hills I storage. A 12-inch, approximately 3,700-foot pipeline (flow line) will be constructed to connect the injection and withdrawal wells to the existing compressor site. A new compressor enclosure will be built on the existing compressor station site to house two additional compressors totaling 5,900 horsepower. Additional dehydration equipment with a capacity of 250 MMcf/d will be added on the compressor site.

The existing 16-inch pipeline connecting the compressor site to PG&E's Lines 400/401 Pipeline System will be utilized without modification. The PG&E interconnection will be expanded to 350 MMcf/d from the existing 100-MMcf/d interconnection. The expanded PG&E interconnect will be accomplished on the existing 0.75-acre interconnection site west of Birds Landing Road and adjacent to PG&E's Lines 400/401 Pipeline System.

As part of Phase I, LGS connected to an existing, aboveground electrical distribution line located 1 mile west of Birds Landing Road to the metering station. The new power line is a single-phase service that is run below ground. No additional power lines will be needed to the compressor or meter stations.

Most surface facilities (well pads, flow line, and compressor/dehydration facilities), with the exception of two observation wells and the remote meter/interconnect facility, will be located on the Kirby Property under long-term lease from Kirby Hill Associates.

Underground Storage Alternatives

A supplement to the PEA (Exhibit B–*Underground Gas Storage Alternatives*) (Jones & Stokes 2005) provided a description of the underground gas storage fields that were evaluated as alternatives to the Kirby Hills gas field and provided a brief analysis for why these alternatives were not chosen. Several technical and market factors affect the suitability of a depleted natural gas field for use as a storage facility. These factors and the underground storage alternatives were described previously in this supplemental submittal to the CPUC.

LGS determined that, although potentially technically feasible as storage reservoirs for natural gas, the additional fields were eliminated from further consideration because of various factors, including surface environment, location relative to the existing natural gas transmission infrastructure, and geologic complexity.

Project Components

The proposed project comprises the following five components:

1. Injection/withdrawal wells
2. Flow line
3. Compression/dehydration
4. PG&E interconnection
5. Conversion of abandoned wells

Each project component is described below, as well as the proposed construction methods, phasing, schedule, and operations and maintenance program. Figures 2-2a and 2-2b provide a general overview of the major project components.

Injection/Withdrawal Wells

Three new well pad sites containing 15 injection and withdrawal wells will be developed along the northern boundary of the Kirby Property (well sites 21, 22, and 23 in Figure 2-2a). These new wells will access the Wagenet Reservoir that is over 2,000 feet below the Domengine Sand formation used for Kirby Hills I storage. The proposed storage reservoir is the depleted Wagenet Sand, which varies in thickness from 90 to 200 feet and exists at a depth between 4,632 and 5,376 feet below mean sea level. It is capped by a 1,500-foot thick layer of hard shale lying directly above the Wagenet Sand, which trapped the original gas resource and which will contain the proposed storage gas. The surface extent of the productive Wagenet Sand covers approximately 160 acres located beneath the Kirby Property and the Wohn Parcel. Historical pressure data indicate that the Wagenet Reservoir is primarily depletion driven, with minimal water production seen during past operations.

The underground gas reservoir will be accessed from three new well pad sites located on the Kirby Property. The proposed well pad sites are shown in Figure 2-2a. The 15 new injection/withdrawal wells will be drilled, some directionally, from the well pads into the storage formation. The surface facilities will consist of well heads and piping. Each well pad area will be fenced and graveled for access control, fire control, and maintenance purposes. Drilling and completion of each well will be conducted in accordance with applicable California Department of Conservation, Division of Oil, Gas, and Geothermal Resource (DOGGR) requirements.

In order to minimize environmental impacts, the authorized temporary well pad for the core well (Variance Request #9 approved by the CPUC February 23, 2007) is proposed to be expanded and used as the pad for well site 22 as shown in Figure 2-2a.