

B. Initial Study

B.1 Project Description

B.1.1 Project Title

Kirby Hills Natural Gas Storage Facility Project

B.1.2 Project Sponsor's Name and Address

Lodi Gas Storage, LLC
14811 St. Mary's Lane, Suite 150
Houston, Texas 77042

B.1.3 Lead Agency Name and Address

California Public Utilities Commission
Energy Division
505 Van Ness Avenue, Fourth Floor
San Francisco, California 94102

B.1.4 Lead Agency Contact Person and Phone Number

Junaid Rahman, Project Manager
Energy Division
California Public Utilities Commission
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B.1.5 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 (see Figure B-1 – General Project Location). The site is approximately six miles west of Rio Vista and 16 miles southeast of Fairfield.

Figure B-2 is a map of the project area showing the boundaries of the leased land. The proposed project contains two major component locations, connected by an approximately six-mile, east-west, pipeline corridor (Figure B-3). 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 storage/withdrawal site located in the Kirby Hills between Montezuma/Nurse Slough on the west and Shiloh Road on the east. The portion of the project area west of Shiloh Road is also located within the Suisun Marsh Secondary Management Area.

B.1.6 Surrounding Land Uses and Setting

The primary existing land uses in the project area are dry land farming (primarily wheat) and livestock grazing. The project site is also within the western portion of the Collinsville-Montezuma Hills Wind Resource Area designated by Solano County in 1987 as land suitable for wind energy development. Since that time, hundreds of wind turbines have been installed in the area and others are in development.

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, sludges, 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.

The following are descriptions of the environmental setting at each of the three major project component locations.

B.1.6.1 Natural Gas Receiving/Metering Station Site

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 will be constructed on an approximately 0.75-acre site on the north side of an existing metering and dehydration station that is part of the Montezuma pipeline system owned and operated by Calpine. The proposed metering station site and existing Calpine facility are within a 160-acre agricultural parcel.

B.1.6.2 Pipeline Right-of-Way

The approximately six-mile pipeline corridor that connects the eastern and western project components 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 under construction

B.1.6.3 Natural Gas Storage/Withdrawal Site

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 proposed sites of the compressor station and injection/withdrawal wells are within 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 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

B.1.7 General Plan Designation

The Montezuma Hills, in which the proposed project would be located, is identified by the Solano County General Plan as one of four areas in the county that are “essential agricultural lands.” Land use within the 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 project site is also within the western portion of the Collinsville-Montezuma Hills Wind Resource Area designated by Solano County in 1987 as land suitable for wind energy development. Another important

Figure B-1. General Project Location
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Figure B-2. Project Area
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Figure B-3. Location of the Project Components
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land use policy affecting the siting of new uses in the upland portion of the project area west of Shiloh Road is the San Francisco Bay Conservation and Development Commission's Suisun Marsh Protection Plan.

B.1.8 Zoning

To implement its policies to preserve the agricultural character of the project area, Solano County has zoned all of the project area east of Shiloh Road as "Agricultural District" (A-160), with a minimum parcel size of 160 acres. Facilities for the production and storage of natural gas are conditionally permitted uses ~~within this zone~~ requiring a ~~Special~~-Use Permit.

The upland area west of Shiloh Road is within the Suisun Marsh Secondary Management Area. This area is zoned "Limited Agricultural District" (AL-160), which allows for agriculture and agriculture-related uses. Facilities for the production and storage of natural gas are conditionally permitted uses ~~within this zone~~ and require a ~~Special~~-Use Permit. A Marsh Development Permit is also required by Solano County in this zoning district to ensure consistency of the proposed use with the Suisun Marsh Protection Plan and local marsh protection ordinances.

B.1.9 Description of Project

B.1.9.1 Purpose and Need

Lodi Gas Storage (LGS) is requesting a Certificate of Public Convenience and Necessity from the California Public Utilities Commission (CPUC) to construct and operate an underground natural gas storage facility to offer its customers the ability to inject and/or withdraw gas into and out of the Kirby Hills Facility up to several times a day. LGS customers would make their own arrangements for purchasing the gas, for transporting it to and through PG&E's natural gas pipeline system for delivery to the storage facility, and for delivery from the storage facility to the customer.

Because of changes in the natural gas industry over the past several years, many California companies are arranging, on their own or through agents, to purchase their natural gas supplies directly from gas producers and then pay pipeline companies and local gas utilities to deliver the purchased gas to the customers' facilities. These customers may also benefit from purchasing natural gas storage services, which allows them to purchase and store gas when prices are relatively low and supplies are relatively high, and then to withdraw the gas from storage for use when prices are high or supplies are scarce (e.g., during a severe cold spell). Storage service also allows customers to inject gas during periods of high or over supply and to withdraw gas during periods of low supply and high demand. During supply emergencies (e.g., when pipeline deliveries are cut off by earthquakes or other natural disasters), stored gas may be the only source available in a given service area.

Three types of storage facilities are currently in use in the United States: abandoned salt caverns, water aquifers, and old production fields. In California, only old production fields are currently used as storage facilities. An old, pressurized production field is considered the most desirable by storage facility developers for several reasons: because the field was already used for gas production, the geology of the reservoir is generally well-known; the cap rock covering the permeable basin holds natural gas in very well, while water below keeps it pressurized for easier withdrawal.

The State's two largest natural gas utilities, PG&E and Southern California Gas Company, for years have stored natural gas in various storage facilities around the State as a method of alleviating the effects of a supply shortage. As a result of California Assembly Bill 2744 (passed in 1992), other independent com-

panies now are also allowed to build such facilities and compete directly with PG&E and Southern California Gas Company in offering natural gas services, including storage services, providing they meet all applicable laws and regulations. Increasing the total amount of natural gas storage capacity within California may reduce the negative effects of supply curtailments and also allow natural gas users to buy gas when it is plentiful and inexpensive, inject it into a storage facility, and then withdraw it later when gas prices are relatively higher. Potential customers for such services might include owners of gas-fired electric power plants, industries and businesses, and groups of schools that pool their gas purchasing power.

For several years, LGS has operated the existing Lodi Gas Storage Facility, located northeast of the City of Lodi in San Joaquin County. The existing Lodi facility is of substantially greater magnitude than the proposed facility and there have been no major problems during its operation. Capacity at the Lodi facility is currently fully subscribed through a combination of short-term and long-term contracts with a variety of market participants. In May 2005, LGS conducted an open season for up to 5 billion cubic feet (bcf) of additional working capacity with 100 Mcf/d of firm injection and withdrawal capacity. Bid Response Forms were received from six market participants with indications of demand for 7.3 bcf of storage capacity and LGS is in the process of negotiating storage services agreements with those parties.

Besides LGS, only one other company (other than PG&E and Southern California Gas Company) currently owns a natural gas storage facility in California. That company, Wild Goose Storage, Inc., began operations at its facility in Butte County in the late 1990s. The Wild Goose Storage facility is similar to that proposed by Lodi Gas Storage, ~~except in that it does not offer~~ **has** the capability of injecting and withdrawing gas ~~several times per~~ **on the same** day. ~~Instead,~~ **Like the proposed project,** the Wild Goose Storage facility was designed ~~more for~~ long-term **and short-term** storage.

B.1.9.2 Project Components

LGS is proposing to use a depleted natural gas reservoir in the Kirby Hills gas field as a temporary 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 will have a maximum injection and withdrawal capability of 100 million cubic feet per day (MMcf/day) of natural gas. Project operations would involve 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 Lodi Gas Storage customers, and conveying the withdrawn gas to the PG&E 400 pipeline for delivery to those customers.

The proposed project is comprised the following six primary components:

- Metering station
- Gas pipeline
- Compressor station
- Flow line
- Injection/withdrawal wells
- Temporary gas injection system

Each project component is described below, as well as the proposed construction methods, phasing, schedule, and operations and maintenance program. Figure B-3 provides a general overview of the major project components. Figures B-4a through B-4c show more detailed layouts of the project components and associated facilities, staging areas, and access roads. Figures B-4a through B-4c also show the relationship of the proposed project to the Shiloh I wind farm development project, which is under construction.

Figure B-4a. Project Components
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Figure B-4b. Project Components
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Figure B-4c. Project Components
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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 would contain low-lying surface facilities; it would be graveled for maintenance purposes and would be fenced to control unauthorized access. The metering station layout is shown in Figure B-5.

The proposed metering station will be located on an approximately 0.75-acre site immediately west of Birds Landing Road. It is near the PG&E 400 and 401 pipelines and is adjacent to an existing metering and dehydration station that is part of the Montezuma pipeline system owned and operated by Calpine (Figure B-4c). **A flow control valve located at the metering station would control the flow to/from PG&E Line 400.** The metering station would be located on the north side of the Calpine facility (see photographs of the site in Figure B-6). Access to the metering station would be provided via an existing gravel road off of Birds Landing Road. A new 250-foot-long access road would be constructed between this existing gravel road and the metering station, and would extend along the west side of the Calpine facility. This new access road would be approximately 20 feet wide and would be graveled. For electrical service, LGS would contract with PG&E to extend an existing aboveground electric distribution line located along Birds Landing Road, to the metering station. The power line would be a single-phase service run on single wooden pole structures.

To facilitate Supervisory Control and Data Acquisition (SCADA) communications with the metering station, a small communications tower would be installed on the peak of Kirby Hills (this tower is identified as the “Antenna Site” and is shown in Figure B-4a). The tower would be freestanding, with a base that is approximately 3 feet by 3 feet and an overall height of less than 13 feet. Access to this tower would be provided by an existing two-track road (Figure B-4a). This road would be improved in order to provide construction and maintenance access to the tower.

Safety measures installed at the meter station would be related to overpressure protection and remote surveillance. High-pressure switches (PSH) that would trigger shutdown of pipeline valves would be the primary protection. In addition, pressure safety valves would be installed to relieve pressure from the piping in the event the PSH control loop fails. These safety devices are mandated by the various codes and standards that apply to gas pipeline facilities (e.g., 49 CFR Part 192-Minimum Federal Safety Standards for the Transportation of Natural and Other Gas by Pipeline). An odorization skid would be installed at the metering station to ensure that any gas delivered to PG&E meets the odorization requirement. Remote surveillance at the station would be accomplished using security cameras and microphones.

The facility would be remotely monitored and flow controlled from the control room of the existing Lodi Gas Storage facility in Lodi, California. This facility has full power backup and can operate at 100% capability with no outside power. The metering station would be equipped with an uninterruptible power supply (battery backup) to maintain control systems power for short power outages. In the event of extended loss of electrical power at either the metering station or any of the project facilities, all facilities would be shut down. In the event of a communications failure between the Kirby Hills facility and the LGS control room in Lodi, all systems would continue to operate on local control systems located at the various sites and stations at Kirby Hills. Personnel would be dispatched to the Kirby Hills site to oversee the local control. In addition, PG&E would have monitoring and shut-in abilities through their communications systems to the proposed metering station.

Gas Pipeline

A 16-inch pipeline would extend approximately 5.9 miles from the metering station to the compressor station located at the Kirby Hills site (see Figure B-4a and description below). Starting at the compressor station, the proposed pipeline would run eastward through non-native annual grassland and a tilled agricultural field. At Shiloh Road, the pipeline would turn north along the east side of the road (on private property) and under an unnamed seasonal drainage. After the pipeline crosses the drainage, it would run northeast crossing under the Bay Area Electric Railroad Association tracks. The pipeline would then continue east and run along the south side of an existing Calpine gas pipeline until reaching Olsen Road. This segment of the pipeline route is located in rolling hills dominated by dryland farming and livestock grazing. At Olsen Road, the pipeline would cross to the north side of the Calpine line until it reaches the metering station near Birds Landing Road. This portion of the pipeline route is also used for dryland farming and livestock grazing. Figure B-7 contains representative photographs of the proposed pipeline route.

The pipeline would be bidirectional, allowing natural gas to flow to and from the Kirby Hills gas field. The pipeline's capacity would be approximately 100 million standard cubic feet per day (MMscfd). The anticipated normal flow would be 25–50 MMscfd. The pipeline would be sized for the lowest expected flowing pressure from PG&E (~600 psig) and the wall thickness would be sized for the Maximum Allowable Operating Pressure (MAOP) during withdrawal (~1,000 psig) or higher, but would not be designed to a pressure higher than 1,480 psig.

The pipe would be coated with fusion bond epoxy. Field joints would either be coated with a heated powder coat or with shrink sleeve wraps. Pipe used for bored or drilled crossings would have an additional armor coating (e.g., 50 mils of Lilly 2040) applied over the fusion bond epoxy coating. The type of cathodic protection system would be determined during the detailed engineering phase of the project. A sacrificial anode system would be the preferred system, if the soils are compatible. If the soils prove incompatible with sacrificial anode systems and an impressed current system is used, the rectifier would be located at the compressor station.

After the pipeline is constructed, a corrosion-inhibiting chemical would be used to coat the inside of the pipe. A corrosion coupon would be installed in the pipeline to provide monitoring of internal corrosion throughout its operational life. Thereafter, the pipeline would be inspected during operations in compliance with federal pipeline safety rules (49 CFR Part 192).

Similar to the metering station, pipeline safety measures related to overpressure protection would consist of high-pressure switches (PSH) that would trigger alarm/shutdown of the gas compressors, pipeline valves, and meter station valves as appropriate, and would be the primary protection. In addition, pressure safety valves would be installed to relieve pressure from the piping in the event the PSH control loop fails. These safety devices are mandated by the various codes and standards that apply to gas pipeline facilities (e.g., 49 CFR Part 192). All remotely operated valves would be designed to fail to the safe position in the event of the loss of pneumatic supply pressure or the loss of electrical signal. In the event of an emergency, blowdown (i.e., purging) of the 5.9-mile pipeline and meter station would be provided at the compressor station. In addition, a manual blowdown would be provided at the meter station. No leak detection system is planned for this pipeline. Regular patrolling of the pipeline route in accordance with County and federal requirements would be implemented.

In the event of a leak, fire, or explosion, the pipeline would be shut in and potentially be blown down at the compressor station. The pipeline would most likely not be blown down in the event of a compressor station fire.

Figure B-5. Plot Plan and Meter Site
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Figure B-6. Photographs of the Proposed Metering Site
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Figure B-7. Representative Photographs of the Gas Pipeline Route
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Compressor Station

The compressor station would be located on an approximately 10-acre site at the eastern base of Kirby Hills (see Figure B-4a). The site is behind a low hill and therefore would be generally screened from view. The compressor station would be constructed in an area that is currently dominated by non-native annual grassland (see Figure B-8).

The plot plan for the compressor station is provided in Figure B-9. The compressor station site would be fenced and graveled for access control, fire control, and maintenance purposes. The compressor station would be fully encircled by an earthen berm to prevent uncontrolled runoff from the site.

The natural gas-driven compressors would have a combined total of 7,200 horsepower (hp) coupled to reciprocating gas compressors. The current phasing of the development calls for two units to be installed initially and a maximum of four units put into operation at some point in the future, depending on market demand and reservoir technical considerations. The compressor units would be housed in a building designed to fit in with the generally agricultural nature of the surrounding area. The building would be designed to control noise by installing appropriate insulation, providing baffling of air vents, directing air vents away from all nearby residences, and providing appropriate muffling equipment. The building would be designed to meet all relevant Solano County noise ordinances. The compressor station also would be required to meet the standards set by the Bay Area Air Quality Management District (BAAQMD), including use of best available control technology (BACT). LGS would be required to obtain a permit to operate the facility from the BAAQMD.

A process flow diagram is provided in Figure B-10. This diagram shows the connections and natural gas flow between the project components. The compressor station would have a maximum injection and withdrawal capability of 100 million cubic feet (MMcf) of natural gas per day. The compressors would provide sufficient pressure to push the natural gas into the storage reservoir and boost the pressure of the gas withdrawn from the storage reservoir so that it can be delivered into the PG&E line 400 pipeline. ~~A flow control valve located at the compressor station would control the flow to/from PG&E Line 400.~~

The design, manufacture, and erection of the compressor building would comply with the requirements of 49 CFR Part 192 (Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards). Fire and gas detection equipment would be installed in the compressor building to alarm and/or shut down and blow down the system in the event gas or fire is detected. These systems would be tied-in to the control system. The Solano County Building and Safety Services Department requires compliance with the California Building Code (CBC). LGS would be required to retain a California licensed architect who would designate the occupancy codes based on factors such as the quantity of flammable materials and types of containers. The County would review all plans to ensure CBC compliance.

In general, the safety measures at the site would be related to overpressure protection for pressure vessels and piping, over fill protection for tanks, and remote surveillance. High-pressure switches (PSH) that would trigger shutdown of gas compressors and/or pipeline valves would be the primary protection. In addition, pressure safety valves would be installed to relieve pressure from the piping in the event the PSH control loop fails. High-level switches on tanks would cause fill lines to shut in, preventing over fill and spillage. In the event these systems fail the tanks would be located within a diked area to contain any potential spills. These safety devices are mandated by the various codes and standards that apply to gas pipeline facilities (e.g., 49 CFR Part 192). Remote surveillance would be accomplished using security cameras and microphones. In addition, fire-fighting equipment would be stationed at various strategic locations throughout the station in conformance with 49 CFR Part 192.

In addition to the safety and control systems described above, the compressor station would be equipped with Emergency Shutdown Stations (ESD Stations) at various strategic locations. These ESD Stations would consist of a button that when pressed activates the ESD system, stopping all gas flow to/from the station and causing all gas within the station to vent to a safe location.

As part of this project component, LGS would install an electrical overhead power line, construct a primary and secondary retention pond, install a water well, and improve existing access roads. Each of these elements is described below.

Electrical Overhead Power Line. LGS would construct an electrical overhead power line to serve the compressor station (see Figure B-4a for the location of this overhead power line). The power line would be approximately 1,200 feet long and would be connected to an existing transmission line in the Kirby Hills. This existing line runs along the northern edge of the property boundary, adjacent to the existing Kirby Hills access road.

Primary and Secondary Retention Ponds. A primary retention pond would be constructed on the 10-acre compressor station site for collection of stormwater flow. An existing abandoned gravel quarry, located approximately 2,000 feet east of the compressor station, would be used as a secondary retention pond. An 8-inch or smaller drainage line would be installed parallel with the gas pipeline from the compressor station as far as the abandoned gravel quarry. The proposed retention pond and drainage line are shown in Figure B-3.

Access Road Improvement. An existing access road that runs along the northern edge of the Kirby Hills (referred to as the Kirby Hills access road) would provide construction and future maintenance access to the compressor station site. This road would be improved as part of the proposed project. A two-track dirt road off of this main gravel road would also be improved to provide direct access to the facility. This connecting access road would be gravel based and would be approximately 20 feet wide. The proposed access roads are shown in Figure B-4a and Figure B-8.

Water Well. A domestic water well would be drilled within the 10-acre compressor station site to supply water to the control building and miscellaneous hose bibs throughout the facility. Other than the use of water in the control building and occasional use through the hose bibs, the gas storage facility would not consume water as part of the gas storage operation.

Flow Line

A 12-inch flow line would run from the compressor station to the injection/withdrawal wells at the top of Kirby Hills (see Figure B-4a and the description of the wells below). The flow line would be approximately 1.1 miles long and would be installed approximately 36 inches deep. Figure B-8 contains a photograph of the area where the flow line would be connected to the proposed compressor station.

The purpose of the flow line is to convey natural gas from the compressor station to the injection/withdrawal wells for injection into the geologic formation and storage. The line would also convey the withdrawn gas from the wells to the compressor station so that it could be compressed to sufficient pressure for injection into the PG&E 400 pipeline. The flow line would be designed with a Maximum Allowable Operating Pressure (MAOP) of 1480 psig, which is higher than the expected maximum reservoir pressure.

Injection/Withdrawal Wells

Figure B-4a shows the horizontal limits of the storage formation that will be used by LGS as an underground reservoir for natural gas transported to the site by its customers. Up to 10 new injection/withdrawal

Figure B-8. Representative Photographs of the Compressor Station Site Area
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Figure B-9. Compressor Station Plot Plan
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Figure B-10. Project Flow Diagram: Permanent Facilities
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wells would be constructed on four existing well pad sites. The injection/withdrawal well sites have been previously graded and contain existing wells and related facilities. The wells are identified in Figure B-4a as Well Sites L-5, S-1, S-2, and S-10 (Figure B-11 contains photographs of Well Sites S-2 and S-10). The wells would be completed into the storage formation, which would store up to 7 bcf of natural gas. The wells would be directionally drilled from the well pads into the storage formation.

Based on the characteristics of the storage reservoir and a review of the records of the previous gas storage operation, LGS anticipates that very little water would be produced during the withdrawal of gas. In the event that the actual water production experienced during operation is significant enough to require frequent trucking of the water offsite for disposal, a disposal well would be drilled on the 10-acre compressor station site and completed in a suitable formation for re-injection in accordance with the requirements of the California Division of Oil, Gas and Geothermal Resources. Otherwise, all produced water would be trucked offsite for disposal at an approved facility.

Existing dirt and gravel roads would be improved in order to provide construction and future maintenance access to the wells. These roads would be improved as part of the proposed project. The access roads to the well sites are shown in Figure B-4a.

Temporary Gas Injection System

The purpose of the temporary gas injection system is to inject natural gas into the storage reservoir while the permanent facilities are under construction. The storage reservoir is nearly depleted and would require the injection of natural gas prior to offering normal storage operations. The temporary gas injection system can be fully constructed and installed in a short period of time once the project is approved. By injecting gas during the construction of the permanent facilities, the storage facility would be ready to provide storage services as soon as the permanent facilities would be complete. The temporary gas injection system would be designed to inject up to 10 million standard cubic feet per day (scfd) of natural gas into the reservoir.

The temporary gas injection system would include a temporary PG&E interconnect at the Kirby Hills High Station, a 4-inch-diameter temporary gas injection pipeline, and a temporary compressor. These system elements are described below and shown in Figure B-3.

Temporary PG&E Interconnect. The temporary gas injection system would provide 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; see Figure B-4a) and a temporary skid-mounted meter. The meter would be installed within a 15- by 30-foot area. This temporary meter would be removed after the permanent facilities would be put into operation.

Temporary Gas Injection Pipeline. As part of this system, a 4-inch-diameter temporary gas injection pipeline would be installed (see Figure B-4a for the location of this pipeline) that would be approximately 1.35 miles in length. The pipeline would be routed from the temporary PG&E interconnect and meter along the flow line pipeline through the compressor station and would connect to Well Site S-2 (Figure B-4a). The segment from the temporary PG&E interconnect and meter to the compressor station would be abandoned in place after the permanent facilities are operating.

Temporary Compressor. The temporary compressor would be a natural gas-fired, reciprocating engine-driven compressor that is approximately 1,000 hp or less. The compressor would be a skid-mounted unit and would not be enclosed in any type of building. The compressor would be located on Well Site S-2 and would be similar to the existing production compressor that is currently located on Well Site S-2 (see

Figure B-11 for a photograph of the temporary compressor site). It would be connected to Well Sites S-1 and S-2 and would be used to inject natural gas into the storage reservoir. After the permanent facility would put into operation, the temporary compressor would be removed.

B.1.9.3 Construction

Pipeline Construction Methods

The following section describes the methods that LGS would use to install the gas pipeline and flow line in upland areas. Currently, LGS is planning to avoid all potential waters of the United States (including the one unnamed drainage and several seasonal wetlands) by horizontally boring under these features. Crossings of the railroad, Shiloh Road, and Olsen Road may also be bored. Horizontal boring methods are described toward the end of this section.

Surveying Right-of-Way. The pipeline right-of-way (ROW) alignment would be surveyed and identified prior to beginning construction activity. Alignment identification would include 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 (e.g., wetlands and special-status species habitat) also would be marked.

Underground Facilities Coordination. To avoid or minimize construction conflicts with existing utilities and public services, LGS would coordinate closely with the Solano County Public Works Department during final project design to identify any potential utility conflicts and initiate relocation efforts. LGS would also contact Underground Service Alert (“USA”) at least 2 full working days before construction activity begins. Underground Service Alert would contact all owners of underground pipelines and utilities that are registered with USA and inform them that construction is about to begin in their service area. This notice would allow those owners to mark the areas near the construction site where their underground facilities are located so that these areas could be avoided during project construction.

Grading Right-of-Way. The dryland-farmed and non-native annual grassland portions of the pipeline ROW would be graded with a bulldozer or similar equipment as necessary to create a safe and level work surface. Where necessary, topsoil would be stripped from all areas to be graded and would be sequestered in a manner to prevent mixing with other soils. Sediment control devices such as silt fences and straw bales would be installed as necessary around waterbodies, roads, and other areas during clearing and grading.

Pipeline Trenching Methods. Trenching would involve excavating a ditch for the pipelines (including the 16-, 12-, and 4-inch-diameter pipelines) and would be accomplished with backhoes or trenching machines. The trench would be excavated to a depth sufficient to provide the appropriate amount of cover, which generally would be a minimum of 3 feet over all pipelines. Depth of cover would be a minimum of 5 feet at road crossings (Shiloh and Olsen Roads) and a minimum of 4 feet at ditches adjacent to roads. Trench spoil would be deposited on the spoil storage portion of the ROW. The trench width for the pipelines would be approximately 4 feet; however, the trench may be wider in wet or sandy areas to allow for unstable soils and a sloped trench wall. Based on the known geologic conditions in the project area, blasting would not be required. Except along Shiloh Road and in areas that support sensitive resources (e.g., seasonal wetlands), the construction easement would be 75 feet wide with a permanent easement width of 30 feet. In areas that contain sensitive biological resources, the pipeline corridor would be reduced to avoid direct and indirect effects on adjacent sensitive resources.

Figure B-11. Kirby Hills Wells Sites S-2 and S-10 and Location of Temporary Compressor
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Stringing, Welding, and Installation. After the construction ROW has been prepared and the trench excavated, pipe and associated support timbers (skids) would arrive on the job site by highway trucks, along with pipe handling equipment in the form of crawler-mounted sideboom tractors and hydraulic cranes. The trucks would travel down the ROW, being off-loaded as they travel; they would place joints of pipe end-to-end, supported by skids with pad material to protect the coating. When emptied of their cargo, trucks would either turn around in areas provided or they would proceed to the next public road crossing for egress. Mud on the vehicle tires, wheels, and undercarriage that could be dropped in transit on public roads would be removed before the vehicles leave the ROW.

Pipeline segments, bent to conform to the trench contour, would be placed along the ROW parallel to the trench. Pipe ends (bevels) would be cleaned prior to welding by means of filing or wire brushing to remove rust, scale, and dirt. A sideboom crawler tractor or other suitable hoisting machine would lift each joint of pipe to abut and align with the bevel of the previous joint, and a suitable space for welding would be attained. Welders qualified by testing to the appropriate welding code would then apply an initial pass of weld and would progress to the next aligned joint as the first weld pass is applied. Subsequent welding passes would be applied by other welders following the initial pass, until satisfactory weld metal has been applied. Each pass, including the final pass, would be mechanically cleaned of slag by wire brush and/or grinding disc, and the welds would be radiographically or ultrasonically inspected for defects. Welds that are defective beyond code limits would be repaired by grinding out the defect and rewelding the objectionable area, or they would be removed and rewelded.

Welding would be performed in accordance with the American Petroleum Institute Standard Number 1104 and federal pipeline safety regulations (49 CFR Part 192). Completed welds would be visually and radiographically or ultrasonically inspected in accordance with the same standards to determine the integrity of the welds.

After passing quality control checks, the weld areas (field joints) would be coated with either a powdered epoxy applied to induction-heated weld areas; with a liquid epoxy; or with a mastic sleeve that, when heated, would shrink to form a snug fit on the pipe, and the mastic would become viscous to eliminate air pockets and provide adhesion. The pipe would be visually checked for damaged coating (holidays), and damaged areas would be repaired by means of melting a stick form of epoxy onto the damaged area.

Pipeline sections that are ready to be installed into the trench would be lowered in by means of nylon straps or wheeled “cradles” suspended from sideboom tractors or other hoisting equipment. Where rock is encountered, the bottom of the ditch would be padded with sand or fine-grained soils. After the last handling, an electrical coating tester attached to a girth spring would be passed along the entire length of pipe, alerting by audible signal the presence of defects (holidays) in the pipe coating. The lowering operation would cease until the defect is repaired. Inspectors would ensure that the minimum required cover is attained. This would be accomplished by measuring the pipe depth.

Trench Backfilling. After the pipe is placed into the trench, the trench would be backfilled with the previously excavated material. Although not anticipated, where topsoil is stored separately from subsoil, the subsoil would be backfilled first and then the topsoil would be replaced. If rock conditions exist in the Kirby Hills, a layer of rock-free soil would be placed over the pipe to protect the coating, and then the backfill operation would be completed. A soil mound would be left over the trench to allow for soil settlement, unless otherwise required by the landowner.

Horizontal Boring Method. Several locations along the pipeline ROW would be crossed using a horizontal boring method: an unnamed seasonal drainage, Shiloh Road, three seasonal wetlands (ryegrass swales), and

the railroad corridor (see Figures B-4b and B-4c for the bore locations). 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 would be lowered into the bore pit and a hole would then be augered along the alignment and a pilot pipe would be jacked forward, behind the auger head. When the auger reaches the bore pit on the opposite side, the carrier pipe would be pulled or jacked through as the pilot pipe would be removed.

Alternately, a pilot hole may be wet bored by hydraulic cutting action with a jet nozzle and then reamed to the appropriate diameter with a reaming bit. These types of guided bores typically use bentonite, which is a fine, nontoxic clay that when mixed with water provides the necessary lubricant and operating fluid for the drilling process. The mixture would be injected into the drill under pressure and would be recirculated back to the surface, where it would be filtered and reused.

Spill prevention countermeasures contained in the Storm Water Pollution Prevention Plan (SWPPP) (described below) would be developed and implemented to prevent or minimize the risk of bentonite entering the seasonal drainage during boring. Although bentonite contamination occurs rarely, bentonite can reach the ground surface and enter surface waters if the bore encounters a rock fracture during high-pressure boring operations, termed a “frac-out.” LGS would prepare a boring plan for the drainage crossing that includes a detailed description of the drilling unit, hole diameter, depth of cover, directional survey and control plan, mud system, additives, and mud pumping pressures.

As part of the bore plan, LGS would develop a frac-out contingency plan. The plan would focus on minimizing the potential for a frac-out associated with tunneling activities; providing for the timely detection of frac-outs; and ensuring an organized, timely, and “minimum-impact” response in the event of a frac-out and release of drilling lubricant (i.e., bentonite). The plan would contain the following measures:

- A full-time monitor would attend all drilling to look for observable frac-out conditions or lowered pressure readings on drilling equipment.
- If a frac-out is identified, all work would stop, including the recycling of drilling lubricant. In the event of a frac-out into water, the pressure of water above the tunnel would keep excess mud from escaping through the fracture. The location and extent of the frac-out would be determined, and the frac-out would be monitored for four hours to determine whether the drilling lubricant congeals (bentonite would usually harden, effectively sealing the frac-out location).
- If the drilling lubricant congeals, no other actions would be taken that would potentially suspend sediments in the water column.
- Surface releases of bentonite would be allowed to harden and then would be removed.
- The contingency plan would identify additional measures to be taken to contain or remove the drilling lubricant if it does not congeal.

Pipeline Testing. After construction and prior to placing the pipelines in service, the completed pipelines would be hydrostatically tested in accordance with the requirements of federal pipeline safety regulations (49 CFR Part 192), LGS testing specifications, and applicable permits. The flow line and gas pipeline would be tested independently. Approximately 350,000 gallons of water would be used for hydrostatic testing. This water would be obtained from existing public or private water supplies, which have not yet been identified. The test water would be filtered through hay bales and discharged into upland agricultural areas.

Compressor Station Construction

Construction activities for the compressor station would involve clearing and grading of the site; constructing a perimeter earthen berm and equipment and building foundations, and installing the perimeter fencing; erecting structures to house the compressors and associated facilities; installing equipment and piping; and cleanup and restoration of the site. Construction of the compressor station is estimated to take nine months, subject to weather and equipment delivery.

The site for the compressor station would be cleared of vegetation and graded as necessary to create a level surface for the movement of construction vehicles and to prepare the area for constructing foundations. Construction activities and storage of construction material and equipment would be confined to the 10-acre compressor station site and the adjoining temporary workspace (see Figure B-4a for the limits of this work space).

Excavating required for the foundations would be performed as needed, and all backfill would be compacted in place. Excess soil would be used on site or would be disposed of in an approved area off site. Compressor building construction would begin after the compressor/engine skids are installed on concrete foundations. Typically, the steel frame of the building is erected, followed by installation of the roof, exterior casing, and insulation as may be needed for noise attenuation. The compressor building would be designed to meet the Solano County noise requirements, and a noise abatement silencer would be installed on the engine exhausts.

Gas pressure piping at the compressor station would involve welded construction, except where connected to flanged components. The piping work may begin in a fabrication shop off site. If offsite fabrication is used, the prefabricated pieces would be shipped to the site and installed in place. Piping installed below grade would be coated for corrosion protection prior to backfilling, and a cathodic protection system would be installed to protect underground piping. Aboveground valves and piping would be installed on concrete pipe supports, and protected from external corrosion by paint coatings.

Equipment such as the glycol dehydration units, reboilers, and coolers would be installed on pads or skids. Pig launchers ("pigs" are devices used to clean the line) and receivers would be installed on pads with concrete containment. The aboveground storage tanks would be installed within diked areas or otherwise installed within secondary containment. Prior to placing the compressor station in service, the gas piping system (both above and below ground) would be 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, would be checked and tested.

After completion of start-up and testing, the compressor station site would be graded, and disturbed areas would be graveled or re-vegetated with a sterile grass. Cleanup and restoration of various parts of the site would be completed as work on the area is finished. The access roads and parking areas would be graded and graveled, or other aggregate would be spread on the surfaces.

Metering Station Construction

Construction activities for the metering station would involve clearing and grading the site; constructing equipment and piping foundations, and installing the perimeter fencing; installing equipment and piping; and cleanup and restoration of the site. Construction of the metering station is estimated to take six weeks, subject to weather and equipment delivery.

