

**Initial Study and Mitigated Negative Declaration
Kebo Oil & Gas, Inc.
Glide 14-1 Natural Gas Well Project**

Prepared for:

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1.0 PROJECT OVERVIEW

1.1 Project Proponent

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Portland, TX 78374

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Sacramento, CA 95864
Attention: Mary Halpin
Telephone: (916) 482-2847

1.2 Lead Agency

California Department of Fish and Game (CDFG)
Bay-Delta Region
Post Office Box 47
Yountville, California 94599

Contact: Ms. Anna Holmes
Bay Delta Region
(209) 948-7163

Mr. Dave Feliz, Wildlife Area Manager
Yolo Basin Wildlife Area
(530)757-2431

1.3 Jurisdictional Setting

The proposed project is located on public lands owned by the State of California, the Resources Agency, CDFG; accordingly, the project proponent will be required to enter into a Drill Site Agreement with CDFG prior to initiating project activities. CDFG, as a public agency, must comply with provisions of the California Environmental Quality Act (CEQA) and the California Endangered Species Act (CESA) prior to approving execution of the Drill Site Agreement.

This Initial Study and Mitigated Negative Declaration (IS/MND) have been prepared pursuant to the requirements of CEQA (Section 21000 et seq., Public Resources Code) and in accordance with the State CEQA Guidelines (Section 15000 et seq., Title 14, California Code of Regulations [CCR]) with CDFG as lead agency.

The proposed project may also require a permit, authorization or review from the following agencies:

- U.S. Army Corps of Engineers, Sacramento District (USACE)
- U.S. Fish and Wildlife Service, Sacramento Field Office (USFWS)
- California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB)
- California Department of Water Resources, Reclamation Board (DWR)

The project proponent will obtain applicable local, state and/or federal government permits or authorizations for the proposed project.

1.4 Project Location

The proposed project area, which includes the proposed well pad and natural gas pipeline, is located within the Yolo Bypass Wildlife Area (Tule Ranch) in an unincorporated area of Yolo County, California. The proposed drill site is located in Section 14 (Township 8 North, Range 3 East) adjacent to an existing north-south trending park access roadway. The project site is located approximately 4.0 miles west of West Sacramento, California, and approximately 4.5 miles east of Davis, California. The proposed drill site and pipeline alignment are identified on Figures 1 and 2.

1.5 Project Description

Kebo proposes to drill a natural gas well from a site located on public lands within the CDFG Yolo Bypass Wildlife Area in Yolo County, California. If economic quantities of natural gas are discovered, the well will be completed, the drill pad will be removed and a raised production platform will be installed, and a natural gas pipeline approximately 2.65 miles in length will be installed to connect the production facility with an existing natural gas collection system located north of the well site.

The proposed project is needed to develop additional natural gas reserves in the State of California. The objective of the proposed project is to locate untapped natural gas sources with potential for development.

Photographs representative of the proposed project area are in Appendix A

The proposed project includes four (4) phases: a site preparation phase, a drilling and testing phase, a production phase, and a site restoration phase. A detailed description of each phase is presented below.

1.5.1 Site Preparation Phase

Prior to initiating site preparation activities, all workers will be given an environmental orientation to ensure that those working in the project area understand the sensitivity of the areas

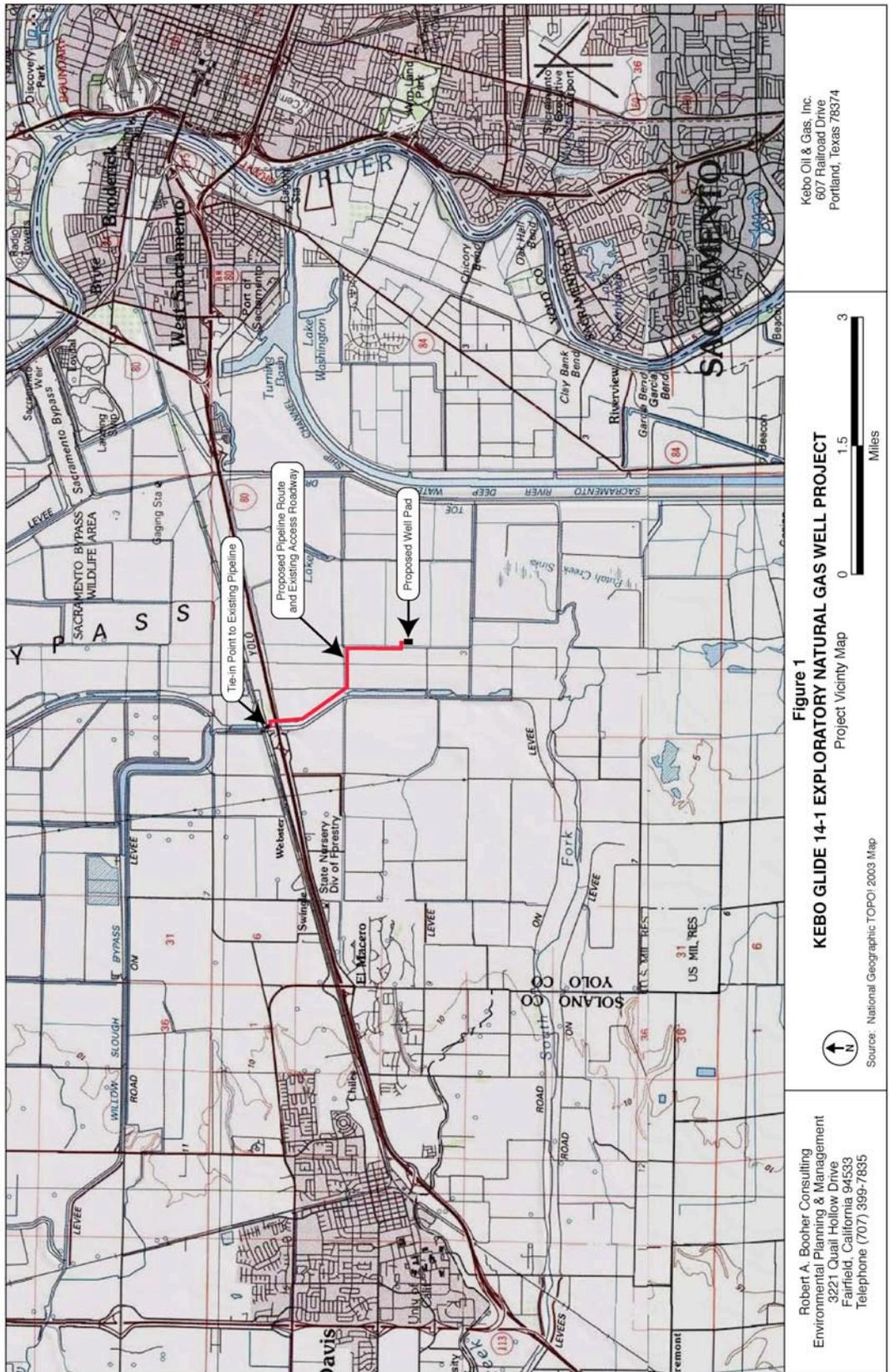


Figure 1
KEBO GLIDE 14-1 EXPLORATORY NATURAL GAS WELL PROJECT
 Project Vicinity Map

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 Environmental Planning & Management
 3221 Quail Hollow Drive
 Fairfield, California 94533
 Telephone (707) 999-7835

Kebo Oil & Gas, Inc.
 607 Railroad Drive
 Portland, Texas 78374

Source: National Geographic TOPOI 2003 Map

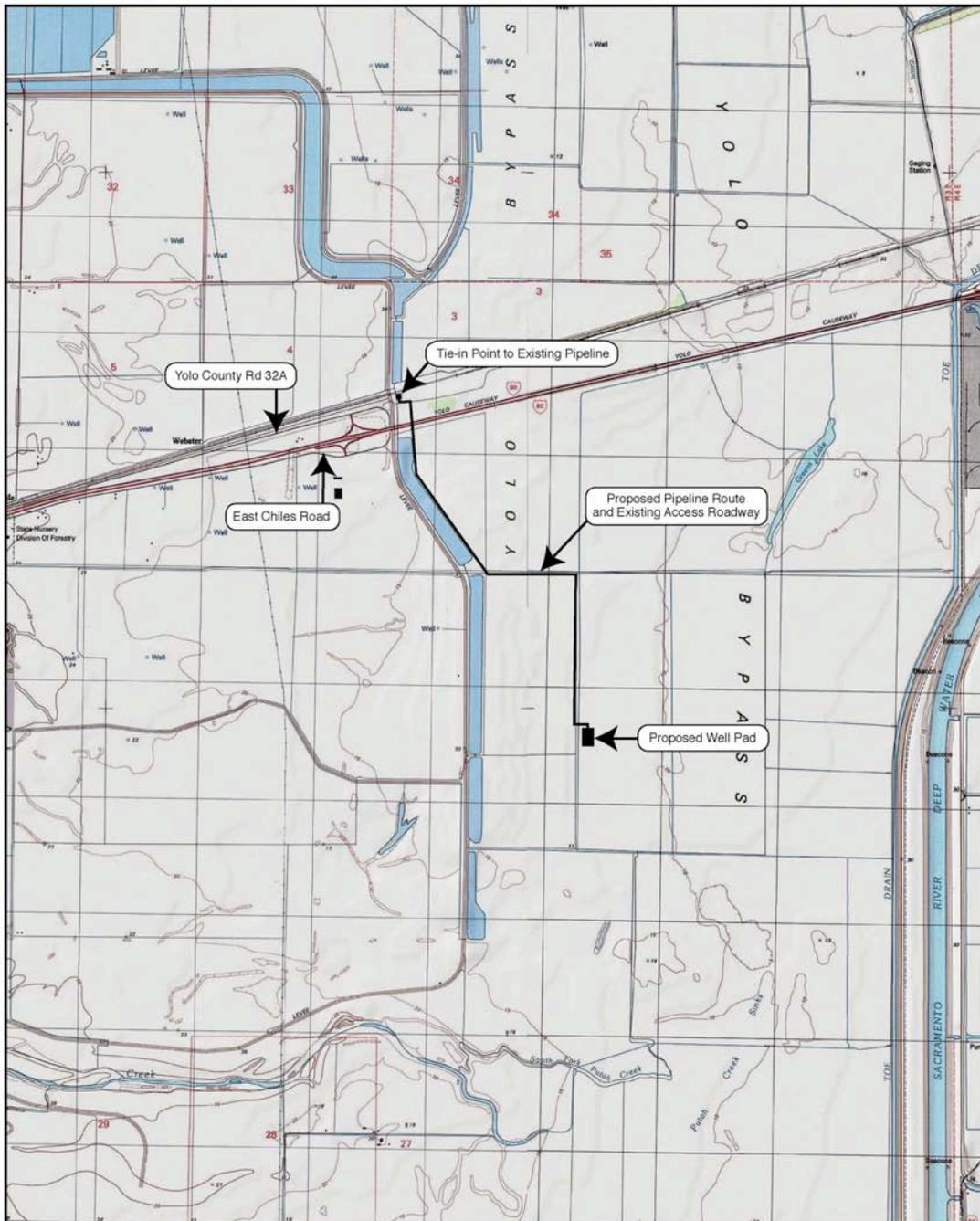


Figure 2
KEBO GLIDE 14-1 EXPLORATORY NATURAL GAS WELL PROJECT
 Project Location Map

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 Fairfield, California 94533
 Telephone (707) 399-7835



Sources: National Geographic TOPOI 2003
 and CNDDB 2007

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adjacent to the project drill sites and the necessity of avoiding disturbance to these areas. The environmental orientation will include a discussion of emergency response guidelines.

Drill site boundaries will be clearly delineated by a project biologist to ensure all activities are confined to the project site. A sediment barrier fence will then be installed around the boundary of the delineated drill site to ensure all project activities are restricted to the work area. The proposed drill site will be cleared of vegetation, a geotextile material will be placed over the project area, and the drill pad will be constructed with fill materials including sand and gravel. Gravel will be applied to the surface of the well pad to complete the preparation of the pad. An access roadway approximately 50 feet in length will be constructed from an existing upland check dam to the proposed well pad to provide access. The proposed well pad would measure 460 feet by 250 feet (115,000 square feet, or 2.64 acres). The proposed drill pad and associated equipment are identified on Figure 3.

All project traffic traveling on access roadways within the Yolo Bypass Wildlife Area will obey a speed limit of 15 miles per hour when traveling to and from the project site. The project proponent estimates that approximately 7 to 10 days will be needed to prepare the site. Construction of the drill site will occur between May 1 and October 1.

1.5.2 Drilling and Testing Phase

The drilling and testing phase of the project will require approximately 20 to 25 total truck trips to mobilize drilling equipment to the site. Equipment will then be rigged and drill activities initiated. Approximately 3 to 4 truck trips a day will be required to support drilling operations.

All drilling and production testing equipment (i.e. drilling rig, mud pumps, mud system equipment, portable water tanks, waste tanks, fuel tanks, portable toilets, pipe racks, and pipe baskets) will be temporarily contained within the proposed drill site. No sump will be excavated; all drilling muds and cuttings will be contained in portable tanks. Drilling muds and cuttings will be transported offsite to an appropriate disposal facility.

Temporary directional lighting will be used during drilling operations. Directional lighting is used to minimize impacts of lighting to nocturnal animals.

Drilling activities will operate 24 hours per day, and each well may require approximately 20 to 30 days to drill and complete. Approximately 12 to 15 personnel will be on site at any given time during drilling operations. After the well is drilled, and the well is either completed or abandoned, the drilling rig (and related equipment) will be removed. All project traffic traveling on access roadways within the Yolo Bypass Wildlife Area will obey a speed limit of 15 miles per hour when traveling to and from the project site. Drilling and testing of the well will occur between May 1 and October 1.