The site for the metering station would be cleared of vegetation and graded as necessary to create a level surface for the movement of construction vehicles and to prepare the area for constructing foundations. Construction activities and storage of construction material and equipment would be confined to the three-quarter-acre metering station site. Excavation for the foundations would be performed as needed and all backfill would be compacted in place. Excess soil would either be used on site or disposed of in an approved area off site.

Gas pressure piping at the metering station would involve welded construction, except where connected to flanged components. The piping work may begin in a fabrication shop off site. If offsite fabrication is used, the prefabricated pieces would be shipped to the site and installed in place. Piping installed below grade would be coated for corrosion protection prior to backfilling, and a cathodic protection system would be installed to protect underground piping. Aboveground valves and piping would be 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 would be installed on pads or skids. A pig launcher would be installed on pads with concrete containment. Prior to placing the metering station in service, the gas piping system (both above and below ground) would be hydrostatically tested. Controls and safety devices would be checked and tested.

After completion of start-up and testing, the metering station site would be graded, and disturbed areas would be graveled or re-vegetated with a sterile grass. The access road would be graded and graveled, or other aggregate would be spread on the surfaces.

Injection/Withdrawal Well Construction

Well pads would be cleared of surface materials and vegetation and then leveled and graded to accommodate drilling equipment. The pad sites would be graded flat, with drainage and runoff contoured to a collection point in order to control stormwater discharge.

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

The drilling rig would operate 24 hours per day, seven days per week while each well is drilled and completed. There would be two 12-hour personnel shifts each day. After the drilling of a well is complete, the drilling rig would be relocated to the next well position. Equipment and materials typically would be delivered during daylight hours.

Drilling activities typically involve 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 would be stopped, the drill string would be unscrewed, and new lengths would be added. The system would be repressurized and drilling would continue. Drilling mud would be used to lubricate the bit, bring drill cuttings back to the surface, and control down hole formation pressure. All fluids used in or for the drilling operation would be contained in temporary mobile tanks or 55-gallon drums stored within a containment area. Fluid and mud circulation systems are based on closed-loop designs, which result in no discharge. Once the well is in place, ancillary valving, piping, and monitoring equipment would be installed and tested.

The final depth of the well may vary depending on the exact depth of the reservoir at each specific well location. The wellhead would be about 10 feet in height and would be connected to a section of above-ground flow line containing the valve, flow control valve, flow meter, and pressure gauge. A manifold/flow line system would connect the wellheads to the compressor station.

Construction Workforce

LGS would retain a construction contractor to install all the components of the project. The maximum workforce estimates are as follows:

- Compressor and metering station construction: 40 workers
- Pipeline construction: 35 workers
- Well drilling and completion work: 15 workers

Construction Equipment and Material Staging Area

Three potential material and equipment staging areas, approximately three to five acres in size, have been identified for the proposed project. The three sites are located near Shiloh and Olsen Roads, and adjacent to the proposed compressor station (see Figures B-4a and B-4b). These sites were chosen because they are heavily disturbed and occur adjacent to major access points. The staging areas would contain laydown areas for equipment, pipes and other construction-related supplies, and a contractor trailer.

Access Roads

Construction and future maintenance access roads were previously described under each of the project components. Except for the metering station, LGS is proposing to use existing paved, dirt, and two-track roads to provide access to the project components. These existing roads would be improved by minimal grading and gravelling to provide adequate access for heavy construction equipment and maintenance vehicles. The access roads would be approximately 20 feet wide. The existing access roads are shown in Figures B-4a through B-4c.

For the metering station, a short new access road (approximately 250 feet) would be constructed to connect the proposed station to the existing gravel road. The new roadway would be located immediately adjacent to the western fenceline of the Calpine facility and would be approximately 0.1 acres (250-foot length by 20-foot width) in size.

The flow line and pipeline would be accessed from existing roads (Shiloh, Olsen, and Birds Landing Roads). Construction access would be provided along the pipeline ROW. No additional access roads are anticipated for these pipelines.

Construction Equipment

Table B.1-1 identifies the equipment that may be used to construct the proposed project.

Table B.1-1. Equipment That May Be Used during Construction of the Proposed Project Equipment

Equipment	Quantity	HP/Piece	Potential Uses	Potential Uses
Water truck	2	250	Compaction and dust control	All
Roller	1	240	Compaction of foundation areas	Metering station, compressor station
Backhoe (track hoe)	4	170	Trench excavation	Gas pipeline, flow line, temporary injection
Crane	1	200	Lifting and setting equipment	Metering station, compressor station
Dump truck	3	300	Hauling road and pad materials	Metering station, compressor station, wells
Flatbed truck	3	300	Hauling equipment	All
Pickup truck	20	225	General use	All
Small crane/forklift	2	100	Loading and unloading equipment	Metering station, compressor station
Rough-terrain forklift	1	150	Lifting equipment	Metering station, compressor station
Boring rig	1	125	Auger boring or directional drilling for railroad, road, and stream crossings	Gas pipeline
Sideboom	6	230	Laying pipeline	Gas pipeline, flow line, temporary injection
Bulldozer	3	175	Clearing, grading, backfill, compacting	All
Grader	1	215	Grading, backfill	Gas pipeline, flow line
Trencher	1	175	Trench excavation	Gas pipeline, flow line

Construction Schedule

Construction activities associated with project components generally would occur Monday through Saturday between 7:00 a.m. and 7:00 p.m. Pending the receipt of necessary project approvals, LGS intends to begin construction in late Spring 2006, and complete construction in late Fall 2006. Construction of the metering station and approximately 7,500 linear feet of gas pipeline that occurs in the Yolo-Solano Air Quality Management District (Y-SAQMD) would be constructed sequentially rather than at the same time.

Only one pipeline construction spread would occur at any given time. In addition, and working concurrently, would be one boring crew and, on occasion, one tie-in crew. The compressor station construction elements are generally related to basic infrastructure for the station. Access road improvements would begin first, but may be executed simultaneously with the construction of the primary and secondary retention ponds (which would be constructed as a part of the civil site preparation phase) and the electrical overhead power line. The water well construction could occur at any time during construction, but would probably be done near the end of the construction phase.

Landowner Coordination and Easement Acquisition

LGS has secured easement options from all private landowners for a construction ROW of 75 feet and a post-construction easement of 30 feet for the gas pipeline. As required by the CPUC, “a list of the names and mailing addresses of all owners of land over, under or on which the project, or any part of the project, may be located, and owners of land adjacent thereto” is contained in Appendix B of the Proponent’s Environmental Assessment (PEA).

B.1.9.4 Operation and Maintenance Program

Operation and maintenance of the proposed facility would be performed by the existing LGS operations and maintenance personnel at its Lodi, California, facility plus two additional staff. The storage facility would be manned during the daylight shift and remotely monitored and controlled at all times from the control room of LGS' existing facility in Lodi, California.

As part of the future operation and maintenance program, aboveground piping components would be maintained to minimize leakage of odorized gas. The facility valves, flanges, and other piping components would be monitored for leaks by operations personnel as part of the day to day operation of the facility. In the event that a leak occurs, releasing odorized gas into the atmosphere, the leak would be repaired as soon as practical. In the event LGS receives notification from a third party concerning odors in the vicinity of the proposed facility, LGS operations personnel would investigate the source of the odor, and repair any leaks contributing to the odor as soon as practical. A log of all third party notifications regarding gas odors would be kept. The date of the notification, the cause of the odor, and the date of the repair of any corresponding odorant leaks would be recorded in the log. A copy of the described log would be submitted to the CPUC quarterly.

B.1.9.5 Applicant-Proposed Measures

LGS prepared a Proponent's Environmental Assessment (PEA) for the proposed project and several alternatives. The PEA and subsequent data responses include measures intended to ensure that development of the project would occur with minimal environmental impacts and would be consistent with applicable rules and regulations. LGS committed to implement these measures during the design, construction, and operation of the proposed project in order to avoid or minimize potential environmental impacts. Therefore, these Applicant-Proposed Measures (APM) are considered part of the proposed project description in the evaluation of environmental impacts (see Section B.3, Environmental Analysis and Mitigation). Project approval is contingent upon LGS adherence to all aspects of the proposed project as described in this document, including project description, APM, and mitigation measures.

Table B.1-2 details APMs by environmental issue area. In some cases, the mitigation measures presented in Section B.3 (Environmental Analysis and Mitigation) either expand upon or add detail to the APM presented in Table B.1-2 in order to ensure that potential impacts are reduced to less than significant levels.

Table B.1-2. Applicant-Proposed Measures (APMs)*

AESTHETICS	
APM A-1: Aesthetics/ Visual Resources	<p>The following measures would be implemented as part of the proposed project to minimize visual impacts of the project and be consistent with Solano County's general plan polices.</p> <ul style="list-style-type: none"> • Construction disturbances would be minimized to help reduce contrast between exposed soils and naturally vegetated and clearing of vegetation and trees at facilities sites would be minimized. • Disturbed agricultural land would be replanted following pipeline construction (if requested by the landowner). • Facilities would be painted with non-glare, earthtone colors to blend with the surrounding vegetation/landscape. • Shielded, non-glare lighting would be used at facilities.

Table B.1-2. Applicant-Proposed Measures (APMs)*

AIR QUALITY	
<p>APM AIR-1: Air quality projection</p>	<p>The following applicable measures would be implemented as part of the proposed project to minimize dust emissions and to be consistent with BAAQMD guidelines for reducing construction impacts to a less than significant level.</p> <ul style="list-style-type: none"> • Water all active construction areas at least twice daily. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard. • Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites. • Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more). • Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (e.g., dirt and sand). • Limit traffic speeds on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible. • Install wheel washers for all exiting trucks or wash off the tires or tracks of all trucks and equipment leaving the site. • Limit the area subject to excavation, grading, and other construction activity at any one time. <p>Lodi Gas Storage also commits to installing BACT to reduce emissions from the natural gas compressor units.</p> <p>Lodi Gas Storage would provide the CPUC with evidence that it has complied with the requirements of the BAAQMD. This evidence shall be in the form of a final permit from the BAAQMD. The final permit would be provided to the CPUC prior to the beginning of construction of the compression facility.</p>
BIOLOGICAL RESOURCES	
<p>APM B-1: Designate work zones</p>	<p>Lodi Gas Storage would identify work areas and would ensure that:</p> <ul style="list-style-type: none"> • Construction activities, equipment, and associated activities (e.g., staging areas) are confined to the designated work zone, and • Areas supporting sensitive resources (e.g., nearby seasonal wetlands and special-status plant population) are avoided. • Construction equipment would be confined to a designated work zone (including access roads) in the project area. Before ground-disturbing activities are initiated, the work zone would be clearly staked and flagged. • Wetland areas and special-status species would be protected and avoided to the extent feasible as part of the proposed project. Where feasible, all adjacent waters and wetlands would be avoided and would be designated as exclusion zones during the preconstruction phase.

Table B.1-2. Applicant-Proposed Measures (APMs)*

<p>APM B-2: Install temporary construction barrier fencing to protect sensitive biological resources adjacent to the construction zone.</p>	<p>The construction specifications will require that a qualified biologist identify sensitive biological habitat onsite and identify areas to avoid during construction. Sensitive communities in the area that generally would be required for construction, including staging and access, will be fenced off to avoid disturbance in these areas. The Lodi Gas Storage's contractor will install orange construction barrier fencing to identify environmentally sensitive areas. Sensitive resources that occur in and adjacent to the construction area include the following areas:</p> <ul style="list-style-type: none"> • Seasonal wetland communities and associated special-status species (VPFS and VPTS) habitat located along the access roads in the Kirby Hills and east of Olsen Road (see PEA Figure 3.3-1). • The stock pond that occurs in the Kirby Hills and provides potential habitat for VPFS, VPTS, and California tiger salamander. • The unnamed seasonal drainage that crosses Shiloh Road. • Occupied burrowing owl habitat (identified during preconstruction surveys). • Occupied raptor nests. • The population of bearded popcorn-flower located along the Kirby Hills access road. The fencing will be installed at least 20 feet from the edge of the population. Prior to construction, Lodi Gas Storage will retain a botanist to conduct a survey in April (or May, depending on rainfall levels in 2006). The botanist will flag the outer extent of the populations and identify the fencing location. <p>Before construction, the contractor will coordinate with a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected area will be designated an environmentally sensitive area and clearly identified on the construction specifications. The fencing will be installed before construction activities are initiated and will be maintained throughout the construction period. The following paragraph will be included in the construction specifications:</p> <p>The Contractor's attention is directed to the areas designated as "environmentally sensitive areas." These areas are protected, and no entry by the Contractor for any purpose will be allowed unless specifically authorized in writing by the CPUC. The Contractor will take measures to ensure that Contractor's forces do not enter or disturb these areas, including giving written notice to employees and subcontractors.</p> <p>Temporary fences around the environmentally sensitive areas will be installed as the first order of work. Temporary fences will be furnished, constructed, maintained, and removed as shown on the plans, as specified in the special provisions, and as directed by Lodi Gas Storage.</p>
<p>APM B-3: Minimize ground-disturbing activities in California Tiger Salamander Upland Habitat.</p>	<p>To minimize disturbance and mortality of adult and juvenile California tiger salamander within underground burrows, Lodi Gas Storage or its contractor will minimize the extent of ground-disturbing activities within upland habitat (grasslands within 2,100 feet of suitable breeding habitat) by limiting the work area to the minimum area necessary for construction.</p>
<p>APM B-4: Monitor construction activities within California Tiger Salamander Upland Habitat and, if found, cease construction activities until the salamander has been removed</p>	<p>A qualified wildlife biologist will monitor all construction activities within California tiger salamander upland habitat. The biologist will look for California tiger salamander during grading, excavation, and vegetation removal activities. If a California tiger salamander is discovered, construction activities will cease until the salamander has moved out of the construction work unassisted or a qualified biologist removes the salamander from the construction area and releases the animal near a suitable burrow at least 300 feet away from the construction area.</p> <p>Prior to the start of daily construction activities, the biological monitor will inspect open trenches to look for trapped California tiger salamanders. If a salamander is found, the monitor will remove the salamander from the trench and release the animal into a suitable burrow at least 300 feet away from the construction area.</p> <p>Handling of California tiger salamanders can be conducted only by a USFWS-approved biologist or as permitted under a biological opinion or project-specific authorization by USFWS.</p>

Table B.1-2. Applicant-Proposed Measures (APMs)*

APM B-5: Conduct pre-construction surveys for active burrowing owl burrows and implement the DFG Guidelines for burrowing owl mitigation, if burrows are detected in the survey area

The Staff Report on Burrowing Owl Mitigation, published by CDFG (1995), recommends that pre-construction surveys be conducted to locate active burrowing owl burrows in the construction area and in a 250-foot-wide buffer zone around the construction area. Lodi Gas Storage or its contractor will retain a qualified wildlife biologist to conduct preconstruction surveys for active burrows according to DFG guidelines. The preconstruction surveys will include a nesting season survey and a wintering season survey conducted in the winter and spring/summer prior to construction of the proposed project. If no burrowing owls are detected, then no further mitigation is required. If active burrowing owls are detected in the survey area, the following measures will be implemented.

1. Occupied burrows will not be disturbed during the nesting season (February 1–August 31). Whenever avoidance is feasible, no disturbance should occur within 160 feet of occupied burrows during the non-breeding season (September 1–January 31) or within 250 feet during the breeding season (February 1–August 31).
 2. When destruction of occupied burrows is unavoidable during the non-nesting season (September 1–January 31), unsuitable burrows will be enhanced (enlarged or cleared of debris) or new burrows created (installing artificial burrows) at a ratio of 2:1 on nearby protected lands approved by DFG. Newly created burrows will follow the guidelines established by DFG.
 3. If owls must be moved away from the construction area, passive relocation techniques (e.g., installing one-way doors at burrow entrances) will be used instead of trapping. At least 1 week will be necessary to accomplish passive relocation and allow owls to acclimate to alternate burrows.
 4. If owls must be moved away from the construction area, the project proponent or its contractor will acquire and permanently protect a minimum of 6.5 acres of foraging habitat per occupied burrow identified in the construction area. The protected lands should be located adjacent to the occupied burrowing owl habitat in the study area or at another occupied site near the study area. The location of the protected lands will be determined in coordination with DFG. Lodi Gas Storage also will prepare a monitoring plan, and provide long-term management and monitoring of the protected lands. The monitoring plan will specify success criteria, identify remedial measures, and require an annual report to be submitted DFG.
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Table B.1-2. Applicant-Proposed Measures (APMs)*

<p>APM B-6: Avoid disturbance of active nests of Swainson's hawk, northern harrier, loggerhead shrike, grasshopper sparrow, horned lark, and other non-special-status tree-, shrub-, and ground-nesting migratory birds and raptors</p>	<p>Causing the abandonment or removing active nests (with eggs or young) of Swainson's hawk, northern harrier, loggerhead shrike, grasshopper sparrow, horned lark, and many other non-special-status migratory birds and raptors violates the State Fish and Game Code and the federal MBTA. To avoid this impact, Lodi Gas Storage or its contractor will implement one of the following two options as part of the proposed project.</p> <ol style="list-style-type: none"> 1. Conduct all construction activity (including vegetation pruning or removal) during the non-breeding season (generally between August 16 and February 28) for most special-status and non-special-status migratory birds; or 2. If construction activities are scheduled to occur during the breeding season for these species (generally between March 1 and August 15), retain a qualified wildlife biologist to conduct the following focused nesting surveys within the appropriate habitat: <ul style="list-style-type: none"> • Tree- and shrub-nesting surveys within and adjacent to the construction work area to look for Swainson's hawk, northern harrier, loggerhead shrike, and other non-listed migratory birds and raptors. • Ground-nesting surveys in annual grasslands within and adjacent to the construction work area to look for northern harrier, grasshopper sparrow, horned lark, and other non-listed migratory birds. <p>The surveys will be conducted within 1 week prior to initiation of construction activities and at any time between March 1 and August 15. If no active nests are detected during surveys, then no additional mitigation is required.</p> <p>If surveys indicate that special-status or non-special-status migratory bird nests are found in the survey area and could be affected by construction activities, a no-disturbance buffer will be established around the site to avoid disturbance or destruction of the nest site until after the breeding season or after a qualified wildlife biologist determines that the young have fledged (generally late June to mid-July). The extent of these buffers will be determined by the biologist (coordinating with DFG) and will depend on the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. These factors will be analyzed in order to make an appropriate decision on buffer distances.</p> <p>If construction activities are scheduled to occur within an area that supports an active nest site or within an established no-disturbance buffer, then construction would be delayed until after the breeding season or until the young have fledged (as determined by the biologist).</p>
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CULTURAL RESOURCES

<p>APM C-1: Paleontological resources</p>	<p>A paleontological resources discovery and management plan would be developed and implemented as part of the proposed project to avoid potential impacts on these resources. This plan would include review of final construction plans to determine which portions of the project would affect paleontologically sensitive sediments that lie deeper than 10 feet below the surface.</p> <p>If potentially significant fossils (defined as deposits that are unique, or that may reasonably be expected to assist in the evaluation of specific areas of research or expand our understanding of prehistory) are encountered, the Lodi Gas Storage would initiate the following measures:</p> <ul style="list-style-type: none"> • Stop construction in the immediate vicinity of the fossil find until they are removed. • Arrange for recovery of fossils by a qualified paleontologist and curation of scientifically prepared specimens in an accredited institution.
<p>APM C-2: Stop work if buried resources are discovered inadvertently</p>	<p>Lodi Gas Storage and its construction contractor will take the steps specified below during project construction. If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or human bone are discovered inadvertently during ground-disturbing activities, work will stop in that area and within 100 feet of the find until a qualified archaeologist can assess the significance of the find and, if necessary, develop appropriate treatment measures in consultation with Solano County, the State Historic Preservation Officer, and other appropriate agencies. In the event that human remains are encountered, Mitigation Measure CR-2 [APM C-3] will be implemented.</p>

Table B.1-2. Applicant-Proposed Measures (APMs)*

<p>APM C-3: Follow proper procedures if human remains are discovered</p>	<p>If human remains of Native American Origin are discovered during project construction, it will be necessary to comply with State laws relating to the disposition of Native American burials, which fall under the jurisdiction of the Native American Heritage Commission (NAHC) (Public Resources Code, Section 5097). If any human remains are discovered or recognized in any location other than a dedicated cemetery, there will be no further excavation or disturbance of the site, or any nearby area reasonably suspected to overlie adjacent human remains, until:</p> <p>The Solano County Coroner has been informed and has determined that no investigation of the cause of death is required and if the remains are of Native American origin,</p> <ul style="list-style-type: none"> • The descendants of the deceased Native Americans have made a recommendation to the land-owner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code, Section 5097.98, or • NAHC is unable to identify a descendant or the descendant fails to make a recommendation within 24 hours after being notified by the NAHC
<p>GEOLOGY</p>	
<p>APM G-1: Prepare an injection plan</p>	<p>The California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) is responsible for wells drilled into an underground gas storage facility. Lodi Gas Storage would complete engineering and geology studies and an injection plan and submit them to the division for approval. These studies would describe the well drilling and abandonment plans; reservoir characteristics; all geologic units, aquifers, and oil and gas zones; and the monitoring system to ensure that injected gas is confined to the intended zone. Lodi Gas Storage would be required to post a bond with DOGGR to ensure proper completion or abandonment of any well drilled.</p>
<p>APM G-2: Seismic-resistant design measures</p>	<p>The project would be designed to meet the seismic safety standards of the Uniform Building Code. Specific design measures may include, but are not limited to, special foundation design, additional bracing and support of upright facilities (e.g., tanks, exhaust stacks), and weighting the pipeline in areas of potential liquefaction. In addition, automated leak detection, isolation, and shutdown controls would limit the secondary effects of equipment damage. Project facilities and foundations would be designed to withstand changes in soil density. When the detailed engineering design of the project is completed, it would be submitted to the DOT, Office of Pipeline Safety (which provides oversight of pipeline construction, operation, and safety) and the DOGGR (which provides oversight of design, installation, and operation of gas wells).</p>
<p>APM G-3: Erosion and sediment control – minimize site disturbance.</p>	<p>The most basic way to avoid erosion is to minimize site disturbance. To minimize site disturbance and ensure that impacts are avoided or reduced to less than significant levels, the construction contractor would be directed to:</p> <ul style="list-style-type: none"> • Remove only the vegetation that is absolutely necessary to remove, • Avoid off-road vehicle use outside the work zone, • Avoid excessive trips along the right-of-way or access or public roads, and • Instruct all personnel on stormwater pollution prevention concepts to ensure that all are conscious of how their actions affect the potential for erosion and sedimentation. <p>Construction inspectors would be on site during all construction activities and would reinforce the importance of confining all vehicular traffic to the existing right-of-way and public access roads.</p>
<p>APM G-4: Erosion and sediment control – perform initial cleanup.</p>	<p>The contractor would be directed to perform initial site cleanup immediately following construction activities. Initial cleanup includes removing debris and spoils and restoring original contours. Initial cleanup conducted as part of the construction contributes significantly to overall site stability and facilitates final cleanup. The site would begin to stabilize naturally with little additional disturbance during final cleanup. A site that is not initially cleaned up is more susceptible to erosion.</p>
<p>APM G-5: Erosion and sediment control – compact subsurface backfill material.</p>	<p>Proper compaction of subsurface soil serves as an erosion control measure. Uncompacted plow or trench furrows are susceptible to subsurface erosion through the migration of surface and subsurface water. Proper compaction of the subsurface material and plow furrows is necessary to help prevent surface and subsurface migration of water along the plow or trench furrow, and to prevent trench settlement.</p>

Table B.1-2. Applicant-Proposed Measures (APMs)*

APM G-6: Erosion and sediment control – install trench plugs.	A trench plug is a permanent mechanical erosion control measure consisting of soil-filled burlap bags placed in the excavated trench before backfilling. This also can be accomplished by substituting standard pipe backfill materials with a short length of impervious materials such as clay or slurry cement. Trench plugs serve to control erosion by arresting subsurface water flow. Trench plugs are placed in the trench at regular intervals along areas with steep slopes. The spacing is determined by slope grade, topography, and soil characteristics.
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APM G-7: Erosion and sediment control – apply an appropriate seed mix.	Seeding consists of sowing soil-stabilizing grasses on areas disturbed by construction activities — except cropland and areas surfaced with pavement or gravel. Vegetation serves to control both erosion and sedimentation. The root structure of the vegetation holds soil in place to resist erosion. Grasses slow the flow of surface water, allowing suspended particles to settle. All disturbed areas would be reseeded immediately after construction activities are completed. Reseeding would use species that are appropriate to the site and acceptable to the landowner.
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HAZARDS AND HAZARDOUS MATERIALS

APM HZ-1: Equipment maintenance and refueling restrictions	<p>The equipment used for the proposed project would require periodic maintenance and refueling. To reduce the potential of contamination by spills, no refueling, storage, servicing, or maintenance of equipment would be performed within 100 feet of sensitive environmental resources. No refueling or servicing would be done without absorbent material or drip pans underneath to contain spilled fuel. Any fluids drained from the machinery during servicing would be collected in leakproof containers and taken to an appropriate disposal or recycling facility. If such activities result in spillage or accumulation of a product on the soil, the contaminated soil would be assessed and disposed of properly. Under no circumstances would contaminated soils be added to a spoils pile.</p> <p>Mobile refueling trucks likely would be used for onsite refueling of construction equipment. The refueling trucks would be independently licensed and regulated to haul and dispense fuels, to ensure that the appropriate spill prevention techniques are implemented.</p> <p>All maintenance materials (i.e., oils, grease, lubricants, antifreeze, and similar materials) would be stored at offsite staging areas. If these materials are required during field operations, they would be placed in a designated area away from site activities and sensitive resources.</p> <p>During construction, all vehicles and equipment required on site would be parked or stored at least 100 feet from waterbodies, wetlands, known archaeological sites, and other sensitive resource areas. These areas would be identified on the construction drawings, as appropriate. All wash-down activities would be conducted at least 100 feet from sensitive environmental resources (e.g., seasonal wetlands and the seasonal drainage along Shiloh Road).</p>
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APM HZ-2: Hazardous materials measures	<p>The following measures would be incorporated into the construction contract specifications to address hazardous materials generated from construction-related activities.</p> <ul style="list-style-type: none"> • Diesel fuel and petroleum-based lubricants would be stored only at designated staging areas. • All hazardous material spills or threatened releases, including petroleum products such as gasoline, diesel, and hydraulic fluid — regardless of the quantity spilled — must be immediately reported if the spill has entered or threatens to enter a water of the State, or has caused injury to a person or threatens injury to public health. <p>Lodi Gas Storage would prepare a Hazardous Materials Contingency Plan that would be implemented if an accidental spill occurs or if any subsurface hazardous materials are encountered during construction. Provisions outlined in this plan would include phone numbers of county and State agencies and primary, secondary, and final cleanup procedures.</p> <p>In addition, Lodi Gas Storage would require that the project contractor prepare a Health and Safety Plan (HSP) to ensure that no impacts would occur if hazardous soils or other materials are encountered during construction of the project. The HSP would include elements that establish worker training, engineering controls, and monitoring. The HSP also would establish security measures to prevent unauthorized entry to cleanup sites and to reduce hazards outside the investigation/cleanup area.</p>
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Table B.1-2. Applicant-Proposed Measures (APMs)*

<p>APM HZ-3: Fire management measures</p>	<p>The Montezuma Hills and project area are classified as a high grassfire risk area due to the dry, grassland environment and strong winds (Solano County, 1977). Lodi Gas Storage recognizes the potential for increased fire risk during summer construction activities. For this reason, Lodi Gas Storage would develop fire management measures as part of their construction safety and emergency response plan for use during construction and operation. The Plan would include notification procedures and emergency fire precautions, such as the following mitigation measures:</p> <ul style="list-style-type: none"> • All internal combustion engines, stationary and mobile, shall be equipped with spark arresters, meeting Agency standards. • Spark arresters shall be in good working order. • Light trucks and cars with factory-installed (type) mufflers, in good condition, may be used on roads where the roadway is cleared of all vegetation. • Smoking signs and fire rules shall be posted on the project bulletin board at the Contractor's field office and areas visible to employees during the fire season. • Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials. • Installation of fire extinguishers at the compressor station and metering station. • Employee training in use of extinguishers and communication with the Montezuma Hills Fire District. • Periodic inspections by the Montezuma Hills Fire District. <p>It is expected that the implementation of this plan would sufficiently mitigate increased fire risk.</p>
<p>NOISE</p>	
<p>APM N-1: Construction noise control</p>	<p>The following measures would be incorporated into the construction contract specifications to reduce and control noise generated from construction-related activities.</p> <ul style="list-style-type: none"> • Restrict construction within 1,000 feet of occupied dwelling units to daytime hours between 7 a.m. and 7 p.m. on weekdays, Saturdays, and non-holidays, unless written approval is obtained from the resident. • Ensure that all construction equipment has sound-control devices no less effective than those provided on the original equipment. No equipment would have an unmuffled exhaust. • Implement appropriate additional noise-reducing measures, including but not limited to: <ul style="list-style-type: none"> – Changing the location of stationary construction equipment, – Shutting off idling equipment, – Rescheduling construction activity, and – Notifying nearby residents in advance of construction work.
<p>APM N-2: Noise reducing treatments at the compressor facility</p>	<p>Lodi Gas Storage shall implement recommended treatments 7.1 through 7.8 in the Hoover & Keith noise report ("Kirby Hills Gas Storage Project – Results of Noise Impact Analysis for a Proposed New Natural Gas Storage Project," Hoover & Keith, 2005) to ensure that noise from the compressor facility does not exceed County noise compatibility standards at the duck club or the nearest residence (50 dBA-Ldn) or at the property line (60 dBA-Ldn).</p>

Table B.1-2. Applicant-Proposed Measures (APMs)*

TRANSPORTATION AND CIRCULATION	
APM T-1: Construction traffic safety measures	<p>Lodi Gas Storage would prepare a Construction Traffic Plan to minimize short-term construction-related impacts on local traffic. These measures would include installation of temporary warning signs at appropriate locations along Birds Landing Road and Shiloh Road (and other roads if determined necessary). The signs would be placed at strategic locations near the site access location and would indicate "Construction Traffic Ahead," "Trucks Entering and Exiting 50 Feet Ahead," or an equivalent message. The signs would be removed after all construction-related activities are completed. The construction traffic plan would include, but not be limited to, the following measures:</p> <ul style="list-style-type: none"> • Coordinate with the County on any lane or road closures, if needed to construct improvements. • Install traffic control devices as specified in the California Department of Transportation's Manual of Traffic Control for Construction and • Maintenance Works Zones. • Provide alternative routes (detours), as necessary, to route local traffic around roadway construction. • Provide notification of any road closures to residents in the vicinity of construction. • Provide access to driveways, private roads, and farm roads outside the immediate construction zone. • Consult with emergency service providers and develop an emergency access plan for emergency vehicle access in and adjacent to the construction zone.
SITE RECLAMATION	
APM SR-1: Site reclamation measures	<p>Site reclamation is the final element of the proposed project. The short-term objectives of reclamation are to control accelerated erosion and sedimentation and to minimize impacts on adjacent waters, land uses, and other sensitive resources. Properly executed construction practices and timely progress would minimize impacts to environmental resources. Long-term reclamation objectives include erosion and sedimentation control, as well as reclamation of topography to preconstruction conditions. The reclamation effort would involve restoration of temporary access roads (where necessary), and installation of erosion control measures that comply with Solano County Public Works Department requirements.</p> <p>Lodi Gas Storage would also prepare a SWPPP that describes when, where, and how the site reclamation BMPs would be implemented (see discussion of "Erosion and Sediment Control" below). The State Water Resources Control Board would review and approve this plan prior to construction.</p>
RESTORATION OF PIPELINE RIGHT-OF-WAY	
APM RP-1: Pipeline ROW restoration measure	<p>Following installation of the pipeline, the right-of-way would be graded to preconstruction grades and contours and would be seeded with an appropriate seed mix. The seed mix would be composed of the appropriate mix of species and acceptable to the landowner.</p>

* APMs (Applicant-Proposed Measures) are numbered based on the section and sequence in which they appear in the PEA or subsequent data responses.

Source: LGS, 2005.

B.1.10 Other Public Agencies Whose Approval is Required

LGS has filed an application with the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity (Application Number 05-07-018) for the proposed Kirby Hills Natural Gas Storage Facility Project pursuant to Public Utilities Code Section 1001 and General Order 131-D. The CPUC has exclusive authority to approve or deny LGS's application; however, various permits from other agencies would also need to be obtained by LGS for the proposed project. The following required approvals and permits from public agencies have been identified for the proposed project. Additional permits that have not yet been identified may also be required.

Local Agencies

- Solano County
 - Department of Resource Management
 - Planning Division
 - Use Permit
 - Marsh Development Permit
 - Division of Building and Safety, grading permit
 - Environmental Health Services Division, Technical Services Program, Water Well Permit
 - Department of Building Inspection, building and electrical permits
 - Transportation Department, encroachment and transportation permits may be obtained for construction within the public right-of-way and for hauling any loads that exceed legal limits
- Bay Area Air Quality Management District, Authority to Construct/Permit to Operate

State Agencies

- California Department of Conservation, Division of Oil, Gas and Geothermal Resources
 - Permit to Conduct Well Operations and Authorization to Inject Produced Water (if necessary)
 - Permit to Operate Kirby Hills Field as a Storage Field
- State Water Resources Control Board (SWRCB), issue a National Pollutant Discharge Elimination System (NPDES) permit for construction activities and discharge of hydrotest water. This permit is required under Section 402 of the Clean Water Act

Federal Agencies

LGS is proposing to avoid all potential waters of the United States and potential habitat for federally listed species. Therefore, no federal permits or authorizations under Section 404 and 401 of the Clean Water Act and Section 7 or 10 under the Federal Endangered Species Act are currently required for the proposed project. ~~However, LGS would prepare an Operation and Maintenance Plan, Damage Prevention Plan, and Emergency Response Plan for pipeline construction, operation, and safety to support authorizations from the U.S. Department of Transportation (USDOT).~~

B.2 Environmental Determination

Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" and requiring implementation of mitigation as indicated by the checklist on the following pages.

- | | | |
|--------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture Resources | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Land Use/Planning |
| <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Population/Housing |
| <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation/Traffic |
| <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Mandatory Findings of Significance | |

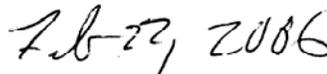
Environmental Determination

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project may have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Kenneth E. Lewis
Program and Project Manager
California Public Utilities Commission



Date

B.3 Environmental Analysis and Mitigation

B.3.1 Aesthetics

AESTHETICS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G

B.3.1.1 Setting

Environmental Setting

Landscape Character. The project area is located in southeast Solano County, about halfway between San Francisco and Sacramento in a rural agricultural area in the Montezuma Hills. Positioned south of Scenic Highway State Route (SR) 12, north of the Sacramento River, and east of Suisun Bay, the project area is approximately six miles west of the City of Rio Vista and 16 miles southeast of the City of Fairfield. The area is sparsely populated, with two small communities: Birds Landing at the intersection of Shiloh and Birds Landing Roads, and Collinsville at the south end of Collinsville Road.

The project region is characterized by low rolling hills, separated by valleys and intermittent drainages. The hills are relatively constant in elevation, with ridge crests that range from 100 to 272 feet above mean sea level (LGS, 2005). Vegetation in the area is dominated by wheat grass and other grasses planted by landowners for agricultural and livestock grazing. There are few trees and shrubs, except for eucalyptus and other trees adjacent to Shiloh Road.

Since 1987, the area has been a County-designated Wind Resource Area (WRA), and hundreds of wind turbines have been installed throughout the hills between SR 12 and the Sacramento River, permanently altering the local visual landscape. Currently 713 wind turbines operate in the WRA to the east and southeast of the project area. Additionally, enXco is currently in the process of applying for County approval to replace 90 of the older Kenetech towers with six GE 1.5 megawatt (MW) towers, which would measure approximately 340 feet tall. The proposed natural gas pipeline corridor would pass through the area of the Shiloh I Wind Plant Project, which is currently under construction and is expected to be completed in the first quarter of 2006. The Shiloh project includes the construction of up to 120 wind turbines that would provide a total generation capacity of approximately 180 MW (Solano County, 2005b). In addition, because the project area has been utilized for natural gas storage and transport for many years, several existing facilities and structures related to natural gas transmission and distribution systems are in the area.

Visual Sensitivity. Sensitive observers are individuals or groups of individuals who are particularly exposed to changes in the aesthetics of the surrounding area. The overall visual sensitivity is a concluding assessment as to the degree of probability that a given landscape would demonstrate a noticeable visual impact with project implementation. Visual sensitivity is derived from a comparison of existing visual quality, viewer concern, and viewer exposure. Sensitive viewers in the project area include occupants of the few rural residences, travelers on SR 12 (approximately 15,000 per day; see Section B.3.15.1), land and business owners in the Suisun Marsh area, and temporary visitors. SR 12 from Fairfield to Rio Vista has been designated as a Scenic Roadway by the Solano County Board of Supervisors (LGS, 2005; Solano County, 1977b). The Western Railroad Museum offers scenic railroad trips through the project region. The railroad crosses the gas pipeline alignment, just east of Shiloh Road (WRM, 2005).

Regulatory Setting

The following State and local plans and policies have been developed to preserve visual resources and protect scenic values within the project area.

California Department of Transportation Scenic Highway Program

California Department of Transportation (Caltrans) has implemented a statewide scenic highway program to preserve and enhance the beauty of California. There are currently no officially designated State Scenic Highways in Solano County (Caltrans, 2005a).

Solano County General Plan

Impacts to visual resources are subject to the policies and regulations of Solano County. The Solano County General Plan is undergoing its first comprehensive update since the General Plan Elements were adopted in the 1970s and 1980s. The Solano County General Plan Update project is expected to begin in early 2006.

The Scenic Roadways Element of the Solano County General Plan (Solano County, 1977b) identifies the components of foreground and distant views from various vantage points within the county and assigns specific policies, depending on the type of component. Specific policies for roads with marshland and grassland foregrounds were developed to preserve the integrity of these views. Policies include retaining the open space around the marshland; preventing modifications to natural water movement; burying utility lines underground; avoiding locating development on the steeper slopes; maintaining setbacks between the proposed development and the view shed; using materials and colors subordinate to the surrounding natural environment; minimizing grading and padding; and preventing the spread of noxious weeds.

Foreground views in the project area consist primarily of rolling grassland. Distant views consist primarily of rolling grassland and open fields, with marshland views from some vantage points. The following policies of the Solano County General Plan are applicable to the proposed project:

C. Rolling Grassland

1. Allowable building construction or road construction which overlaps such a foreground component and is in view of the designated scenic roadway should be subject to site and design review by qualified county or city staff or by an urban design consultant to the staff.
4. Since rolling grassland is highly vulnerable to visual disruption by development activity, grading of a development site should be restricted to minimize alteration of the natural terrain. Padding should be prohibited and the use of adaptable foundation should be encouraged to accommodate topographic variations while minimizing cut and fill.

The Scenic Roadways Element of the Solano County General Plan also requires the protection of views along scenic highways. People traveling on SR 12, a county-designated scenic highway that runs through the project area, experience views that include marshland and flat and rolling grassland in the foreground. Travelers can also see open fields with distant windbreaks and the Vaca Mountains in the distance. Because of the intervening rolling grassland and hills, the project components would not be visible to travelers on SR 12.

Solano County policies and standards for the protection of visual corridors are also discussed in the Land Use and Circulation Element of the General Plan (Solano County, 1980). There are three visual corridors near the Montezuma Hills WRA:

- Vallejo-Benicia Hills along I-780;
- Vallejo-Benicia Hills along I-80 from Vallejo to Cordelia and along I-680 from Benicia to Cordelia; and
- Suisun Valley along I-80 between Cordelia and Fairfield.

According to the policies of this Plan, the County shall protect and maintain these visual corridors. The project would be located almost 15 miles from these corridors and would not be visible because of the long distance and topography.

The Solano County Land Use and Circulation Element also sets policies for placement of utility cables through agricultural lands. According to the Plan, all transmission lines should be located and constructed in a manner that minimizes disruption of natural vegetation and agricultural activities and avoids unnecessary scarring of hill areas.

B.3.1.2 Environmental Impacts and Mitigation Measures

a. Would the project have a substantial adverse effect on a scenic vista?

LESS THAN SIGNIFICANT. Visitors to Birds Landing, Collinsville, the Montezuma Slough, and other areas accessible by passing through the project area would be affected by temporary changes to the visual landscape of the area due to construction related activities. Staging areas adjacent to Olsen Road and Shiloh Road (across from the Old Shiloh Church) would be visible during the construction period to travelers on the respective roadways. The proposed overhead single-pole power line extending from the metering station along Birds Landing Road to the PG&E distribution line system, the new access road to the metering station, and the metering station itself would be visible from Birds Landing Road, a two-lane paved roadway. The 1,200-foot long power line along the northern edge of the compressor station boundary would not be visible from Shiloh Road due to intervening rolling grassland, hills, as well as eucalyptus and other trees along Shiloh Road. Overhead single-pole power lines in open space/agricultural locations would be similar to the existing distribution lines to which the new lines would connect and they would be consistent with the County's policies for rural districts and agricultural lands. There are also several existing facilities and structures related to natural gas transmission and distribution systems in the area.

The Western Railroad Museum offers nostalgic and scenic railroad trips during special events throughout the year. Groups interested in traveling the area can also charter historic railroad cars (Solano County, 2005b; WRM, 2005). Visitors may see the construction activities associated with portions of the proposed project, such as pipeline installation and horizontal boring under the railroad tracks; however, upon completion of construction the underground facilities in the area of the railroad tracks would not be noticeable. Therefore, due to the relatively few viewers and the consistency with existing utility features, as well as the implementation of APM A-1 (see Section B.1.9.5), the proposed project would have a less than significant adverse effect on a scenic vista and no additional mitigation is required.

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?

NO IMPACT. There is no State-designated scenic highway within the project vicinity (Caltrans, 2005a). SR 12 is the closest designated Scenic Roadway to the project area, which has an average daily traffic of approximately 15,000 vehicles; however, because of the intervening rolling grassland and hills, the project components would not be visible to travelers on SR 12. Therefore, the proposed project would result in substantial damage to scenic resources within any designated scenic highway.

c. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

LESS THAN SIGNIFICANT. The metering station would be visible to people who access their property from, or otherwise use, Birds Landing Road. The station would be located next to an existing site that has been developed with similar uses (i.e., the Calpine metering and dehydration station). A short section of new roadway would connect the station site to the existing access road off of Birds Landing Road.

Although electric pole lines would be visible from existing traveled roads and some residences, similar to the existing gravel access roads, these are common elements of the landscape and would be consistent with the County's policies for rural districts and agricultural lands.

The gas and flow pipelines would be buried features and would not be permanent components of the landscape. The compressor station would be located on a 10-acre site at the eastern base of the Kirby Hills. The site is behind a low hill and therefore generally would be screened from view. The existing well pad sites are located at the top of the Kirby Hills and are not visible from surrounding areas.

As discussed in (a) above, most elements of the project would not be visible or would be similar in type and view to existing elements. Pursuant to APM A-1, LGS has committed to implement measures as part of the project to minimize disturbance of the visual character of the project sites. Consequently, potential impacts related to degradation of the existing visual character of the sites are considered less than significant and no additional mitigation is required.

d. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

LESS THAN SIGNIFICANT. Except for the compressor facility, LGS has indicated that all aboveground facilities would have low-pressure sodium or similar low-glare lights (5 foot-candles). The lights would be shielded and directed downward, and would likely be unnoticeable from distances greater than 0.25 miles. In addition, the lights would be illuminated only when nighttime activities are necessary (LGS, 2005).

The proposed compressor facility would have three light poles with low intensity lights (5 foot-candles). These lights would illuminate the facility at all times. The facility would also have high-intensity floodlights (30 foot-candles) for nighttime servicing. These lights, however, would be illuminated only when necessary (LGS, 2005). The site would be behind a low hill and therefore generally would be screened from view.

Although the project would introduce several new light sources into the area, these lights would be similar to those commonly used for farm or rural residential lighting and would be shielded with non-glare lighting (APM A-1). Because these facilities would be located in areas with existing low-density residential development, they would not substantially alter nighttime views. Therefore, this impact is considered less than significant and no additional mitigation is required.

B 3.2 Agricultural Resources

AGRICULTURAL RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland.

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.2.1 Setting

Environmental Setting

Solano County is a predominately suburban and rural area located between San Francisco and Sacramento. The County covers 906.9 square miles, consisting of 682.6 square miles of rural land area, 145.6 square miles of urban area, and 78.7 square miles of water area (Solano County, 2003). Approximately 64% of the land in Solano County (about 344,100 acres) is used for agriculture, primarily irrigated agriculture, dry land farming, and grazing/pasture (Solano County, 2003). The primary existing land uses in the project area are dry land farming (primarily wheat, barley and oats) and livestock grazing.

The California Farmland Mapping and Monitoring Program does not classify any of the project area as “important farmland.” Soil types in the project area are primarily Diablo and Altamont Clay Series, which are not associated with prime farmland, farmland of statewide importance, or unique farmland under the U.S. Soil Conservation Service’s rating system (Solano County, 2005b; LGS, 2005). Most of the land in the project area is not suitable for irrigated agriculture and is considered suitable for dry land farming and grazing only.

Regulatory Setting

Solano County General Plan

The project area is within an unincorporated area of Solano County. Because of its contribution to the local agricultural economy, the Solano County General Plan identifies the Montezuma Hills, which includes the project area, as one of four County “essential agricultural lands.” To preserve its agricultural character and discourage non-agricultural uses, particularly non-agriculture residential development, the Land Use and Circulation Element of the Solano County General Plan (Solano County, 1995) designates the use of the project area as “Extensive Agriculture.” The Solano County General Plan includes the following policies relevant to the proposed project to preserve agricultural resources:

Policy 1: Preserve and maintain essential agricultural lands.

Policy 2: In essential agricultural areas, the County shall encourage the formation and retention of agricultural parcels of sufficient size to be maintained as a farmable unit.

Policy 9: Within the Extensive Agricultural designation, the maximum permitted residential density is one dwelling per 160 acres.

These policies not only set standards for farm size and housing density in the project area, but they also suggest preserving essential agricultural lands by protecting them from urbanization and preventing conflicting land uses from occurring within essential agricultural areas.

The Land Use and Circulation Element of the General Plan also sets polices for placement of utility cables through agricultural lands. According to the Plan, all transmission lines should be located and constructed in a manner that minimizes disruption of natural vegetation and agricultural activities and avoids unnecessary scarring of hill areas (Solano County, 1995).

To implement its policies to preserve the agricultural character of the project area, Solano County has zoned all of the project area east of Shiloh Road as “Agricultural District” (A-160). Facilities for the production and storage of natural gas are conditionally permitted uses within this zone requiring a Special Use Permit. The upland area west of Shiloh Road is within the Suisun Marsh Secondary Management Area and is zoned “Limited Agricultural District” (AL-160), which allows for agriculture and agriculture-related uses. Facilities for the production and storage of natural gas are conditionally permitted uses within this zone requiring a Special Use Permit, but a Marsh Development Permit is also required by Solano County to ensure consistency of the proposed use with the Suisun Marsh Protection Plan and local marsh protection ordinances.

California Land Conservation Act of 1965 (Williamson Act)

Most of the project area is within agricultural land preserves considered to be “Non-Prime Agricultural Land” and enrolled in Williamson Act contracts. The California Land Conservation Act of 1965 (Williamson Act) enables counties and cities to designate agricultural preserves (Williamson Act lands) and offer preferential taxation to agricultural landowners based on income derived from farming and open space uses as opposed to full market value of the property. In return for the preferential tax rate, the landowner is required to sign a contract with the county or city agreeing not to develop the land for a minimum period of at least 10 years. Contracts are automatically renewed annually unless a party to the contract files for non-renewal or petitions for cancellation. Local governments receive an annual subvention of forgone property tax revenues from the State via the Open Space Subvention Act of 1971.

Lands under Williamson Act contracts must comply with regulations pertaining to parcel size, allowable development, and compatible uses. Non-agricultural uses, including petroleum and natural gas extraction and utilities services, are allowable on lands under Williamson Act contract subject to the following requirements of the Williamson Act to ensure compatibility with long-term agricultural viability (found in the California Government Code):

Section 51238(a)(1) Notwithstanding any determination of compatible uses by the county or city pursuant to this article, unless the board or council after notice and hearing makes a finding to the contrary, the erection, construction, alteration, or maintenance of gas, electric, water, communication, or agricultural laborer housing facilities are hereby determined to be compatible uses within any agricultural preserve.

51238.1(a) Uses approved on contracted lands shall be consistent with all of the following principles of compatibility:

1. The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels or on other contracted lands in agricultural preserves.
2. The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.
3. The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use. In evaluating compatibility a board or council shall consider the impacts on noncontracted lands in the agricultural preserve or preserves.

51238.1(b) A board or council may include in its compatible use rules or ordinance conditional uses which, without conditions or mitigations, would not be in compliance with this section. These conditional uses shall conform to the principles of compatibility set forth in subdivision (a) or, for nonprime lands only, satisfy the requirements of subdivision (c).

51238.1(c) In applying the criteria pursuant to subdivision (a), the board or council may approve a use on nonprime land which, because of on-site or off-site impacts, would not be in compliance with paragraphs (1) and (2) of subdivision (a), provided the use is approved pursuant to a conditional use permit that shall set forth findings, based on substantial evidence in the record, demonstrating the following:

1. Conditions have been required for, or incorporated into, the use that mitigate or avoid those on-site and off-site impacts so as to make the use consistent with the principles set forth in paragraphs (1) and (2) of subdivision (a) to the greatest extent possible while maintaining the purpose of the use.
2. The productive capability of the subject land has been considered as well as the extent to which the use may displace or impair agricultural operations.
3. The use is consistent with the purposes of this chapter to preserve agricultural and open-space land or supports the continuation of agricultural uses, as defined in Section 51205, or the use or conservation of natural resources, on the subject parcel or on other parcels in the agricultural preserve. The use of mineral resources shall comply with Section 51238.2.
4. The use does not include a residential subdivision.

B.3.2.2 Environmental Impacts and Mitigation Measures

- a. *Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as Shown on the Maps Prepared Pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to Non-agricultural use?*

NO IMPACT. Construction of the proposed project would result in the conversion to non-agricultural uses of approximately 11 acres of agricultural land currently used for grazing and dryland farming (10 acres at the compressor site and 0.75 acres at the metering site). However, none of this land is classified under the California Farmland Mapping and Monitoring Program as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, the proposed project would have no impact on the conversion of significant agricultural resources to non-agricultural use.

- b. *Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?*

LESS THAN SIGNIFICANT. The proposed project is consistent with the policies of Solano County's General Plan for the preservation of agriculture in the project area. The project area is zoned for agriculture, and facilities for the production and storage of natural gas are conditionally permitted uses within these zones.

Most of the project area is within nonprime agricultural preserves, subject to Williamson Act contracts. Pursuant to the Williamson Act, Solano County may approve compatible non-agricultural uses of nonprime agricultural land if the proposed use does not (1) significantly alter or degrade the long-term viability of the agricultural lands within or adjacent to the area; (2) remove a significant amount of land from agricultural or open land uses; or (3) otherwise degrade or impair current and future agricultural activities. The Williamson Act permits installation of gas pipelines and related facilities on lands subject to land conservation contracts, with conditions to ensure compatibility with existing agricultural operations (Government Code Section 51238). The installation of gas pipelines, flow lines, wells, and metering/compressor stations on agricultural lands would not have a substantial effect on productivity of the land and would not require contract cancellation. Permanent loss of up to 11 total acres of land currently used for grazing and dryland farming, including approximately 0.75 acres at the metering station site and up to 10 acres at the compressor station site, would not significantly compromise the long-term productive agricultural capability of the covered Williamson Act parcels, nor would it significantly displace or impair current or reasonably foreseeable agricultural operations. Impacts are less than significant and no mitigation measures are required.

- c. *Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?*

LESS THAN SIGNIFICANT.

Temporary Impacts. Construction of the proposed project facilities could result in temporary conflicts and construction-related nuisances at construction sites, including localized construction noise, dust, and construction equipment traffic, that would temporarily inconvenience residents and agricultural operations near the project facilities. During project construction, temporary construction easements would be necessary to install the proposed project facilities. Disturbances in agricultural activities would be temporary, and crop production would reestablish on the pipeline easement after construction is completed.

As a public utility, LGS would be required to offer appropriate compensation for land held in private ownership as part of the acquisition of utility easements. LGS would also be required to compensate land-

owners for removal of any structures, crops, and agriculture-related improvements required to construct the project (LGS, 2005). LGS has also committed to implementing measures, such as APM SR-1, to ensure that areas affected by construction are restored to preconstruction conditions. Impacts are less than significant and no mitigation measures are required.

Permanent Impacts. Implementation of the proposed project would result in the permanent loss of up to 11 acres of land currently used for grazing and dryland farming, including approximately 0.75 acres at the metering station site and up to 10 acres at the compressor station site. The amount of acreage removed from agricultural use would not be substantial compared to the amount of similar land uses available in the project area.

The pipelines associated with the proposed project would be located underground and would not result in the permanent loss of agricultural capabilities. Normal agricultural activities would resume over the easement once construction is complete because there is generally little need for access to maintain the pipeline. Long-term disruptions to agricultural lands resulting from pipeline construction are expected to be insignificant. Impacts are less than significant and no mitigation measures are required.

B.3.3 Air Quality

AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **Would the project:**

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.3.1 Setting

Criteria Pollutants. Air quality is determined by measuring ambient concentrations of criteria pollutants, which are air pollutants for which acceptable levels of exposure can be determined and for which standards have been set. The degree of air quality degradation is then compared to the current National and California Ambient Air Quality Standards (NAAQS and CAAQS). Unique meteorological conditions in California and differences of opinion by medical panels established by the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (U.S. EPA) cause considerable diversity between State and federal standards currently in effect in California. In general, the CAAQS are more stringent than the corresponding NAAQS. The relevant standards currently in effect in California are shown in Table B.3-1.

Table B.3-1. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.08 ppm
Respirable Particulate Matter (PM ₁₀)	24-hour	50 µg/m ³	150 µg/m ³
	Annual Mean	20 µg/m ³	50 µg/m ³
Fine Particulate Matter (PM _{2.5})	24-hour	—	65 µg/m ³
	Annual Mean	12 µg/m ³	15 µg/m ³
Carbon Monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9.0 ppm	9.0 ppm
Nitrogen Dioxide (NO ₂)	1-hour	0.25 ppm	—
	Annual Mean	—	0.053 ppm
Sulfur Dioxide (SO ₂)	1-hour	0.25 ppm	—
	24-hour	0.04 ppm	0.14 ppm
	Annual Mean	—	0.03 ppm

Notes: ppm=parts per million; µg/m³= micrograms per cubic meter; "—" =no standard
Source: CARB, 2005a.

Attainment Status and Air Quality Plans. The U.S. EPA and CARB classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. While the project area is within a single county (Solano County), the western portion of the project area (west of Olsen Road) is located within the San Francisco Bay Air Basin (SFBAB) under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), and the eastern portion of the project area (east of Olsen Road) is located within the Sacramento Valley Air Basin (SVAB) under the jurisdiction of the Yolo-Solano Air Quality Management District (Y-SAQMD).¹ The stationary source components of the project are all located within the SFBAB within the jurisdiction of the BAAQMD. Table B.3-2 summarizes federal and State attainment status of criteria pollutants for the two jurisdictions/air basins encompassed by the project.

Table B.3-2. Attainment Status for the San Francisco Bay and Sacramento Valley Air Basins

Pollutant	Attainment Status ^a San Francisco Bay Air Basin		Attainment Status ^a Sacramento Valley Air Basin	
	Federal	State	Federal	State
Ozone – 1 Hour	N/A	Serious Nonattainment	N/A	Serious Nonattainment
Ozone – 8 Hour	Marginal Nonattainment	Not Available ^b	Serious Nonattainment	Not Available ^b
CO	Attainment	Attainment	Attainment	Attainment
NO ₂	Attainment	Attainment	Attainment	Attainment
SO ₂	Attainment	Attainment	Attainment	Attainment
PM10	Attainment	Nonattainment	Attainment	Nonattainment
PM2.5	Attainment	Nonattainment	Attainment	Attainment

Source: CARB, 2005b; USEPA, 2005

N/A – Not Applicable

a. Unclassifiable/Attainment and Unclassified designations are equivalent to Attainment and are shown as Attainment in this table.

b. The attainment status of the California 8-hour ozone standard, promulgated in 2005, have not yet been determined.

The closest and potentially most representative ambient air quality monitoring station is located in Fairfield. However, this station monitors only ozone. Other nearby monitoring stations include: Vallejo in Solano County, and Pittsburg and Bethel Island in Contra Costa County. All of these nearby monitoring stations are located

¹ See Figure 4b in the project description to see where Olsen road bisects the pipeline route.

in the SFBAB. There are no close-by monitoring stations located downwind of the project area in the SVAB. The project area's ambient air quality monitoring data shows that the area is well below the State and federal ambient air quality standards for CO, NO₂, and SO₂. However, the ozone, PM10 and PM2.5 concentrations in the project area do show exceedances of the CAAQS and NAAQS. The local ambient air quality data for these nonattainment pollutants for 2002 through 2004, as represented by the upwind Fairfield and Vallejo monitoring sites, are presented in Table B.3-3.

Table B.3-3. Nonattainment Pollutant Ambient Air Quality Data Near Project Site (2002-2004)

Short-Term Standards		Annual Exceedances		Monitoring Station
1-Hour Ozone	Concentration	CAAQS	NAAQS	Location
2002	0.103 ppm	4	0	Fairfield – Chadbourne Road
2003	0.090 ppm	0	0	Fairfield – Chadbourne Road
2004	0.096 ppm	1	0	Fairfield – Chadbourne Road
8-Hour Ozone				
2002	0.083 ppm	NA	0	Fairfield – Chadbourne Road
2003	0.077 ppm	NA	0	Fairfield – Chadbourne Road
2004	0.077 ppm	NA	0	Fairfield – Chadbourne Road
24-Hour PM10				
2002	79.8 ug/m ³	2	0	Vallejo – 304 Tuolumne St
2003	38.2 ug/m ³	0	0	Vallejo – 304 Tuolumne St
2004	50.8 ug/m ³	1	0	Vallejo – 304 Tuolumne St
24-hour PM2.5				
2002	72.3 ug/m ³	NA	1	Vallejo – 304 Tuolumne St
2003	30.8 ug/m ³	NA	0	Vallejo – 304 Tuolumne St
2004	39.7 ug/m ³	NA	0	Vallejo – 304 Tuolumne St
Annual Standards		Exceeds Standard?		
Annual PM10		CAAQS	NAAQS	
2002	22/19 ug/m ³ ^a	YES	NO	Vallejo – 304 Tuolumne St
2003	22/19 ug/m ³ ^a	YES	NO	Vallejo – 304 Tuolumne St
2004	22/19 ug/m ³ ^a	YES	NO	Vallejo – 304 Tuolumne St
Annual PM2.5 (three year average)				
2002	14/12 ug/m ³ ^a	YES	NO	Vallejo – 304 Tuolumne St
2003	14/11 ug/m ³ ^a	YES	NO	Vallejo – 304 Tuolumne St
2004	14/11 ug/m ³ ^a	YES	NO	Vallejo – 304 Tuolumne St

Source: CARB, 2005b

The monitoring data from Fairfield indicates, as represented from 2002 through 2004, that the area somewhat north and upwind of the project site area experiences occasional exceedances of the State 1-hour ozone standard and would have exceeded the State 8-hour ozone standard if the 8-hour standard were in effect from 2002 through 2004. However, the Fairfield monitoring data does not show any exceedances of the federal ozone standards.² Additionally, the monitoring data from Vallejo indicates, as represented from 2002 through 2004, that the area upwind of the project site area experiences occasional exceedances of the State 24-hour PM10 standard and federal 24-hour PM2.5 standard, but does not exceed the federal 24-hour PM10 standard. Additionally, the Vallejo monitoring data indicates that the area upwind of the site exceeds the State annual PM2.5 and PM10 standards but does not exceed the federal annual PM2.5 and PM10 standards.

² The federal 8-hour ozone standard is not based on the maximum 8-hour concentration, but rather the average of the 4th highest 8-hour concentrations for the past three years of monitoring, which for Fairfield is below the NAAQS of 0.08 ppm.

Rules and Regulations

The applicable rules and regulations for the two jurisdictions included in the project area are different. All of the stationary source emission sources, including the temporary drill rigs, are located in the BAAQMD jurisdiction; therefore, a greater number of BAAQMD rules and regulations are applicable to the proposed project than Y-SAQMD regulations. Neither district has fugitive dust rules that specifically regulate construction operations; however, both districts have CEQA guidelines that provide recommended construction emission control measures and the recommendations from these CEQA guidelines have been incorporated in the air quality impact analyses.

BAAQMD Rules (BAAQMD 2005)

Applicable BAAQMD rules cover both the construction, including well drilling, and the operation of the project. The BAAQMD rules applicable to the proposed project are as follows:

Regulation 2 Rule 1 – Permits. This rule defines what equipment is subject to permitting/new source review requirements and exempts portable stationary equipment (e.g., drill rigs) from permitting if they comply with all applicable requirements of the Statewide Portable Equipment Registration Program.

Regulation 2 Rule 2 – New Source Review. This rule requires the proposed project's stationary source equipment to meet Best Available Control Technology requirements, and requires offsets if emissions are greater than specified offset thresholds.

Regulation 2 Rule 5 – New Source Review of Toxic Air Contaminants. This rule requires the proposed project's stationary source equipment to meet Best Available Control Technology for Toxics requirements if the source emissions create a cancer risk greater than one in one million or creates an acute or chronic health risk index greater than 0.20. Additionally, this rule requires the district to deny permits to any facility that creates a cancer risk greater than ten in one million or creates an acute or chronic health risk index greater than 1.0.

Additionally, general rules such as Regulation 6 – Particulate Matter and Visible Emissions and Regulation 8, Rule 3 – Architectural Coatings (if painting is done on any of the project facilities during construction or later during operations maintenance) are applicable to the proposed project's construction and operation.

Y-SAQMD Rules (Y-SAQMD 2005)

Y-SAQMD does not have a fugitive dust control rule that specifically regulates construction. Therefore, the applicable rules are limited to the generic nuisance (Rule 2.5) and opacity (Rule 2.2) rules for Y-SAQMD. Additionally, while it is not anticipated that the construction activities within Y-SAQMD jurisdiction would include equipment that meet the definition of portable equipment if such equipment are used in this jurisdiction they must either meet Y-SAQMD permitting requirements or be registered under the State portable equipment registration program (Rule 3.3).

B.3.3.2 Environmental Impacts and Mitigation Measures

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

NO IMPACT. The project would be inconsistent with air quality plans if it would result in population and/or employment growth that exceeds the growth estimates included in the applicable air quality plans, or could be inconsistent if the project does not conform to the strategies in the applicable air quality plans. The

project includes construction in two jurisdictions/air basins and operations within one air basin. The project itself would not directly lead to population growth like a housing project, and would have minimal increase in long-term employment with only two additional staff (LGS, 2005).

The proposed project includes short-term construction activity and long-term operations within the BAAQMD jurisdiction and short-term construction activity and negligible operating activities (maintenance/inspection) within the Y-SAQMD jurisdiction. The proposed project will comply with all applicable rules and regulations that have been developed at part of the BAAQMD and Y-SAQMD air quality plans and, as noted below, will follow the BAAQMD and Y-SAQMD CEQA mitigation recommendations. Therefore, the proposed project will not impact or obstruct the implementation of the applicable air quality plans.

b. Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

LESS THAN SIGNIFICANT IMPACT WITH MITIGATION. The proposed project would create temporary construction emissions and on-going operating emissions from the proposed compressor station. The proposed project would be permitted as required under BAAQMD regulations. Therefore, the operating emissions, which are almost entirely from what would be permitted equipment, would be permitted by the BAAQMD to ensure that they would not violate any air quality standards and not substantially contribute to an existing or projected air quality violation.

BAAQMD Impact Analysis

Most of the proposed project’s construction and essentially all of the project’s operating emissions would occur in the jurisdiction of the BAAQMD, while some of the proposed project construction would occur in the jurisdiction of the Y-SAQMD. The estimated construction and operating emissions within the BAAQMD are provided in Table B.3-4.

Table B.3-4. Maximum Daily Emissions BAAQMD Jurisdiction

Construction Emissions	NOx	PM10	CO	ROG	SOx
Pipeline Construction	74 lbs/day	104 lbs/day	85 lbs/day	11 lbs/day	0 lbs/day
Surface Facilities	60 lbs/day	66 lbs/day	70 lbs/day	9 lbs/day	0 lbs/day
Flowline Construction	74 lbs/day	104 lbs/day	85 lbs/day	11 lbs/day	0 lbs/day
Well Drilling	158 lbs/day	2 lbs/day	18 lbs/day	2 lbs/day	0 lbs/day
Maximum Daily Emissions ^{a, b}	218 lbs/day	170 lbs/day	155 lbs/day	20 lbs/day	0 lbs/day
Operating Emissions	NOx	PM10	CO	ROG	SOx
Compressor Station	57.1 lbs/day	0.2 lbs/day	228.4 lbs/day	57.1 lbs/day	0.2 lbs/day
Glycol Dehydration System	1.2 lbs/day	0.03 lbs/day	4.9 lbs/day	0.9 lbs/day	0.1 lbs/day
Total Operating Emissions	58.3 lbs/day	0.2 lbs/day	233.3 lbs/day	58.0 lbs/day	0.3 lbs/day
BAAQMD Operating Emissions Significance Criteria	80 lbs/day	80 lbs/day	—	80 lbs/day	—
Exceeds Criteria?	NO	NO	—	NO	—
Compressor Station	6.3 tons/yr	0.02 tons/yr	25 tons/yr	6.3 tons/yr	0.02 tons/yr
Glycol Dehydration System	0.1 tons/yr	Negligible	0.5 tons/yr	0.1 tons/yr	0.01 tons/yr
Total Operating Emissions	6.4 tons/yr	0.02 tons/yr	25.5 tons/yr	6.4 tons/yr	0.03 tons/yr
BAAQMD Significance Criteria	15 tons/yr	15 tons/yr	—	15 tons/yr	—
Exceeds Criteria?	NO	NO	—	NO	—

Source: LGS, 2005, with independent assessment by Aspen Environmental Group (see Appendix 3, Air Quality Calculations)

a – For NOx the maximum daily emissions occur during the overlap of the well drilling and surface facilities construction, while for PM10, CO and ROG it occurs during the overlap of the surface facilities and the pipeline construction.

b - BAAQMD does not have numeric significance thresholds for construction emissions. Conformance with BAAQMD construction CEQA mitigation requirements is discussed below.

Table B.3-4 shows that the project would not exceed the BAAQMD operating emissions CEQA significance thresholds (BAAQMD, 1999). BAAQMD does not have numeric significance thresholds for construction emissions; rather the CEQA guidelines provide a list of mitigation measures for small and large (over 4-acre projects) as well as other mitigation measures that might be imposed at the discretion of the lead agency. LGS has proposed the air quality protection measures (see APM AIR-1 in Table B.1-2), which come directly from the BAAQMD CEQA Guidelines, as best management practices (BMPs) to mitigate the project’s construction fugitive dust emissions.

The project, adjacent to the Shiloh I Wind Plant, is obviously located in a windy area. Therefore, there is the potential for increased fugitive dust emissions, or fugitive dust impact events, during high wind events, particularly if no wind-based mitigation measures are implemented. Therefore, wind based mitigation is considered necessary for the air basins in general and to limit potential significant impacts to the few area residents that are located within one-half mile of the construction areas.