1.5.3 Production Phase

If economic quantities of natural gas are discovered, the well will be completed and production facilities will be installed. Only a limited portion of a drill site will be required for a production pad. Dimensions of production facilities will be approximately 100 feet by 200 feet. The remaining portion of a drill site will be returned to natural grade and restored to wetland habitat.

Production facilities will include a wellhead gas meter, a heater/separator, production water and condensate storage tanks and the pipeline. The wellhead will be enclosed in a steel cage and production equipment will be elevated on a production platform in order to prevent any damage that could result from potential flooding. The production platform would measure approximately 20 feet by 30 feet (600 square feet, or 0.01 acres). The proposed production pad and associated equipment are identified on Figure 4. No dehydrator will be required for the well. If compression is required, a portable compressor with an engine size less than 100 hp will be used. The project proponent proposes to paint all production equipment in camouflage or an earthen tone to blend in with the environment and to prevent glare.

Natural gas will be metered for customer sales and the production facility will be inspected on a daily basis. By-products including production water and condensates will be stored temporarily in 300 barrel capacity storage tanks that are approximately 12 feet in diameter.

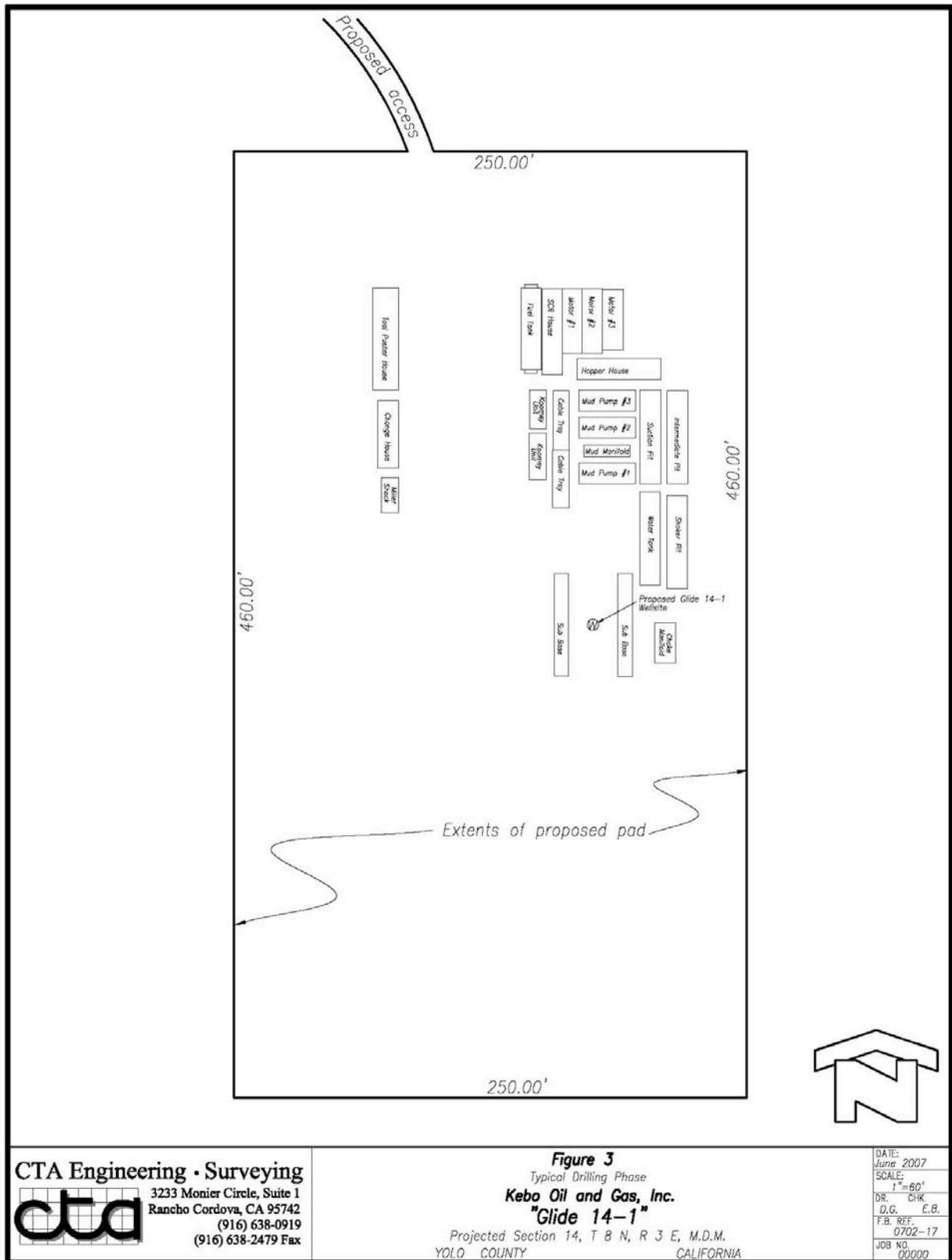
By-products will be periodically transported from the facility by truck for off site disposal and/or recycling at an applicable facility. Typically a maximum of one truck trip per week will be required to transport by-products offsite. During the producing life of a well, a workover service rig (a small mobile drilling rig) may be occasionally required to improve production.

A natural gas pipeline will also be installed during the installation of production equipment. The proposed pipeline will be installed using traditional open-cut trench methods. A typical trench detail is shown on Figure 5.

Trenching requires the use of a backhoe to establish an open trench of approximately four feet to six feet deep and approximately two feet wide. Pipe will be four inches in diameter or less and will be placed beside the trench by the stringing crew. Pipe joints will be bonded together and all joint connections will be inspected and tested prior to laying pipe into the trench. Pipe will be lowered into the trench by a small side-boom crane. The pipe will then be covered with soils that were excavated during trenching and the ground compacted above the pipe. After the pipeline is buried, the construction corridor will be re-contoured to approximately the same grade or slope that existed prior to pipeline installation.

All project traffic traveling on access roadways within the Yolo Bypass Wildlife Area will obey a speed limit of 15 miles per hour when traveling to and from the project site.

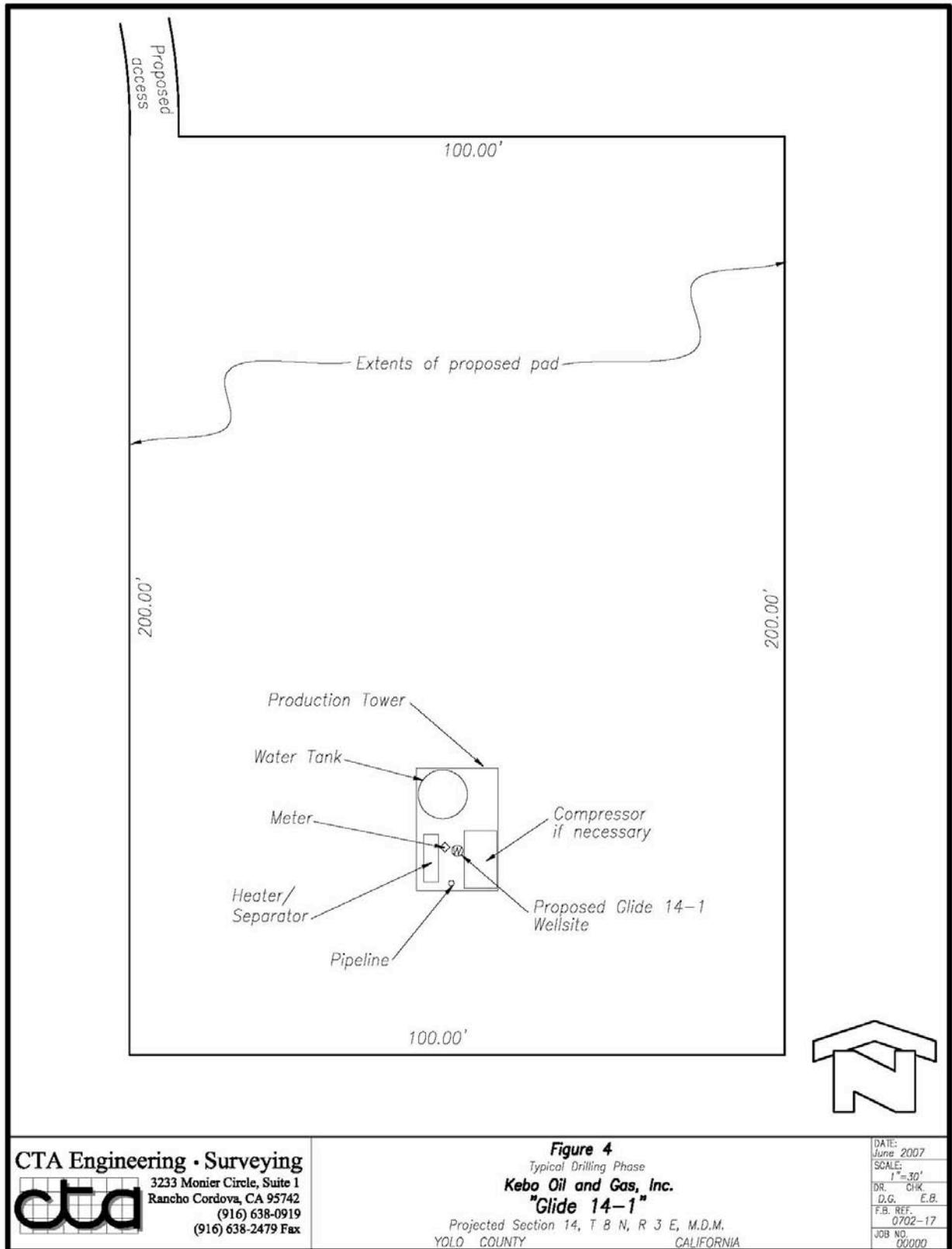
The pipeline will be approximately 2.65 miles (14,000 feet) in length, and will connect to an existing Pacific Gas and Electric natural gas pipeline north of the proposed well site. The pipeline will be installed within an existing gravel roadway in order to avoid impacts to adjacent wetlands. Approximately six to ten personnel working approximately seven to



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Figure 3
 Typical Drilling Phase
Kebo Oil and Gas, Inc.
"Glide 14-1"
 Projected Section 14, T 8 N, R 3 E, M.D.M.
 YOLO COUNTY CALIFORNIA

DATE:	June 2007
SCALE:	1"=60'
DR:	CHK
D.G.:	E.B.
T.B. REF.:	0702-17
JOB NO.:	00000



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Figure 4
 Typical Drilling Phase
Kebo Oil and Gas, Inc.
"Glide 14-1"
 Projected Section 14, T 8 N, R 3 E, M.D.M.
 YOLO COUNTY CALIFORNIA

DATE:	June 2007
SCALE:	1" = 30'
DR.:	CHK.
D.G.:	E.B.
F.B. REF.:	0702-17
JOB NO.:	00000

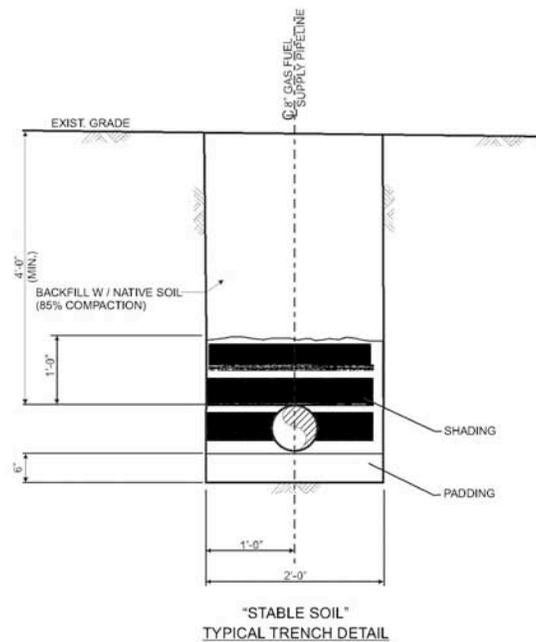
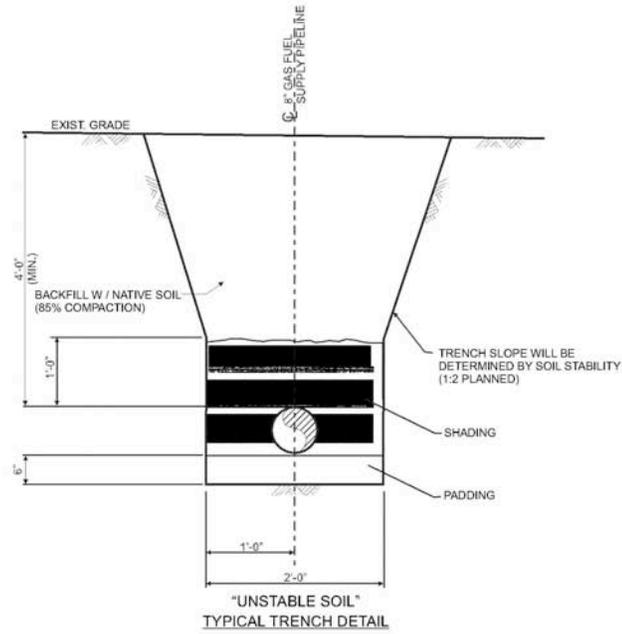


Figure 5
Typical Pipeline Trench Detail

fourteen days will be required to operate equipment and install the proposed production facility including the pipeline. The proposed pipeline route is shown on Figure 2.