Additionally, the BAAQMD CEQA Guidelines provide the option to add construction equipment mitigation if deemed necessary by the lead agency. The use of feasible construction equipment mitigation is considered necessary to mitigate the project’s construction NOx and PM emissions because: (1) the SFBAB is an ozone and PM non-attainment area; (2) the construction emissions would generally be directed into the SVAB, also an ozone and PM non-attainment area, due to the predominate west to east winds; and (3) the SFBAB construction NOx emissions would exceed the significance criteria for the downwind district by over a factor of two. The construction equipment mitigation considered feasible and reasonable is the use of ultra low sulfur diesel and the use of off-road equipment (for equipment over 50 hp) that at a minimum meets EPA/CARB Phase I engine standards.

Y-SAQMD Impact Analysis

For the determination of impact significance, the Y-SAQMD construction emission significance thresholds have been compared to the worst-case phases of the project construction occurring within Y-SAQMD jurisdiction³ and that comparison is provided in Table B.3-5. The emissions for these activities were reviewed and recalculated as necessary for reasonable worst case conditions.

Table B.3-5. Maximum Daily Emissions Y-SAQMD Jurisdiction (lb/day)

Construction Emissions	NOx	PM10	CO	ROG	SOx
Metering station – land clearing and excavation	59.6	25.2	65.0	8.3	0.0
Pipeline construction	74.0	104.0	85.1	10.5	0.0
Y-SAQMD construction significance thresholds	82	150	550	82	—
Exceed thresholds?	NO	NO	NO	NO	—

Source: LGS, 2005, with independent assessment by Aspen Environmental Group (see Appendix 3, Air Quality Calculations).

The calculated construction emissions occurring within the Y-SAQMD jurisdiction are estimated to remain below the Y-SAQMD construction emission significance thresholds. The pipeline construction is estimated to be the worst-case daily construction emissions scenario. The metering station and pipeline construction within Y-SAQMD’s jurisdiction would not occur at the same time, nor would the construction of the power line, which would be assured through the incorporation of Mitigation Measure AQ-4 (see below). The construction of the overhead power line is much less involved than the other construction; therefore, this construction scenario would not be the worst-case day emission source and therefore was not calculated.

³ Please note that personnel from both the BAAQMD and the Y-SAQMD were contacted to discuss this issue of separation of jurisdiction and separation of emissions and the method used in this analysis conforms to their guidance.

The Y-SAQMD has provided other nearby major construction projects with suggested fugitive dust control actions (Solano County, 2005b) beyond the few measures outlined in their CEQA guidelines (Y-SAQMD, 2002). However, the proposed project is limited to the construction of approximately 1.9 miles of a small underground gas pipeline (no more than 16-inch diameter), construction of a metering station on a 0.75-acre site, construction of a 1,200-foot overhead power line, and one small proposed staging area within the Y-SAQMD jurisdiction. Therefore, the proposed ground disturbance within the Y-SAQMD jurisdiction from the proposed project's construction activities would be limited. Except adding measures to control emissions during high wind events, the BAAQMD CEQA Guideline measures proposed by the applicant as BMPs appear adequate to mitigate the fugitive dust emissions from the construction activities within the Y-SAQMD jurisdiction.

The following mitigation measures ensure feasible control of construction equipment emission, proper control of fugitive dust during high winds, and ensure that emissions in Y-SAQMD's jurisdiction remain below the CEQA construction emission significance thresholds. With these mitigation measures the project has been determined to have less than significant criteria pollutant attainment/nonattainment impacts.

Mitigation Measures

- AQ-1** During high wind events, defined as periods with sustained gusts over 25 mph, construction areas (unpaved roads, excavation areas, disturbed areas) that have visible dust emissions shall be watered no less frequently than every hour at the source of origin of those visible emissions; and activities causing visible dust emissions that remain visible for more than 100 feet from their point of origin will be discontinued or those activities reduced to limit the visible dust plume to less than 100 feet from their point of origin. Additionally, during high winds construction activities within one-half mile of any downwind residence that cause visible fugitive dust will be discontinued when the visible dust plumes that remain visible for more than 50 feet past their point of origin.
- AQ-2** All diesel fueled construction equipment will be fueled with diesel fuel meeting CARB ultra low sulfur (15 ppm max) certification specifications.
- AQ-3** All diesel fueled off-road construction equipment with engines 50 hp or larger will at a minimum meet USEPA/CARB Tier 1 engine standards. Records of equipment compliance will be kept by the general construction contractor. This measure does not apply to equipment permitted by the local air quality district or certified through the CARB's Statewide Portable Equipment Registration Program. This also does not apply to any single specialized equipment items that will be used for less than 5 days total during the project construction.
- AQ-4** The (1) pipeline construction, (2) metering station construction, and (3) overhead power line construction within the Y-SAQMD jurisdiction (i.e., east of Olsen Road) shall be completed so none of these three construction activities are active on the same given day as another one of these three construction activities.

c. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

LESS THAN SIGNIFICANT IMPACT. The proposed project site is located in a sparsely populated area and there are no other nearby major projects proposed that, along with the proposed project, could cause significant ongoing cumulative air quality impacts. There is a major wind power project currently under

construction, the Shiloh I Wind Plant Project; however, the construction of this project is scheduled to be completed prior to the start of construction of the proposed project, and no operating emissions would occur from the wind turbines to cause cumulative operating emissions (Solano County, 2005b). Therefore, there are no known nearby proposed projects that would have significant overlapping construction or operation emissions with the proposed project. Impacts would be less than significant and mitigation measures are not required.

As noted above, the proposed project's emissions are below local air district significance thresholds and there are no known nearby major air quality cumulative projects; therefore, the proposed project would have less than significant cumulative impacts.

d. Would the project expose sensitive receptors to substantial pollutant concentrations?

LESS THAN SIGNIFICANT IMPACT. The proposed project site is located in a sparsely populated area,⁴ and there are no schools, or other specific sensitive receptors (hospitals, convalescent homes, etc.) located near to the project site that could be impacted by substantial pollutant concentrations from the proposed project's construction or operation emissions. Additionally, there are only nine residences located within one-half mile of the project's construction and operating areas.

The proposed well foundation construction and drilling sites are located more than ~~two~~ one miles from the nearest residence. Construction impacts are most significant directly adjacent to the construction area and the impacts decrease rapidly with distance. While the emissions from the well foundation construction and drilling are fairly high, the distance to the nearest sensitive receptors is such that their impacts would be less than significant.

The proposed pipeline construction route would go nearby several residences, including four residences that would be within one quarter mile. However, the 5.9-mile pipeline construction is scheduled to be completed within 92 days (a rate of approximately 340 feet per day), so the pipeline construction would not occur near any given residence for more than a few days. Additionally, the pipeline construction emissions are below the Y-SAQMD CEQA construction significance criteria (See Table B.3-5).

The nearest residential site to the proposed project's compressor station site is located more than three quarters of a mile to the east southeast, and a duck club is located approximately four tenths of a mile to the east northeast. The BAAQMD would be responsible for permitting the compressor station and would ensure that it meets Best Available Control Technology (BACT) and Best Available Control Technology for Toxics (TBACT) requirements and that it would not impact area residents to substantial pollutant concentrations, either criteria pollutant or air toxic pollutants through implementation of their New Source Review and New Source Review of Toxic Air Contaminants rules (Regulation 2, Rule 2 and Rule 5, respectively).

The project applicant performed screening air toxics health risk analysis on the operating emissions from the compressor station and glycol dehydration system (LGS, 2005). Using conservative screening level modeling techniques and assumptions (such as applying maximum determined impacts regardless of the location of those impacts), this screening health risk analysis determined that the worst case cancer risk would be less than one in million and the acute and chronic health index risks would both be below 0.2. Therefore, the operating emission potential air toxic health risks are less than significant.

⁴ See Figure 13 in Section B.3.11 for the location of all current residences located within one-half mile of the proposed project's construction areas.

Therefore, considering the proposed project’s emission potential and the limited number of nearby sensitive receptors, the proposed project’s construction and operation will have less than significant pollutant concentration impacts to sensitive receptors.

e. Would the project create objectionable odors affecting a substantial number of people?

LESS THAN SIGNIFICANT IMPACT. Construction equipment and construction operations, such as the potential for limited asphalt paving, may create objectionable odors. Operations maintenance/inspection equipment and operations emissions of natural gas piping components could also create mildly objectionable odors. The only source of truly objectionable odors would be from the odorant injection system that would be located at the metering station. However, only accidental releases would release significant quantities of raw odorant. Accidental releases of odorant are analyzed in the Hazard and Hazardous Materials section (Section B.3.7).

LGS has committed to an operations and maintenance program to minimize leaks from aboveground gas components (compressor, valves, flanges, etc.), would respond to third party notification of natural gas odors (i.e., mercaptan odorant odors), and provide the CPUC with a quarterly report that identifies these notifications (LGS, 2005). Therefore, the potential for significant normal releases from the project’s piping components would be minimized.

In general, the project’s odor emission potential would be minor, and with the exception of the odorizing facility, the odors that could be emitted from the project’s construction and operation emission sources can generally be characterized as mild. The project area is sparsely populated, and there are no residences located within one-half mile of the metering station/odorant injection system, so any odors from the project’s construction and operation would not normally be able to affect a substantial number of people. Therefore, normally occurring odors from the proposed project would not have the potential to create objectionable odors affecting a substantial number of people, and the proposed project’s construction and operation would have less than significant odor impacts.

B.3.4 Biological Resources

BIOLOGICAL RESOURCES

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Have a substantial adverse effect on Federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.4.1 Setting

The project area lies in the Sacramento Valley geographic subregion of the California Floristic Province (Hickman, 1993). The project area encompasses rolling hills, with elevations ranging from approximately 50 to 300 feet. The rolling hills are bordered by the Sacramento River to the south and Suisun Marsh to the west and north (north of the Kirby Hills portion of the project area). The climate is hot and subhumid, with a mean annual precipitation of 16 to 20 inches falling entirely as rain during winter and spring months (LGS, 2005).

The general region has been transformed from a native landscape to the current altered landscape, where wildlife abundance and diversity are somewhat limited in the Montezuma Hills. The landscape is generally monotypic (i.e., dryland farming), is mostly treeless, consists of several windfarm operations, and exhibits limited occurrence of wetlands or other distinctive biological communities (LGS, 2005).

Vegetation and Wildlife

Agricultural Land. Two major types of agricultural uses in the project area are dryland farming (i.e., wheat) and livestock grazing. Approximately 75 percent of the project site is in wheat production or preparation for wheat production, with the remainder being utilized as grazing lands. The farmers in the Montezuma Hills typically use a 1- to 3-year crop rotation cycle, where grazing and fallow years follow planting and harvesting.

Depending on the crop pattern and proximity to native habitats, agricultural lands (particularly fallow croplands) can provide relatively high-value foraging habitat for wildlife. Raptor species such as red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius*), barn owl (*Tyto alba*), and great horned owl (*Bubo virginianus*) use agricultural lands for foraging because rodents often congregate in these fields. Ground-feeding granivorous passerines such as savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), Brewer's blackbird (*Euphagus cyanocephalus*), and red-winged blackbird (*Agelaius phoeniceus*) also forage in the stubble and disced crop fields (LGS, 2005).

Non-Native Annual Grassland. Non-native annual grasslands are the most common community in the project area, occurring at or nearly all project components. The species composition of the non-native annual grasslands varies with grazing intensity, aspect, soil disturbance, and soil type. In general, the annual grassland is characterized by a mix of annual grasses and weedy forbs, including medusa-head, soft chess, hare barley, slender wild oat, ripgut brome, yellow star-thistle, red-stem filaree, tarweed, several species of brodiaea, and dove weed. Native grasses are sparse but include purple needlegrass and fescues. The non-native annual grasslands in the project area (particularly the Kirby Hills) are grazed by cattle for a portion of the year.

The project area provides suitable foraging habitat and cover for some wildlife species, particularly small rodents such as California ground squirrel (*Spermophilus beecheyi*) and Botta's pocket gopher (*Thomomys bottae*), grassland-associated passerines such as horned larks (*Eremophila alpestris*), and raptors. Wide-ranging animals, such as turkey vulture (*Cathartes aura*), red-tailed hawk, and coyote (*Canis latrans*), occur in the area. Species observed in grasslands during surveys of the project area include western meadowlark, western kingbird (*Tyrannus verticalis*), red-tailed hawk, savannah sparrow, house finch (*Carpodacus mexicanus*), northern harrier (*Circus cyaneus*), American kestrel, gopher snake (*Pituophis melanoleucus*), and western fence lizard (*Sceloporus occidentalis*) (LGS, 2005).

Seasonal Wetlands. Seasonal wetland communities occur primarily in the eastern portion of the project area (east of Olsen Road) and along the Kirby Hills access road. In the project area, seasonal wetlands usually pond or are saturated for short periods and do not remain inundated for very long into the growing season. The species composition in seasonal wetlands in the study area is variable depending on the depth and length of inundation, position on the landscape, soil type, and previous disturbance factors. Dominant species found in seasonal wetlands in the study area include varying associations of Italian ryegrass, coyote thistle, downingia, goldfields, popcorn flower, and woolly marbles. During summer, the seasonal wetlands were dominated by tufted hairgrass, Mediterranean barley, turkey mullein, and curly dock (LGS, 2005).

Several wildlife species use seasonal wetlands. When wetlands are ponding, waterbirds such as mallard (*Anas platyrhynchos*), killdeer (*Charadrius vociferous*), black-necked stilt, American avocet, greater yellowlegs (*Tringa melanoleuca*), and long-billed curlew (*Numenius americana*) commonly forage on floating and emergent vegetation and invertebrates in the wetlands. Some seasonal wetlands in the study area could also provide habitat for special-status invertebrates and California tiger salamander (*Ambystoma californiense*) (LGS, 2005).

Most of the seasonal wetlands have a hydrologic connection to the Suisun Marsh and would therefore most likely be considered jurisdictional wetlands by the U.S. Army Corps of Engineers (Corps) and regulated under Section 404 of the Clean Water Act. They also would be considered wetlands by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) (LGS, 2005).

Seasonal Drainage. Two seasonal drainages occur in the study area. One unnamed seasonal drainage crosses under Shiloh Road (D-1 in Figure B-12); the other drainage is referred to as "The Big Ditch" and crosses under Birds Landing Road (D-2 in Figure B-12). These drainages are blue-line streams that contain a well-defined bed and bank and support seasonal wetland vegetation below their ordinary high water marks. Drainage D-1 is approximately 15 feet wide and conveys water westerly into the Suisun Marsh. Drainage D-2 is approximately 12 feet wide and conveys water into Lucol Hollow Creek (LGS, 2005).

The seasonal drainages that occur in the study area have moderate wildlife value because streamside vegetation provides nesting habitat for several bird species and foraging and refuge habitat for amphibians, reptiles, and mammals occupying the open water and adjacent grassland habitats. Birds such as herons and belted kingfishers forage in these communities, primarily along the water's edge. Many species of insectivorous birds, including white-throated swift, barn swallow, cliff swallow, black phoebe, and ash-throated flycatcher, catch their prey over open water (LGS, 2005).

Because the seasonal drainages eventually connect to the Suisun Marsh, they are considered as waters of the United States under Section 404 of the Clean Water Act (CWA) (LGS, 2005).

Stock Ponds. One seasonal stock pond occurs in the Kirby Hills, just north of the compressor station site (W-2 in Figure B-12). The pond is an artificially created feature that was excavated in an upland area

Figure B-12. Biological Resources Located in the Study Area
[CLICK HERE TO VIEW](#)

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and is sustained by seasonal rainfall. The vegetation cover is very sparse and consists of scattered seasonal wetland species, as described above (LGS, 2005). Another seasonal stock pond is located west of Well Site L-5, and although smaller in size, has characteristics similar to those of the other stock pond described above.

These stock ponds could provide seasonal habitat for several amphibian species that depend on these temporary waterbodies for successful reproduction, including the federally listed California tiger salamander and the western spadefoot, a federal species of concern (LGS, 2005).

The larger stock pond is isolated and does not have a hydrologic connection to any waters of the United States. Therefore, it is not likely to be considered as waters of the United States or regulated by the Corps. However, the pond likely would be considered a wetland by DFG and USFWS (LGS, 2005). The smaller stock pond was constructed within an ephemeral drainage and would likely be considered as waters of the United States and regulated by the Corps.

Vegetation within the Project Footprint

Vegetation within the project footprint is dominated by agricultural land and non-native annual grassland. The footprint avoids wetland and aquatic features either by locating pipeline routes away from such features, or boring under stream channels and seasonal wetlands.

Special-Status Species

Wildlife

Based on a review of CDFG's California Natural Diversity Data Base (CNDDB) species lists for the project region (CDFG, 2005), and biological communities present in the project area, a total of 69 special-status wildlife species were identified as potentially occurring within the project region (Table B.3-6). None of the wildlife species listed in Table B.3-6 have been previously documented in the project area (CDFG, 2005); however, much of the project area has probably not been surveyed for special-status wildlife.

Of the 69 special-status wildlife species listed in Table B.3-6, 53 species were eliminated from further consideration because suitable habitat for these species is not present in the study area or because the species range does not extend into the study area. A brief explanation for the absence of these species and their habitats is provided in Table B.3-6. Although the study area provides foraging habitat for six species of birds, including long-billed curlew, tricolored blackbird, golden eagle, Swainson's hawk, ferruginous hawk, and American peregrine falcon, these species do not breed in the study area and would not be affected by the proposed project. These species are not discussed further.

The remaining 10 species listed in Table B.3-6 are known to occur or potentially occur in the project area and are discussed below.

San Joaquin Pocket Mouse

The San Joaquin pocket mouse (*Perognathus inornatus*) is designated as a federal species of concern. Although other federal species of concern are addressed in the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (USFWS, 1998), the San Joaquin pocket mouse was not included, suggesting that the USFWS may consider populations of this species to be stable. This small rodent occupies west-central California, ranging from the upper Sacramento Valley south through the San Joaquin and Salinas valleys. The

San Joaquin pocket mouse inhabits arid, annual grassland, savanna, and desert-shrub associations with sandy washes, fine-textured soils, and grassy or weedy ground (Best, 1993). This species is nocturnal and spends the day below ground in a simple burrow, and forages at night on the surface of the ground for seeds.

Although the San Joaquin pocket mouse has not been documented in the project area or Solano County (MVZ, 2005), the project area is within the geographic range of the species (Zeiner et al., 1990). Suitable grassland habitat is present in the project area; therefore, there is a moderate potential for this species to occur in the project area.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a federal species of concern and a CDFG Species of Special Concern. Western burrowing owl is found throughout much of California in annual and perennial grassland, desert, and arid scrubland. It can be found in vacant lots in residential areas, along railroad ballast, along dirt roads, and on canal levees. The critical requirement for burrowing owl habitat is the presence of suitable burrows. The species uses burrows excavated by ground squirrels and badgers, as well as artificial burrows such as cement culverts, debris piles, or openings under roads. Its breeding season extends from February through August, peaking in April and May (Zeiner et al., 1990).

No burrowing owls were observed in the project area during April and June 2005 field surveys (LGS, 2005), and no documented occurrences of the species are known from the project area (CDFG, 2005). Several records of nesting burrowing owls have been documented in Solano County in similar grassland and agricultural habitats that are present in the project area. The nearest reported sighting occurred approximately 3 miles east from the project area (CDFG, 2005). Intensive agriculture and the significant reduction of California ground squirrel populations from the project area have reduced the availability of burrows used by burrowing owls as breeding and wintering sites. Although no burrowing owls were observed in the project area during reconnaissance-level field surveys, these surveys were not adequate to conclude that burrowing owls are absent from the project area. Because there are known occurrences near the project area and suitable nesting habitat is present, the potential for burrowing owls to occur within the project area is considered moderate.

White-tailed Kite

The white-tailed kite (*Elanus leucurus*) is designated as a CDFG Fully Protected Species. Kites are year-round residents of coastal and valley lowlands, and are rarely found away from agricultural areas. This species preys mostly on voles and other small mammals, and occasionally on birds, insects, reptiles, and amphibians. Nests are placed in shrubs and trees adjacent to open grasslands or agricultural areas. White-tailed kites breed from February to October, peaking from May to August.

Although the white-tailed kite has not been documented in the project area, it is regularly observed throughout Solano County. Trees and shrubs in the project area provide suitable nesting habitat for this species, and the open grazed grasslands, fence rows, and agricultural fields provide suitable foraging habitat. Because suitable habitat is present, there is a high potential for this species to breed in the project area.

Northern Harrier

The northern harrier (*Circus cyaneus*) is designated as a CDFG Species of Special Concern. The breeding range includes most of the Central Valley, the Sacramento–San Joaquin Delta, the Suisun Marsh, and portions of San Francisco Bay (Zeiner et al., 1990). Northern harriers use tall grasses and forbs in wetlands and field borders for cover. They roost and nest on the ground in shrubby vegetation, often near a marsh edge. Harriers breed between April and September, with peak activity in June and July. Northern harriers feed mainly on voles and other small mammals, birds, small reptiles, crustaceans, and insects.

A northern harrier was observed foraging in the project area during an April 2005 field survey (LGS, 2005). Although no marsh habitat (preferred nesting substrate) is present in the project area, northern harriers could also nest in tall grasslands and agricultural lands that are left undisturbed during the breeding season; these are present in the project area. Because northern harrier was documented during field surveys, there is a high potential for the species to nest in the project area.

California Horned Lark

The California horned lark (*Eremophila alpestris actia*) is designated as a CDFG Species of Special Concern. It is a ground-nesting bird, preferring open grasslands and prairies with short vegetation or bare ground and little or no shrub or tree cover. California horned larks may also occupy the edges of agricultural fields or row crop stubble.

Several horned larks were observed foraging in annual grasslands near the project area during field surveys conducted in April and June 2005 (LGS, 2005). Within the project area, suitable nesting habitat occurs within relatively undisturbed grazed annual grasslands. The project area has a high potential to support nesting California horned larks.

Loggerhead Shrike

Loggerhead shrike (*Lanius ludovicianus*) is designated as a CDFG Species of Special Concern. It is a common year-round resident throughout the lowlands and foothills of California. Loggerhead shrikes prefer open habitats with shrubs, fences, utility poles, or other perches. They tend to avoid urbanized areas but often frequent open croplands. Nests are usually hidden in densely foliated shrubs or trees. The breeding season is from March through August.

Several loggerhead shrikes were observed foraging in annual grasslands in the project area during field surveys conducted in April 2005 (LGS, 2005). Trees and shrubs in the project area provide suitable nesting habitat for this species. Because loggerhead shrikes were observed in the project area during the breeding season, there is a high potential for this species to breed in the project area.

Vernal Pool Crustaceans

Four special-status vernal pool crustaceans may occur in the project vicinity: the federal endangered Conservancy fairy shrimp (*Branchinecta conservatio*), federal threatened vernal pool fairy shrimp (*Branchinecta lynchi*), and two federal species of concern, the midvalley fairy shrimp (*Branchinecta mesovallensis*) and California linderiella (*Linderiella occidentalis*). These species have an abbreviated life cycle, hatching when rains first

inundate the pool, maturing in as little as a week, mating, shedding cysts, and dying. Resting cysts lay in the pool substrate through summer, hatching with the next season's rains. The cysts can lie dormant for decades before hatching.

Within the project area, potentially suitable habitat for vernal pool crustaceans is present within seasonal wetlands in the Kirby Hills. No occurrences of these species are known from the project area (CDFG, 2005); however, it is unlikely that protocol-level surveys for the species have been previously conducted in the project area. Because suitable habitat is present and these species are known to occur in Solano County (CDFG, 2005; Eriksen and Belk, 1999), there is a moderate potential for these vernal pool crustaceans to occur in the project area.

Plants

Based on a review of CNDDDB (2005), 29 special-status plant species were identified as having the potential to occur in the project region (Table B.3-6). Eleven of the species listed in Table B.3-6 do not occur in the study area because they have extremely limited ranges (i.e., Antioch Dunes evening-primrose) or are limited to habitats that are not present in the project area (i.e., serpentine soils, brackish marsh, tidal salt marsh, or dunes).

Overall, most of the study area has relatively low potential to support special-status plants, particularly along the gas pipeline alignment between Shiloh and Olsen Roads. This portion of the alignment is primarily agricultural lands and heavily disturbed. The gas pipeline alignment between Olsen and Birds Landing roads contains non-native annual grasslands and seasonal wetlands (primarily ryegrass swales) within the agricultural lands. These non-native annual grasslands and seasonal wetlands were identified as potential habitat for some of the special-status plants listed in Table B.3-6 (including bearded popcorn-flower and Parry's tarweed).

The seasonal wetlands and non-native annual grasslands located east of Shiloh Road and in the Kirby Hills were also identified as containing potential suitable habitat for special-status plants. Bearded popcorn-flower (*Plagiobothrys hystriculus*) and Parry's tarweed (*Centromadia parryi parryi*) are the only special-status plant species located during the 2005 field surveys. Bearded popcorn-flower is an annual member of the Borage Family (Boraginaceae). The plants are small, with stems less than 40 centimeters (16 inches) long that are erect to horizontally spreading. The flowering period is in May.

Bearded popcorn-flower was described in 1920, based on two collections from Solano County, the first by Katherine Brandegee from Elmira in 1882, and the second by Willis Jepson from the Montezuma Hills in 1892. Until recently, these were the only known collections; and the California Native Plant Society had listed the species as "presumed extinct" (List 1A). Because the species was presumed to be extinct, neither USFWS nor CDFG had considered the species for listing as threatened or endangered. In May 2005, Jones & Stokes' botanists rediscovered the species at two locations, one in the Montezuma Hills and one in the Kirby Hills (LGS, 2005). The extent and number of plants at these locations are relatively small (less than 50 plants in each population).

The Kirby Hills population of bearded popcorn flower is the only occurrence found in the study area. This population occurs along the south side of the existing access road, just upslope from the seasonal wetland that occurs immediately along the road. As stated above, the population is small (less than 50 plants) and is dispersed through a 100-foot by 30-foot area. As described below in the "Impact Analysis" section, this population would not be directly or indirectly affected by the proposed project and would be fenced prior to construction to ensure that access road improvement activities do not affect the population.

Habitat for bearded popcorn-flower consists of low, moist areas in annual grassland, such as the upper margins of seasonal wetlands. Associated species include Italian ryegrass, coyote thistle, hyssop loosestrife, and harvest brodiaea. Because bearded popcorn-flower plants are small and tend to spread horizontally, they are very difficult to detect in areas of dense ryegrass, which may be one reason the species has been rarely encountered.

Parry's tarweed (*Centromadia parryi* ssp. *parryi*) has no State or federal status but is a CNPS List 1B species that is considered rare, threatened, or endangered in California and elsewhere (CNPS, 2005). Parry's tarweed is known as *Hemizonia parryi* ssp. *parryi* in the Jepson Manual (Hickman, 1993). Parry's tarweed is a member of the Asteraceae (sunflower family) and is endemic to California. This annual herb is one to seven centimeters tall, smells faintly of tar, and is covered long, fine hairs and terpenoid glands covering its stem and leaves; it can be distinguished from the other subspecies of *C. parryi* by the size of its involucre [five to 10 millimeters(mm)], and ligules (three to six mm). The flowers are yellow and bloom from May through November.

The historic range of Parry's tarweed includes the North and South Coast Ranges and the southern Sacramento Valley, and occurrences have been reported in Butte, Colusa, Glenn, Lake, Napa, San Mateo, and Solano Counties. Parry's tarweed inhabits coastal prairie, meadows and seeps, valley and foothill grassland on mesic soils, alkaline marshes and swamps, and coastal salt marshes and swamps, typically at elevations below approximately 1,400 feet (CNPS, 2005).

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
Mammals			
<i>Suisun ornate shrew</i> <i>Sorex ornatus sinuosus</i>	FSC, CSC	Requires dense low-lying cover and driftweed and other litter above the mean high tide line for nesting and foraging.	Not Present. Tidal habitat is not present.
<i>Townsend's western big-eared bat</i> <i>Corynorhinus townsendii townsendii</i>	CSC	Primarily found in rural settings in a wide variety of habitats including oak woodlands and mixed coniferous-deciduous forest. Day roosts highly associated with caves and mines. Very sensitive to human disturbance.	Not Present. Typical roost habitat not present in project area.
<i>small-footed myotis</i> <i>Myotis ciliolabrum</i>	FSC	Commonly found in arid uplands of California. Feeds on a variety of small flying insects. Seeks cover in caves, buildings, mines, crevices, and occasionally under bridges.	Not Present. Typical roost habitat not present in project area.
<i>long-eared myotis</i> <i>Myotis evotis</i>	FSC	Primarily a forest associated species. Day roosts in hollow trees, under exfoliating bark, rock outcrop crevices and buildings. Other roosts include caves, mines and under bridges.	Not Present. Typical roost habitat not present in project Area.
<i>fringed myotis</i> <i>Myotis thysanodes</i>	FSC	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwood/sequoia groves. Buildings, mines and large snags are important day and night roosts.	Not Present. Typical roost habitat not present in Project area.

Kirby Hills Natural Gas Storage Facility
B. INITIAL STUDY

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
<i>long-legged myotis</i> Myotis volans	FSC	Generally associated with woodlands and forested habitats. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	Not Present. Typical roost habitat not present in project area.
<i>Yuma myotis</i> Myotis yumanensis	FSC	Known for its ability to survive in urbanized environments. Also found in heavily forested settings. Day roosts in buildings, trees, mines, caves, bridges and rock crevices. Night roosts associated with man-made structures.	Not Present. Typical roost habitat not present in project area.
<i>greater western mastiff bat</i> Eumops perotis californicus	FSC, CSC	Found in a wide variety of habitat. Distribution appears to be tied to large rock structures which provide suitable roosting sites, including cliff crevices and cracks in boulders.	Not Present. Typical roost habitat not present in project area.
<i>riparian brush rabbit</i> Sylvilagus bachmani riparius	FE, SE	Forage within or very close to brushy cover, along trails, and fire breaks in riparian areas.	Not Present. Suitable riparian habitat absent; not in range of species.
<i>San Joaquin pocket mouse</i> Perognathus inornatus inornatus	FSC	Occurs in dry, open grasslands or scrub areas on fine-textured soils. Forages on seeds, green vegetation and insects.	Moderate Potential. Suitable grassland habitat is present, but the general project area is surrounded by aquatic barriers.
<i>salt-marsh harvest mouse</i> Reithrodontomys raviventris	FE, SE	Primary habitat in pickleweed-dominated saline emergent marshes of San Francisco Bay. Require adjacent upland areas for escape from high tides.	Not Present. Tidal habitat is not present.
<i>riparian (San Joaquin Valley) woodrat</i> Neotoma fuscipes riparia	FE, CSC	Found in riparian areas along San Joaquin, Stanislaus, Tuolumne Rivers. Requires mix of brush and trees with suitable nesting areas in trees, snags, and logs.	Not Present. Suitable riparian habitat absent; not in range of species.
<i>San Francisco dusky-footed woodrat</i> Neotoma fuscipes annectens	FSC, CSC	Occurs in forest habitats of moderate canopy and moderate to dense understory. Also found in chaparral habitats. Feeds mainly on woody plants: live oak, maple, coffeeberry, alder, and elderberry	Not Present. Suitable riparian or scrub habitat absent.
Birds			
<i>American Bittern</i> Botaurus lentiginosus	FSC	Occurs in fresh emergent wetlands, often hiding, resting, and roosting solitarily amidst tall, dense, emergent vegetation, on ground, or near ground on log, stump, or on emergent plants.	Not Present. Emergent wetlands are not present in the project area.
<i>White-faced Ibis</i> Plegadis chihi	FSC, CSC	Prefers to feed in fresh emergent wetland, shallow lacustrine waters, and muddy ground of wet meadows and irrigated or flooded pastures and croplands.	Low Potential. May rarely forage in grasslands and agricultural areas within the project area; does not breed in project area.

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
<i>Aleutian Canada Goose</i> <i>Branta canadensis leucoparvieia</i>	FSC	Winters at lakes and inland prairie habitats. Forages in pastures and cultivated fields. Loafs is lakes, reservoirs, and ponds.	Low Potential. May rarely forage in grasslands and agricultural areas within the project area; does not breed in project area.
<i>White-tailed Kite</i> <i>Elanus leucurus</i>	FSC, CFP	Year-long resident of coastal and valley lowlands; rarely found away from agricultural areas. Preys on small diurnal mammals and occasional birds, insects, reptiles, and amphibians.	High Potential. Likely forages throughout project area; suitable nesting habitat adjacent to project area.
<i>Bald Eagle</i> <i>Haliaeetus leucocephalus</i>	FPD, FT, SE, CFP	Requires large bodies of water, or free-flowing rivers with abundant fish adjacent snags or other perches. Nests in large, old-growth, or dominant live tree with open branchwork.	Not Present. Typical foraging and nesting habitat not present in project area.
<i>Northern Harrier</i> <i>Circus cyaneus</i>	CSC	Found in open grasslands, prairies, and marshes. Tend to nest near water.	High Potential. Likely forages throughout project area; suitable nesting habitat adjacent to project area.
<i>Sharp-shinned Hawk</i> <i>Accipiter striatus</i>	CSC	Generally associated with woodland habitats. Typically nests in isolated areas away from human disturbance.	Low Potential. May forage in project area in winter; no suitable nesting habitat.
<i>Cooper's Hawk</i> <i>Accipter cooperi</i>	CSC	Inhabits areas with dense tree stands or patchy woodlands. Usually nests in deciduous riparian areas or second-growth conifer stands near streams.	Low Potential. May forage in project area in winter; no suitable nesting habitat.
<i>Ferruginous Hawk</i> <i>Buteo regalis</i>	FSC, CSC	Frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys and fringes of pinyon-juniper habitats.	Moderate Potential. May occur as a winter visitor; does not nest in project area.
<i>Swainson's Hawk</i> <i>Buteo swainsoni</i>	FSC, ST	Breeds in stands with few trees in juniper-sage flats, riparian areas and oak savannah. Requires adjacent suitable foraging areas such as grasslands or grain fields supporting rodent populations.	Moderate Potential. May forage in grasslands and agricultural areas within the project area; does not breed in project area.
<i>Golden Eagle</i> <i>Aquila chrysaetos</i>	CSC, CFP	Found in rolling foothill and mountain areas, sage-juniper flats, dessert. Cliff-walled canyons provide nesting habitat in most parts of range.	Moderate Potential. May forage in grasslands and agricultural areas within the project area; does not breed in project area.
<i>American Peregrine Falcon</i> <i>Falco peregrinus anatum</i>	FSC, SE, CFP	Winters throughout Central Valley. Requires protected cliffs and ledges for cover. Feeds on a variety of birds, and some mammals, insects, and fish.	Moderate Potential. May forage in grasslands and agricultural areas within the project area; does not breed in project area.
<i>Osprey (nesting)</i> <i>Pandion haliaetus</i>	CSC	Nests in tree tops near ocean shores, bays, fresh-water lakes, and larger streams.	Low Potential. Foraging and nesting habitat are not present in project area.
<i>California Black Rail</i> <i>Laterallus jamaicensis coturniculus</i>	ST, CFP	Rarely seen resident of saline, brackish, and fresh emergent wetlands in the San Francisco Bay area. Nest in dense stands of pickleweed	Not Present. Tidal wetlands are not present in project area.