The production phase of the project will last as long as economically feasible supplies of natural gas are present. At the current time, it is unknown how long the gas will take to extract. Production activities would occur 24 hours a day, 365 days a year. The proposed pipeline would be installed between May 1 and October 1.

At conclusion of the wells economic life (production), each well will be abandoned and plugged according to the State of California, Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) regulations.

1.5.4 Site Restoration Phase

The goal of the site restoration phase is to restore the site to its condition or better than that observed at the time of project initiation. Once the well is abandoned and plugged, surface equipment will be removed from the site. Any sand and or gravel used to build up the site will then be removed from the site. Contours will be re-established to near grade conditions present at the time of project initiation. Wetland vegetation will be planted to provide erosion control and improve habitat. The project proponent will submit a restoration and revegetation plan to CDFG for approval prior to initiating site restoration.

1.6 Mitigation Measures Incorporated into the Project

Mitigation measures are recommended for incorporation into the proposed project to reduce identified potential impacts to less than significant levels. A detailed analysis of potential impacts and discussion of proposed mitigation measures are included in Section 2. A CEQA Environmental Checklist has been prepared for the project, and has been included as Appendix D. A Mitigation Monitoring and Reporting Program is included in Appendix E of this report.

The project applicant is responsible for compliance with the mitigation measures required by this document. The project proponent will implement the recommended mitigation measures during all aspects of the proposed project (site preparation, drilling and testing, production phase, and site restoration phase). This responsibility will be ongoing during all phases of the project. Standards for success shall be full compliance with mitigation measures as they are described. CDFG, as lead agency is responsible for compliance and verification.

2.0 ENVIRONMENTAL SETTING AND DISCUSSION OF POTENTIAL IMPACTS

2.1 Land Use and Planning

2.1.1 Environmental Setting

The proposed project will include drilling a natural gas well, and if economic quantities of natural gas are discovered, the well will be completed. If the well is completed, the drill pad will be reduced in size, a raised production platform will be installed, and a natural gas pipeline approximately 2.65 miles in length will be installed to connect the production facility with an existing natural gas collection system located north of the well site.

The proposed project area is located in an unincorporated area within the Yolo Bypass Wildlife Area (also known as Tule Ranch) in Yolo County, California. The project site is located approximately 4.0 miles west of West Sacramento, California, and approximately 4.5 miles east of Davis, California. The Sacramento River Deep Water Channel is located approximately 1.8 miles east of the proposed project area.

The proposed project area is comprised primarily of undeveloped agricultural and recreational lands. Other land uses within and/or adjacent to the proposed project area include natural gas exploratory and production wells, natural gas pipelines, duck hunting clubs, waterlines, scattered rural residences, railroad lines, wildlife management and viewing, and recreational boating (on the Sacramento River Deep Water Channel).

2.1.2 Environmental Impacts

The proposed project will have a significant adverse effect if it will:

- a) conflict with general plan designation or zoning,
- b) conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project,
- c) be incompatible with existing land use in the vicinity,
- d) affect agricultural resources or operations (e.g., impacts to soils or farmlands, or impacts from incompatible land uses), or
- e) disrupt or divide the physical arrangement of an established community (including a low-income or minority community).

The following is a discussion of potential effects of the proposed project for each of these criteria.

- a) **Conflict with general plan designation or zoning.** No impact. The Yolo County General Plan (Yolo County 1983 [currently being revised]) designates land throughout the County for specific uses. The General Plan has also identified an Urban Limit Line (ULL) which defines and divides urban areas from areas to be preserved as non-urban. The proposed project area is located outside of the ULL in an area designated

as open space.

Development of oil and gas wells within the unincorporated area of Yolo County is governed by the Yolo County General Plan and Title 8 (Chapters 1-8) of the Yolo County Zoning Code. Development of oil and gas wells is a permissible activity within areas designated as open space according to these plans and regulations. However, as the proposed project is located on land owned by the State of California the Yolo County Oil and Gas Drilling Operation Site Plan Certification for the project is not required. No planning or zoning conflicts have been identified.

- b) **Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project.** No Impact. The proposed project area, including the drill site and pipeline, are located within an unincorporated area of Yolo County. No city or incorporated area of the County currently has plans to absorb this area into their sphere of influence.

The project proponent will obtain all permits as required by law. A list of agencies potentially requiring permits is included in Section 1.3. No other local environmental plans or policies are applicable to the proposed project. Accordingly, no conflict with applicable environmental plans or policies has been identified.

- c) **Be incompatible with existing land uses in the vicinity.** Less than significant impact. Land uses within and/or adjacent to the proposed project area include railroad lines, natural gas pipelines, natural gas wells, agriculture, and other structures used for various purposes. Proposed project activities are compatible with these existing land uses.

Construction of the proposed pipeline could temporarily restrict the use of the associated access roads. However, any restriction to the use of the access road would be short term and temporary in duration. Once the pipeline is installed within the access road, there would be no incompatibilities with the existing use of the roads.

- d) **Affect agricultural resources or operations (e.g., impacts to soils or farmlands, or impacts from incompatible land uses).** Less than significant impact. Rice is currently grown in the area of the proposed well pad on an irregular basis determined by CDFG. The project could lead to a temporary, but long-term effect on a small area of agricultural cropland if production facilities are installed. However, the area of impact is very small (approximately 0.5 acres). At the conclusion of production activities, all facilities and equipment will be removed, and the site will be restored to the original condition prior to project implementation. Additionally, the use of agricultural and open space lands for natural gas exploration and production activities is considered a compatible use. Therefore, impacts are considered less than significant.

- e) **Disrupt or divide the physical arrangement of an established community**

(including a low-income or minority community). No impact. No drilling or construction related activities will take place within established communities. Accordingly, the proposed project will not disrupt or divide the physical arrangement of an established community (including a low-income or minority community).

2.1.3 Mitigation Measures

Implementation of the proposed project will not have a significant impact on land use policies, regulations, or use of the project site. Therefore, no mitigation measures are required.

2.2 Population and Housing

2.2.1 Environmental Setting

The project area is currently undeveloped and located in an unincorporated area of Yolo County within the Yolo Bypass Wildlife Area. The project area is currently designated as open space under the Yolo County General Plan and zoning regulations. The community of West Sacramento and Davis are located approximately 4.0 miles west and 4.5 miles west respectively, from the proposed project area.

2.2.2 Environmental Impacts

The proposed project will have a significant adverse effect on population or housing if it will:

- a) cumulatively exceed official regional or local population projections,
- b) induce substantial growth in an area either directly or indirectly (e.g. through projects in an undeveloped area or extension of major infrastructure), or
- c) displace existing housing, especially affordable housing.

The following is a discussion of potential effects of the proposed project for each of these criteria.

- a) **Cumulatively exceed official regional or local population projections.** No impact. The proposed project involves short-term natural gas exploration drilling activities, and if economic quantities of natural gas are discovered, installation and operation of production equipment and a natural gas pipeline. Drilling activities will employ approximately 12 to 15 individuals. This is the maximum number of personnel required during any of the project phases. This temporary employment will not involve permanent relocation of persons to local or regional areas. In the event that natural gas resources are located and production equipment is installed, the production facility will be unmanned. Therefore, the project will not cumulatively exceed regional or local population projections.
- b) **Induce substantial growth in an area either directly or indirectly.** No Impact.

Drilling activities associated with the proposed project are short term and the project proponent will contract the services of companies located throughout California. In the event that natural gas resources are located and production equipment is installed, the production facility will be unmanned. Accordingly, the proposed project will not result directly or indirectly in substantial growth in Yolo County.

- c) **Displace existing housing, especially affordable housing.** No impact. Implementation of the proposed project will not result in displacement of existing housing, including affordable housing.

2.2.3 Mitigation Measures

Implementation of the proposed project will not result in impacts to housing and population. therefore, no mitigation measures are required.

2.3 Geology and Soils

2.3.1 Environmental Setting

The project area is located within the Great Valley geomorphic province. The Great Valley of California, also called the Central Valley of California, is a nearly flat alluvial plain, extending from the Tehachapi Mountains at the south to the Klamath Mountains at the north and from the Sierra Nevada on the east to the Coast Ranges on the west. The valley is about 450 miles long and has an average width of about 50 miles. Elevations of the alluvial plain are generally just a few hundred feet above mean sea level (msl), with extremes ranging from a few feet below msl to about 1,000 feet above msl (Hackel 1966).

Geologically, the Great Valley geomorphic province is a large, elongate, northwest-trending asymmetric structural trough that has been filled with an extremely thick sequence of sediments, ranging in age from Jurassic to Recent. This asymmetric geosyncline has a long, stable eastern shelf supported by the subsurface continuation of the granitic Sierran slope and a short western flank expressed by the upturned edges of the basin sediments (Hackel 1966).

The general project area consists of a mixture of sand, silt, and gravel of Quaternary levee and channel deposits. The alluvium that makes up the floodplain of the Sacramento River and other adjacent streams ranges from moderately coarse textured to moderately fine textured. The project area is flat and topographically featureless, typical of a floodplain environment, except for the presence of levees.

Seismicity

Seismic hazards refer to earthquake fault ground rupture and ground shaking (primary hazards) and liquefaction and earthquake-induced slope failure (secondary hazards). The primary seismic hazards in the project area are related to ground shaking, soil liquefaction, and seiches.

Surface Rupture and Faulting

The project area is located in a region of California characterized by low seismic activity. The Uniform Building Code (UBC) recognizes no active seismic sources within the project vicinity (International Conference of Building Officials 1997), and no active faults are known to cross the project area. The project area is located within UBC Seismic Hazard Zone 3. The Zone 3 designation indicates that earthquakes in the region have the potential to make standing difficult and cause stucco and some masonry walls to fall. Structures must be designed to meet the regulations and standards associated with Zone 3 hazards.

Three pre-Quaternary faults/fault zones are located an approximate 20-mile radius of the project area. The Willows fault zone runs approximately 12 miles to the east of the project area. The East Valley fault runs to the west of the project area. The Midland fault zone runs approximately 10 miles to the southwest of the project area (Jennings 1994). None of these faults/fault zones are within an Alquist-Priolo Special Studies Zone (Hart and Bryant 1997). The active fault nearest to the project area is the Dunnigan Hills fault, 30 miles to the northwest (Jennings 1994). This fault is within an Alquist-Priolo Special Studies Zone (Hart and Bryant 1997). The critical earthquake for the project area would originate at the nearest point of the Midland fault zone or the Dunnigan Hills fault.

Ground-Shaking Hazard

On the basis of a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10% probability in 50 years (California Geological Survey 2003; Cao et al. 2003), the probabilistic peak horizontal ground acceleration values for the proposed project area are 0.1g to 0.2g (where g equals the acceleration speed of gravity). This indicates that the ground-shaking hazard in the project area is low. Farther to the west, the groundshaking hazard increases, coinciding with the increase in abundance of associated faults and fault complexes (California Geological Survey 2003; Cao et al. 2003).

Liquefaction and Related Hazards

Poorly consolidated, water-saturated fine sands and silts located within 50 feet of the surface are typically considered the most susceptible to liquefaction. Soils and sediments that are not water-saturated and that consist of coarser or finer materials are generally less susceptible to liquefaction (California Division of Mines and Geology 1997).

Depth to groundwater in the vicinity of the project area is low, and the project area is underlain mostly by somewhat fine sands. Even with the prevalence of silty sand deposits that underlie the project area, the susceptibility of soils and sediments to liquefaction is low because the groundshaking hazard in the project area is low.

Two potential ground failure types associated with liquefaction are lateral spreading and

differential settlement (Association of Bay Area Governments 2001). Lateral spreading involves a layer of ground at the surface being carried on an underlying layer of liquefied material over a nearly level surface toward a river channel or other open face. Lateral spreading is not a significant concern within the project area.

Another common hazard in the region is differential settlement, as soil compacts and consolidates to varying degrees after ground shaking ceases. Differential settlement occurs when the layers that liquefy are not of uniform thickness, a common problem when the liquefaction occurs in artificial fills. Settlement can range from 1% to 5%, depending on the cohesiveness of the sediments (Tokimatsu and Seed 1984). Differential settlement is not a significant concern within the project area.

Seiches

Seiches are earthquake-generated waves within enclosed or restricted bodies of water. The bodies of water most susceptible to seiches in or near the project area are the Sacramento River, the Yolo and Sacramento Bypasses, and the Deep Water Ship Channel. The dangers of seiches during seismic events are limited to those periods during the flood season when the Yolo and Sacramento Bypasses and Sacramento River are full. Overtopping of levees during this period could cause a limited amount of flooding; however, the risk of this happening is greatly reduced by the very limited time in which the Sacramento River and Yolo and Sacramento Bypasses are at these stages.

Land Subsidence

Historically, land subsidence has been a significant problem in the Sacramento-San Joaquin Delta and the southern half of the San Joaquin Valley. Subsidence occurs in three ways: as a result of compaction and oxidation of peat soils, hydrocompaction, and groundwater overdraft. The project area is not located in a portion of Yolo County that has experienced subsidence as a result of groundwater withdrawal. However, its proximity to such an area suggests it is possible for subsidence of this type to occur in the project area.

Volcanic Activity

Volcanic activity is not a concern within the project area because the nearest active volcanic region is located near Lassen Peak, approximately 200 miles to the northeast of the project area.

Landslides

Within the limits of ground disturbance of the project area, there is no risk of naturally occurring large landslides, since it is essentially flat and topographically featureless.

2.3.2 Environmental Impacts

Implementation of the proposed project would have a significant impact on geology, earth and soils if it would result in, or expose persons to, potential impacts involving one or more of the following:

- a) fault rupture;
- b) seismic ground shaking;
- c) seismic ground failure, including liquefaction;
- d) seiche, tsunami, or volcanic hazard;
- e) landslides or mudflows;
- f) erosion, changes in topography, or unstable soil conditions from excavation, grading, or fill;
- g) subsidence of the land;
- h) expansive soils; or
- i) impacts on unique geologic or physical features.

The following is a discussion of potential effects of the proposed project for each of these criteria.

- a) **Fault rupture.** No impact. Implementation of the proposed project will not expose persons to impacts involving fault rupture. The proposed project would not involve construction of any habitable structures, and therefore would not increase risks associated with fault rupture hazards.
- b) **Seismic ground shaking.** No impact. The project would not involve construction of any habitable structures, and therefore would not increase risks associated with ground shaking hazards. Should the proposed project identify economic quantities of natural gas, production facilities will be built in accordance with existing seismic design and construction standards.
- c) **Seismic ground failure, including liquefaction.** No impact. Activities associated with drilling and natural gas production are not expected to increase the potential for liquefaction. Drilling equipment and production facilities will be supported on piling to create a stable platform for drilling activities and production facilities.
- d) **Seiche, tsunami, or volcanic hazard.** No impact. The project site is not likely to be subject to tsunami or volcanic hazard. Activities associated with drilling and natural gas production are not expected to trigger a seiche.
- e) **Landslides or mudflows.** No impact. The proposed project is in a relatively flat area, and no existing landslide or mudflow features have been mapped or identified in the vicinity of the proposed project. None of the activities associated with drilling and natural gas production are expected to contribute to increased potential for landslides or mudflows.

- f) **Erosion, changes in topography, or unstable soil conditions from excavation, grading, or fill.** Less than significant impact. The proposed project will involve grading, excavation, backfilling, and compaction activities, at the drill site and along the pipeline alignment. These activities that could potentially result in erosion of soil. However, the project proponent will prepare and implement an erosion control plan prior to initiating any ground disturbance activities. The erosion control plan will be submitted to CDFG for review and approval.
- g) **Subsidence of the land.** Less than significant impact. The project will not involve construction of any habitable structures or other facilities, and therefore would not increase risks associated with land subsidence. Previous studies have shown that the principal causes of subsidence in the Sacramento Delta in order of importance include oxidation of organic carbon contained in peat deposits, soil consolidation caused by extraction of ground water and channelization of surface water, and natural consolidation. Less important causes include tectonic movement, wind erosion, and natural gas extraction.

In the Sacramento Delta, rates of subsidence due to peat oxidation are about 1 to 4 inches per year, whereas subsidence rates potentially attributable to natural gas extraction in the project region have been reported to be one order of magnitude less, ranging from 0.15 to 0.5 inches per year. However, soil descriptions indicate the project site will be developed on materials not associated with peat deposits. Accordingly, there is even less potential for subsidence within the project area.

Local subsidence could potentially be caused by the weight of the drilling equipment compressing shallow unconsolidated soil. However, the drill rig will be supported on piling seated on more compact soils at depth. Accordingly, no local subsidence of shallow soils is anticipated as a result of the presence of the drilling equipment.

- h) **Expansive soils.** No impact. The proposed project could involve the construction of structural facilities that may be affected by the presence of expansive soils. However, the proposed production facilities would be pile-supported and not susceptible to damage from expansive soils located at the site. Following placement of the pipeline, the trench would be filled with non-expansive materials. In no case would the project expose people to impacts from expansive soils. No impact would occur.
- i) **Impacts on unique geologic or physical features.** No impact. There are no known geologic or physical features of a unique nature located in the proposed project area. No impact is expected during implementation of the proposed project.

2.3.3 Mitigation Measures

Because implementation of the proposed project will not result in significant adverse effects on geology and soils, no mitigation measures are required.

2.4 Water Resources

2.4.1 Environmental Setting

The proposed project site is located within the Yolo Bypass Wildlife Area in an unincorporated area of Yolo County, California. The nearest waterways to the project site include Putah Creek 1.6 miles south of the well pad, the Sacramento River Deep Ship Channel located approximately 1.8 miles to the east of the drill site, Green Lake approximately 1.0 mile east of the pipeline alignment, and the Willow Slough Bypass approximately 0.2 miles north of the proposed pipeline tie-in point with an existing pipeline. Numerous drainage ditches and wetlands occur throughout the general project area. The proposed well pad will be constructed in an agricultural wetland used for growing rice crops.

Drainage from the proposed well pad traverses east about 0.5 miles to a drainage ditch that drains the general area near the well pad. Drainage in the Yolo Bypass flows southeasterly towards the Putah Creek Sinks and a toe drain along the western boundary of the Sacramento River Deep Water Ship Channel. The toe drain flows approximately 12 miles south and empties into Cache Slough and the Sacramento River.

Because of surface water infiltration and the low elevation of the project area, groundwater depth in the project area is shallow.

2.4.2 Environmental Impacts

Implementation of the proposed project would have a significant adverse environmental impact on water resources or conditions if it resulted in one or more of the following:

- a) changes in absorption rates, drainage patterns, or the rate and amount of surface runoff;
- b) exposure of people or property to water related hazards such as flooding;
- c) discharge into surface waters or other alterations of surface water quality;
- d) changes in the amount of surface water in any water body;
- e) changes in currents, or the course or direction of water movements;
- f) changes in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations, or through substantial loss of groundwater recharge capability;
- g) alter direction or rate of groundwater flow;
- h) impacts ground water quality; or
- i) substantial reduction in amount of groundwater otherwise available for public water supplies.

The following is a discussion of potential effects of the proposed project for each of these criteria.

a) **Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff.** Less than significant impact. The proposed project will not significantly alter the topography of the general project area. The proposed well pad will change the topography of approximately 2.64 acres for the construction of the well pad. However, the surface will be covered with gravel, which will allow absorption of water into the ground. Drainage from the well pad will continue to move to the east/southeast as it does presently. Work will be performed in accordance with an erosion control plan approved by CDFG.

b) **Exposure of people or property to water-related hazards such as flooding.** Less than significant with mitigation incorporated. Each gas well is a self-enclosed pressurized pipe system, and will be designed to have no open tanks or control systems subject to release or failure when flooding occurs in the Yolo Bypass. Numerous pumping stations and gas wells in the vicinity of the Yolo Bypass are designed with flood safety mechanisms.

The proposed project site is within the FEMA/ESRI 100-year flood zone and may be subject to flood levels fifteen (15) feet above ground level based on the edge of the 100-year flood zone at 25 feet msl. The wellhead will be enclosed with metal cages and production equipment will be elevated 12 feet above ground level at the drill site to prevent impacts associated with flooding. The project proponent does not propose to make any changes to levees or waterways that will expose additional people or property to flooding or other water related hazards.

c) **Discharge into surface waters or other alterations of surface water quality.** Less than significant impact with mitigation incorporated. The proposed project could result in a spill of hazardous and/or non-hazardous materials onto the ground, if not contained properly at the time of the spill. Pollutants could be discharged into adjacent waterways through storm water overland flow.

d) **Changes in the amount of surface water in any water body.** No impact. No project activities will require the use of surface waters during project implementation. Therefore, the project would not change the quantity of water in any rivers, channels, lakes, and/or sloughs.

e) **Changes in currents, or the course or direction of water movements**No impact. No project activities will occur within waterways. Therefore, the project would not affect currents or other water movements within these waterways.

f) **Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations, or through substantial loss of groundwater recharge capability.** No impact. Drilling and production activities will not involve withdrawal of groundwater from aquifers currently being used for water supply. Although excavation and potential dewatering activities would occur along the pipeline alignment, the magnitude of the excavation

and dewatering would not be sufficient to substantially affect shallow groundwater hydrology.

- g) **Altered direction or rate of flow of groundwater.** No impact. Excavation during construction of the gas pipelines would be relatively minor; therefore, the project will not appreciably alter the quantity or flow patterns of groundwater in the project area, nor will it alter the direction or flow rate of groundwater in the protect area.
- h) **Impacts on groundwater quality.** No impact. In compliance with DOGGR requirements, Kebo will install surface casing cemented in place from the surface to a minimum depth of 10% of the total hole depth. Casing is used to prevent blowouts and also protects shallower groundwater aquifers. Additionally, bentonite drilling mud is used for circulation and to seal the hole to prevent cross contamination of aquifers. Bentonite is an inert clay material, and it will not affect groundwater quality. If economic quantities of natural gas are identified, the boring will be cased and cemented to the target depth, thereby preventing potential contamination of shallower groundwater aquifers.
- i) **Substantial reduction in the amount of groundwater otherwise available for public water supplies.** No impact. Natural gas extraction is sometimes accompanied by extraction of production water from the natural gas production zone. However, this production water is not of a quality suitable for public water supply. The proposed project will not affect the amount of groundwater available for public water supplies.

2.4.3 Mitigation Measures

To ensure that environmental impacts on water quality are minimized and remain less than significant, the following mitigation measures will be implemented:

Mitigation Measure 2.4.3a

Elevate and/or enclose production equipment. Production equipment will be elevated above the 100-year flood levels and well heads will be enclosed with metal cages.

Mitigation Measure 2.4.3b

Properly dispose of generated waste. Waste generated during project activities shall be stored in designated waste collection containers away from waterways and shall be disposed of according to applicable regulatory requirements.

Mitigation Measure 2.4.3c

Properly maintain vehicles and equipment. Vehicles and equipment shall be maintained properly to prevent leakage of hydrocarbons and other automotive fluids. All maintenance shall occur in designated areas located away from waterways.

Mitigation Measure 2.4.3d

Locate fueling areas to minimize risk of water contamination. An earthen berm will be

constructed around the drill sites to prevent the possibility of any spilled hydrocarbons from reaching surface water adjacent to the site.

Mitigation Measure 2.4.3e

Maintain accessibility to spill prevention and response equipment. Spill prevention and response equipment, including drip pans, drop cloths, and absorbent materials, shall be kept at all designated maintenance and fueling areas. Steel sheet-piling will be used as an effective secondary containment for any potential surface spill.

Mitigation Measure 2.4.3f

Promptly clean up spills and notify responsible agencies. Any accidental spill of hydrocarbons or other vehicle fluids shall be cleaned up immediately. Crewmembers shall use absorbent material to prevent a spill from entering waterways. Responsible agencies shall be notified immediately in the event of an accidental spill to ensure proper clean up and disposal of the spilled material.

2.5 Air Quality

2.5.1 Setting

Regional Climate and Meteorology

The geographical features that make up the Sacramento Valley dictate the climate in the project area. The Sierra Nevada binds the Sacramento Valley to the east, and coastal ranges impede winds from the west. The project area is approximately 4 miles from the Sacramento metropolitan area. The lack of barriers and flat valley floor allow pollutants to readily disperse throughout the Sacramento Valley.

The air quality of the region is impacted by pollution generated from other regions, primarily Sacramento, the upper Sacramento Valley, and the San Francisco Bay area. Moist marine breezes originating from the south (through the Carquinez Strait) help diffuse and dilute pollutants during the summertime. In the winter, sea breezes weaken from the south due to smaller temperature and pressure gradients. During this season, the Pacific High Pressure Cell migrates south. Dry winds from the north become more frequent, although winter storms can still bring strong southerly winds. The region is categorized as a Mediterranean climate with warm and dry summers along with cool winters during which most of the annual precipitation occurs. The absence of the Pacific High Pressure Cell in the winter allows storms that are normally deflected away by the cell to reach inland and subsequently drop their precipitation. The project area's inland position can create large diurnal fluxes in temperature and precipitation.

The phenomenon of temperature inversions can drastically change the overall air quality in the project area. Typical winter inversions are formed when the sun heats the upper layers of air, trapping air below that has been cooled by contact with the cooler earth surface during the night. Between late spring and early fall, an inversion layer forms when warm air from the

Valley is forced above the cool air (due to its density) from the Sacramento-San Joaquin Delta and San Francisco Bay. In either case, the warm air forms a ceiling that prevents vertical diffusion of the air column. Both types of inversion layers make dispersion and dilution of pollutants more difficult. Inversion layers can be critical in influencing ambient air pollutant concentrations. The warm upper layer forms a trap that stagnates the air below, allowing large concentrations of carbon monoxide and particulate matter to accumulate in the profile. Ozone can also be generated in these inversion layers as ozone precursors build up and react in the inversion profile (with the presence of sunlight).

Another phenomenon that contributes to the poor air quality in the Sacramento Valley is called the “Schultz Eddy”. Predominate southwesterly winds generally move pollutants out of the Valley to the north. However, during the summer and early fall, the Schultz Eddy essentially reverses this trend and causes pollutants to be blown south back into the Sacramento area. The phenomenon usually dissipates by noon with the arrival of Delta sea breezes. As in the case with inversion layers, this phenomenon can significantly affect ambient air pollutant concentrations.

Regional Air Quality

In order to gauge the healthfulness of a region’s air quality, the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) have established threshold concentrations for air contaminants in the ambient air. Ambient air samples are analyzed and compared to levels set by the governing agency. Both California and the federal government have established their own health-based ambient air quality standards for the following criteria pollutants: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns (PM₁₀), particulate matter less than 2.5 microns (PM_{2.5}), and lead (Pb). These standards are in place to protect sensitive receptors with an adequate margin of safety from adverse health effects. The California ambient air quality standards (CAAQS) are more stringent than the national standards (NAAQS). California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. The state and national ambient air quality standards for each of the criteria pollutants are summarized in Table 2-1, Ambient Air Quality Standards. The relevant health effects associated with the major criteria pollutants are described in Table 2-2, Health Effects Summary of the Major Criteria Pollutants.