Kirby Hills Natural Gas Storage Facility
B. INITIAL STUDY

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
<i>California Clapper Rail</i> Rallus longirostris obsoletus	FE, SE	Found in tidal salt marshes of the San Francisco Bay. Require mudflats for foraging and dense vegetation on higher ground for nesting.	Not Present. Tidal wetlands are not present in project area.
<i>Western Snowy Plover</i> Charadrius alexandrinus nivosus	FT, CSC	Found on sandy beaches, salt pond levees and shores of large alkali lakes. Need sandy gravelly or friable soils for nesting.	Not Present. Typical foraging and nesting habitat are not present in the study area.
<i>Mountain Plover</i> Charadrius montanus	FSC, CSC	Winter resident in short grasslands and plowed fields below 1000m.	Low Potential. May forage in project area in winter; no suitable nesting habitat.
<i>Long-billed Curlew</i> Numenius americanus	FSC, CSC	Winters in large coastal estuaries, upland herbaceous areas, and croplands. Breeds in northeastern California in wet meadow habitat.	Moderate Potential. May forage in project area in winter; no suitable nesting habitat.
<i>California Least Tern (nesting colony)</i> Sterna antillarum browni	FE, SE	Breeding colonies in San Francisco Bay found in abandoned salt ponds and along estuarine shores. Nests on barren to sparsely vegetated site near water.	Not Present. Typical foraging and nesting habitat are not present in the study area.
<i>Western Yellow-billed Cuckoo</i> Coccyzus americanus occidentalis	FC, SE	Found in deep forest riparian areas.	Not Present. Typical foraging and nesting habitat are not present in the study area.
<i>Western Burrowing Owl</i> Athene cucularia hypugea	FSC, CSC	Frequents open grasslands and shrublands with perches and burrows. Preys upon insects, small mammals, reptiles, birds, and carrion. Nests and roosts in old burrows of small mammals.	Moderate Potential. Occurs in Potrero Hills; however, burrow habitat appears sparse in project area.
<i>Short-eared Owl</i> Asio flammeus	CSC	Found in open, treeless areas with elevated sites for perches and dense vegetation for roosting and nesting.	Low Potential. May forage in project area; no suitable nesting habitat.
<i>Vaux's Swift</i> Chaetura vauxi	FSC, CSC	Forages high in the air over most terrain and habitats but prefers rivers/lakes. Requires large hollow trees for nesting.	Low Potential. May forage in project area; no suitable nesting habitat.
<i>Costa's Hummingbird</i> Calypte costae	FSC	Occurs in arid habitats such as desert washes, edges of desert riparian and valley foothill riparian, coastal scrub, desert scrub, desert succulent shrub, lower-elevation chaparral, and palm oasis.	Low Potential. Typical habitat not present in project area.
<i>Rufous Hummingbird</i> Selasphorus rufus	FSC	Found in a wide variety of habitats that provide nectar-producing flowers. A common migrant and uncommon summer resident of California.	Low Potential. Typical habitat not present in project area.
<i>Allen's Hummingbird</i> Selasphorus sasin	FSC	Breeds in sparse and open woodlands, coastal redwoods, and sparse to dense scrub habitats. Distribution highly dependent on abundance of nectar sources.	Low Potential. Typical habitat not present in project area.

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
<i>Olive-sided Flycatcher</i> <i>Contopus cooperi</i>	FSC	Most often found in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain	Not Present. Typical habitat not present in project area.
<i>Little Willow Flycatcher</i> <i>Empidonax traillii brewsteri</i>	FSC, SE	Most numerous where extensive thickets of low, dense willows edge on wet meadows, ponds, or backwaters. Winter migrant.	Not Present. Suitable riparian habitat is not present in the project area.
<i>California horned lark</i> <i>Eremophila alpestris actia</i>	CSC	Frequents grasslands and other open habitat with low, sparse vegetation. Nests on ground in the open.	High Potential. Suitable nesting and foraging habitat is present in the project area.
<i>Bank Swallow</i> <i>Riparia riparia</i>	SE	Migrant in riparian and other lowland habitats in western California. Nests in riparian areas with vertical cliffs and banks with fine-textured or sandy soils in which to nest.	Not Present. Typical habitat not present in project area.
<i>California Thrasher</i> <i>Toxostoma redivivum</i>	FSC	Common resident of foothills and lowlands in cismontane California. Occupies moderate to dense chaparral habitats and extensive thickets in young or open valley foothill riparian habitat.	Not Present. Typical habitat not present in project area.
<i>Loggerhead Shrike</i> <i>Lanius ludovicianus</i>	FSC, CSC	Prefers open habitats with scattered shrubs, trees, pots, utility lines from which to forage for large insects. Nest well concealed above ground in densely foliated shrub or tree.	High Potential. Suitable nesting and foraging habitat is present in the project area.
<i>Saltmarsh Common Yellowthroat</i> <i>Geothlypis trichas sinuosa</i>	FSC, CSC	Frequents low, dense vegetation near water including fresh to saline emergent wetlands. Brushy habitats used in migration. Forages among wetland herbs and shrubs for insects primarily.	Low Potential. Typical habitat not present in project area.
<i>Yellow-breasted Chat</i> <i>Icteria virens</i>	CSC	Nests in low, dense riparian thickets consisting of willow, blackberry, and wild grape.	Not Present. Suitable riparian habitat is not present in the project area.
<i>Bell's Sage Sparrow</i> <i>Amphispiza belli</i>	FSC, CSC	Prefers dense chaparral and scrub habitats in breeding season. Found in more open habitats in winter.	Not Present. Suitable chaparral habitat is not present in the project area.
<i>Suisun Song Sparrow</i> <i>Melospiza melodia maxillaris</i>	FSC, CSC	Inhabits cattails, tules, sedges and salicornia in brackish-water marshes surrounding Suisun Bay.	Low Potential. Typical tidal wetland habitat not present in project area.
<i>Tricolored Blackbird</i> <i>Agelaius tricolor</i>	FSC, CSC	Usually nests over or near freshwater in dense cattails, tules, or thickets of willow, blackberry, wild rose or other tall herbs.	Moderate Potential. May forage in project area; no suitable nesting habitat.
<i>Lawrence's Goldfinch</i> <i>Carduelis lawrencei</i>	FSC	Inhabits oak woodlands, chaparral, riparian woodlands, pinyon-juniper associations, and weedy areas near water during the breeding season.	Low Potential. May forage in project area; no suitable nesting habitat.

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
Reptiles and Amphibians			
<i>western pond turtle</i> Clemmys marmorata	CSC	Occurs in perennial ponds, lakes, rivers and streams with suitable basking habitat (mud banks, mats of floating vegetation, partially submerged logs) and submerged shelter.	Not Present. Perennial aquatic habitat is not present in the project area.
<i>California horned lizard</i> Phrynosoma coronatum frontale	FSC, CSC	Occurs in valley-foothill hardwood, conifer and riparian habitats, as well as in pine-cypress juniper and annual grass habitats. Prefers sand areas, washes, flood plains and wind-blown deposits.	Low Potential. No documented occurrences in Solano County (Jennings and Hayes, 1994).
<i>silvery legless lizard</i> Anniella pulchra pulchra	FSC, CSC	Found in sandy or loose loamy soils under sparse vegetation. Soil moisture is essential.	Low Potential. No documented occurrences in Solano County (Jennings and Hayes, 1994).
<i>giant garter snake</i> Thamnophis gigas	FT, SE	Prefers freshwater marsh and low gradient streams. Has adapted to drainage channels and irrigation ditches.	Not Present. Suitable aquatic habitat is not present in the project area.
<i>Alameda whipsnake</i> Masticophis lateralis euryxanthus	FT, SE	Prefers a chaparral habitat with rock outcroppings and small mammal burrows for basking and refuge. Can occur in adjacent communities, including grassland and oak savanna. Found in the east bay hills.	Not Present. project area is not within the geographic range of this species.
<i>California tiger salamander</i> Ambystoma californiense	FT, CSC	Inhabits annual grassland habitat and mammal burrows. Seasonal ponds and vernal pools crucial to breeding	Low Potential. Minimal mammal burrows available for underground refuge; no apparent natural breeding habitat was present prior to construction of stock ponds. Nearest occurrence is 4.5 miles northwest of project area (CDFG, 2005).
<i>western spadefoot toad</i> Scaphiopus (Spea) hammondi	FSC, CSC	Occurs primarily in grasslands but occasionally populates valley-foothill hardwood woodlands. Feed on insects, worms, and other invertebrates.	Low Potential. No documented occurrences in Solano County (Jennings and Hayes, 1994).
<i>California red-legged frog</i> Rana aurora draytonii	FT, CSC	Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive vegetation. Documented to disperse through upland habitats after rains.	Not Present. Suitable aquatic habitat is not present in the project area for most of the dry season. According to Jennings and Hayes (1994), a population of this species cannot be maintained if surface water disappears every year.
<i>foothill yellow-legged frog</i> Rana boylei	FSC, CSC	Found in or near rocky streams in a variety of habitats. Feed on both aquatic and terrestrial invertebrates.	Not Present. Suitable stream habitat is not present in the project area.
Invertebrates			
<i>Conservancy fairy shrimp</i> Branchinecta conservatio	FE	Inhabit highly turbid water in vernal pools. Known from six populations in the northern Central Valley.	Moderate Potential. Documented to occur in central Solano County (Eriksen and Belk, 1999). Some seasonal wetlands are present in the project area.
<i>vernal pool fairy shrimp</i> Branchinecta lynchi	FT	Inhabit small, clear-water sandstone-depression pools, grassy swales, slumps, or basalt-flow depression pools.	Moderate Potential. Documented to occur 3 miles north of the project area (CDFG, 2005). Some seasonal wetlands are present in the project area.

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
<i>Midvalley fairy shrimp</i> <i>Branchinecta mesovallensiss</i>	FSC	Lives in extremely shallow, ephemeral vernal pools. Known from only a few locations in the Central Valley.	Moderate Potential. Documented to occur 3 miles north of the project area (CDFG, 2005). Some seasonal wetlands are present in the project area.
<i>vernal pool tadpole shrimp</i> <i>Lepidurus packardi</i>	FE	Pools commonly found in grass-bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	Low Potential. Seasonal wetlands observed in the project area probably do not have sufficient inundation to support reproduction. Unlikely to occur in stock ponds.
<i>California linderiella</i> <i>Linderiella occidentalis</i>	FSC	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools has very low alkalinity and conductivity.	Moderate Potential. Documented to occur in central Solano County (Eriksen and Belk, 1999). Some seasonal wetlands are present in the project area.
<i>valley elderberry longhorn beetle</i> <i>Desmocerus californicus dimorphus</i>	FT	Occurs in mature elderberry bushes in the Central Valley. Prefers to lay eggs in branches 2-8 inches in diameter.	Not Present. Elderberry shrubs not observed in project area.
<i>Delta green ground beetle</i> <i>Elaphrus viridis</i>	FT	Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis AFS. Prefers sandy mud substrate where it slopes gently into water with low-growing vegetation.	Low Potential. Project area is not within the known geographic distribution of the species.
<i>Callippe silverspot butterfly</i> <i>Speyeria callippe callippe</i>	FE	Restricted to northern coastal scrub of the San Francisco peninsula, and to grassy hilltops and slopes from Solano County to Santa Clara County. Hostplant is <i>Viola pedunculata</i> .	Low Potential. Kirby Hills are likely too isolated for this species to successfully disperse to in numbers sufficient to maintain a population.
<i>Lange's metalmark butterfly</i> <i>Apodemia mormo langei</i>	FE	Inhabits stabilized dunes along the San Joaquin River. Primary host plant is <i>Eriogonum nudum</i> var. <i>auriculatum</i> .	Not Present. Project area is not within the known geographic distribution of the species.
Plants			
<i>Mt. Diablo manzanita</i> <i>Arctostaphylos auriculata</i>	List 1B	Chaparral in canyons and on slopes on sandstone, between 490 and 1,650 feet. Bloom period Jan-Mar.	Not Present. Project area is not within the known geographic distribution of the species.
<i>Suisun Marsh aster</i> <i>Aster lentus</i>	FSC, List 1B	Brackish and freshwater marsh, below 500 feet. Bloom period Aug-Nov.	Low Potential. Typical habitat is not present within the project footprint.
<i>Heartscale</i> <i>Artriplex cordulata</i>	FSC, List 1B	Alkali grassland, alkali meadow, alkali scrub, below 660 feet. Bloom period May-Oct.	Low Potential. Typical habitat is not present within the project footprint; however, suitable alkali wetlands do occur immediately south.
<i>Brittlescale</i> <i>Atriplex depressa</i>	List 1B	Alkali grassland, alkali meadow, alkali scrub, chenopod scrub, playa, valley and foothill grasslands on alkaline or clay soils, below 660 feet. Bloom period May-Oct.	Low Potential. Typical habitat is not present within the project footprint; however, suitable alkali wetlands do occur immediately south.
<i>San Joaquin spearscale</i> <i>Atriplex joaquiniana</i>	FSC, List 1B	Alkali grassland, alkali scrub, alkali meadows, saltbush scrub, below 1,000 feet. Bloom period Apr-Sept.	Low Potential. Typical habitat is not present within the project footprint; however, suitable alkali wetlands do occur immediately south.
<i>Big tarplant</i> <i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>	List 1B	Annual grassland, on dry hills and plains, between 50 and 1,500 feet. Bloom period Jul-Oct.	Low. Potential habitat is present, but thought to be extirpated in Solano County (LGS, 2005).

Kirby Hills Natural Gas Storage Facility
B. INITIAL STUDY

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
<i>Parry's Tarweed</i> <i>Centromadia parryi parryi</i>	List 1B	Annual grassland, coastal prairie	High Potential. One population was observed along the Kirby Hills access road; another was found just east of Olsen Road (LGS, 2005).
<i>Suisun thistle</i> <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	FE, List 1B	Salt marshes and swamps, below 3 feet. Bloom period Jul–Sept.	Low Potential. Typical habitat is not present within the project footprint.
<i>Hoover's cryptantha</i> <i>Cryptantha hooveri</i>	List 1B	Coarse, sandy soil in grassland. Bloom period Apr–May.	Low Potential. Potential habitat is present, but not documented to occur in Solano County (LGS, 2005).
<i>Dwarf downingia</i> <i>Downingia pusilla</i>	List 2	Vernal pools and mesic valley and foothill grasslands, 1,500 feet. Bloom period Mar–May.	Moderate Potential. Seasonal wetlands are present in the vicinity of the project footprint; documented to occur in Solano County.
<i>Round-leaved filaree</i> <i>Erodium macrophyllum</i>	List 2	Open sites, dry grasslands, and shrub lands below 4,000 feet. Bloom period Mar–May	Low Potential. Potential habitat is present, but no nearby documented occurrences (LGS, 2005).
<i>Contra Costa wallflower</i> <i>Erysimum capitatum</i> ssp. <i>angustatum</i>	FE, SE, List 1B	Inland dunes. Bloom period Mar–Jul.	Low Potential. Typical habitat is not present within the project footprint.
<i>Diamond-petaled California poppy</i> <i>Eschscholzia rhombipetala</i>	FSC, List 1B	Grassland, chenopod scrub, on clay soils, where grass cover is sparse enough to allow growth of low annuals. Bloom period Mar–Apr.	Low Potential. Potential habitat is present, but no nearby documented occurrences (LGS, 2005).
<i>Fragrant fritillary</i> <i>Fritillaria liliacea</i>	FSC, List 1B	Adobe soils of interior foothills, coastal prairie, coastal scrub, annual grassland, often on serpentinite below 1,350 feet. Bloom period Feb–Apr.	Moderate Potential. Suitable habitat is present in the vicinity of the project footprint; documented to occur in Solano County.
<i>Brewer's western flax</i> <i>Hesperolinon breweri</i>	FSC, List 1B	Serpentine slopes in chaparral, and grasslands, 100–2,300 feet. Bloom period May–Jul.	Low Potential. Typical habitat is not present within the project footprint.
<i>Carquinez goldenbush</i> <i>Isocoma arguta</i>	FSC, List 1B	Annual grassland on alkaline soils and flats, generally below 70 feet. Bloom period Aug–Dec.	Moderate Potential. Documented to occur north of the project area; suitable habitat present.
<i>Contra Costa goldfields</i> <i>Lasthenia conjugens</i>	FE, List 1B	Alkaline or saline vernal pools and swales, below 700 feet. Bloom period Mar–Jun.	Moderate Potential. Suitable habitat is present in the vicinity of the project footprint; documented to occur in Solano County.
<i>Delta tule pea</i> <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	FSC, List 1B	Coastal and estuarine marshes, below 1,000 feet. Bloom period May–Sept.	Low Potential. Typical habitat is not present within the project footprint.
<i>Legenere</i> <i>Legenere limosa</i>	FSC, List 1B	Deep, seasonally wet habitats such as vernal pools, ditches, marsh edges, and riverbanks, below 500 feet. Bloom period May–Jun.	Moderate Potential. Suitable habitat is present in the vicinity of the project footprint; documented to occur in Solano County.
<i>Heckard's pepper-grass</i> <i>Lepidium latipes</i> var. <i>heckardii</i>	List 1B	Annual grassland on margins of alkali scalds, below 660 feet. Bloom period Apr–May.	Low Potential. Potential habitat is present, but no nearby documented occurrences (LGS, 2005).
<i>Woolly-headed lessingia</i> <i>Lessinia hololeuca</i>	List 3	Clay or serpentinite soils of coastal scrub, lower montane coniferous forest, valley and foothill grasslands, below 1,000 feet. Bloom period Jun–Oct.	Low Potential. Typical habitat is not present within the project footprint.

Table B.3-6. Special-Status Species that Occur or Potentially Occur within or Near the Project Area

Species	Status*	Habitat	Potential Occurrence in Project Area
<i>Mason's lilaepsis</i> <i>Lilaepsis masonii</i>	FSC, SR List 1B	Freshwater and intertidal marshes, streambanks in riparian scrub, generally at sea level. Bloom period Apr–Nov.	Low Potential. Typical habitat is not present within the project footprint.
<i>Showy madia</i> <i>Madia radiata</i>	List 1B	Oak woodland, grassland, slopes below 3,000 feet. Bloom period Mar–May.	Low Potential. Potential habitat is present, but no nearby documented occurrences (LGS, 2005).
<i>Robust monardella</i> <i>Monardella villosa</i> ssp. <i>globosa</i>	List 1B	Oak woodland and grassy openings in chaparral. Bloom period Jun–Jul.	Low Potential. Typical habitat is not present within the project footprint.
<i>Little mouseltail</i> <i>Myosurus minimus</i> ssp. <i>apus</i>	FSC, List 3	Alkaline vernal pools and marshes, below 5,000 feet. Bloom period Mar–Jun.	Low Potential. Potential habitat is present, but no nearby documented occurrences (LGS, 2005).
<i>Baker's navarretia</i> <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	List 1B	Vernal pools and swales in woodland, lower montane coniferous forest, mesic meadows, and grassland, generally below 5,600 feet. Bloom period May–Jul.	Low Potential. Typical habitat is not present within the project footprint.
<i>Antioch Dunes evening-primrose</i> <i>Oenothera deltoides</i> ssp. <i>howellii</i>	FE, SE, List 1B	Inland dunes generally below 330 feet. Bloom period Mar–Sept.	Low Potential. Typical habitat is not present within the project footprint.
<i>Bearded popcorn-flower</i> <i>Plagiobothrys hystriculus</i>	List 1A	Mesic grassland, vernal pools. Bloom period Apr–May.	High Potential. One population was observed just south of the Kirby Hills access road (LGS, 2005).
<i>Blue skullcap</i> <i>Scutellaria lateriflora</i>	List 2	Mesic meadow, marshes and swamps, generally below 1,640 feet. Bloom period Jul–Sept.	Low Potential. Typical habitat is not present within the project footprint.

Sources: USFWS Species lists (USFWS 2005), and CNDDDB Solano County lists (2005).

* Key to status codes:

- FE - Federal Endangered
- FT - Federal Threatened
- FC - Federal Candidate
- FPD - Federal Proposed Delisted
- FSC - United States Fish and Wildlife Service Federal Species of Concern
- NMFS - Species under the Jurisdiction of the National Marine Fisheries Service
- SE - State Endangered, CFP - CDFG Fully Protected Animal
- CSC - CDFG Species of Special Concern, CSC (Draft) - 4 April 2001 Draft
- CDFG Species of Special Concern
- SLC - Species of Local Concern
- None - No status given but rookery sites are monitored by CDFG
- List 1B - CNPS 1B List, Endangered, Threatened, or Rare in California
- List 2 - CNPS 2 List, Endangered, Threatened, or Rare in California, more common elsewhere
- List 3 - CNPS 3 List, Plants about which additional information is needed (a review list).

B.3.4.2 Environmental Impacts and Mitigation Measures

- a. **Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

LESS THAN SIGNIFICANT IMPACT. Implementation of APMs B-1 through B-6 (see Table B.1-2) would reduce potential impacts to special-status species that potentially occur in the vicinity of the project footprint to a less than significant level. Potential aquatic habitat for vernal pool crustaceans and Cal-

ifornia tiger salamander would be avoided. Upland habitat for the California tiger salamander would be largely avoided by constructing wells on existing pads, and trenching would temporarily disturb a relatively small area of available upland habitat. Similar measures were required at the adjacent Shiloh I wind farm project. No salamanders have been observed on that site where upland disturbance was over a significantly larger area than the proposed Kirby Hills project. Pre-construction surveys would result in the avoidance of active nests of special-status and other bird species. Areas supporting special-status plant species would be identified and avoided. Impacts would be less than significant and no additional mitigation measures are required.

- b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

LESS THAN SIGNIFICANT IMPACT. There are no significant impacts to the riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. Impacts would be less than significant and no additional mitigation measures are required.

- c. Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means?*

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED. The proposed gas pipeline along Shiloh Road would cross an unnamed seasonal drainage that would be considered as waters of the United States by the Corps. Installation of the pipeline would use a bore construction method to cross under the drainage bed and bank, and other potential jurisdictional wetlands that occur along the route. Therefore, this analysis assumes that no significant impacts on the drainage and other jurisdictional features would result.

Based on a site investigation conducted by WRA, some unmapped potential wetland features were observed near the pipeline route and Kirby Hills access road. As a result, Mitigation Measure BIO-1, which is a modification to a portion of APM B-2, is required to avoid impacts to all wetland features.

Mitigation Measure

BIO-1 The construction specifications will require that a qualified biologist, who has been trained to conduct wetland delineations, identify sensitive biological habitat on site and identify areas to avoid during construction.

- d. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?*

LESS THAN SIGNIFICANT IMPACT. The proposed project would not result in interference with the movement of any native species. Trenching of the pipeline would be conducted after the California tiger salamander movement and dispersal period (early November through mid-May) and would not result in any impediments to movement. Impacts would be less than significant and no additional mitigation measures are required.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

NO IMPACT. There are no significant conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. No impacts would occur.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or State habitat conservation plan?

NO IMPACT. There are no significant conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or State habitat conservation plan. No impacts would occur.

B.3.5 Cultural Resources

CULTURAL RESOURCES				
Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.5.1 Setting

Prehistoric Background

The project area is located within the boundaries of the Delta subregion of the Central Valley archaeological region (Moratto, 1984); however, the prehistory of the area is primarily based on the majority of known prehistoric archaeological sites that occur to the east, closer to the delta and the Sacramento River. Very few prehistoric sites have been investigated in the vicinity of the project area, and no prehistoric sites are known within the project area itself. The following discussion is largely based on Moratto (1984) with other contributions noted.

The Delta archaeological subregion is characterized by deeply buried sites on the alluvial plain and deeply stratified mounded sites situated on small knolls that rise above the flood plain. The earliest evidence of the widespread occupation of the Delta region appears to be around 4500 years ago and is characterized by the Windmill Pattern. Known Windmill Pattern sites are typically located on low rises or knolls in the floodplains of creeks or rivers. The Windmill Pattern is identified by the cemeteries which contain bodies laid on the stomach and extended with the head oriented to the west. Bodies are occasionally found resting on the back or in other positions, but are typically found with abundant grave goods, such as large projectile points baked clay net sinkers, bone fish hooks and spears, and the faunal remains and ground stone tools such as mortars and milling slabs. Charmstones, quartz crystals, bone awls and needles, shell beads and ornaments from abalone are also characteristic of the Windmill Pattern (Beardsley, 1948; Heizer, 1949; Heizer and Fenenga, 1939; Lillard et al., 1939; Ragir 1972; and Schulz 1970).

The Berkeley Pattern appeared around 2500 years ago lasting to about 1500 years ago and although it overlapped the Windmill Pattern, it persisted after the Windmill was no longer present. Sites with both of these archaeological patterns are found throughout central California and are not unique to the Delta subregion. Berkeley Pattern sites are characterized by deep midden deposits suggesting larger residential group size and greater frequency of site reuse or even a greater degree of sedentism than that indicated by the Windmill Pattern sites. Berkeley Pattern burials are characterized by bodies placed in a tightly flexed position. Burials are often found interspersed with evidence of occupation. Fewer burials are associated with grave goods. Grave goods include bone tools, groundstone, occasional quartz crystals, and some shell beads of different styles than those found with the Windmill Pattern graves.

The Augustine Pattern replaces the Berkeley Pattern beginning around 1500 years ago and lasts through historic times. These sites appear to be even larger and more intensively occupied (larger populations, longer stays) than with the Berkeley Pattern. Graves continue to be interspersed with living areas and bodies are typically placed in the flexed position. Cremations appear and become more frequent approaching the historic period. Grave goods increase and are quite extravagant with some burials, sometimes including thousands of shell beads and clusters of elaborate abalone ornaments. Groundstone styles change but show an increased importance of acorns and seeds in the diet. Projectile points are much smaller than in preceding periods indicating the adoption of the bow and arrow.

The kinds of archaeological remains that would be expected to be found within the project area would be scanty and nearly invisible. Remains of a campfire, a lost arrowhead, or the minor debris from the resharpening of a spear point or arrow might be all that remains of the prehistoric use of this landscape.

Historical Background

The Delta was visited frequently by Spanish explorers. Pedro Fages scouted the shores of San Francisco Bay in search of a suitable mission site and by 1772 had traveled as far inland as the San Joaquin River (Kyle, 1990; Thompson, 1958). Colonel Juan Bautista de Anza explored the same territory in 1776. The Spanish launched explorations of the Sacramento River as well, beginning with Francisco Eliza's expedition up that river. Between 1806 and 1817, mission site reconnaissance expeditions were conducted by a number of explorers, including Gabriel Moraga (1806, 1808), Father Ramon Abella (1811), Jose Antonio Sanchez (1811), and Father Narciso Duran (1817) (Beck and Haase, 1974).

Euro-American encroachment into the Montezuma Hills began in 1844 when John Bidwell (1819-1900) petitioned the Mexican government for a land grant in southeastern Solano County (Kyle, 1990). Manuel Micheltorena, the 13th governor of Mexican Alta California, made the grant to Bidwell that same year for the 17,726-acre Rancho Los Ulpinos. The grant was located on the west bank of the Sacramento River and extended east into the eastern portion of the project area (Beck and Haase, 1974; Kyle, 1990; Gregory, 1912; Hunt, 1926). Bidwell built an adobe house in the vicinity of present-day Rio Vista, and attempted to cultivate the land. Bidwell's efforts at agriculture, as well as those of subsequent settlers on the ranch, were unsuccessful; although one settler went on to establish the town that became Rio Vista (Hunt, 1926).

The second thrust of Euro-American settlement occurred in 1846 with the establishment of the Hastings Adobe at the head of Suisun Bay, approximately 0.5 miles southwest of the project area. The adobe is named for Lansford W. Hastings, a lawyer from Oregon who attempted to establish a Mormon Colony at the site. Hastings constructed an adobe for himself which he named Montezuma House. The American occupation of California in 1846 dashed Hastings' hope for a land grant from the Mexican government. Three years later, Hastings abandoned the adobe (Hunt, 1926; Kyle, 1990; Theodoratus et al., 1980).

The adobe was reoccupied in 1853 by Lindsay Powell Marshall, Sr., and his sons John and Charles Knox. Marshall, a native of Booneville, Missouri, was a land speculator and cattle rancher who had acquired land in Benicia in 1852. Marshall and his sons took possession of the Hastings Adobe as squatters, although they purchased the property from Hastings in 1854 (Gregory, 1912; Kyle, 1990; Theodoratus et al., 1980). The Marshalls raised livestock and grew crops on the ranch and expanded their landholdings by systematically acquiring additional acreage. Portions of the Marshall ranch were sold to John Kierce and Edward Jenkins by 1880, and Samuel Stratton acquired the adobe in the 1890s. Stratton continued to farm the property, dairying and cultivating grain, until 1964 (Theodoratus et al. 1980).

In 1861 the State legislature created the State Board of Reclamation Commissioners and authorized it to form reclamation districts (McGowan, 1961). In an attempt to enclose large areas within natural levees, 32 districts were formed. After the board was dissolved in 1866, control of swamp and overflowed land fell to the counties (Thompson, 1958). Acreage limitations were removed and land incentive programs were instituted. When a landowner certified that \$2 per acre had been spent on reclamation, the purchase price of the land was refunded to the deed holder. Speculators took advantage of this offer and a period of opportunistic and often irrational levee building followed (McGowan, 1961; Thompson, 1958).

Among the agriculturists to take advantage of the availability of land was Emery Upham. Upham began acquiring land and established a large livestock and ranching operation just north of Collinsville in 1865. By 1870 Upham owned 6,500 acres of the Montezuma Hills and adjacent slough areas. Upham increased his acreage through 1880 by which time his holdings comprised 8,100 acres, including the town of Collinsville. Upham grew wheat and raised swine, sheep, and dairy and beef cattle. Upon his death in 1897 Upham's land was divided and sold to private landowners, who continued to farm and ranch on the land (William Self Associates, 1993).

The Old Shiloh Church and associated cemetery located at 2595 and 2597 Shiloh Road was built in 1870. Members of the Cumberland Presbyterians built the church with proceeds from burial plot sales on the property (Solano County Historical Society). A stroll through the cemetery reveals headstones with dates as early as the 1870s. The church was destroyed by fire in 1875 and rebuilt in 1876. The cemetery served as the final resting place for many of the area's early pioneers, including John Bird, after whom Bird's Landing is named. In 1955 the church was restored and in 1969 the Old Shiloh Church was named a Solano County Point of Historical Interest. The Church falls just outside of the project area at the northwestern corner of the east-west pipeline alignment planned for the proposed project.

The 1870s saw the expansion of railroads throughout California. Several different routes connected the major towns of the Delta area, such as Benicia, Vallejo, Fairfield, and Pittsburg to the rest of California. The Oakland, Antioch, & Eastern Railway Co. (OA&E) (established March 28, 1911), a predecessor to the Sacramento Northern Railway, extended its Oakland-to-Sacramento line through the Montezuma Hills between 1913 and 1914. The OA&E ran a 93-mile route from San Francisco to Sacramento providing mostly passenger service as well as transporting agricultural goods out of the Montezuma Hills enabling rapid transport of agricultural products to a wide market (C. F. Weber & Co., 1914; Robertson, 1998). In 1928 the OA&E was bought by the Sacramento Northern Railway, owned by Western Pacific. By 1941 passenger service on this section of the railway was abandoned. During WWII, freight business increased servicing the Pittsburg steel plant, the Fairfield Army Air Corps Base, the Concord Naval Weapons Depot, and the Oakland Army Terminal. With the abandonment of the Suisun Strait Ferry, which used to take cars across the strait, the line was de-electrified in 1953. Some excursions along this portion of the railway continued through the 1960s and 1970s. The Union Pacific acquired the line in 1987 by merger and decided to abandon it. The Bay Area Electric Railroad Association (BAERA) raised the necessary money to lease 22 miles from Montezuma to Dozier and west to Canon near Fairfield.

Today BAERA operates a “Prairie Train” service in the spring and a “Pumpkin Patch Train” service in October along the route (Western Railway Museum, 1997; California State Railroad Museum, 2004).

Paleontological Resources

The Montezuma and Kirby Hills are underlain by sediments and sedimentary rock from the Cenozoic Era (Tertiary and Quaternary periods). The Montezuma formation (clayey sands of fluvial origin) and the Tehama formation (sandstones, siltstones, and volcanoclastics) historically have not been a source of fossils. The Markley formation, however, has produced carbonized plant remains and microscopic foraminifera and diatoms (LGS, 2005). Nonetheless, the Markley formation is considered to have a low sensitivity or potential for the presence of significant paleontological resources because it is known to contain only “common and/or widespread invertebrate fossils of which the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood” (LGS, 2005).

B.3.5.2 Environmental Impacts and Mitigation Measures

a. Would the project cause a substantial adverse change in the significance of an historical resource as defined in §15064.5 [§15064.5 generally defines historical resource under CEQA]?

LESS THAN SIGNIFICANT IMPACT. Two historical resources fall within the project area. The first resource is an abandoned residence in poor condition located on Shiloh Road south of the Old Shiloh Church (2595 Shiloh Road) on Assessor’s Parcel Number 0048-070-410. This residential building is part of a complex that includes a barn and four ancillary structures. The residence was built prior to the production of the 1908 Antioch quadrangle map. The two-story rectangular side-gabled vernacular building with Colonial Revival-inspired elements is structurally unsound, missing a balcony, rear gables, and all glass windows. The poor structural integrity of the building and lack of architectural integrity would appear to preclude it from achieving CEQA significance under formal evaluation.

The abandoned residence may fall within the 100-foot corridor centered on the proposed pipeline alignment (the alignment has not been staked). The construction plans do not call for the demolition of this building and the building itself is likely to be judged ineligible for listing on the National Register of Historic Places and the California Register of Historic Resources under formal evaluation. The proposed project would not cause a substantial adverse change in the significance of the historic resource and therefore the impact is considered less than significant. No mitigation is required provided construction plans do not change.

The second resource is the historic Oakland, Antioch, & Eastern Railway (completed 1913), precursor of the Sacramento Northern Railway (1928) and the current Bay Area Electric Railroad tracks. The railway was the first route through the Montezuma Hills and would appear to be a significant historical resource associated with important events in the region. This resource would appear to meet CEQA significance criterion A subject to formal evaluation.

Construction plans indicate horizontal boring beneath the railroad tracks to avoid any alteration of the resource. Therefore the proposed project would not cause a substantial adverse change in the significance of the historic resource and therefore the impact is considered less than significant. No mitigation is required.

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

LESS THAN SIGNIFICANT IMPACT. There are no archaeological resources recorded in the project area, and no evidence of such resources was observed by either field survey crews for the Shiloh I Wind Plant (Solano County, 2005b) or the current Kirby Hills project. Although no known archaeological resources were identified during the research or fieldwork completed to date, there is a low potential that subsurface intact deposits from either the prehistoric or the historic era could be inadvertently unearthed during ground-disturbing activities associated with project construction. For example, there is a low potential that subsurface historic deposits such as a privy, garbage dump, or well may exist within the immediate vicinity of the dilapidated pre-1908 residence on Shiloh Road southeast of the Old Shiloh Church. However, implementation of APM C-2 (see Table B.1-2), which requires that work be stopped in the event of an archeological resource find, would ensure that impacts related to archaeological resources are less than significant level. No additional mitigation measures are required.

c. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

LESS THAN SIGNIFICANT IMPACT. As previously stated, one of the three geologic formations at the project site (Markley formation) is known to yield fossils. However, these fossils are common and widespread invertebrate fossils; and the taxonomy, phylogeny, and ecology of the species contained in the rock are well understood. Thus, the occurrence of this formation at the project site is not considered a unique paleontological site, and the impact of disturbing this formation is considered less than significant. No mitigation is required.

d. Would the project disturb any human remains, including those interred outside of formal cemeteries?

LESS THAN SIGNIFICANT IMPACT. According to the California Health and Safety Code, disturbance of Native American human remains is a felony (Section 7052). Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission (NAHC). No human remains are known to be located in the project area. However, there is always the possibility that unmarked burials may be unearthed during construction. Implementation of APM C-3 (see Table B.1-2) would ensure that potential impacts related to disturbing human remains are less than significant. No additional mitigation measures are required.

B.3.6 Geology and Soils

GEOLOGY AND SOILS

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.6.1 Setting

Physical Setting

The project area lies both within the Montezuma Hills and the Kirby Hills areas of Solano County. The Montezuma Hills and Kirby Hills cover an area of approximately 100 square miles and comprise unique geologic formations just north of the confluence of the Sacramento and San Joaquin Rivers where they discharge to Suisun Bay. These low-lying hills are surrounded by Suisun Marsh and Suisun Bay to the west, the islands and sloughs of the Sacramento–San Joaquin River Delta to the south and east, and Central Valley lowlands to the north.

Geology

The project area lies both within the Montezuma Hills and the immediately adjacent Kirby Hills to the west in the Vacaville assemblage. The proposed metering station and much of the proposed pipeline would be located in the Montezuma Hills, and the compressor station and injection/recovery wells would be located in the Kirby Hills. The Montezuma Hills are composed of Quaternary-period (early Pleistocene) sediments known as the Montezuma formation. This material is primarily poorly sorted, poorly consolidated clayey sand, silt, and pebble gravel, apparently of non-marine, fluvial origin. The hills are relatively smooth, rounded, and low lying. The Kirby Hills comprise the Markley marine sandstone (with siltstone) and Neroly sandstone, formed in the Tertiary period (Eocene and Miocene, respectively), which have weathered to a higher terrain than the poorly consolidated Montezuma Hills. Between these two formations, the pipeline connecting the metering and compressor stations also crosses the Tehama formation (also from the Tertiary period [Pliocene]) and overlying recent alluvium. This formation is composed of sandstone, siltstone, conglomerate, and volcanoclastic (ash fragments) rocks. (LGS, 2005)

Faults and Seismicity

The San Francisco Bay Area region, including the project site, is considered seismically active. The State of California considers a fault segment historically active if it has generated earthquakes accompanied by surface rupture during historic time (i.e., approximately the last 200 years). A fault that shows

evidence of movement within Holocene time (approximately the last 11,000 years) is defined as active. A fault segment is considered potentially active if there is evidence of displacement during Quaternary time (approximately the last two million years).

The major active and potentially active faults near the project area are the Kirby Hills–Montezuma Hills–Antioch Faults (historically active), Rio Vista Fault (potentially active), Clayton–Marsh Creek–Greenville Faults (active), Cordelia–Green Valley–Concord Faults (active), Calaveras Fault (active), Hayward Fault (historically active), and San Andreas Fault (historically active), as well as the Diablo Thrust (Table B.3-7). The Kirby Hills–Montezuma Hills–Antioch Fault passes through the proposed well field, about one mile west of the compressor station; and the metering station site is about 6 miles west of the Rio Vista Fault. Although no evidence exists of surface faulting along the Kirby Hills Fault in the Holocene, many smaller earthquakes have been recorded at depth along its linear trend (see Table B.3-7, below). The Marsh Creek–Greenville and Cordelia–Green Valley–Concord faults are about 9 and 12 miles from the project area, respectively. The project area is also located 10 to 12 miles from the newly identified Diablo Thrust. A major seismic event or earthquake on any of these faults is possible and could cause significant ground shaking in the project area. The project site and immediate vicinity is not known to have experienced surface rupture from an earthquake, and no fault-rupture hazard zones as defined by the Alquist-Priolo Earthquake Fault Zoning Act are present (CDMG, 2000).

Severe ground shaking can involve forces that damage structures not designed to withstand them. The estimated peak ground acceleration (10 percent probability of being exceeded in 50 years) in the project area is moderate for California (and high from a national perspective) and in the range of 35 to 65 percent of the acceleration of gravity (g). Severe ground shaking also can induce liquefaction (induced flow as if a liquid) of certain saturated substrates, which can greatly magnify damage to overlying structures not designed to accommodate this possibility. Sandy substrates below the water table are most susceptible in this regard. The relatively unconsolidated sandy substrates reported for the Montezuma Hills, especially in low-lying areas where the seasonal water table may be relatively shallow, may be susceptible to liquefaction. However, the clay content would act to counter the possible susceptibility.

Table B.3-7. Active Faults in the Project Vicinity

Fault	Historical Seismicity*	Maximum Moment Magnitude Earthquake
Kirby Hills-Montezuma Hills	Many <M 4 in the last 35 years	Not available
Midland-Rio Vista	None within the last 700,000 years	Not available
March Creek-Greenville	M 5.6 in 1980	6.9
Cordelia-Concord-Green Valley	Historic active creep	6.9
Diablo Thrust	Newly recognized	6.7
Calaveras	M 5.6-6.4 in 1867 M 4-4.5 in 1970 and 1990	6.8
Hayward	M 6.8 in 1868 Many <M 4.5	7.1
Rodgers Creek (possible extension of Calaveras Fault)	M 6.7 in 1898 M 5.6, 5.7 in 1969	7.0
San Andreas	M 7.1 in 1989 M 8.25 in 1906 M 7.0 in 1838 Many <M6	7.9

* A Richter magnitude (M) and year for recent or large events. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave.
Source: LGS, 2005

Landslide Hazards

A landslide (also called mass movement) involves the downslope transport of soil, rock, and sometimes vegetative material, primarily under the influence of gravity. Landslides occur when shear stress (primarily weight) exceeds the shear strength of the soil/rock. The shear strength of the soil/rock may be reduced during high rainfall periods when materials become saturated. Landslides also may be induced by ground shaking from earthquakes. Landslides usually involve most or all of the soil profile and often part of the underlying parent material. They may take several forms, including soil creep, earthflow, slump, debris slide, debris flow, and rockfall.

According to the Solano County General Plan, the project area is classified as Category 3, or generally stable lands, and is therefore not at a high risk of landslides. No evidence of mass movement has been observed in areas that could affect project elements. The Montezuma and Kirby hills, unlike many parts of the Coast Ranges, do not appear to be susceptible to slumping. Some rockfall or debris slide is possible in the steeper portions of the Kirby Hills.

Soils

Six soil types are found in the project area (Table B.3-8). All soils have relatively high clay content; none are classified as silty or sandy. As a result, all of the soils have high shrink-swell potential. They swell or expand when wetted and shrink or contract as they dry, threatening the stability of structures without adequately engineered foundations. Also, these clayey soils do not absorb water readily and generate moderately high to high rates of runoff. The hazard of erosion by running water of these soils varies from slight, where gently sloping, to high in steeper parts of the Kirby Hills. The clayey surface texture of these soils renders them less susceptible to wind erosion and limits their susceptibility to water erosion. Also, the high clay content and related low permeability make these soils inadequate for on site sewage disposal.

Table B.3-8. Soils and Key Soil Characteristics in the Project Area

Soil Name/Slope	Project Elements Affected ¹	Topsoil/Subsoil Texture	Shrink-Swell Potential	Erosion Hazard Rating	Hydrologic Soil Group ²
Altamont clay, 0–2%	GP	Clay/silty clay loam	High	Slight	D
Altamont–San Ysidro–San Benito complex, 2–9%	GP, MS?	Clay/silty clay loam	High	Moderate	D
Altamont–San Ysidro–San Benito complex, 9–30%	GP	Clay/silty clay loam	High	Moderately high	D
Antioch–San Ysidro complex, 0–2%	GP	Loam/clay	High	Slight	D
Antioch–San Ysidro complex, 2–9%	GP, MS?	Loam/clay	High	Slight	D
Dibble–Los Osos clay loam, 9–50%	GP (<9% slope), CS	Clay loam/clay	High	Moderate to high	C

¹ Project elements: CS = compressor station, MS = metering station, GP = gas pipeline. MS= indicates site is near boundary of soil mapping units.

² Hydrologic soil group: C = slow infiltration rate/moderately high runoff potential; D = Very slow infiltration rate/high runoff potential. Source: LGS, 2005.

Applicable Regulations, Plans, and Standards

Alquist-Priolo Earthquake Fault Zoning Act of 1972. In response to the 1971 San Fernando Earthquake, which damaged numerous homes, commercial buildings, and other structures, California passed the Alquist-Priolo Earthquake Fault Zoning Act. The goal of the act is to avoid or reduce damage to struc-

tures like that caused by the San Fernando Earthquake, by preventing the construction of buildings on active faults. In accordance with the law, California Geological Survey (formerly the California Department of Mines and Geology) (CGS) maps active faults and the surrounding earthquake fault zones for all affected areas. Any project that involves the construction of buildings or structures for human occupancy, such as an operation and maintenance building, is subject to review under this law. Structures for human occupancy must be constructed at least 50 feet from any active fault.

California Seismic Hazards Mapping Act of 1990. The Seismic Hazards Mapping Act is designed to protect the public from the effects of strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes. The act requires site-specific geotechnical investigations to identify the hazard and the formulation of mitigation measures before the permitting of most developments designed for human occupancy. Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California, constitutes the guidelines for evaluating seismic hazards other than surface fault rupture and for recommending mitigation measures as required by Public Resources Code Section 2695(a).

California Building Code. The California Building Code (CBC) contains requirements related to excavation, grading, and construction. Because the project area is located in Seismic Zone 4, the project is required to consider ground acceleration in structural design to provide earthquake-resistant design.

B.3.6.2 Environmental Impacts and Mitigation Measures

- a. *Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*
 - i) *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

LESS THAN SIGNIFICANT WITH MITIGATION. According to the Fairfield South Quadrangle Map of Alquist-Priolo Earthquake Fault Zones, the project site is approximately 12 miles east from the nearest Alquist-Priolo Earthquake Fault Zone (CDMG, 2000). However, the compressor station would be located approximately one mile east of the seismically active Kirby Hills-Montezuma Hills Fault, which passes through the project well field. Other active and historically active faults within 25 miles of the project area have a history of surface rupture associated with large earthquakes (see Table B.3-7). Surface fault rupture in the well field and flow line area is possible. If project facilities are compromised by fault rupture, an uncontrolled release of flammable natural gas could result. Ignition of released gases could further damage project facilities and threaten personnel safety.

Modern buried welded steel pipelines constructed in accordance with 49 CFR 192 have generally performed well during seismic events. At fault crossings, however, pipeline ruptures have occurred where the pipeline has been placed in compression. Where the pipe has crossed the fault, placing the pipe in tension, significant displacements have been experienced without rupture. Mitigation Measure HZ-1 is proposed (see Section B.3.7, Hazards and Hazardous Materials), which would ensure proper pipeline design at any fault crossings, areas subject to liquefaction, and adequate pipe wall design to withstand the combined pipe stresses, including those caused by ground shaking. Implementation of Mitigation Measure HZ-1 would reduce potentially significant impacts to less than significant levels.

ii) Strong seismic ground shaking?

LESS THAN SIGNIFICANT WITH MITIGATION. Intense ground shaking (strong ground acceleration) could occur throughout the project area and could damage any or all of the project elements. However, buried pipelines are flexible and generally can resist strong ground shaking and ground displacement caused by liquefaction. Aboveground facilities are at greater risk because ground motion can be amplified, depending on the design of the structure and the underlying geologic materials. Failures typically occur at joints connecting the aboveground facilities to the belowground facilities, due to differences in motion. As part of the proposed project, LGS will design the project to meet the seismic safety standards of the California Building Code and to comply with the requirements of the federal, State, and local agencies with oversight responsibilities to ensure the safety of the proposed project. As mentioned above in Section a.ii), Mitigation Measure HZ-1 is proposed (see Section B.3.7, Hazards and Hazardous Materials), which would ensure the proper design and adequate pipe wall design to withstand the combined pipe stresses, including those caused by ground shaking. Implementation of Mitigation Measure HZ-1 would reduce potentially significant impacts to less than significant levels.

iii) Seismic-related ground failure, including liquefaction?

LESS THAN SIGNIFICANT WITH MITIGATION. Liquefaction induced by ground shaking could occur in portions of the Montezuma Hills and increase the potential for damage of the gas pipeline and metering station. However, buried pipelines are flexible and generally can resist ground displacement caused by liquefaction. Aboveground facilities are at greater risk because ground motion can be amplified, depending on the design of the structure and the underlying geologic materials. Failures typically occur at joints connecting the aboveground facilities to the belowground facilities, due to differences in motion. Secondary effects of seismic activity such as liquefaction may damage aboveground and belowground facilities due to lateral or vertical displacement. Mitigation Measure HZ-1 is proposed (see Section B.3.7, Hazards and Hazardous Materials), which would ensure the proper design in areas subject to liquefaction, and adequate pipe wall design to withstand the combined pipe stresses, including those caused by ground shaking. Implementation of Mitigation Measure HZ-1 would reduce potentially significant impacts to less than significant levels.

iv) Landslides?

LESS THAN SIGNIFICANT IMPACT. The proposed project is not located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. Using the geotechnical investigation information and other facility design guidelines, all project elements will be designed to avoid landslide, lateral spreading, subsidence, liquefaction, or collapse. This potential impact is therefore considered less than significant, and no mitigation is required.

b. Would the project result in substantial soil erosion or the loss of topsoil?

LESS THAN SIGNIFICANT IMPACT. Construction activities would expose disturbed and loosened soils to erosion from rainfall, surface runoff, and wind. Because of the high clay content of the project area soils, accelerated soil erosion during project construction is not expected to occur, except at isolated locations where slopes are steep and erosion by running water is likely once the protective vegetation cover is removed. As runoff accumulates in these areas, it could concentrate into rivulets that cut grooves (rills) into the soil surface. If the water flow is sufficient, these rills could develop into gullies.

Erosion control measures will be implemented to minimize accelerated erosion and sedimentation. Except for the fenced facilities, the site topography will be reclaimed to preconstruction conditions. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the project, which will describe when, where, and how the site reclamation best management practices (BMPs) will be implemented. Because these environmental commitments have been incorporated into the project design, the potential impact related to soil erosion is considered less than significant. No mitigation is required.

c. Would the project be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

LESS THAN SIGNIFICANT IMPACT. The proposed project is not located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse. Using the geotechnical investigation information and other facility design guidelines, all project elements will be designed to avoid landslide, lateral spreading, subsidence, liquefaction, or collapse. This potential impact is therefore considered less than significant, and no mitigation is required.

d. Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

LESS THAN SIGNIFICANT IMPACT. As previously noted, all soils in the project area are highly expansive and could therefore damage structures constructed without adequate foundations. Based on geotechnical investigation and engineered design, all project elements will be designed to withstand shrink-swell forces, the magnitudes of which can readily be anticipated. This potential impact is therefore considered less than significant, and no mitigation is required.

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

NO IMPACT. No septic tanks are planned for the Kirby Hills Natural Gas Storage Facility.

B.3.7 Hazards and Hazardous Materials

HAZARDS AND HAZARDOUS MATERIALS				
Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HAZARDS AND HAZARDOUS MATERIALS

Would the project:

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

This section evaluates public health and safety issues related to hazardous materials handling and storage, and the potential for rupture or explosion of project components. Because natural gas is explosive under certain conditions, system safety is an important factor in the review of any facility that handles or stores natural gas. For this Initial Study, an independent engineering analysis of the proposed project was performed to evaluate system safety and risk of upset. This study evaluated the potential for a fire or catastrophic explosion resulting from facility operation and the systems and procedures proposed by LGS to avoid or minimize risks to workers and the public. The results of that study are contained in Appendix 4.

B.3.7.1 Setting

Existing Conditions

The proposed project will be located in a rural agricultural area with very little development. The primary use of the project area is dry-land farming and livestock grazing, but includes a natural gas field and related facilities. Residential development in the project area is very scattered and includes only a few residences. The closest structures to the project area are a hunting club and a few single-family residences located east of Kirby Hills.

Kirby Hills is a natural gas production and storage field that has been in production since the 1930s. Existing natural gas facilities on Kirby Hills are operated by Calpine and include three natural gas storage wells (Lambie S-10, Lambie S-1, and Lambie S-2), four natural gas production wells (Lambie 5, Lambie 9, Lambie 11, and Lambie 1A), one compressor, and a master metering station (ERM, 2005).

Included with its application to the CPUC, LGS submitted a Phase I Environmental Site Assessment of the Kirby Hills property (ERM, 2005). The purpose of the study was to identify the presence of “recognized environmental conditions” (REC) that may have resulted from past or present operations at Kirby Hill or surrounding properties that could pose a hazard to workers or the public. This study revealed evidence of the following RECs in connection with Kirby Hills:

- REC-1: Possible location of a former knock out (small steel tank where petroleum hydrocarbons collect in natural gas operations) at Lambie S-1.

- REC-2: Location of former compressor C-3, where “unknown hydrocarbon” has previously been detected in soil.
- REC-3: Location of a former unidentified compressor.
- REC-4: Compressor C-2, where stained soils and concrete were observed during ERM’s site visit.
- REC-5: Distressed vegetation, possibly caused by drilling muds, near Lambie S-10.
- REC-6: Borrow pit on the north side of Kirby Hills.
- REC-7: Lambie 1A, where “unknown hydrocarbon” has previously been detected in soil.
- REC-8: Master metering station, where “unknown hydrocarbon” has previously been detected in soil.
- REC-9: A potential sump, which is a disposal site for drilling mud, on the north side of Kirby Hills near the former access road to an abandoned gas well, Wagenet 3.
- REC-10: A potential sump near natural gas well Lambie 5.
- REC-11: A potential sump near natural gas well Lambie 1.
- REC-12: Two potential sumps approximately 400 and 600 feet west of natural gas well Lambie 11.

The Phase I study recommended a Phase II site investigation to document whether releases of hazardous substances to soil have occurred at REC-1, REC-3 through REC-6, and REC-9 through REC-12 and to further evaluate the impacts previously identified at REC-2, REC-7, and REC-8. The Phase I study also concluded that the potential exists for additional sumps to be present at Kirby Hills that were not observed during the site visit or in the historical information sources that were reviewed. The study recommended that if the Phase II investigation sampling program finds environmental impacts at these locations, then additional research should be conducted to verify if any additional sumps were used at Kirby Hill. If additional sumps are identified during that research, additional Phase II soil sampling activities may be warranted.

The Phase I study submitted by LGS with its application was limited to the Kirby Hills area and did not include the pipeline corridor or the metering station site along Birds Landing Road. However, a Phase I Environmental Site Assessment was conducted for the Shiloh I Wind Plant Project EIR (Solano County, 2005b), which includes the proposed pipeline corridor and metering station site for the Kirby Hills Natural Gas Storage Facility. The Shiloh I Environmental Site Assessment found no records of hazardous waste sites within these areas or observed any evidence suggesting the presence of unrecorded disposal sites in the LGS project area.

Regulatory Setting

Natural Gas Storage and Pipeline Safety

Federal regulations and standards for natural gas pipelines are the responsibility of the Office of Pipeline Safety in the U.S. Department of Transportation (USDOT). Federal safety standards for transportation of natural gas by pipeline are contained within 49 CFR Part 192.

Within California, the CPUC regulates the operations and maintenance of natural gas storage fields. The Utilities Branch of the CPUC enforces federal pipeline safety regulations (49 CFR 192) through the natural gas safety program under CPUC General Order No. 112-E, which governs the design, construction, testing, operation, and maintenance of intrastate gas gathering, transmission and distribution piping systems.

The California Division of Oil, Gas and Geothermal Resources (DOGGR) regulates design, construction, and maintenance of natural gas storage fields within California, including drilling of wells, surface production and pipeline equipment requirements, field operations, and well abandonment procedures.

Hazardous Materials and Waste Handling

Various federal, State, and local laws, ordinances, regulations and standards (LORS) govern the routine transport, use, and disposal of hazardous materials. These LORS require materials classified as hazardous to be stored appropriately and persons responsible for handling to be trained to manage them safely.

The U.S. Environmental Protection Agency (USEPA) administers the Resource Conservation and Recovery Act (RCRA – 40 CFR Parts 240-299) that establishes a system for controlling hazardous waste from point of origin to final disposal. The USEPA also requires facilities that store, handle, or produce significant quantities of hazardous material to prepare a Spill Prevention, Control, and Countermeasures (SPCC) Plan to ensure that containment and countermeasures are in place to prevent release of hazardous materials to the environment.

The California Environmental Protection Agency (CALEPA) administers the Hazardous Waste Control Act (HWCA – Title 26 CCR), which outlines requirements for proper management of hazardous materials. Within Solano County, the Solano County Department of Resource Management has developed policies on hazardous waste management and requires businesses that handle hazardous materials in excess of 55 gallons of liquids, 500 pounds of solids, and 200 cubic feet of a compressed gas to develop a Hazardous Materials Business Plan.

B.3.7.2 Environmental Impacts and Mitigation Measures

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

LESS THAN SIGNIFICANT IMPACT. The proposed project would routinely use various materials during both its construction and operational phase that could be hazardous to workers, nearby residents, and the general public if not transported, handled, and disposed of safely. These potentially hazardous materials include:

- Fuels, lubricants and solvents used for reciprocating engines, including the compressors and construction equipment;
- Corrosion inhibitors used to protect the integrity of pipelines, valves, and well components;
- Methanol used as needed to prevent freezing of valves; and
- Methyl mercaptan used as an odorant in natural gas.

LGS has committed to APM HZ-1 that specifies procedures and restrictions on equipment maintenance and refueling during construction and operation of the project. Implementation of these measures would reduce to insignificant levels the potential exposure of the public to hazardous materials used on-site for routine operations. LGS estimates that project operations will generate about 1,000 gallons of liquid hazardous waste per year, primarily used oil. Small quantities of oily rags, oil filters, and tri-ethylene glycol filters would also be generated. Under current federal, State, and local regulations, these hazardous wastes would be stored on-site for a maximum of 90 days before they would be picked up by a licensed hazardous waste hauler for transport to a licensed hazardous waste storage facility. Liquid wastes would be temporarily held in storage tanks at the compressor site within structures capable of containing 110 percent

of the storage tank capacities. Solid wastes would be temporarily stored at the compressor site in enclosed, secured areas.

A small potential exists for the accidental release of hazardous wastes temporarily stored on-site, but the chance of it reaching the public is insignificant because the volumes of materials used or stored at the compressor site are small and enclosed within storage areas, and only a few scattered residences are in the area, the nearest almost one mile distant. LGS has also committed to APM HZ-2 that contains (1) the construction contract specifications for handling of hazardous materials generated from construction-related activities including a requirement that the project contractor prepare a Health and Safety Plan; and (2) a commitment to preparing a Hazardous Materials Contingency Plan to be implemented if an accidental spill occurs. Therefore, the project will not create a significant hazard to the public or the environment as the result of transport, use or disposal of hazardous materials.

b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED. For this Initial Study, an independent engineering analysis of the proposed project was performed to evaluate system safety and risk of upset. The results of that study are contained in Appendix C. The system safety analysis concluded that if the project components are designed and constructed in accordance with applicable laws, ordinances, regulations and standards (LORS), the project will have a less than significant impact. However, the primary regulation applicable to this project, 49 CFR 192 (Minimum Federal Safety Standards for the Transportation of Natural and Other Gas by Pipeline), does not require an independent, third party review of the design, nor any oversight of the construction inspection for the major project components. Third party design reviews and construction inspections are employed in many other industries to help protect the public safety, public health, the environment, property, and the public welfare by ensuring compliance with applicable LORS. For example, the widely adopted Uniform Building Code gives local building officials the responsibility for independent design reviews (plan checks) and construction observation of buildings and other structures prior to occupancy.

Although the Solano County Public Works and Resource Management Departments may conduct a plan check and inspection of some project components (e.g., compressor building), they may not have the expertise to oversee the engineering and construction of the process facilities and pipeline components. The CPUC has the responsibility for enforcing the requirements of 49 CFR 192 for these intrastate pipeline facilities. To ensure that these regulations are complied with during the design and construction of the proposed facilities, the following mitigation measure is recommended:

Mitigation Measure

HZ-1 An independent, third party design review shall be conducted of the Applicant's construction drawings and specifications. Project construction shall also be independently monitored to ensure compliance with all applicable laws, ordinances, regulations, and standards. The applicant shall make payments to the CPUC for these design review, plan check and construction inspection services. These design review and construction observation services shall not in

any way relieve the applicant of its responsibility and liability for the design, construction, operation, maintenance, and emergency response for these facilities.⁵

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

NO IMPACT. No existing or proposed schools are within or nearby the project area. Therefore, in the unlikely event of release of hazardous emissions or materials from the project site, no impacts would occur to existing or proposed schools within one-quarter mile of the project.

d. Would the project be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

LESS THAN SIGNIFICANT IMPACT WITH MITIGATION INCORPORATED. A Phase I Environmental Site Assessment for the Shiloh I Wind Power Project (Solano County, 2005b) found no evidence of hazardous materials sites within its project area, which included the portions of the Kirby Hills Natural Gas Storage Facility's project area east of Shiloh Road. However, the Phase I Environmental Site Assessment (ERM, 2005) submitted by LGS with its application to CPUC revealed evidence of several "recognized environmental conditions" (REC) within the portion of the project area west of Shiloh Road around Kirby Hills that may have resulted from past or present natural gas drilling and production operations within the Kirby Hill Gas Field or surrounding properties that could pose a hazard to workers or the public. LGS' Phase I study also concluded that the potential exists for additional sumps to be present at Kirby Hill that were not observed during the site visit or in the historical information sources that were reviewed. The study recommended a Phase II site investigation to document whether releases of hazardous substances to soil have occurred at specific sites. Completion of that Phase II study prior to construction within the western area should reduce the risk to workers and the public of exposure to undocumented hazardous wastes during the project's construction phase to a less than significant level.

Mitigation Measure

HZ-2 Prior to construction within the portion of the land west of Shiloh Road leased by LGS that will be disturbed by construction activity ("LGS leased land"), a Phase II site investigation shall be conducted to further evaluate whether a spill or release of hazardous materials has occurred on those sites on the portion the LGS leased land within Kirby Hills identified by the Phase I Environmental Site Assessment submitted by LGS (ERM, 2005). Samples should be taken at those locations on the LGS leased land identified in Appendix G of LGS' Phase I Environmental Site Assessment and analyzed for VOCs and petroleum hydrocarbons following standard EPA protocol. If the Phase II investigation sampling program finds environmental impacts on the LGS leased land, additional research shall be conducted to verify if other unrecorded sumps were used within the particular impacted LGS leased land. If other sumps are discovered within the particular LGS leased land, additional Phase II soil sampling activities shall be conducted to delineate the extent of contamination and recommend appropriate action.

⁵ The CPUC may wish to consider the California Energy Commission's (CEC's) model for conducting these reviews for new electrical power plants. These plants have many of the same components as the proposed project (e.g., pipelines, compressors, electrical systems, buildings, etc.). In most instances, the local building departments do not have the necessary resources, nor expertise, to independently verify the design of the process facilities. In these situations, the CEC retains an independent third party to act as their Deputy Chief Building Official. This third party conducts the plan checks of the applicant's construction drawings and performs the construction inspections to ensure compliance with applicable LORS.

- e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?*

NO IMPACT. No public airport or public use airport is located within two miles of the project area. The closest public airport is in Rio Vista, six miles east of the project area. Therefore, the proposed project would not result in an aircraft safety hazard for workers or nearby residents.

Travis Air Force Base is located approximately five miles north of the project area. The Federal Aviation Administration prepared a Land Use Compatibility Plan for Travis Air Force Base, which was adopted by the Solano County Airport Land Use Commission in 2002. This plan sets forth height restrictions and policies for ensuring compatibility of future development in the vicinity of the base with flight operations. Portions of the project area are within land use compatibility zones C and D, which contain policies affecting residential development and other noise sensitive uses such as schools, hospitals, libraries, etc. The proposed project does not include any components that would intrude into airspace affecting operations at Travis Air Force Base and would be consistent with the base Land Use Compatibility Plan.

- f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?*

NO IMPACT. No private airstrip is located within or in the vicinity of the project area. Therefore, the proposed project would not result in an aircraft safety hazard for workers or nearby residents.

- g. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

NO IMPACT. The proposed project would be located in a rural agricultural area with only a few scattered residences. No emergency response plan or emergency evacuation plan has been adopted for the project area.

- h. Would the project expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?*

LESS THAN SIGNIFICANT. The Health and Safety Element of the Solano County General Plan (Solano County, 1977a) classifies the Montezuma Hills, which includes the project area, as a high grassfire risk area due to the dry, grassland environment and strong winds. During the construction phase, heavy equipment and passenger vehicles driving on vegetated areas before clearing and grading with heated mufflers could increase the danger of fire.

Fire and rescue services in the project area are provided by the Montezuma Hills Fire District, which operates four fire stations that are equipped for grass fires. These are located at Birds Landing Road; Collinsville Road near Collinsville; Shiloh Road; and one in Rio Vista. The Rio Vista Fire Department also provides fire and rescue services to the city of Rio Vista and surrounding areas.

The increased risk of wildland fire in the project area during the project construction phase is potentially significant, but LGS has committed to APM HZ-3 that specifies development of a Grass Fire Control Plan. This mitigation measure will reduce the potential for impacts to public safety from wildland fires in the project area to an insignificant level.

B.3.8 Hydrology and Water Quality

HYDROLOGY AND WATER QUALITY

Would the project:

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
a. Violate Regional Water Quality Control Board water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Substantially deplete groundwater supplies or interfere substantially with groundwater discharge such that there would be a net deficit in the aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion or siltation on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Place within 100-year flood hazard area structures that would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j. Cause inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.8.1 Setting

Climate

The North Pacific High Pressure System produces northerly winds along the entire west coast of the United States during most of the year and dominates the region's large-scale meteorology. The climate in the project area is characterized by hot, dry summers and cool, wet winters. The average annual precipitation in the project area varies annually and is strongly influenced by the Diablo Range in Contra Costa County. Most precipitation is associated with rainstorms that generally occur from October through April. These storms originate over the Pacific Ocean and carry considerable moisture. The duration of rainfall is usually one to four days. Severe thunderstorm cells often are embedded in the rainstorms. These storms can produce high peak flows and large flow volumes that can cause extensive flooding. Precipitation in the summer is infrequent and is usually limited to scattered thunderstorms.

Surface Water

One drainage crosses through the project area, just south of the Old Shiloh Church (see Figure B-4a). This drainage conveys seasonal water from an area just west of Olsen Road. The drainage flows into the Suisun Marsh, which drains into the Sacramento River and eventually into San Francisco Bay. A second drainage (The Big Ditch) runs along the eastern edge of the project area, immediately adjacent to Birds Landing Road. This drainage is also seasonal and conveys runoff into Lucol Hollow Creek. As described in Section B.3.3. (Biological Resources), seasonal wetlands occur in low-lying areas within the Kirby Hills portion of the project and occur along the eastern portion of the project (between Olsen and Birds Landing Roads).

Groundwater

The project area is located primarily within the Suisun/Fairfield Valley groundwater basin. Groundwater plays an important role in meeting the water needs of people and agriculture in Solano County. Many of the residences in the project area rely on wells for their drinking water supply; other than the domestic wells that are near landowner's homes, no groundwater wells are located within the project area.