Currently, the Sacramento Valley Air Basin in the vicinity of the project is designated as nonattainment for the federal 8-hour ozone standard, the state 1-hour ozone standard, and the state PM₁₀ standards. A considerable amount of the ozone that is monitored in this area results from pollutants that have been transported from the Sacramento metropolitan area. Due to the lack of physical barriers and coastal winds blowing inland, air pollution generated in the metropolitan Bay Area is also easily spread to surrounding regions such as the Sacramento Valley.

The PM₁₀ emissions in the project area arise from agricultural processes that dominate the project region. The presence of inversion layers can augment the ambient air concentrations

**Table 2-1
 Ambient Air Quality Standards**

Pollutant	Averaging Time	National Standards	California Standards
Ozone	1 Hour	0.12 ppm	0.09 ppm
	8 Hour	0.08 ppm	--
Nitrogen Dioxide	Annual Average	0.05 ppm	--
	1 Hour	--	0.25 ppm
Sulfur Dioxide	Annual Average	0.03 ppm	--
	24 Hour	0.14 ppm	0.05 ppm
	1 Hour	--	0.5 ppm
Carbon Monoxide	8 Hour	9 ppm	9 ppm
	1 Hour	35 ppm	20 ppm
Particulate Matter (PM ₁₀)	Annual	50 µg/m ³	20 µg/m ³
	24 Hour	150 µg/m ³	50 µg/m ³
Particulate Matter (PM _{2.5})	Annual	15 µg/m ³	12 µg/m ³
	24 Hour	65 µg/m ³	--
Lead	30-Day Average	--	1.5 µg/m ³
	Monthly Average	1.5 µg/m ³	--

Notes:
 ppm = parts per million
 µg/m³ = micrograms per cubic meter
 Source: CARB 2007.

of pollutants such as CO, ozone, and PM₁₀. Directly emitted pollutants have the ability to stay in an inversion profile without mixing or diluting, causing an increase in pollutant concentration. Measures are being taken to reduce PM₁₀ emissions from agricultural processes such as regulating agricultural burning, required field wetting, and experiments involving till versus no till treatments.

Local Air Quality

The project area is governed by the Yolo-Solano Air Quality Management District (YSAQMD). It is the duty of the YSAQMD to adopt and enforce air quality related rules and regulations. The primary goal of the YSAQMD is to ensure clean and healthful air for the public. The YSAQMD is also responsible for bringing the area into attainment with both national and California ambient air quality standards (NAAQS and CAAQS, respectively). Progress towards attainment is measured at local air quality monitoring stations. The closest air monitoring station to the proposed project is in Davis. The monitoring station is located on the University of California Davis campus where all of the primary criteria pollutants are monitored with the exceptions of sulfur dioxide (SO₂), sulfates, and particulate matter (PM₁₀

**Table 2-2
 Health Effects Summary of the Major Criteria Pollutants**

Pollutants	Sources	Adverse Effects
Ozone (O ₃)	Atmospheric reaction of organic gases with nitrogen oxides in the presence of sunlight.	Aggravation of respiratory and cardiovascular diseases. Irritation of eyes. Impairment of cardiopulmonary function. Plant leaf injury.
Nitrogen Oxide (NO ₂)	Motor vehicle exhaust. High temperature stationary combustion. Atmospheric reactions.	Aggravation of respiratory illness. Reduced visibility. Reduced plant growth. Formation of acid rain.
Carbon Monoxide (CO)	By-products from incomplete combustion of fuels and other carbon containing substances, such as motor exhaust. Natural events, such as decomposition of organic material.	Reduced tolerance for exercise. Impairment of mental function. Impairment of fetal development. Death at high levels of exposure. Aggravation of some heart diseases (angina).
Suspended Particulate Matter (PM _{2.5} and PM ₁₀)	Stationary combustion of solid fuels. Construction activities, industrial processes, Atmospheric chemical reactions.	Reduced lung function. Aggravation of effects of gaseous pollutants. Aggravation of respiratory and cardiorespiratory diseases. Increased cough and chest discomfort. Soiling. Reduced visibility.
Sulfur Dioxide (SO ₂)	Combustion of sulfur containing fossil fuels. Smelting of sulfur bearing metal ores. Industrial processes.	Aggravation of respiratory diseases (asthma, emphysema). Reduced lung function. Irritation of the eyes. Reduced visibility. Plant injury. Deterioration of metals, textiles, leather, finishes, coatings, etc.
Lead (Pb)	Contaminated soils (e.g., from leaded fuels and lead based paints).	Impairment of blood function and nerve construction. Behavioral and hearing problems in children.

Source: CARB 2007.

Source: CARB 2007.

and PM_{2.5}).

Sensitive Receptors

An individual whose immune system has not yet developed completely or has diminished a significant amount is labeled as “sensitive receptor”. These populations are more susceptible to respiratory infections and other air quality related health problems. Sensitive receptors in a

project's vicinity are given special attention to prevent exposing children, the elderly, and the ill to toxic air contaminants (TACs). These sensitive populations are more prone to health problems associated with TAC exposure. Certain land uses are regarded as sensitive receptors due to the types of people that occupy them. Some of these land uses include: elementary and secondary schools, hospitals, childcare centers, and retirement homes. Residential areas are also considered sensitive receptors due to the presence of children and the elderly who may live there.

The area surrounding the proposed project site is composed of unoccupied and undeveloped land, Interstate 80, and agricultural fields. There are currently no sensitive receptors such as hospitals, elementary schools, childcare centers, or retirement homes in the vicinity of the project site.

Toxic Air Contaminants

Federal

Regulation of TACs, termed Hazardous Air Pollutants (HAPs) under federal regulations, is achieved through federal and state controls on individual sources. Federal law defines HAPs as non-criteria air pollutants with short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects. The 1990 federal Clean Air Act (CAA) Amendments instituted a comprehensive plan for achieving significant reductions in both mobile and stationary source emissions of HAPs. Under the 1990 CAA Amendments, a total of 189 chemicals or chemical families were designated as HAPs because of their adverse human health effects. Title III of the 1990 federal CAA Amendments amended Section 112 of the CAA to replace the former program with an entirely new technology-based program. Under Title III, the EPA must establish maximum achievable control technology emission standards for all new and existing "major" stationary sources. Major stationary sources of HAPs are required to obtain an operating permit from the YSAQMD pursuant to Title V of the 1990 CAA Amendments.

State

California law defines TACs as air pollutants having carcinogenic or other health effects. Assembly Bill (AB) 1807 (the Tanner Bill, passed in 1983) established the State Air Toxics Program and the methods for designating certain chemicals as TACs. A total of 244 substances have been designated TACs under California law. They include the (federal) HAPs adopted as TACs in accordance with AB 2728. After a chemical has been identified as a TAC, the ARB develops Airborne Toxic Control Measure(s) to reduce its emissions and associated health impacts. Currently, the CARB is implementing and proposing control measures to limit the emissions from heavy-heavy-duty trucks and other diesel engines.

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; AB 2588 does not regulate air toxic emissions directly. Under AB 2588, sources emitting more than 10 tons per year of any

criteria air pollutant must estimate and report their toxic air emissions to the local air districts. The local air districts then prioritize facilities on the basis of emissions and “high priority” facilities are required to submit a health-risk assessment and communicate the results to the affected public. Depending on the risk levels, emitting facilities are required to implement varying levels of risk reduction measures. The YSAQMD is responsible for implementing AB 2588 in the Yolo and northeastern Solano County.

Regulatory Considerations

US Environmental Protection Agency

The EPA is responsible for enforcing the CAA and the national ambient air quality standards (NAAQS) that it establishes. These standards identify levels of air quality for seven “criteria” pollutants: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), and lead (Pb). The thresholds are considered to be the maximum levels of ambient (background) air pollutants determined safe (within an adequate margin of safety) to protect the public health and welfare.

The EPA designates air basins as being in “attainment” or “nonattainment” of NAAQS for each of the seven “criteria” pollutants. Nonattainment air basins are ranked (marginal, moderate, serious, severe, or extreme) according to the degree of nonattainment levels. The air basin is then required to submit a State Implementation Plan (SIP) that describes how the state will achieve the federal standards by specified dates. The extent of a given SIP depends on the severity of the air quality in the specific air basin. The status of the project area with respect to attainment with the NAAQS is summarized in Table 2-3.

**Table 2-3
 Attainment Status of Yolo-Solano Air District**

POLLUTANT	ATTAINMENT FOR FEDERAL STANDARD	ATTAINMENT FOR STATE STANDARD
Ozone	No/Severe	No/Serious
NO_x	Yes	Yes
PM₁₀	Yes	No
SO_x	Yes	Yes
CO	Yes	Yes

The 1990 CAA Amendments were enacted in order to better protect the public’s health and utilize more efficient methods of reducing pollution emissions. The major areas of improvement from the amendments include: air basin designations, automobile/heavy-duty engine emissions, and toxic air pollutants. In response to the rapid population growth and the associated rise in motor vehicle operations, the 1990 CAA Amendments addressed tailpipe emissions from automobiles, heavy-duty engines, and diesel-fueled engines. The 1990 Amendments established more stringent standards for hydrocarbons, NO x, and CO emissions in order to reduce ozone and carbon monoxide levels in heavily populated areas. Fuels

became more strictly regulated by requiring new fuels to be less volatile, contain less sulfur (regarding diesel fuels), and have higher levels of oxygenates (oxygen-containing substances to improve fuel combustion). The EPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf), and those that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.

California Air Resource Board

The ARB, a branch of the California Environmental Protection Agency (CalEPA), oversees air quality control and planning throughout California. It is primarily responsible for ensuring the implementation of the California Clean Air Act (CCAA), responding to the federal CAA requirements, and regulating motor vehicle emissions and consumer products within the state. In addition, the ARB sets health-based air quality standards (CAAQS) and control measures for toxic air contaminants (TAC). However, the focus of most of its research goes toward motor vehicle emissions since they are the largest concern regarding air pollution in California. The ARB establishes new standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications in order to further reduce vehicular emissions.

The CCAA established a legal mandate for air basins to achieve the California ambient air quality standards by the earliest practical date. These standards apply to the same seven criteria pollutants as the federal CAA and also include sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. State standards are more stringent than the federal standards, and in the case PM₁₀ and SO₂, far more stringent. The CCAA requires that nonattainment area develop an attainment plan to bring the district within attainment. In the case of nonattainment for ozone, as is the case in the YSAQMD, the plan is required to produce a five percent annual reduction in ozone precursor emissions. The ARB supervises and supports the regulatory activities of local air quality districts as well as monitors air quality itself. Health and Safety Code Section 39607(e) requires the ARB to establish and annually review area designation criteria. These designation criteria provide the basis for the ARB to designate areas of the state as “attainment,” “nonattainment,” or “unclassified” according to state standards. Finally, Health and Safety Code Section 39608 authorizes the ARB to use the designation criteria to designate areas of California and to annually review those area designations.

The CARB makes area designations for 10 criteria pollutants: O₃, CO, NO₂, SO₂, PM₁₀, PM_{2.5}, sulfates, lead, hydrogen sulfide, and visibility-reducing particles. The status of the project area with respect to attainment with the CAAQS is summarized in Table 2-3.

Yolo-Solano Air Quality Management District

The YSAQMD is the primary agency responsible for meeting state and federal ambient air quality standards for all criteria pollutants in the project area. The YSAQMD not only regulates the criteria pollutants, but also takes actions to minimize TACs and nuisance odors

in its jurisdiction. In order to accomplish these goals, the YSAQMD uses its authority to regulate, permit, and inspect local point sources. Though the state is responsible for mobile sources, the YSAQMD has the authority to implement transportation control measures. Automotive vehicle exhaust contains criteria pollutants such as NO_x and VOC, both of which are precursors to ozone. The YSAQMD works together with other Sacramento area districts to maintain the area's portion of the SIP.

2.5.2 Environmental Impacts

The proposed project would have a significant adverse environmental effect on air quality if it would:

- a) violate an air quality standard or contribute to an existing or projected air quality violation;
- b) expose sensitive receptors to pollutants;
- c) alter air movement, moisture, or temperature or cause any change in climate; or
- d) generate objectionable odors,

The following is a discussion of the potential effects of the proposed project for each of these significance criteria.

- a) **Violate an air quality standard or contribute to an existing or projected air quality violation.** Less than significant impact with mitigation incorporated. Site preparation and restoration phases include earth-moving activities that generally have the potential to generate emissions of fine particulate matter (PM₁₀ and PM_{2.5}), as well as tailpipe emissions of diesel particulate, nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), and reactive organic gases (ROG). PM₁₀ and PM_{2.5} emissions are potentially the most significant. However, the total number of vehicles and duration of use will be limited during these phases.

Particulate emissions may result from the construction of roads and the clearing of vegetation and leveling of the drilling pad. Particulate emissions may also result from driving vehicles over unpaved roads. The proposed project will adopt mitigation measures, such as the watering of roadway surfaces, in order to reduce particulate emissions from unpaved roadway surfaces.

In addition to the normal construction activities, the drilling phase also includes the use of portable diesel engines to power electrical generators for power used at the site and to power the drill rigs. All engines will comply with permitting requirements of YSAQMD (i.e., all engines greater than 50 horsepower will have either a permit from YSAQMD or will meet all requirements of the Statewide Portable Equipment Registration Program). Therefore, the emissions from drilling activities will be mitigated to the level of non-significance.

During the production phase, a well may be developed at the drill site if economic quantities of natural gas are discovered during the drilling and testing phase of the proposed project. Size of the deposit, pressure, composition of the natural gas, and water content are all important variables that cannot be determined until after an economic well is discovered and tested. Accordingly, potential emissions associated with this phase of the proposed project cannot be quantified at this time. Nevertheless, mitigation can be proposed and the level of significance can be determined.

The production phase of the proposed project may include two sub-phases. Generally, a natural gas deposit will be under sufficient pressure to push the gas to the surface, where the pressure is reduced at the choke. After this pressure has been relieved, gas is pumped from the well through use of a compressor (a pump driven by a diesel engine).

During the free-flow phase, gas passing through the choke will cool and must be heated with indirect heating from a natural gas fired burner. Emissions from the natural gas fired burner are exhausted to the atmosphere, including emissions of NO_x, CO, and ROG. The exact size of the burner for this operation will not be known until after the well is drilled. However, it is expected that the burner will operate at less than 10 million BTU per hour. This is a small burner and is exempt from permitting requirements of YSAQMD. Emissions will be below the level of significance.

During the pumping phase, the burner will potentially be replaced by a pump driven by a 100-horsepower diesel engine. As discussed above for the drilling phase, any diesel engine greater than 50 horsepower will follow permitting requirements of YSAQMD.

Production water storage tanks will contain liquid water from the well. The water may contain small amounts of light hydrocarbons (such as hexane, benzene, toluene) originating with the methane in the well. As the storage tank is filled, the displaced air in the head space is vented from the tank. This is a potential source of emissions of ROG and individual hydrocarbon compounds.

In addition to the exhaust stacks and vents in the production equipment, another potential source of emissions is leaks from valves and flanges throughout the production equipment. This is a potential source of ROG and the individual compounds that comprise the ROG. These losses are minimal to non-existent, as they would represent a safety hazard and a loss of product.

In summary, each phase of the proposed project may result in a minor increase in air emissions. Emissions from construction related activities, including PM₁₀ emissions from earth-moving activities will be mitigated, as necessary, and are considered to be less than significant. Upon completion of the drilling and testing phase (after production specific data becomes available), production operations will be designed and any necessary mitigation will be identified and installed. This process will assure

that no air quality standards will be violated and that the project will not contribute to an existing or projected air quality violation.

Implementation of each phase of the proposed project will not violate any air quality standard or contribute to an existing or projected air quality violation. Potential impacts associated with each phase of the project are considered to be less than significant with mitigation.

- b) **Expose sensitive receptors to pollutants.** Less than significant with mitigation. Even though the proposed project is located in a very remote, rural setting, it is possible that sensitive receptors could be exposed to fugitives dust emissions, diesel emissions, and emissions from production equipment. Mitigation is proposed to reduce fugitive dust emission impacts to a less than significant level.

Emissions from the various stationary source diesel engines used during the drilling and production phases of the project are considered less than significant as all stationary source diesel engines (including portable engines) that are greater than 50 horsepower will meet permitting requirements and strict emission control requirements of the YSAQMD.

During the drilling phase of the project more detailed information will be available for appropriate design of the natural gas production equipment. Potential emissions and their sources have been identified qualitatively. The project proponent has committed to submit permit applications to the YSAQMD and to comply with the resulting permit conditions issued with the YSAQMD permits. Accordingly, impacts associated with emissions from production equipment are considered less than significant.

- c) **Alter air movement, moisture, or temperature or cause any change in climate.** No impact. The proposed project would not alter air movement, moisture, or temperature or cause any change in climate.
- d) **Generate objectionable odors.** Less than significant. Natural gas drilling, production wells, and associated operations are not likely sources of objectionable odors. Due to the rural location of the proposed operation, it is very unlikely that any odors at all will be an issue.

2.5.3 Mitigation Measures

The following mitigation measures will be incorporated into the project to ensure that project impacts on air quality remain less than significant.

Mitigation Measure 2.5.3a

Minimize fugitive dust emissions. To minimize the generation of fugitive dust emissions, the project proponent shall implement the following dust control measures:

- Water all active construction areas, as needed.
- Cover all trucks hauling soil, sand, or other loose materials or require all trucks to maintain at least two feet of freeboard.
- Apply water on all unpaved access roads, parking areas, and staging areas, as needed.
- Sweep (with water sweepers) all paved access roads, parking areas and staging areas, as needed.
- Sweep public streets (with water sweepers) if visible soil material is carried onto adjacent public streets.

2.6 Transportation and Circulation

2.6.1 Environmental Setting

Vehicle access to the proposed project site is via Federal Interstate 80 (I-80), which links the area to other major arterials from surrounding regions. However, I-80 is not located directly next to the proposed well site. In order for vehicles to access the well site, the following route from I-80 would most likely be utilized:

- From I-80, traffic would take Exit 78, and would then turn left (east) on to County Road 32B;
- Traffic would then turn right onto an unnamed gravel roadway that crosses over a levee.
- Traffic would then turn right (south) on to another unnamed gravel road. Traffic would then follow a number of other unnamed gravel roadways to the project site.

All traffic related to implementation of the proposed project will obey the following speed limit rules when traveling to and from the project site:

- When traveling on access roadways within the Yolo Bypass Wildlife Area, all project personnel will obey a speed limit of 15 miles per hour.
- When traveling on local, state and federal roadways, project personnel will observe all posted speed limits.

2.6.2 Environmental Impacts

The proposed project will have a significant effect on traffic/circulation if it results in one or more of the following:

- a) increased vehicle trips or traffic congestion;
- b) hazards to safety from design features (e.g., sharp curves or dangerous intersection) or incompatible uses (e.g., farm equipment);
- c) inadequate emergency access or access to nearby uses;
- d) insufficient parking capacity on-site or off-site;
- e) hazards or barriers for pedestrians or bicyclists;

- f) conflicts with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks);
- g) air, waterborne, and/or rail traffic impacts.

The following is a discussion of potential effects of the proposed project for each of these significance criteria.

- a) **Increased vehicle trips or traffic congestion.** Less than significant impact. As previously discussed in Section 2.1.2, implementation of the proposed project will result in a minor increase in vehicle trips as necessary to transport crew and equipment to the site during site preparation, drilling and testing, and construction of the production facility and pipeline. However, the proposed project will not generate substantial long-term operational trips during production. Because project generated truck and employee vehicle trips would be short-term in nature during site preparation, drilling and testing, and construction period only, the impact of these trips on the local circulation system is considered less than significant.
- b) **Hazards to safety from design features or incompatible uses.** No impact. Construction of the pipeline facilities will take place within privately owned access roadways. The project will not result in impacts regarding hazards to safety from design features or incompatible uses.
- c) **Inadequate emergency access or access to a nearby use.** Less than significant impact. The proposed project would not result in any permanent structure affecting emergency access. Pipeline construction would not result in total blockage of any public roadways. Construction of the pipeline would be short term and would not alter existing emergency access or prevent access to nearby land uses. If the access road is impacted by pipeline construction, it would be restored at the end of each work day.
- d) **Insufficient parking capacity on-site or off-site.** No impact. Implementation of a natural gas well drilling program requires a limited number of vehicle parking spaces over a short period of time. All project related parking spaces will be within the designated staging and/or work area. Production facilities are unmanned. Accordingly, the project will not result in impacts associated with parking capacity.
- e) **Hazards or barriers for pedestrians or bicyclists.** Less than significant impact. The proposed project will result in a temporary increase in project generated traffic in the project vicinity during site preparation, drilling and testing and construction periods. However, these activities are short-term. While this traffic would temporarily increase the risk of a traffic hazard for pedestrians and bicyclists, no sidewalks or designated bike trails are located within the project site. The project would not result in the introduction of any substantial or long-term hazards or barriers for pedestrians or bicyclists either onsite or offsite.

f) **Conflicts with adopted policies supporting alternative transportation.** No Impact. Implementation of the proposed project will not result in any permanent residences, permanent employment, or other features that could affect regional transportation. Accordingly, there will be no conflicts with adopted policies supporting alternative transportation. No impact is expected.

g-h) **Air, waterborne or rail traffic impacts.** No impact. Implementation of the proposed project will not result in impacts to air traffic. No project activities will occur within any waterway. The proposed interconnect point of the proposed pipeline with the existing pipeline north of the well site will take place adjacent to an existing, railroad line. The railroad line is currently utilized for train traffic. Construction work will occur outside of the railroad line. Therefore, the project is not expected to interfere with the operation of the railroad line.

2.6.3 Mitigation Measures

Because implementation of the proposed project will not result in significant adverse effects to traffic and circulation, no mitigation measures are required.

2.7 Biological Resources

2.7.1 Environmental Setting

Biological resources considered in this assessment include terrestrial and aquatic habitats, migratory and wintering wildlife populations, and special-status plant and wildlife species known or having potential to occur during project implementation. Vegetation communities and common wildlife found in the project area, as well as known and potentially occurring special-status plant and wildlife species are described in the setting section below. Descriptions of potential impacts that the proposed project could have on biological resources within the project area, and mitigation measures to minimize or avoid potential impacts are also described.

Information reviewed and techniques utilized to prepare this biological assessment included the following:

- a search of the California Natural Diversity Database (CNDDDB) (CDFG 2007), the California Native Plant Society's (CNPS) *Electronic Inventory of Rare and Endangered Plants* (CNPS 2007), and the USFWS online electronic database of special-status species (USFWS 2007). The findings of these searches are depicted on Figure 6;
- a wetland delineation conducted on March 29 and April 11, 2007, to delineate waters of the United States. The findings of this investigation are discussed in a wetland delineation report, which is included as part of the biological assessment report attached as Appendix B;

- a reconnaissance-level biological survey conducted by Robert A. Booher Consulting (RAB Consulting) biologists on March 29 and April 11, 2007, to determine the presence or absence of special-status wildlife species, and to collect data on habitats and common wildlife species present (attached as Appendix B);
- contact with regulatory agencies and others with knowledge of biological resources within the project area; and
- a review of the Jepson Manual: Higher Plants in California (Hickman 1996).

Major Vegetation Communities

Three (3) biological communities were documented in the project area: ruderal/disturbed, fresh emergent wetland, and annual grassland. For the purposes of this biological assessment, these communities correspond to those described in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). Each of these communities is described further below.

Ruderal/Disturbed

The ruderal/disturbed vegetative community type was identified within the project study area wherever disturbed soils occurred, active land uses were present, or active land uses were absent where disturbance had occurred in the recent past. This vegetative community was primarily observed along the existing access roadways /pipeline route. Common vegetative species found in this community were composed of weedy non-native species. Common species identified during the field visit included: redroot pigweed (*Amaranthus retroflexus* L.), field mustard (*Brassica campestris*), black mustard (*Brassica nigra* L. Koch), yellow-star thistle (*Centaurea solstitialis*), poison hemlock (*Conium maculatum*), large crabgrass (*Digitaria sanguinalis* (L.) Scop.), quackgrass (*Elytrigia repens* (L.) Nevski), common willow herb (*Epilobium ciliatum* ssp. *ciliatum*), red-stemmed filaree (*Erodium cicutarium*), fennel (*Foeniculum vulgare*), California mustard (*Guillenia lasiophylla*), cow parsnip (*Heracleum lanatum*), prickly lettuce (*Lactuca serriola* L.), common mallow (*Malva neglecta* Wallr.), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), white sweetclover (*Melilotus alba*), wild radish (*Rhaphanus sativus*), perennial sowthistle (*Sonchus arvensis* L.), and annual sowthistle (*Sonchus oleraceus*).

Although often comprised of non-native plant species, ruderal habitats, particularly at edges of natural communities, can provide foraging habitat for many species of birds and mammals. In the Sacramento Delta, these habitats can be occupied by California ground squirrels and other rodents, and can potentially support burrowing owl (*Athene cunicularia*) nest sites.

Fresh Emergent Wetland

The fresh emergent wetland vegetative community was observed within the footprint of the

proposed well pad, and within drainage ditches and wetland areas along the proposed pipeline route/existing access route. Fresh emergent wetlands are characterized by erect, rooted herbaceous hydrophytes. Dominant vegetation generally consists of perennial monocots up to 6.6 feet tall. All emergent wetlands are flooded frequently, enough so that the roots of the vegetation prosper in an anaerobic environment. The acreage of Fresh Emergent Wetlands in California has decreased dramatically since the turn of the century due to drainage and conversion to other uses, primarily agriculture.

Vegetative species observed during field surveys included water plantain (*Alisma plantago-aquatica*), coyote bush (*Baccharis piliaris*), poison hemlock (*Conium maculatum*), California sedge (*Carex californica*), oakleaf goosefoot (*Chenopodium glaucum* L.), Pacific golden-saxifrage (*Chrysosplenium glechomifolium* Nutt.), tall flatsedge (*Cyperus eragrostis*), Baltic rush (*Juncus Balticus*), toad rush (*Juncus bufonius* L.), common rush (*Juncus effusus*), Mexican rush (*Juncus mexicanus* Willd.), miner's lettuce (*Montia perfoliata* (Donn) T.J. Howell), white-head navarretia (*Navarretia leucocephala* Benth.), swamp smartweed (*Polygonum amphibium*), rabbitsfoot grass (*Polypogon monspeliensis* L. Desf), California rose (*Rosa californica*), Himalayan blackberry (*Rubus discolor*), California blackberry (*Rubus ursinus*), clustered dock (*Rumex conglomeratus*), curly dock (*Rumex crispus* L.), common tule (*Scirpus acutus*), California bulrush (*Scirpus californicus*), bulrush (*Scirpus microcarpus*), duckweed (*Spirodela oligorrhiza*), narrow-leaved cattail (*Typha angustifolia*), broad-leaved cattail (*Typha latifolia*), and cocklebur (*Xanthium strumarium* L.).