Water Quality

The Basin Plan for the San Francisco Bay region designates waterbodies with beneficial water uses. The Sacramento River, Montezuma Slough, and Suisun Marsh provide beneficial uses related to fish habitat, water supply, and recreation. The San Francisco Regional Water Quality Control Board (SFRWQCB) maintains lists of impaired waterbodies. Suisun Bay is listed for high levels of polychlorinated biphenyls (PCBs) and mercury, and the Suisun Marsh is listed for urban runoff and storm sewer drainages. Some of the Suisun wetlands also are listed as impaired. However, the drainage that crosses through the project area is not listed as impaired for water quality.

Flood Hazard Zones

The Federal Emergency Management Agency (FEMA) designates the 100-year flood zone under the National Flood Insurance Program. The seasonal drainage that crosses through the project area is not subject to stormwater and tidal inundation as part of the FEMA-designated 100-year floodplains (LGS, 2005).

Applicable Regulations, Plans, and Standards

Federal Regulations

Clean Water Act (Sections 401 and 404). The Clean Water Act (CWA) was implemented to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters,” including streams and wetlands (33 CF 1251; 33 CFR 328.3). Under Section 404 of the CWA, dredge and fill activities across and in wetlands and streams are regulated by the U.S. Army Corps of Engineers (Corps). Under the CWA, the regional water board must issue or waive Section 401 water quality certification for the project to be permitted under Section 404. Water quality certification requires evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States.

National Pollutant Discharge Elimination System. Created under the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program applies to stormwater and point source discharges. The EPA has delegated regulatory authority for the NPDES program to the nine regional water quality control boards. The SFRWQCB has jurisdiction over the project area. A provision of the NPDES permit

requires that a Storm Water Pollution Prevention Plan (SWPPP) be developed and that it be implemented concurrently with construction.

Under the NPDES program, the SFRWQCB has also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Low Threat Discharge Permit). This permit applies to various categories of dewatering activities. This permit contains waste discharge limitations and prohibitions similar to those in the General Construction Permit. To obtain coverage, the applicant must submit a Notice of Intent (NOI) and a Pollution Prevention and Monitoring Program (PPMP). The PPMP must include a description of the discharge location, discharge characteristics, primary pollutants, receiving water, treatment systems, spill prevention plans, and other measures necessary to comply with discharge limits. A representative sampling and analysis program must be prepared as part of the PPMP and be implemented by the applicant, along with record keeping and quarterly reporting requirements during dewatering activities. For dewatering activities that are not covered by the general permit, individual NPDES permits and waste discharge requirements (WDRs) must be obtained from the SFRWQCB.

State Regulations

Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act of 1969 authorizes the State Water Resources Control Board (SWRCB) to apply WDRs for discharges to State waters. The Act requires that the SWRCB or the RWQCB adopt water quality control plans (Basin Plans) for the protection of water quality. The Basin Plan for the San Francisco Bay region, developed by the SFRWQCB, was adopted in 1968 and was most recently revised in 1995. Under this plan, the SFRWQCB designates waterbodies with beneficial uses, sets water quality objectives to protect those uses, and implements plans to achieve water quality objectives through its regulatory programs.

Solano County

The Solano County Grading and Erosion Control Ordinance requires that projects excavating more than 8,000 square feet, or moving or filling more than 100 cubic yards at any site, obtain a grading permit from the Department of Resource Management (Solano County, 2005a). The ordinance also recommends that grading activities be conducted during the drier months (May through October) to allow soil stabilization and revegetation in advance of the rainy seasons. To continue grading past October, applicants must request an extension from the Department of Resource Management. A SWPPP also is required as part of the grading permit application.

The Solano County Environmental Health Services Division, Technical Services Program, regulates the construction, reconstruction, destruction, and inactivation of water wells. The purpose of the program is to ensure that “groundwater of the county will not be contaminated or polluted and that water obtained from wells will be suitable for beneficial use and will not jeopardize the health, safety, or welfare” of individuals in Solano County (Ord. No. 1348, Section 1). The Technical Service Program conducts or oversees site evaluations, plan reviews, permit issuance, and construction and destruction inspections for wells pursuant to the California Well Standards (California Department of Water Resources Bulletin No. 74-81) and Solano County Code Chapters 13.10 and 6.4 (LGS, 2005).

B.3.8.2 Environmental Impacts and Mitigation Measures

a. Would the project violate any water quality standards or waste discharge requirements?

LESS THAN SIGNIFICANT IMPACT. Construction activities would expose disturbed and loosened soils to erosion from rainfall, water, and wind erosion and remove the protective cover of vegetation and lessen

the natural soil resistance to rainfall impact erosion. Sedimentation occurs when the velocity of water in which soil particles are suspended is slowed sufficiently to allow particles to settle out. Larger particles, such as gravel and sand, settle out more rapidly than fine particles, such as silt and clay. Sediment is considered a pollutant by the SFRWQCB and also transports other adsorbed pollutants such as nutrients, hydrocarbons, and metals. Concentrations of nutrients and other pollutants associated with sediment particles, such as metals and certain pesticides, also could increase. Although these effects are usually short-term and greatly diminish after revegetation, sediment and sediment-borne pollutants may be remobilized under suitable hydraulic conditions.

Although sediment from erosion is the pollutant most frequently associated with construction activity, other pollutants of concern include toxic chemicals and miscellaneous wastes. A typical construction site uses many chemicals or compounds that can be hazardous to aquatic life, should they enter a waterway. Gasoline, oils, grease, solvents, lubricants, and other petroleum-based products are commonly used in construction activities. Many petroleum products contain a variety of toxic compounds and impurities, and tend to form oily films on the water surface, altering oxygen diffusion rates. Concrete, soap, trash, and sanitary wastes are other common sources of potentially harmful materials.

Accidental spillage of construction chemicals into a watercourse also may occur. The impact of toxic construction-related materials on water quality is largely determined by the duration and time of the activities. Construction occurring in the dry season has a low potential for soil and channel erosion, and for runoff of toxic chemicals into the drainages that cross through the project area because it would be dry.

Potential impacts regarding stormwater during construction would be reduced or controlled through implementation of the SWPPP. Compliance with the NPDES permit requires that structural and operational BMPs be used where necessary to minimize water quality impacts associated with construction and industrial operations. Also, APMs G-3 through G-7 are designed to control erosion that would occur during the construction phase of the project (see Table B.1-2). Grading would be designed to direct runoff from disturbed areas away from surface waters, and temporary settling basins or other filtering mechanisms would be used to control sediment discharges. In addition, visual monitoring of runoff water quality and quantitative analytical testing of runoff samples would be used to identify potential impacts, and corrective measures could then be implemented, if necessary. In addition, a Hazardous Materials Contingency Plan will be implemented if an accidental spill occurs or if any subsurface hazardous materials are encountered during construction, per the requirements of APM HZ-2. Because LGS would implement the measures described above and is required to comply with the permits described above, this impact is considered less than significant. No mitigation is required.

During construction of the well field pipelines and the transmission pipeline, approximately 350,000 gallons of water would be pumped from existing public or private water supplies for hydrostatic testing of the pipeline. The hydrostatic test water would be discharged and filtered through hay bales on agricultural lands. Hydrostatic testing would be conducted in accordance with the requirements of U.S. DOT pipeline safety regulations 49 CFR Part 192, LGS testing specifications, and applicable permits. The flow line and gas pipeline would be tested independently. Hydrostatic testing of the pipeline involves pumping at significant rates from several undetermined intake points over two to three days. Water for hydrostatic testing would be obtained from existing public or private water supplies. Although the source has not yet been identified, Lodi anticipates that the majority of the water needed for hydrostatic testing would be purchased. Pumping rates, intake locations, and controls would be established in coordination with the water purveyor, Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA) Fisheries, SFRWQCB, and the Corps to prevent impacts on local agricultural operations, prevent channel erosion, minimize disturbance of sediment, and protect aquatic species.

Upon completion of the pressure test, the water would be drained to a series of holding tanks for testing prior to discharge to the receiving waters. Discharge of hydrostatic test water into the existing surface waters is regulated by the SFRWQCB in accordance with the requirements of the NPDES permit and WDRs issued by the SFRWQCB, and would comply with the water quality goals specified in the Basin Plan. LGS would sample and test hydrostatic test waters to confirm compliance with these requirements, and shall treat hydrostatic test water prior to discharge, if needed. Separated sediment and/or sediment removed from the pipeline following hydrostatic testing will be disposed of at an appropriate facility.

The project would be required to comply with existing laws and permit requirements to protect the environment from water quality degradation related to hydrostatic testing. This impact is considered less than significant, and no mitigation is required.

Operation of the project could lead to degradation of shallow groundwater and surface waters. The use of hazardous material onsite could lead to contamination of surface water and groundwater if proper precautions are not taken. Several hazardous materials may be stored and used at the compressor facility. Accidental spills or leakage of these materials may impair water quality. However, pursuant to APM HZ-2, LGS would develop a Hazardous Materials Contingency Plan that would be implemented if an accidental spill occurs.

Saline water produced from the gas storage formations when the project would withdraw gas would be separated, stored in tanks, and either reinjected into the same formations or trucked off location to a properly licensed commercial disposal location. The gas storage formations are greater than 1,000 feet below the potable water aquifers in the area and are separated by several impervious shale formations. The California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) regulates the design, drilling, and operation of these reinjection wells to ensure that water is reinjected only into the desired aquifer. Based on the stringent requirements and oversight of that department, the reinjection of produced water into the gas storage formations would not affect potable groundwater quality. Because LGS would implement APMs to avoid and minimize potential degradation of surface water quality during operation of the project, this impact is considered less than significant. No mitigation is required.

b. Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

LESS THAN SIGNIFICANT IMPACT. Up to 10 new injection/withdrawal wells would be constructed on four existing well pad sites in the Kirby Hills (see Figure B-4a). The wells would be completed into the storage formation, which would store up to 7 billion cubic feet (BCF) of natural gas. The wells would be directionally drilled from the well pads into the storage formation. The injection/withdrawal well sites have been previously graded and contain existing wells and related facilities. Groundwater contamination may include introduction of drilling fluid contaminants to the potable water aquifers overlying the well field, and creation of potential conduits for cross-contamination between potable water aquifers and the underlying saline and non-potable aquifers.

The DOGGR is responsible for wells drilled into an underground gas storage facility. Before receiving a permit to drill the wells and operate the project, LGS would complete engineering and geology studies and an injection plan and submit them to the division for approval. These studies would describe the

well drilling and abandonment plans; reservoir characteristics; all geologic units, aquifers, and oil and gas zones; and the monitoring system to ensure that injected gas is confined to the intended zone. In addition, DOGGR staff would oversee well drilling and testing to ensure that the wells would be completed as designed and permitted to prevent movement of groundwater between aquifer layers. LGS would be required to post a bond with DOGGR to ensure proper completion or abandonment of any well drilled. Because of the oversight and requirements by DOGGR, this impact is considered less than significant. No mitigation is required.

LGS plans to drill a domestic water well within the 10-acre compressor station site. This well would supply water to the control building and miscellaneous hose bibs throughout the facility. Other than the use of water in the control building and occasional use through the hose bibs, the gas storage facility would not consume water as part of the gas storage operation. As described in the Regulatory Setting (and in Chapter 2, "Project Description"), LGS must submit an application to construct a water well to the Solano County Environmental Health Services Division, Technical Services Program. The permit application requires a site plan that identifies sources of potential contamination to groundwater (such as the presence of underground storage tanks, industrial waste or septic systems, and animal stockyards) as well as other wells within a 100-foot radius of the proposed well, property lines, and utility easements within a certain radius of the proposed well. Well drilling must be performed by a licensed well-drilling contractor and according to the California Well Standards. LGS would implement conditions of the County permit as part of the well drilling operation to ensure that potential impacts on groundwater are minimized. Therefore, the potential impact on groundwater is considered less than significant, and no mitigation is required.

c. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on or off site?

LESS THAN SIGNIFICANT IMPACT. The proposed project components would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite. Because LGS would implement APMs to avoid and minimize potential erosion and siltation and the degradation of surface water quality during operation of the project, this impact is considered less than significant. No mitigation is required.

d. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site?

LESS THAN SIGNIFICANT IMPACT. See response to question "c" above.

e. Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to provide substantial additional sources of polluted runoff?

LESS THAN SIGNIFICANT IMPACT. See response to questions "a", "b", and "c" above.

f. Would the project otherwise substantially degrade water quality?

LESS THAN SIGNIFICANT IMPACT. LGS would implement APMs (see Table B.1-2) to avoid substantial degradation of water quality during both the construction and operation phases of the project. This impact is considered less than significant and no mitigation is required.

g. Would the project place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

NO IMPACT. The proposed project does not involve placement of housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. There would be no impact.

h. Would the project place within a 100-year floodplain structures that would impede or redirect flood flows?

NO IMPACT. None of the proposed facilities would be placed within a 100-year flood hazard area structures that would impede or redirect floodflows. There would be no impact.

i. Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

NO IMPACT. There are no levees or dams or other water features that would be affected by the proposed project. Therefore, the project would not expose people or structures to a significant risk of loss, injury, or death involving flooding. There would be no impact.

j. Would the project cause inundation by seiche, tsunami, or mudflow?

NO IMPACT. The project area does not occur within a region that could be affected by inundation by seiche, tsunami, or mudflow. There would be no impact.

B.3.9 Land Use and Planning

LAND USE PLANNING

Would the project:

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.9.1 Setting

Existing Land Use

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. The primary existing land uses in the project area are dry land farming (primarily wheat) and livestock grazing. 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

area along Olsen Road. This 84-acre site accepted liquids, sludges, 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.

The proposed 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 that would be 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 would be constructed on an approximately 0.75-acre site on the north side of an existing metering and dehydration station that is part of the Montezuma pipeline system owned and operated by Calpine. The proposed metering station site and existing Calpine facility are within a 160-acre agricultural parcel.

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 proposed sites of the compressor station and injection/withdrawal wells are within two large agricultural parcels used for grazing that combined are approximately 1,055 acres in size. This area is within the Kirby Hills Gas Field and includes several pads for producing gas wells connected by gathering lines to the Montezuma pipeline system. This area borders the Suisun Marsh on the west. The Suisun Marsh, the largest remaining wetland near San Francisco Bay, comprises approximately 85,000 acres of tidal marsh, managed wetlands, and waterways in southern Solano County.

The approximately six-mile pipeline corridor that connects the eastern and western project components 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 a railway. The pipeline corridor also crosses through a large wind power project under construction.

Regulatory Setting

The project area is within an unincorporated area of Solano County. Because of its contribution to the local agricultural economy, the Solano County General Plan identifies the Montezuma Hills, which includes the project area, as one of the four County “essential agricultural lands.” To preserve its agricultural character and discourage non-agricultural uses, particularly non-agriculture residential development, the Land Use and Circulation Element of the Solano County General Plan (1980) designates the use of the project area as “Extensive Agriculture.” The portion of the project area east of Shiloh Road is also within the western portion of the Collinsville-Montezuma Hills Wind Resource Area designated by Solano County in 1987 as land suitable for wind energy development. Since that time, hundreds of wind turbines have been installed in the area and others are in development. To implement its policies to preserve the agricultural character of the project area, Solano County has zoned all of the project area east of Shiloh Road as “Agricultural District” (A-160). Facilities for the production and storage of natural gas are conditionally permitted uses within this zone requiring a Special Use Permit.

The portion of the project site west of Shiloh Road is within the Secondary Management Area for the Suisun Marsh. In 1977, the California Legislature enacted the Suisun Marsh Preservation Act that included a Marsh Protection Plan that established two management areas within the marsh — the Primary Management Area comprised of the tidal marshes, seasonal marshes, managed wetlands and lowland grasslands; and the Secondary Management Area of adjacent upland grasslands and cultivated lands that serve as a buffer between the Primary Management Area and developed land.

The Suisun Marsh Protection Plan recognizes the existence of natural gas reservoirs beneath the marsh and that “facilities for the long-term storage of natural gas are necessary because of seasonal variation in gas

supply and demand.” The Suisun Marsh Protection Plan includes the following policies for natural gas resources (SFBCDC, 1976):

1. Transportation of natural gas by underground pipeline is the most economical and safe method of gas transportation in the Suisun Marsh area. Future gas pipelines should be permitted if they are consistent with the Suisun Marsh Protection Plan and if the design and construction meet the following standards:
 - (a) Existing pipeline systems are utilized to the maximum extent feasible.
 - (b) The pipeline design meets all applicable safety standards of the Office of Pipeline Safety Operations (OPSO) and other regulatory agencies.
 - (c) The pipeline route avoids tidal marshes and managed wetlands wherever possible and, if that is not possible, the route crosses as little marsh or managed wetland as possible.
 - (d) Wide track or amphibious construction equipment is used in tidal marsh or managed wetland areas. Pads or mats are used as needed to prevent any construction equipment from sinking into the soft marsh muds and damaging the marsh plants.
 - (e) The "trench and push" construction method is used in all tidal marsh and managed wetland areas where feasible, so that the construction zone is kept as small as possible and the minimum amount of heavy equipment passes through the marsh or wetland area.
 - (f) Prior to any pipeline construction or related activities in the Marsh, the contractors consult with the Department of Fish and Game to determine at what time such construction or related activities should be conducted so as to create the least possible adverse impact on breeding, migration, or other fish and wildlife activities.
 - (g) Prior to any underground pipeline construction in the Marsh, the contractors consult with the Solano County Mosquito Abatement District to ensure existing recirculation water ditches are not blocked and levees are adequately repaired after pipeline construction, or that effective mosquito control measures are maintained.
 - (h) At slough, mudflat and bay crossings of gas pipelines, the trench is dredged in a manner that minimizes turbidity and prevents interference of the dredging operation with fish or wildlife.
 - (i) A regular surface and aerial inspection of the pipeline route is carried out as required by OPSO.
2. If additional gas wells or ancillary facilities are required for gas exploration, production, or injection, the drilling should be accomplished with the following safeguards:
 - (j) Drilling operations conform to the regulations of the California Division of Oil and Gas designed to prevent damage to natural resources.
 - (k) The drilling operation is confined to as small an area as possible and does not irreversibly damage unique vegetation or fish and wildlife habitats.
 - (l) After drilling is complete, all drilling muds, waterwaste, and any other fluids are removed entirely from the site and disposed of in a manner that does not adversely affect the Marsh.
 - (m) All buildings, tanks "Christmas trees" or other facilities related to the production or storage of natural gas do not result in the permanent loss of water surface in the Marsh.
3. Construction and drilling in tidal marsh and managed wetland areas should occur only during the dry months of the years (generally May through August) when these activities would not disturb wintering waterfowl.

4. If gas wells are abandoned, they should be sealed in accordance with Division of Oil and Gas regulations; the drilling or production facilities should be removed; and the surface area should be revegetated with native vegetation within one growing season after abandonment.
5. Storage of natural gas in depleted gas reservoirs is a reasonable use of the resource and should be permitted. Storage facilities should meet all safety standards of the Division of Oil and Gas.
6. Because the Suisun Marsh offers both natural gas and depleted gas fields suitable for gas storage, and because it is close to the urban Bay Area and the proposed waterfront industrial area on the Sacramento River, gas will probably continue to be transported out of, into, and around the Marsh. All gas transportation into and out of the Marsh is now by underground pipeline systems. If other types of systems for the transport or storage of liquefied natural gas (LNG) are proposed for the Suisun Marsh area, a detailed investigation of the hazards and impacts of LNG facilities should be carried out prior to approval of the facilities.

A key feature of the Suisun Marsh Preservation Act was a requirement that local agencies with land use jurisdiction over the marsh prepare a Local Protection Program to implement the objectives and policies of the Act. Pursuant to this requirement, Solano County amended its General Plan in 1980 to incorporate policies into its Resource Conservation and Open Space Plan, a part of the Environmental Resources Management Element of the General Plan, to protect water quality and riparian habitat within and adjacent to the marsh. To implement these marsh protection policies, Solano County has zoned the area west of Shiloh Road within the Primary Management Area “Marsh Protection” (MP), significantly restricting all uses because it is considered an irreplaceable and unique resource. None of the project area is within the MP zoning district. The upland area west of Shiloh Road within the Secondary Management Area is zoned “Limited Agricultural District” (AL-160), which allows for agriculture and agriculture-related uses. Facilities for the production and storage of natural gas are conditionally permitted uses within this zone requiring a Special Use Permit, but a Marsh Development Permit is also required by Solano County to ensure consistency of the proposed use with the Suisun Marsh Protection Plan and local marsh protection ordinances.

B.3.9.2 Environmental Impacts and Mitigation Measures

a. Would the project physically divide an established community?

NO IMPACT. The project site is within a rural agricultural area with only a few scattered residences. Development of the project would not divide an established community and would only cause minor short-term disturbance to residences in the area during the construction phase.

b. Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

NO IMPACT. The proposed project is consistent with the policies of the Solano County General Plan and the Suisun Marsh Protection Plan for the project area. Natural gas production and storage facilities are conditionally permitted within both the Agricultural (A-160) and Limited Agricultural (AL-160) districts, provided that they do not affect the agricultural character of the area (see Section B.3.2 – Agricultural Resources).

c. Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?

NO IMPACT. None of the project area is within the Suisun Marsh Primary Management Area or zoned Marsh Protection (MP). Only the portion of the project area west of Shiloh Road is within the Secondary Management Area. Natural gas storage facilities are conditionally permitted within the Secondary Management Area, provided that a Marsh Development Permit is obtained from Solano County to ensure that the project is consistent with the policies of the Suisun Marsh Protection Plan to protect marsh water quality, riparian habitat, and the agricultural character of the upland areas.

B.3.10 Mineral Resources

MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.10.1 Setting

The most common mineral resource in the region is aggregate, in the form of sand and gravel, which is used for road base and in production of Portland cement concrete. No significant aggregate deposits have been identified within or adjacent to project facilities (LGS, 2005).

Regulatory Context

The California State Legislature enacted the Surface Mining and Reclamation Act (SMARA) in 1975 to limit new development in areas containing significant mineral deposits. SMARA calls for the State Geologist to classify the lands within California based on mineral resource availability. Although California has a wide range of mineral commodities, it was recognized that regionally produced construction materials, like sand, gravel, and crushed stone, are used in every urban area of the State and require special classification data. The California Division of Mines and Geology (CDMG) has classified urbanizing lands according to the presence or absence of significant sand, gravel, or stone deposits that are suitable as sources of aggregate. These areas, called Mineral Resource Zones (MRZ), are described below:

- **SZ.** Scientific Resource area containing unique or rare occurrences of rocks, minerals, or fossils that are of outstanding scientific significance.
- **MRZ-1.** Mineral Resource Zone where adequate information indicates that no significant mineral deposits are present or likely to be present.
- **MRZ-2.** Mineral Resource Zone where adequate information indicates that significant mineral deposits are present, or there is a high likelihood for their presence and development should be controlled.
- **MRZ-3.** Mineral Resource Zone where the significance of mineral deposits cannot be determined from the available data.
- **MRZ-4.** Mineral Resource Zone where there is insufficient data to assign any other MRZ designation.

The classification system is intended to ensure that through appropriate lead agency policies and procedures, mineral deposits of statewide or regional significance are considered in agency decisions. The MRZ-2 classification would automatically warrant protective mitigation. Each lead agency develops and adopts mineral resource management policies to incorporate into its planning policies, based on the mineral classification data provided. Most of the comprehensive mineral resource mapping in California has been completed for urban areas where there is a high probability that converted land uses would be incompatible with mining.

B.3.10.2 Environmental Impacts and Mitigation Measures

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

NO IMPACT. Project implementation would not adversely affect any known natural gas or aggregate deposits. No significant aggregate deposits are mapped in the project area. Construction and operation of the project would not interfere with or preclude the operation of mineral resource management in the region. No impact would occur.

b. Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

NO IMPACT. See response to question “a” above.

B.3.11 Noise

NOISE					
Would the project:		Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a.	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b.	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c.	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d.	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f.	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.11.1 Setting

Community Noise

To describe environmental noise and to assess project impacts on areas that are sensitive to community noise, a measurement scale that simulates human perception is customarily used. The A-weighted scale of frequency sensitivity accounts for the sensitivity of the human ear, which is less sensitive to low frequencies, and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that can be used to conveniently compare wide ranges of sound intensities.

Human activities cause community noise levels to be widely variable over time. For simplicity, sound levels are usually best represented by an equivalent level over a specific period of time period (Leq) or by an average level occurring over a 24-hour period (e.g., Ldn and CNEL). The Leq, or equivalent sound level, is a single value (in dBA) for any desired duration, which includes all of the time-varying sound energy in the measurement period, usually one hour. The Ldn, or day-night average sound level, is equal to the 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m. The CNEL, or community noise equivalent level, is the same as Ldn with an additional 5-decibel penalty for the hours between 7:00 p.m. and 10:00 p.m. The actual difference between Ldn and CNEL noise levels is typically less than one decibel.

Community noise levels are usually closely related to the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the Ldn noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the Ldn is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be adverse to public health.

The surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation and residency are often considered incompatible with substantial nighttime noise because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference. At 70 dBA, sleep interference effects become considerable (USEPA, 1974).

Existing Noise Conditions

The proposed project area is rural and supports grazing and dryland farming and a few associated residences. The noise environment is defined mainly by noises generated by distant transportation, local traffic, and wind, including wind turbine generators. The windy conditions in the project area and vicinity produce a somewhat elevated ambient noise condition that increases with wind speed.

Noise monitoring was not conducted for the proposed project; however, monitoring was conducted for the Shiloh I Wind Plant Project (Solano County, 2005b), which is located in the same general area as the proposed project. The results of existing ambient noise measurements conducted for the Shiloh Project in 2001 and 2004 are provided below to characterize existing noise levels in the proposed project area. Figure B-13 shows the location of three long-term measurement positions in the project area.

Figure B-13. Noise-Sensitive Uses in the Proposed Project Area
[CLICK HERE TO VIEW](#)

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Measurements at Position LT-1 were conducted on July 30 and 31, 2001. The sound meter was located 144 feet from the centerline of Birds Landing Road. Additional measurements were taken at Positions LT-4 and LT-5 between July 30 and August 3, 2004. Measurement position LT-4 was located near position LT-1 but was located 300 feet from Birds Landing Road. Position LT-5 was located 50 feet from Shiloh Road at the intersection of Shiloh Road and Little Honker Bay Road.

At Site LT-1, the CNEL for the 24-hour period was 58 dBA. For the daytime hours, the average hourly Leq was 54 dBA, the evening was 56 dBA, and the nighttime was 49 dBA. Maximum daytime levels ranged from 65 to 85 dBA. At Site LT-4, the CNEL for the 24-hour period ranged from 69 to 74 dBA. For the daytime hours, the hourly Leq ranged from 56 to 67 dBA, and the nighttime ranged from 61 to 70 dBA. At Site LT-5, the CNEL for the 24-hour period ranged from 65 to 70 dBA. For the daytime hours, the hourly Leq ranged from 56 to 67 dBA, and the nighttime ranged from 61 to 70 dBA.

The wind farm noise assessment concludes that the ambient noise levels were higher than expected, possibly due to self-generated noise caused by wind blowing across the noise meter microphone windscreen (Solano County, 2005b). The ambient CNEL level in the project area is probably closer to approximately 45 dBA (Hoover & Keith 2005). For the purposes of this study, it is assumed that the ambient noise level in the project area is a CNEL of 45 dBA.

Land Uses and Receptors Sensitive to Noise in the Project Vicinity

Sensitive receptors are individuals or certain land uses that are sensitive to high noise levels, such as residences, schools, places of worship, and hospitals. The areas surrounding the project site are generally agricultural with limited rural residential land uses. A duck club also is located in the area. Figure B-13 shows the location of the duck club and residences in the project area. The proposed locations of the permanent and temporary compressors also are shown. Table B.3-9 summarizes the distance between the long-term primary noise sources (compressors and well-drilling sites) and the noise-sensitive uses. In addition, several residences are located within about 300 feet of the pipeline alignment.

Applicable Regulations

Regulating environmental noise is generally the responsibility of local governments. The U.S. EPA once published guidelines on recommended maximum noise levels to protect public health and welfare (U.S. EPA, 1974), and the State of California maintains recommendations for local jurisdictions in the General Plan Guidelines published by the Governor’s Office of Planning and Research (OPR, 1998). The following summarizes the local requirements.

Table B.3-9. Distances to Sensitive Receptors in the Project Area

Use	Distance to Permanent Compressor (feet)	Distance to Temporary Compressor (feet)	Distance to Nearest Well Drilling Site (feet)
Duck club	2,020	6,850	7,050
Residence 1	7,660	9,070	8,560
Residence 2	6,650	10,480	9,670
Residence 3	5,640	10,080	8,870
Residence 4	4,640	9,270	8,060
Residence 5	4,230	9,070	7,560

Note: Residences 6 and 7 are more than 5 miles from the compressor site; however, they are located adjacent to the pipeline alignment.

Solano County

Policy 4 in the Solano County Noise Element relates to the proposed project and states the following:

The introduction of any fixed point, permanent, non-residential, noise-emitting land use (industrial, commercial, public, etc.) shall be prohibited if the projected noise emission level will exceed one or more of the following:

- 50 dBA CNEL as measured at the boundary of a nearby residential zone.
- 60 dBA CNEL as measured at the boundary of a nearby commercial zone, business zone (personal service, offices), or noise-sensitive industrial or manufacturing zone (research, communications, etc).

The Noise Element also identifies maximum allowable noise levels from construction equipment. The maximum allowable noise levels vary by equipment type; they are in the range of 75 to 80 dBA for most equipment and as high as 95 dB for pile-driving equipment.

B.3.11.2 Environmental Impacts and Mitigation Measures

- a. Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

Construction

LESS THAN SIGNIFICANT IMPACT. Construction of the metering station, gas pipeline, compressor station, flow line, and injection/withdrawal wells would result in temporary increases in noise levels in the area of construction activity. Primary noise-generating activities would include excavation, grading, scraping, horizontal boring, and compaction activities. Vehicles traveling to and from construction sites also may affect noise in the area, but to a lesser degree. The magnitude of construction-noise impacts would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, the duration of the activity, the distance between the activity and noise-sensitive receptors, and shielding effects from local barriers and topography.

Noise increases from pipeline installation typically would last no more than a few days at any given location. Noise from construction of other facilities would occur over several weeks. Table B.3-10 shows Leq values for various types of construction equipment that may be used during construction.

Table B.3-10. Noise Emission Levels Typical for Construction Equipment

Equipment	Typical Noise Level 50 Feet from Source (dBA)
Backhoe	80
Bulldozer	85
Grader	85
Loader	85
Roller	75
Scraper	89
Truck	88

A reasonable worst-case assumption is that the three loudest pieces of equipment would operate simultaneously and continuously over at least a 1-hour period. The combined sound level of three of the loudest pieces of equipment listed in Table B.3-10 (scraper, truck, and bulldozer) is 92 dBA, measured at a distance of 50 feet. Table B.3-11, which assumes this combined-source noise level, summarizes predicted noise levels at various distances from an active construction site. These predicted construction noise levels include the effects of acoustical absorption by the ground but do not include the effects of shielding from structures or topography.

Table B.3-11 indicates that, under the worst-case construction noise assumption, construction noise could exceed the Solano County construction noise standard of 75 dBA within about 250 feet of an active construction site (Hoover & Keith, 2005). The two residences on the east end of the pipeline alignment are

Table B.3-11. Estimated Construction Noise in the Vicinity of Active Construction Sites

Distance Between Source and Receiver (feet)	Geometric Attenuation (dB)	Ground Effect Attenuation (dB)	Calculated Sound Level (dBA)
50	0	0	92
100	-6	-2	85
250	-14	-4	74
300	-16	-5	72
400	-18	-6	69
500	-20	-6	66
600	-22	-7	64
700	-23	-7	62
800	-24	-7	61
900	-25	-8	60
1,000	-26	-8	58
1,200	-28	-9	56
1,400	-29	-9	55
1,600	-30	-9	53
1,800	-31	-10	52
2,000	-32	-10	50
2,500	-34	-10	48
3,000	-36	-11	46

Notes: Calculations are based on Federal Transit Administration 1995. These calculations do not include the effects, if any, of local shielding from walls, topography, or other barriers that may reduce sound levels further.

facilities. The sites are not visible from surrounding areas and are located over 7,000 feet from the nearest noise-sensitive use. The wells would be directionally drilled from the well pads into the storage formation. Noise from well drilling produces a sound pressure level of 85 dBA at 50 feet (Hoover & Keith, 2005). Well drilling is proposed to be conducted on a 24-hour basis for 12 or more weeks. With the nearest noise-sensitive use located over 7,000 feet from the well drilling sites, noise from well drilling at the noise-sensitive uses would be approximately 30 dBA and well below the ambient noise level and the County's noise standard of 50 CNEL. This impact is therefore considered less than significant, and no mitigation is required.

Operations

LESS THAN SIGNIFICANT IMPACT. An analysis of noise from the compressor facility and associated gas blow down venting was submitted with LGS' application to the CPUC (Hoover & Keith, 2005). This analysis is included in Appendix 5. indicates that without noise attenuation treatments, noise from the compressor facility could exceed the County's residential noise standard of 50 CNEL at the closest residence located 4,200 feet from the compressor (Hoover & Keith, 2005). Noise would also exceed 50 CNEL at the duck club, which is located about 2,000 feet from the facility. However, implementation of noise attenuation treatments specified in the Hoover & Keith report (see Appendix 5, pages 6 through 8) indicate that noise from the compressor facility could be reduced to a CNEL level of 41 dBA at a distance of 4,200 feet (the nearest residence). This corresponds to a CNEL of approximately 47 dBA at the duck club. These values are below the County's residential standard of 50 dBA CNEL.