Fresh emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds and numerous mammals, reptiles, and amphibians. Many species rely on fresh emergent wetlands for their entire life cycle. Wildlife species commonly found in this community include song sparrows (*Melospiza melodia*), red-winged blackbirds (*Agelaius phoeniceus*), raccoons (*Procyon lotor*), California voles (*Microtus californicus*), California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), black-tailed deer (*Odocoileus hemionus columbianus*), and skunks (*Mephitis* sp.). This community is a sensitive community because of historic and continuing loss of wetland habitats from agricultural conversion, urbanization, and flood control development. At the time of our field visit, this wetland feature contained no standing water.

Annual Grassland

California annual grassland was observed along portions of the shoulder of the proposed access roadway/pipeline alignment. Common species found in this community were composed of introduced grasses and broadleaf weedy species, which quickly re-colonize disturbed areas.

Common species identified during the field visit included wild oat (*Avena fatua*), black mustard (*Brassica nigra* L. Koch), ripgut (*Bromus rigidus* Roth), soft cheat grass (*Bromus secalinus* L.), soft chess (*Bromus mollis*), yellow-star thistle (*Centaurea solstitialis*), California mustard (*Guillenia lasiophylla*), foxtail barley (*Hordeum leporinum*),

Mediterranean barley (*Hordeum marinum*), perennial rye grass (*Lolium perenne*), common mallow (*Malva neglecta* Wallr.), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), bristly ox-tongue (*Picris echioides*), and wild radish (*Rhaphanus sativus*).

Grasslands support a variety of mammals, birds, and reptiles, and provide foraging habitat for raptors. Many species use the grassland for only part of their habitat requirements, foraging in the grassland and seeking cover in surrounding tree and scrub cover. Grassland cover provides foraging, nesting, and denning opportunities for resident species such as western fence lizard (*Sceloporus occidentalis*), northern alligator lizard (*Elgaria coerulea*), gopher snake (*Pituophis melanoleucus*), western meadowlark (*Sturnella neglecta*), goldfinch (*Carduelis tristis*), ring-necked pheasant (*Phasianus colchicus*), red-winged blackbird (*Agelaius phoeniceus*), California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), pocket gophers (*Thomomys* spp.), black-tailed jackrabbit (*Lepus californicus*), and occasionally black-tailed deer (*Odocoileus hemionus columbianus*).

The rodent, bird, and reptile populations offer foraging opportunities for avian predators such as the northern harrier hawk (*Circus cyaneus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), barn owl (*Tito alba*), and great horned owl (*Bubo virginianus*). Mammalian predators which utilize grasslands include gray fox (*Urocyon cinereoargenteus*) and long-tailed weasel (*Mustela frenata*). Foraging activity of these predatory species, which tend to require relatively undisturbed habitat, is generally limited to the undeveloped fringes of the Project Area where habitat fragmentation has not occurred and human activity is limited.

Sensitive Habitats and Species

Sensitive habitats are especially diverse, regionally uncommon, considered sensitive habitats (as defined by the CNDDDB), or regulated by federal or state agencies (e.g., Section 404 of the Clean Water Act). Most sensitive habitats are given special consideration because they provide important ecological functions, including filtering of surface waters (wetlands) and providing essential habitat for common and special-status plant and wildlife species. The only habitat type described previously that qualifies as a sensitive habitat in the proposed project area is fresh emergent wetland. No naturally occurring vernal pools were identified during the wetland assessment.

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts (ESAs) or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are species that fall into the following categories:

- plants or animals listed or proposed for listing as threatened or endangered under the federal ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 1711 [listed animals] and various notices in the Federal Register [FR][proposed species]);
- plants or animals that are candidates for possible future listing as threatened or

endangered under the federal ESA (61 FR 40, February 28, 1996);

- plants or animals designated as "species of special concern" by CDFG and USFWS;
- plants or animals listed or proposed for listing by the State of California as threatened;
- endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);
- plants listed as rare or endangered under the California Native Plant Protection Act (CDFG Code, Section 1900 et seq.);
- plants that meet the definitions of rare or endangered under CEQA [State CEQA Guidelines, Section 15380];
- animals fully protected in California (CDFG Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]);
- plants considered under the CNPS to be "rare, threatened, or endangered in California" (Lists I B and 2 in CNPS 2007); and
- plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2007), which may be included as special-status species on the basis of local significance or recent biological information.

Special-status species known to occur or with potential to occur in the proposed project area were determined based on:

- a search of the CNDDDB (CNDDDB 2007), the CNPS *Electronic Inventory of Rare and Endangered Plants* (CNPS 2007), and the USFWS online electronic database of special-status species (USFWS 2007). The findings of these searches are depicted on Figure 6;
- a wetland delineation conducted on March 29 and April 11, 2007, to delineate waters of the United States;
- a reconnaissance-level biological survey conducted by RAB Consulting biologists on March 29 and April 11, 2007, to determine the presence or absence of special-status wildlife species, and to collect data on habitats and common wildlife species present;
- contact with regulatory agencies and others with knowledge of biological resources within the project area; and
- a review of the Jepson Manual: Higher Plants in California (Hickman 1996).

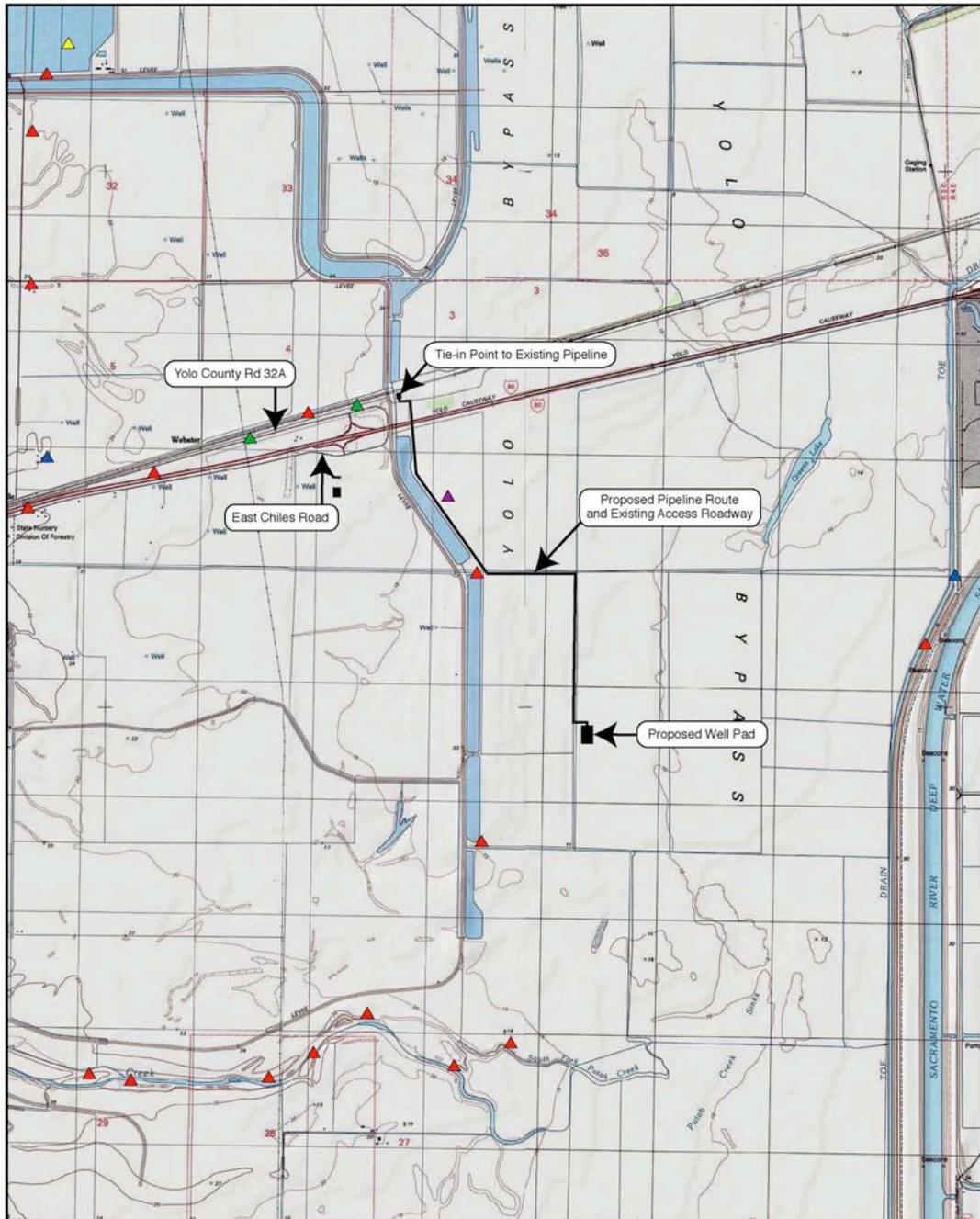


Figure 6
KEBO GLIDE 14-1 EXPLORATORY NATURAL GAS WELL PROJECT
 CNDDB Occurrences in the Project Area

<p>LEGEND CNDDB Occurrences Common Names</p>	<p>▲ Swainson's hawk ▲ Western snowy plover</p>	<p>▲ Giant garter snake ▲ California linderella</p>	<p>▲ Burrowing owl</p>
<p>Robert A. Booher Consulting Environmental Planning & Management 3221 Quail Hollow Drive Fairfield, California 94533 Telephone (707) 399-7835</p>	<p>0 0.5 1 Miles</p> <p>Sources: National Geographic TOPO! 2003 and CNDDB 2007</p>	<p>Kebo Oil & Gas, Inc. 607 Railroad Drive Portland, Texas 78374</p>	

Special-status plant species potentially occurring in the proposed project area were defined as those special-status species with known populations in or near the proposed project area and those known from habitats either identical to or similar to those found in the proposed project area. Figure 6 illustrates special-status species occurrences within the proposed project area and vicinity.

35 special-status species were identified as potentially occurring within the general vicinity of the project study area. Of these 35 species, 4 species have been documented within the project study area, 19 of the species have a low to high potential of occurring within the project study area, while 16 of the special-status species were determined to have no potential of occurring within the study area.

Table 2.4 presents information on the special-status species (plants and wildlife) that have been documented within the general vicinity of the proposed project site. Table 2-4 also provides a likelihood of occurrence analysis for each species that may have potential to occur at the project site.

Table 2-4
Special-Status Species Recorded or Potentially Occurring Within The Vicinity Of The Proposed Project Site, Yolo County, California.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
<i>Birds</i>					
Tri-colored blackbird	<i>Agelaius tricolor</i>	-	CSC	Highly colonial species. Most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	Moderate potential. No individual tri-colored blackbirds observed during surveys. CDFG has recently documented fairly large numbers of this species within the project area. Suitable nesting and foraging habitat exists within the project study area.
Western burrowing owl	<i>Athene cunicularia hypugea</i>	-	CSC	Open grasslands, prairies, farmlands, deserts.	Low potential. Potential nesting and foraging habitat present within the project study area. No individual owls or sign of their presence observed during survey of project study area. No appropriate nesting burrows observed in the project study area.
Swainson's hawk	<i>Buteo swainsoni</i>	-	CT	Inhabits grassland, shrubland, and agricultural areas where it has open areas to forage for its small prey and where roost sites are available. In breeding season, also requires nesting trees, usually trees bordering agricultural fields, in wetland borders, and on abandoned farms. Forages by soaring over open areas and by searching from perches.	Moderate to high potential. No individual Swainson's hawks observed during surveys. This species has been sighted in the vicinity of the project study area. Suitable foraging and nesting habitat exists within project area.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	FT	CSC	Nests on sandy beaches, salt pond levees, and the shores of large alkali lakes. Requires sandy, gravelly, or friable soils for nesting.	Low potential. No appropriate habitat for this species present within the project study area. This species has been observed nesting at 2 locations within 0.5 miles of the project site according to CDFG.
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	FC	CE	Nesting habitat consists of cottonwood willow riparian forest. Also may be found nesting in walnut and almond orchards.	No potential. No appropriate habitat for this species present within the project study area.
White-tailed kite	<i>Elanus leucurus</i>	-	Fully Protected	Nests in rolling foothills and valley margins with scattered oaks and river bottomlands, or marshes next to deciduous woodland. Require open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Moderate potential. No individual kites observed during surveys. This species has been documented within the project area by CDFG. Suitable foraging and nesting habitat exists within the project area.
Peregrine falcon	<i>Falco peregrinus</i>	-	CE/Fully Protected	Peregrines generally feed and breed near water. This species nests on protected ledges of high cliffs, banks, dunes, and mounds in woodland, forest, and coastal habitats. However, pairs are also known to nest on human-made structures such as bridges and buildings. Riparian areas and coastal and inland wetlands are important yearlong habitats. Peregrine falcons forage over most wetland habitats, including salt ponds that harbor many bird species it uses as prey. Peregrines prey on bird species such as ducks, shorebirds, and doves.	No nesting habitat for peregrine falcons was observed within the project area. However, this species may forage in the project area at any time. This species has been observed foraging in the general project area.
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT	CE	Nests and winters near ocean shores, lake margins and rivers. Nests in large, old-growth, or dominant live trees with open branches, especially Ponderosa pine. Roosts communally in winter.	No potential. No appropriate habitat for this species present within the project study area.
Purple Martin	<i>Progne subis</i>	-	CSC	Open or semi-open areas such as farmland, meadows, fields, parks, and residential areas. Usually found near open water.	Low potential. Potential nesting and foraging habitat present within the project study area. No individual purple martins observed during survey of project study area.
Mammals					
Pallid bat	<i>Antrozous pallidus</i>	-	CSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
American badger	<i>Taxidea taxus</i>	-	CSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Require sufficient food, friable soils, and open uncultivated ground. Prey on burrowing rodents. Dig their own burrows.	No potential. No appropriate habitat for this species present within the project study area.
Fish					
Sacramento perch	<i>Archoplites interruptus</i>	-	CSC	Formerly inhabited sloughs, slow-moving rivers, and lakes of the Central Valley. Now mostly found in reservoirs and farm ponds. Often associated with beds of rooted, submerged, and emergent vegetation and other submerged objects. Aquatic vegetation is especially essential for the young-of-year which remain close to it and/or in shallow areas. Sacramento perch are able to tolerate a wide range of physicochemical water conditions.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Delta smelt	<i>Hypomesus transpacificus</i>	FT	CT	Delta smelt are found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties. Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the mixing zone and disperse widely into river channels and tidally-influenced backwater sloughs. They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone. Most spawning happens in tidally-influenced backwater sloughs and channel edgewater. Although spawning has not been observed in the wild, the eggs are thought to attach to substrates such as cattails, tules, tree roots and submerged branches.	Moderate to high potential. May occur within the project study area during flooding events I the Yolo Bypass Wildlife Area.
Chinook salmon (Sacramento River Winter-Run, Central Valley Spring-Run, Central Valley Fall- and Late Fall-Run)	<i>Oncorhynchus tshawytscha</i>	FE / FT / FSC	SE/ST/-	Adult winter-run Chinook salmon leave the ocean and migrate through the Sacramento-San Joaquin River Delta into the Sacramento River from November through July. Juvenile winter-run Chinook salmon rear and emigrate in the lower Sacramento River from October through March. Adult spring-run Chinook salmon enter the Sacramento and San Joaquin River main streams in February through July. Spring-run Chinook salmon appear to emigrate at 3 different life stages: as fry, fingerlings, or yearlings. Fry may occur between December and January, fingerlings occur from February through May, and yearling spring-run Chinook salmon emigrate from October through February, with abundance peaking in November. Fall-run Chinook salmon were historically the most abundant run of Central Valley Chinook salmon. They occupy the major Central Valley river systems. After 2 to 4 years of maturation in the ocean, adult fall-run Chinook salmon return to their natal freshwater streams to spawn. Adult fall-run Chinook salmon enter the Sacramento River system from July through December and spawn from October through December. Juvenile fall-run and late fall-run Chinook salmon may rear from January to June.	Moderate to high potential. May occur within the project study area during flooding events I the Yolo Bypass Wildlife Area