Implementation of APM NOI-2, which requires the use of the eight specific attenuation treatments specified in the Hoover & Keith report, would ensure that operational noise impacts are less than significant. No other mitigation measures are required.

located within this distance (Residences 6 and 7 in Figure B-13). However, pursuant to APM N-1, LGS has committed to: limit construction activity within 1,000 feet of dwelling units to daytime hours of 7 a.m. to 7 p.m. on weekdays, Saturday, and non-holidays; ensure that construction equipment has effective sound control devices; and implementing noise reducing measures, including changing the location of stationary construction equipment, turning idling equipment off, rescheduling construction activity, and notifying nearby residents in advance of construction work. In addition, because pipeline construction would occur in any given area for only a day or two, this impact is considered less than significant. No mitigation is required.

Up to 10 new injection/withdrawal wells would be constructed on four existing well pads sites in the Kirby Hills. The injection/withdrawal well sites have been previously graded and contain existing wells and related

b. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

LESS THAN SIGNIFICANT IMPACT. Vibration levels from construction equipment and activities might be perceptible to some of the residences in the immediate vicinity of the construction sites. The activity that would be most likely to cause groundborne vibration would be the pass-by of heavy trucks on uneven surfaces and rock drilling. LGS would not perform any blasting to grade any of the sites. The level of groundborne vibration that could reach sensitive receptors would depend on the distance to the receptor, what equipment is used, the soil conditions surrounding the construction site. The impact from construction-related groundborne vibration would be short-term and confined to only the immediate area around activity (within about 25 feet). Because the project components are more than 25 feet from the nearest sensitive receptor, no residence would be exposed to excessive vibration, and the impact would be less than significant. Implementation of above APMs N-1 and N-2 would further reduce the impact.

c. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

LESS THAN SIGNIFICANT IMPACT. For the purposes of this study, it is assumed that the ambient noise level in the project area is a CNEL of 45 dBA. Permanent noise sources associated with the project would result in a CNEL of 41 dBA at the nearest residential receptor and approximately 47 dBA at the duck club (see Section B.3.11.2 (a), above). The two dBA increase at the duck club would not likely be noticeable. Impacts would be less than significant with implementation of APM N-2 and no additional mitigation measures are required.

d. Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

LESS THAN SIGNIFICANT IMPACT. Noise impacts associated with construction would mainly affect the two residences along the eastern portion of the proposed pipeline route (see Figure B-13). However, short-term construction noise impacts would be less than significant with implementation of APM N-1, described in Section B.3.11.2 (a), above.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

NO IMPACT. The proposed project is not located within an airport land use plan area and would not expose people residing or working in the project area to excessive airport noise levels. No impact would occur.

f. For a project within the vicinity of a private air strip, would the project expose people residing or working in the project area to excessive noise levels?

NO IMPACT. There are no known private airstrips in the project area. No impact would occur.

B.3.12 Population and Housing

POPULATION AND HOUSING

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.12.1 Setting

The California Department of Finance’s January 1, 2005 estimated population of Solano County is 421,657, an increase of approximately 1 percent over the January 1, 2004 estimate and 6.7 percent over the 2000 U.S. Census (CDOF, 2005). According to the Association of Bay Area Governments (ABAG), Solano County is the fastest-growing of the nine Bay Area counties, with a population projected to reach 547,120 people by 2020 (Solano County, 2005b). This 2020 estimated population would be a 38.7 percent increase from 2000 and a 61.2 percent increase since 1990.

With the Solano County population increasing at an average of 1.3 percent annually, the most notable change is occurring in the City of Rio Vista with a 71 percent increase over the past 10 years. According to the California Department of Finance’s January 2004 city and county estimated populations, 95 percent of residents live within the County’s seven cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo (CDOF, 2005). All but two of these cities are located along Interstate 80. Benicia is located in southern Solano County near the conjunction of Highways 780 and 680. Rio Vista is located to the east of the project area, at the intersection of State Highways 84, 12, and 113. Unincorporated areas account for 19,650 people (Solano County, 2005b).

Partially as a result of this population increase, land uses in Solano County have become increasingly urbanized over the last 30 years. During the 2002-2004 mapping cycle, a net of 2,283 acres were converted to urban and built-up land (CDOC, 2005). Despite pressures to urbanize, in some cases, urbanization is being replaced by the conservation of lands for recreational uses.

The project area is located approximately 6 miles west of the City of Rio Vista, which is a small, yet rapidly growing, community with an estimated 6,837 residents as of January 1, 2005 (CDOF, 2005). In Rio Vista, housing is suburban-residential and urban-residential. Birds Landing and Collinsville are unincorporated towns immediately adjacent to the project area. Birds Landing mainly consists of a few houses and a bar at the intersection of Birds Landing and Shiloh Roads. Collinsville is a 27-acre residential area at the end of Collinsville Road.

The project is located within zip code 94512. According to the 2000 U.S. Census, 130 persons reside in this zip code. Housing in this area is comprised largely of single-family, owner-occupied units, with 65 percent houses and 35 percent apartment/condominiums. Housing is often agriculture-related or rural residential (Solano County, 2005b; Census, 2000).

Regulatory Setting

The Association of Bay Area Governments (ABAG) developed “A Land Use Policy Framework for the San Francisco Bay Area” in July 1990, to establish a guidance framework for regional comprehensive planning. ABAG includes the governments of the nine counties in the Bay Area, including Solano County, and 99 of the 101 cities in the Bay Area. The policies in the framework encourage efficient use of existing land uses and infrastructure, subregional coordination on items of regional importance, and actions and programs which improve revenue generation and cost sharing. The following policy is applicable to the proposed project:

Policy Four – Provision of housing opportunities for all income levels are encouraged by developing city and county plans and policies that improve housing supply and affordability to meet local and regional needs.

The Housing Element of the Solano General Plan (2005e) presents the housing needs and establishes policies for meeting these needs, including accommodating future residential development and a moderate amount of rural residential development.

B.3.12.2 Environmental Impacts and Mitigation Measures

a. Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

LESS THAN SIGNIFICANT IMPACT. Direct population growth would not occur during the construction and operation phases of the project. Although approximately 90 construction workers would be employed during project construction between the spring and fall of 2006, construction phase workers would commute from cities and metropolitan areas outside the project vicinity, such as Sacramento and the Bay Area. Impacts on population and the local housing market due to construction are, therefore, not expected.

During operation, the project would employ up to 10 employees. It is expected that these employees and their families would reside in urban centers outside the project area, and commute to the project site. Public services and utilities provided to the project site would not increase substantially, and no new jobs would be created. The minimal road improvements for the project would not encourage or make accessible development of previously undeveloped land. Therefore, the proposed project would not result in population growth or the need for additional housing because the number of workers for construction (90) and operation (10) would be small. Impacts would be less than significant and no mitigation would be necessary.

b. Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

NO IMPACT. As described under (a) above, few, if any, workers are expected to relocate to the area, and therefore, no new housing would be needed for the project, no housing would be displaced, and no new competition for existing housing would likely occur.

c. Would the project displace substantial numbers of people necessitating the construction of replacement housing elsewhere?

NO IMPACT. No people would be displaced by construction or operation of the proposed project. As described under (a) and (b) above, the proposed project would be mostly within open space/agricultural land and no homes would need to be moved or demolished as a result of this project. Therefore, no people would be displaced and there would not be a need for replacement housing as a result of the proposed project.

B.3.13 Public Services

PUBLIC SERVICES

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.13.1 Setting

Environmental Setting

Fire Protection. The Montezuma Hills Fire Department provides fire and rescue services to the project area. Four fire stations that are equipped for grass fires are operated by this district on: Birds Landing Road, Collinsville Road near Collinsville, Shiloh Road, and in Rio Vista. The Rio Vista Fire Department also provides fire and rescue services to the City of Rio Vista and surrounding areas. The department's total coverage area is approximately 100 square miles, with an estimated population of 5,000 (LGS, 2005; Rio Vista, 2005). The department is dispatched by the Solano County Sheriff's Department and receives as-needed support from the County and State Offices of Emergency Services.

Law Enforcement. The Solano County Sheriff's Office is located in Fairfield and provides protection for unincorporated sections of Solano County, including the project area (Solano County, 2005f). The nearest city police department is in Rio Vista, 6 miles east of the project area. The Rio Vista Police Department consists of a police chief, 3 police sergeants, 9 sworn officers, 1 records position, 2 reserve officers, and 1 citizen volunteer (Rio Vista, 2005).

Schools. Solano County has seven school districts, several colleges, and adult and special education facilities. Students in the project area are typically enrolled in the Fairfield-Suisun, River Delta, Travis, and Vacaville School Districts. The River Delta District serves the project sites (LGS, 2005; Solano County, 2003).

Parks. The closest regional park serving Solano County is Sandy Beach Park in Rio Vista, more than 5 miles from the project area. The Suisun Marsh is the largest natural recreation area in the project vicinity. Fishing, duck hunting, water sports, upland game hunting, and wildlife observation are popular recreational activities in the marsh. Duck hunting is the most prevalent activity in the marsh. In addition, the Montezuma Slough Day Use Area and the Western Railway Museum routes are located close to the project area. The day use area is adjacent to the marsh and has a small parking lot, picnic tables, and a paved pedestrian trail alongside the slough. The museum is located north of Little Honker Bay Road, and the Bay Area Electric Railroad Association operates a tourist train along the Sacramento Northern Railroad through the western portion of the project area (WRM, 2005).

Medical Facilities. Major hospitals within Solano County are located in Fairfield, Vacaville, and Vallejo. The Solano Emergency Medical Services Cooperative handles emergency response in the county, including the project area. The cooperative includes six of the county's seven cities and rural fire districts. Each partner provides logistical and financial support to ensure a swift response to any medical emergency occurring in any part of the county. The Rio Vista Fire Department also provides a minimum of emergency medical technician-level care 24 hours per day (Rio Vista, 2005).

Regulatory Setting

The Solano County General Plan will be going through its first comprehensive update since the General Plan Elements were adopted in the 1970s and 1980s. The Solano County General Plan Update project is expected to begin in early 2006. Currently there are no local, State, or federal goals, objectives, or policies that relate to the potential effects of the project on public services.

B.3.13.2 Environmental Impacts and Mitigation Measures

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

a) Fire protection?

LESS THAN SIGNIFICANT IMPACT. Construction-related activities associated with the proposed project could result in injuries to construction workers and increase the demand for emergency response at project facility sites and along the pipeline construction corridor. However, with implementation of APM T-1: Construction Traffic Safety Measures as part of the proposed project, emergency service providers in the area would be able to respond adequately to emergencies associated with construction-related activities because such services are located within an appropriate distance, and an emergency access plan would be in place during construction to ensure emergency vehicle access in and adjacent to the construction work area.

Any increase in demand for emergency response attributable to the risk of fire at the compressor facility would be offset by LGS's provision as part of the project of information, training, and equipment, as well as the implementation of APM HZ-3: Fire Management Measures. Therefore, this impact is considered less than significant, and no additional mitigation is required.

b) Police Protection?

LESS THAN SIGNIFICANT IMPACT. As described in (a) above, construction-related activities associated with the proposed project could result in injuries to construction workers and increase the demand for emergency response at project facility sites and along the pipeline construction corridor. An emergency access plan would be in place during construction to ensure emergency vehicle access in and adjacent to the construction work area (see APM T-1: Construction Traffic Safety Measures).

Because there is no population growth anticipated as a result of the proposed project that would require increased police protection to accommodate increases in population or new facilities, the operation of the project would not impact police services. However, during construction, there would be a higher risk of vandalism and theft of construction equipment or tampering with a construction site that would rely upon the current police force. However, the construction period is relatively short (spring to fall of 2006) and there is a sufficient police force currently in place. The use of the police force would be a temporary construction-related impact, but that impact would be less than significant.

c) Schools?

NO IMPACT. The proposed project is not anticipated to cause a long-term increase in the local student population, which would require additional school facilities. Also, construction of the proposed project construction is not anticipated to result in a significant construction force that would require an increase of school services. Therefore, the proposed project would have no impact on school services.

d) Parks?

NO IMPACT. The proposed project would not run through any parks. In addition, the proposed project would not result in a direct increase of population growth or increased housing. Therefore, the project would not tax existing parks nor necessitate the need for additional parks in the area.

e) Other Public Facilities?

NO IMPACT. The proposed project is not anticipated to cause an increase in the need for other public facilities because it involves the storage of natural gas for times of high demand and/or low supply and could be the only source in a given service area during supply emergencies. The demand for other public services, such as hospitals and maintenance of public facilities, will not change as a result of the project.

B.3.14 Recreation

RECREATION

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Would the project result in permanent and/or temporary impacts, such as possible disruption of recreational activities, affecting the recreational value of existing facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.14.1 Setting

Environmental Setting

The project area is within a rural agricultural area of southeastern Solano County. No regional or neighborhood parks are located within or in proximity to the project area. The Suisun Marsh is the largest natural recreation area in the vicinity of the project area, which borders the project on the west. The eastern boundary of the Suisun Marsh Secondary Management Area, which acts as a buffer around the marsh habitat, includes all of the project area west of Shiloh Road. Associated with the marsh is the Montezuma Slough Day Use Area, which is located about three miles south and outside the project area. The day use area has a small parking lot, picnic tables, and a paved pedestrian trail alongside the Slough. Also associated with the marsh are several private gun clubs in the area.

The Western Railway Museum, operated by the Bay Area Electric Railroad Association, is located about two miles north of the project area along Highway 12 between its intersections with Shiloh and Little Honker Roads. This museum gives visitors the opportunity to ride historic streetcars and interurban electric trains from all over California and other western states. In addition to the exhibits in the museum, the Bay Area Electric Railroad Association operates a tourist train along the restored main line of the old Sacramento Northern Railroad south to Montezuma, crossing the proposed pipeline corridor just east of Shiloh Road.

Regulatory Setting

The Solano County Resource Conservation and Open Space Element of its General Plan identifies lands along the Sacramento River and within Suisun Marsh as significant outdoor recreation sites. To protect these and other recreation areas, the Land Use and Circulation Element of the Solano County General Plan establishes policies regulating development in these areas including preservation of the scenic quality of the Sacramento River and Delta area as a valuable element of the natural landscape and important scenic resource through compatible land uses, and provision for public and private recreation and access to the river and delta areas for such uses as fishing, boating, picnicking, hiking and nature study.

B.3.14.2 Environmental Impacts and Mitigation Measures

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

NO IMPACT. No neighborhood or regional parks are within or in proximity to the project area. The only nearby recreational facilities are the Montezuma Slough Day Use Area, the Western Railway Museum, and several private gun clubs. After construction, the proposed project would employ approximately 10 personnel who are expected to reside in urban centers outside the project area and commute to the project site. These new employees will not significantly increase the use of existing parks or recreational facilities in the area. Therefore, the proposed project would not result in substantial deterioration of existing recreational facilities in the area.

b. Would the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

NO IMPACT. The proposed project does not include or require the construction or expansion of any recreational facilities.

c. Would the project result in permanent and/or temporary impacts, such as possible disruption of recreational activities, affecting the recreational value of existing facilities?

LESS THAN SIGNIFICANT IMPACT. Tourists riding the train operated by the Bay Area Electric Railroad Association along the restored main line of the old Sacramento Northern Railroad that crosses the project area could view construction activities and potentially experience some noise and dust during project construction, but these would be short-term. Others using the Suisun Marsh could be similarly affected by short-term construction activities, which could diminish their recreational experience. However, the effects would be temporary, occurring only during construction; therefore, this impact is less than significant and no mitigation is required.

B.3.15 Transportation/Traffic

TRANSPORTATION AND TRAFFIC				
Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.15.1 Setting

Transportation Network

The roadway network that could potentially be affected by the proposed project includes the roadways that would be crossed by the proposed pipeline (i.e., Shiloh Road and Olsen Road) and the highways and roadways that would be used to provide access to the various components of the proposed project. Figure B-2 depicts the roads in the immediate project area. The public roadways that could be affected by the proposed project are under the jurisdiction of the State [e.g., Interstate 80 (I-80) and State Routes (SR) 12 and 113] and Solano County (e.g., Shiloh Road, Olsen Road, Birds Landing Road).

I-80, SR 12, and SR 113 are each heavily used in the project area by commuters and regional through-traffic and exhibit relatively high daily trips and a.m. and p.m. peak hour traffic levels during weekdays. The other public roads in the project area are County maintained and comparatively very low levels of traffic.

See Table B.3-12 for average daily traffic (ADT) and other information for the roadways that may be affected by the proposed project.

Access to the project area by construction workforce and delivery vehicles from San Francisco and Sacramento would be via I-80. Vehicles from Contra Costa County would travel via I-680 to I-80 or via SR 4 to SR 160. SR 113 would provide access from Dixon and I-80. Primary access to the project area from the freeway network would be from SR 12. Existing public roadways would provide local access to the project sites. Project vehicles would travel from SR 12 to Shiloh Road and Little Honker Bay Road, which would provide access to Collinsville Road, Birds Landing Road, and Olsen Road. From Birds Landing Road, vehicles would travel to Montezuma Hills Road. From Collinsville Road, vehicles would also have access to Talbert Lane.

Table B.3-12. Description of Project Area Roads

Roadway	Segment	Jurisdiction	Lanes	Average Daily Traffic*	Count Year
Interstate 80	North of eastbound SR 12	Caltrans	10	188,000	2004
Interstate 80	South of eastbound SR 12	Caltrans	10	215,000	2004
State Route 12	West of SR 113	Caltrans	2	13,500	2004
State Route 12	East of SR 113	Caltrans	2	16,700	2004
State Route 113	North of SR 12	Caltrans	2	4,350	2004
Little Honker Bay Road	Shiloh Road and Olsen Road	Solano County	2	97	1982
Shiloh Road	SR 12 and Olsen Road	Solano County	2	255	2004
Olsen Road	Birds Landing Road and SR 12	Solano County	2	42	1984
Birds Landing Road	Olsen Road and SR 12	Solano County	2	313	1997
Collinsville Road	Olsen Road and Talbert Lane	Solano County	2	393	2004
Montezuma Hills Road	East of Collinsville Road	Solano County	2	135	1994

Sources: Solano County, 2005b and Caltrans, 2005b.

*Traffic levels for roads under Caltrans jurisdiction are expressed in Annual Average Daily Traffic (AADT).

Bicycle

There are no designated bicycle lanes or paths in the immediate project area.

Rail

The Sacramento Northern Railroad runs parallel to the east side of Shiloh Road in the project area. The Western Railroad Museum offers interurban rides over the re-electrified portion of the Sacramento Northern railroad interurban mainline to Gum Grove (WRM, 2005).

Applicable Regulations, Plans, and Standards

California Department of Transportation. LGS would need to apply for and obtain a California Department of Transportation (Caltrans) Transportation Permit for movement of vehicles that may qualify as an oversized or excessive load, or for transportation of oversized or excessive loads on State roadways such as SR 12. This permit would determine a specific route for the shipper to follow from origin to destination.

Solano County. Local traffic in the project area is subject to the policies and regulations of the Solano County Public Works Agency. Solano County transportation policies and standards for roadways are discussed in the Land Use and Circulation Element of the General Plan. The Solano County Road Improvement Standards and Land Development and Subdivision Requirements have set specific guidelines for

the construction of public and private road improvements, including design standards addressing slopes, widths, connection to county roads, and other features (Solano County, 2001). Because the proposed project would include the encroachment of two county roads (i.e., Shiloh Road and Olsen Road), it would be necessary for the Applicant and/or the construction contractor to obtain encroachment permits from the Solano County Transportation Department.

B.3.15.2 Environmental Impacts and Mitigation Measures

- a. Would the project cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?*

LESS THAN SIGNIFICANT WITH MITIGATION. LGS has indicated that during the peak periods of construction, approximately 90 people would be working on the project in the area. This number includes workers associated with all aspects of project construction (e.g., pipeline construction and construction of related facilities). In addition, construction of the proposed project would entail the delivery of materials to the various project sites. LGS estimates that as many as 27 daily truck trips during the peak of construction would be required for material delivery and removal at the various project sites. Combining construction employee traffic volumes with delivery and haul truck trips, it is estimated that project construction would require a maximum of approximately 120 vehicle trips per day during the peak period of construction, which would last up to six months. It is estimated that approximately 95 trips would occur during the morning and afternoon peak traffic periods.

Local roadways in the project area have relatively low traffic volumes. Project related traffic would not increase traffic on the local roads to a level that is substantial in relation to the existing traffic load and capacity of the street system. Therefore, congestion caused by construction vehicles accessing the work areas from local roads would be minimal and limited to the short-term duration of construction.

However, the roadways in the area that provide regional access (e.g., SR 12) are often congested with traffic during the peak commute hours. Therefore, project related trips that would occur during the peak commute hours along SR 12 could result in additional traffic congestion on SR 12. This would result in a potentially significant impact. However, LGS would be required to obtain transportation permits from the County and Caltrans for hauling oversized loads. The transportation permits would include certain project stipulations, such as the designation of haul routes and requirements to repair any damage caused to roadways. In order to specifically address potential impacts associated with peak hour traffic congestion, Mitigation Measure TRA-1 (see below) is recommended, which would require construction traffic in the project area to be scheduled during off peak hours. Implementation of the required transportation permit stipulations as well as Mitigation Measure TRA-1 would ensure that impacts related to peak hour traffic congestion would be reduced to less than significant levels.

In addition, construction activities would occur within the public right-of-way (ROW) of Shiloh Road and Olsen Road. Installation of the pipeline within these ROWs may require temporary lane and/or road closures that could result in local traffic congestion. LGS would be required to obtain ROW encroachment permits from the County in order to construct within the road ROWs. The encroachment permits would include stipulations to control traffic congestion that LGS would be required to implement.

In addition to required County encroachment permits, LGS proposes to prepare a Construction Traffic Plan pursuant to APM T-1 to further reduce potential construction impacts. The Plan would identify measures to control traffic, such as installation of temporary warning signs and traffic control devices,

identification of detours, notification to property owners, and maintenance of access to driveways, private roads, and farm roads outside the immediate construction zone. See Table B.1-2 for the complete text of the APM T-1. Adherence to the stipulations of the County permits as well as those that would be part of LGS's Construction Traffic Plan, congestion impacts caused by project-related lane closures would be temporarily adverse, but less than significant.

Mitigation Measure

TRA-1 Lodi Gas Storage and/or the construction contractor shall schedule construction traffic, including construction worker and material delivery trips, to avoid peak traffic commute hours along State Route 12. Carpooling of the construction workforce shall also be encouraged.

b. Would the project cause, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways to be exceeded?

LESS THAN SIGNIFICANT WITH MITIGATION. As described above, existing traffic levels for local roadways in the project area have low traffic volumes and operate at acceptable levels of service. However, SR 12 and the other roadways that provide regional access to the area are often congested with traffic during the peak commute hours. Implementation of the required transportation permit stipulations as well as Mitigation Measure TRA-1 (see Section B.1 b., above) would ensure that impacts related to roadway LOS would be reduced to less than significant levels.

c. Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

NO IMPACT. The proposed project includes the development and construction of natural gas storage and pipeline facilities. The proposed project would not result in a change in air traffic patterns. No impacts would occur.

d. Would the project substantially increase hazards because of a design feature or incompatible uses?

NO IMPACT. The project does not involve any design hazards or incompatible uses related to transportation. Therefore, the proposed project would not increase hazards on area roadways due to a design feature or incompatible uses. No impacts would occur.

e. Would the project result in inadequate emergency access?

LESS THAN SIGNIFICANT IMPACT. Construction-related activities within and adjacent to public road ROW and increased truck and vehicle traffic along project access routes could temporarily increase response times for emergency response providers along affected roadways. However, LGS has committed to implementing APM T-1 (see Table B.1-2), which includes a provision requiring LGS to consult with emergency service providers and to develop an emergency access plan for emergency vehicle access in and adjacent to the construction zones. Implementation of APM T-1 as well as the stipulations of the Caltrans and County permits would ensure that potential impacts associated with disruptions to emergency response routes would be less than significant.

f. Would the project result in inadequate parking capacity?

NO IMPACT. The proposed project does not cross any parking lots and would not affect street parking on the roadways near the proposed project. Therefore, there would be no impact to parking.

g. Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

NO IMPACT. The proposed project would not conflict with adopted policies, plans, or programs that support alternative transportation in the project area. No impacts would occur.

B.3.16 Utilities and Service Systems

UTILITIES AND SERVICE SYSTEMS

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Comply with federal, State, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

B.3.16.1 Setting

Environmental Setting

Water. Because land in the project area is suitable for dry-land farming and grazing activities, the farms do not require irrigation or other large-scale water use. Water use in the project area is therefore mostly limited to domestic purposes. According to the Solano County General Plan, unincorporated areas of the county are required to provide most of their own water, largely from on-site wells (LGS, 2005).

Sewage. Residences and establishments in unincorporated areas of the county, including the project area, largely maintain their own sewer systems (e.g., septic tanks) under the authority of the County Health Department (LGS, 2005).

Solid Waste Disposal. In addition to the closed IT Montezuma Hills hazardous waste disposal facility, the Rio Vista landfill (301 Airport Road) is the closest waste disposal site to the project; however, the Rio Vista landfill was closed as well on October 1, 1992 (CIWMB, 2005). Two active and permitted solid waste disposal facilities in Solano County are: Potrero Hills Landfill, located at 3675 Potrero Hills Lane in Suisun City, and Hay Road Landfill, Inc. (B+J Landfill), located at 6426 Hay Road, which is about

0.25 miles west of Highway 113 in Vacaville (CIWMB, 2005). The Potrero Hills Landfill has a maximum permitted throughput of 4,330 tons/day and a remaining capacity of 13,800,000 cubic yards. The Hay Road Landfill has a maximum permitted throughput of 2,400 tons/day and a remaining capacity of 22,815,505 cubic yards (CIWMB, 2005). Landfills are also present in Sacramento and the East Bay.

Gas and Electricity. Pacific Gas and Electric (PG&E) supplies electricity to Solano County, including the project area. Gas and electrical use in the project area is mainly residential, and many gas pipelines are present for distribution. Power lines and towers cross the project area and connect into the Bay Area grid.

Regulatory Setting

State

California State law (Article 2 of California Code 4216-4216.9, Section 1, Chapter 3.1) requires that an excavator must contact a regional notification center at least two days prior to excavation of any subsurface installations. The center for northern California is Underground Service Alert. Any utility provider seeking to begin an excavation project can call Underground Service Alert's toll-free hotline. Underground Service Alert, in turn, will notify the utilities that may have buried lines within 1,000 feet of the excavation. Representatives of the utilities are required to mark the specific locations of their facilities within the work area prior to the start of excavation.⁶ The excavator is required to probe and expose the underground facilities by hand prior to using power equipment.

Solano County General Plan

In addition, the Solano County Housing Element, part of the General Plan, guides housing and development within the County. According to the Plan, the County "recognizes that the provision of essential public facilities and services is an important and necessary prerequisite to the maintenance of satisfying living environment" (Solano County, 2005e).

The Solano County General Plan will be going through its first comprehensive update since the General Plan Elements were adopted in the 1970s and 1980s. The Solano County General Plan Update project is expected to begin in January 2006. In the Solano County Housing Element Update, the County sets the following objectives and policies:

G.2 Domestic water for rural development shall be provided principally through on-site individual wells. When individual well systems in an area of the unincorporated County become marginal or inadequate for serving domestic uses, public water service may be permitted in conformance with the General Plan. In such cases, public water service shall be provided and managed through a public agency. If lands proposed for water service are not within the boundaries of an existing public water agency, the Board of Supervisors shall, as a condition of development, designate a public agency to provide and manage the water service. Water facilities shall be designed to provide water service only to the developed areas and those designated for potential development. Such facilities shall be designed to prevent any growth inducing impacts on adjoining designated agricultural and open space lands.

G.3 The County shall continue to work with the local school districts in implementing mechanisms and procedures for mitigating impacts on school facilities resulting from future County development.

⁶ Markings are made directly on the pavement using spray paint.

B.3.16.2 Environmental Impacts and Mitigation Measures

a. Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

NO IMPACT. The proposed project would not generate wastewater. Therefore, the wastewater treatment requirements of the San Francisco Regional Water Quality Control Board (SFRWQCB) would not be exceeded.

b. Would the project require, or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

NO IMPACT. The proposed project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities.

c. Would the project require, or result in the construction of, new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

LESS THAN SIGNIFICANT IMPACT. Construction of the compressor station would require a new, on-site stormwater detention basin. This new primary pond would be constructed on the compressor station site and an existing abandoned gravel quarry would be used as a secondary retention pond. Potential environmental effects (primarily construction-related impacts on biological resources) associated with this detention basin would be minimized through the implementation of APMs, BMPs, and a Stormwater Pollution Prevention Plan (SWPPP) (LGS, 2005) and described in the Project Description (Section B.1). This impact is considered less than significant and no additional mitigation is required.

d. Would the project have sufficient water supplies available to serve the proposed project from existing entitlements and resources, or would new or expanded entitlements be needed?

LESS THAN SIGNIFICANT IMPACT. Construction crews would bring in potable water for drinking purposes and non-potable water would be used for dust control. In addition, a domestic water well would be drilled within the compressor station site to supply water to the control building and miscellaneous hose bibs throughout the facility during operation. Because of the relatively small scale and temporary short-term nature of construction and minimal water consumption during gas storage operation, there are sufficient water supplies available to serve the project from existing entitlements and resources. Potential impacts would be less than significant.

e. Would the project result in a determination by the wastewater treatment provider that serves or may serve the proposed project that it has adequate capacity to serve the proposed project's projected demand in addition to the provider's existing commitments?

NO IMPACT. As described in (a) above, the project would not require services of a wastewater treatment facility.

f. *Would the project be served by a landfill with sufficient permitted capacity to accommodate the proposed project's solid waste disposal needs?*

LESS THAN SIGNIFICANT IMPACT. A large amount of soil would be excavated during project construction. However, most of the soil excavated for the project would be used at the project site for filling and grading activities. There may be a minimal amount of excess material that would be delivered to a local landfill, such as Potrero Hills or Hay Road landfill, both of which have sufficient permitted capacity to accommodate the project's solid waste disposal needs. Therefore, this impact is considered less than significant and no mitigation is required.

g. *Would the project comply with federal, State, and local statutes and regulations related to solid waste?*

NO IMPACT. The proposed project would comply with federal, State and local statutes and regulations related to solid waste.

B.3.17 Mandatory Findings of Significance

MANDATORY FINDING OF SIGNIFICANCE	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Does the project have impacts that are individually limited, but cumulatively considerable? (<i>Cumulatively considerable</i> means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

a. *Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?*

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED. The portion of the project area west of Shiloh Road is within the Secondary Management Area for the Suisun Marsh, which is intended to serve as a buffer between the Primary Management Area (the tidal marshes, seasonal marshes, managed wetlands and lowland grasslands) and developed area. The Suisun Marsh Protection Plan permits natural gas production, transportation, and storage within the Secondary Management Area, provided that facilities are designed and constructed to prevent impacts to the Primary Management Area. To implement the Suisun Marsh Protection Plan, Solano County requires a Marsh Development Permit for proposed uses within the Secondary Management Area. As described in Section B.3.4, Biological Resources, the project could result in impacts to wetlands. However, implementation of Mitigation Measure BIO-1 described in Section

B.3.4 would reduce these potentially significant impacts to less than significant levels. Similarly, implementation of applicant-proposed measures presented in Table B.1, Cultural Resources, would ensure that impacts related to archaeological resources are less than significant.

With the suggested mitigation incorporated as conditions of a Marsh Development Permit, the proposed project would not have a significant adverse effect, either individually or cumulatively, on natural resources. No significant impacts would occur that could not be mitigated to a less than significant level.

b. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, effects of other current projects, and the effects of probable future projects.)

LESS THAN SIGNIFICANT IMPACT. CEQA defines a cumulative impact as an effect that is created as a result of the combination of the proposed project together with other projects (past, present, or future) causing related impacts. Cumulative impacts of a project need to be evaluated when the project’s incremental effect is cumulatively considerable and, therefore, potentially significant.

As discussed in preceding sections B.3.1 through B.3.16, many of the potential impacts of the proposed project would occur during construction, with few lasting operational effects, primarily associated with safety risk (see below and Section B.3.7, Hazards and Hazardous Materials). Because the construction-related impacts of the proposed project are temporary and localized, they would only have the potential to combine with similar impacts of other projects if they occur at the same time and in close proximity. The proposed project site is located in a sparsely populated area and there are no other nearby major projects proposed that, along with the proposed project, could cause significant ongoing cumulative impacts. There is a major wind power project currently under construction, the Shiloh I Wind Plant Project; however, the construction of this project is scheduled to be completed prior to the start of construction of the proposed project (Solano County, 2005b). The construction impacts of the proposed project (primarily related to biological resources, noise, air pollutant emissions, and minor traffic) have little potential to combine with similar effects of other projects in the general vicinity, particularly considering that the implementation of appropriate mitigation measures (see Sections B.3.1 through B.3.16, and the Mitigation Monitoring Plan in Section C) would reduce the construction-related effects of the proposed project to less than significant levels. Therefore, there are no known nearby proposed projects that would have significant overlapping construction or operation emissions with the proposed project. Impacts would be less than significant and mitigation measures are not required.

c. Does the project have environmental effects, which would cause substantial adverse effects on human beings, either directly or indirectly?

LESS THAN SIGNIFICANT WITH MITIGATION INCORPORATED. The preceding sections of this Initial Study discuss various types of impacts that could adverse effects on human beings, including:

- Dust and air pollutant emissions associated with project construction activities (see Section B.3.3, Air Quality)
- Hazards, such as seismic hazards, exposure to hazardous substances, flooding, or wildland fires (see Section B.3.6, Geology and Soils; Section B.3.7, Hazards and Hazardous Materials; and Section B.3.8, Hydrology and Water Resources); and
- Traffic hazards related to project-generated traffic (see Section B.3.15, Transportation/Traffic).

These are all temporary impacts associated with project construction activities. Each type of impact with the potential to cause substantial adverse effects on human beings has been evaluated, and this Initial Study concludes that all of these potential impacts are either less than significant or can be mitigated to a less than significant level with the implementation of measures presented herein (see Mitigation Monitoring Plan, Section C, for a complete listing of impacts and the associated mitigation measures). Therefore, the proposed project does not involve any activities, either during construction or operation, which would cause significant adverse effects on human beings that cannot be readily mitigated to a less than significant level.