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	FT	-	After maturing for 1 to 3 years in the ocean, adult steelhead typically begin their spawning migration into the Sacramento and San Joaquin Delta System in fall and winter. Adult steelhead enter the mainstream Sacramento River in July, peak in abundance in the fall, and continue migrating through February and March. Juvenile steelhead will remain in fresh water and continue to rear for 1 to 3 years before migrating to the ocean in November through May to mature. Smolt typically migrate to the ocean during march through June.	Moderate to high potential. May occur within the project study area during flooding events I the Yolo Bypass Wildlife Area
Sacramento splittail	<i>Pogonichthys macrolepidotus</i>	-	CSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay, associated marshes, slow moving river sections, and dead end sloughs. Require flooded vegetation for spawning and foraging for young.	Moderate to high potential. May occur within the project study area during flooding events I the Yolo Bypass Wildlife Area
Invertebrates					
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE	-	Endemic to the grasslands of the northern two-thirds of the Central Valley. Found in large, turbid pools. Inhabit astatic pools located in swales formed by old braided alluvium filled by winter and spring rains.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	-	Endemic to the grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains in astatic rain-filled pools. Inhabit small clear-water sandstone-depression pools and grassed swales, earth slumps, or basalt-flow depression pools.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Sacramento Valley tiger beetle	<i>Cicindela hirticollis abrupta</i>	-	-	Sandy floodplain habitat in the Sacramento Valley. Found on terraced floodplains or low sandy water edge flats.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FE	-	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for stressed elderberry shrubs.	No potential. No habitat (I.e., elderberry bushes) for this species is present within the project study area.
Vernal pool tadpole shrimp	<i>Lepidurus packardi</i>	FE	-	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
California linderiella	<i>Linderiella occidentalis</i>	-	-	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Antioch multilid wasp	<i>Myrmosula pacifica</i>	-	-	Not Available. Last documented sighting in 1945.	No potential. Species not found in association with agricultural fields or ruderal habitat.
Amphibians/Reptiles					
California tiger salamander	<i>Ambystoma californiense</i>	FT	CSC	Primarily inhabit non-native grassland providing underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	No potential. No grassland habitat (potential aestivation habitat) currently occurs within the general project area.
California red-legged frog	<i>Rana aurora draytonii</i>	FT	CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to aestivation habitat, consisting of small mammal burrows and moist leaf litter.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Giant garter snake	<i>Thamnophis gigas</i>	FT	CT	Prefer freshwater marsh and low gradient streams. Have adapted to drainage canals and irrigation ditches.	Medium to high potential. Potential foraging and aestivation habitat present within project study area. Giant garter snake has been observed within the general area of the project site.
Plants					
Alkali milk-vetch	<i>Astragalus tener</i> var. <i>tener</i>	-	List 1B	Alkali playa, valley and foothill grassland, and vernal pools. Low ground, alkali flats, and flooded lands in annual grassland or in playas or vernal pools. Elevational range: 1 to 170 meters. Blooming period: March through June.	Medium to high potential. May occur along canal areas adjacent to the project site and study area.
Heartscale	<i>Atriplex cordulata</i>	-	List 1B	Alkaline flats and scalds in the Central valley or sandy soils in chenopod scrub, valley or foothill grassland, and meadows. Elevational range: 1-150 meters. Blooming period: Apr through October.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Brittlescale	<i>Atriplex depressa</i>	-	List 1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools. Usually found in alkali scalds or alkali clay soils in meadows or annual grassland. Rarely associated with riparian, marsh, or vernal pool habitat. Elevational range: 1 to 320 meters. Blooming period: May through October.	Medium potential. May occur along canal areas adjacent to the project site and study area.
San Joaquin spearscale	<i>Atriplex joaquiniana</i>	-	List 1B	Chenopod scrub, alkali meadow, and foothill grassland. Found in seasonal wetlands with <i>Distichlis spicata</i> and <i>Frankenia</i> . Elevational range: 1 to 320 meters. Blooming period: April through October.	Low to medium potential. May occur in marsh habitat within the project study area. Plant species was not observed during field surveys at the site.
Rose-mallow	<i>Hibiscus lasiocarpus</i>	-	List 2	Marshes and swamps (freshwater). Moist, freshwater-soaked river banks and low peat islands in sloughs. Elevational range: 0 to 150 meters. Blooming period: June through September.	Low to medium potential. May occur in marsh habitat within the project study area. Plant species was not observed during field surveys at the site.
Northern California black walnut	<i>Juglans californica</i> var. <i>hindsii</i> Jepson	-	List 1B	Riparian forest and woodlands. Found in deep alluvial soil associated with creeks and streams. Elevational range: 0 to 395 meters. Blooming period: April through May.	No potential. Suitable habitat for this species does not occur within the project study area.
Heckard's pepper-grass	<i>Lepidium latipes</i> var. <i>heckardii</i>	-	List 1B	Valley and foothill grassland and vernal pools. Found on alkaline soils. Elevational range: 3 to 30 meters. Blooming period: March through May.	Medium potential. May occur along canal areas adjacent to the project site and study area.
Colusa grass	<i>Neostapfia colusana</i>	FT	CE/List 1B	Vernal pools. Elevational range: 5 to 200 meters. Blooming period: May through August.	Medium potential. May occur along canal areas adjacent to the project site and study area.
Solano grass	<i>Tuctoria mucronata</i>	FE	CE/List 1B	Vernal pools. Elevational range: 5 to 10 meters. Blooming period: April through August.	Medium potential. May occur along canal areas adjacent to the project site and study area.
Sensitive Habitats					
Elderberry Savanna (not present)					
Great Valley Cottonwood Riparian Forest (not present)					

FEDERAL	FE	Federally listed as Endangered
	FT	Federally listed as Threatened
	FC	Federal Candidate Species (former Category 1 candidates)
STATE	CE	State listed as Endangered
	CT	State listed as Threatened
	CR	State designated as Rare
	CSC	California Department of Fish and Game designated "Species of Special Concern"
CNPS	CNPS List 1b	Plants that are rare, threatened, or endangered in California and elsewhere
	CNPS List 2	Plants that are rare, threatened, or endangered in California, but are more common elsewhere
	CNPS List 3	Plants about which we need more information – a review list
	CNPS List 4	Plants of limited distribution – a watch list

Source: CDFG 2007, CNPS 2007, and USFWS 2007.

Other Sensitive Biological Resources

Other sensitive biological resources also occur in the project area and are presented below.

Nesting Swallows

Several swallow species nest and forage within the project area. Nesting swallows are protected under the Migratory Bird Treaty Act (MBTA). Nesting swallow species present within the project area include cliff swallows (*Hirundo pyrrhonota*), barn swallows (*Hirundo rustica*), bank swallows (*Riparia riparia*), and tree swallows (*Tachycineta bicolor*).

Nesting and Foraging Herons

Nesting heron rookeries have been identified within the general vicinity of the project site. These rookeries normally occur within wetland, riparian, or watercourse habitats. Most of these rookeries include mixed species, such as great blue herons (*Ardea herodias*) and great egrets (*Ardea alba*). Each of these species begins nesting in late March and most young have fledged by July 1. No heron rookeries were identified within the project study area.

Nesting and Wintering Waterfowl/Shorebirds

The Yolo Bypass, and specifically the Yolo Bypass Wildlife Area, is managed for wildlife, primarily waterfowl. The Yolo Bypass lies within the Pacific Flyway, a major flight corridor for many types of birds. Large concentrations of waterfowl occur in the managed wetlands on both private and public lands during the winter months. Abundant species include northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), American widgeon (*Anas americana*), green-winged teal (*Anas crecca*), lesser scaup (*Aythya affinis*), ring-necked duck (*Aythya collaris*), and white-fronted geese (*Anser albifrons*). These managed wetlands also support shorebirds, including American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), dowitcher (*Limnodromus scolopaceus*), western (*Calidris mauri*) and least sandpipers (*Calidris minutilla*), and dunlin (*Calidris alpina*).

2.7.2 Environmental Impacts

Thresholds of Significance

Significant impacts on biological resources would occur if implementation of the proposed project results in:

- Adversely affect, either directly or through habitat modifications, any endangered, rare, or threatened species, as listed in Title 14 of the CCR (sections 670.2 or 670.5) or in Title 50, CFR;
- Have a substantial adverse impact, 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 CDFG or USFWS;
- Cause a reduction in the area or habitat value of critical habitat areas designated under the federal ESA;
- Substantially fragment or isolate wildlife habitats or movement corridors, especially riparian and wetland habitats, or impede the use of wildlife nurseries;
- Have a substantial adverse impact, such as a reduction in area or geographic range, on any riparian habitat, other sensitive natural community, or significant natural areas identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;
- Adversely affect federally protected wetlands (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;
- Substantially decrease the size of important native upland wildlife habitats or wildlife use areas;
- Substantially decrease the amount of available forage, including forage from agricultural lands for wintering waterfowl;
- Impact locally designated species (e.g., heritage trees and wildlife populations unique to the project area); and
- Cause avoidance of fish or biologically important habitat for substantial periods, which may increase mortality or reduce reproductive success.

Potential Effects

Potential Impacts to Common Vegetative Communities/Wildlife Habitat from Project Activities

Potential impacts to common vegetative communities/wildlife habitats (i.e., ruderal/disturbed and annual grassland) within the proposed disturbance area would occur during installation of the proposed pipeline and access roadway. Vegetation in the disturbance zone would be completely removed during site preparation activities. Because such vegetative communities/wildlife habitats, and associated plant species are locally and regionally common, impacts are considered less than significant. Therefore, no mitigation measures are proposed.

Potential Impacts to Special-Status Plant Species from Project Activities

Implementation of the proposed project could potentially result in significant impacts on endangered, threatened, rare, or other special-status plant species (as identified in Table 1) located in the proposed disturbance area (wetland habitat within the disturbance area for the well pad). Direct impacts could result from ground disturbance activities during construction of the well and production pads. These impacts could result in the direct mortality of individuals or small populations of these plant species.

Potential Impacts to Nesting Swallows and Herons from Project Activities

Implementation of the proposed project could result in potentially significant impacts on nesting swallows occurring within the project area. Impacts would occur from construction-related noise during installation of the drill and production pads, and installation of the natural gas pipeline. Because swallows are a migratory species, and are protected under the MBTA, project-related impacts that cause nesting failure would be considered a significant impact.

Proposed project activities could also result in potentially significant impacts on nesting herons utilizing upland habitats adjacent to foraging areas (i.e., wetlands, marshes, watercourses) if project related activities destroy nests or cause reproductive failure. Heron rookeries are protected under CDFG code 3503.5.

Potential Impacts to Nesting and Wintering Waterfowl/Shorebirds from Project Activities

Implementation of the proposed project could result in potentially significant impacts on nesting and wintering waterfowl and shorebirds occurring within the project area. Impacts to these species would occur due to noise created during construction of the drilling and production pads, drilling of the well, installation of the proposed natural gas pipeline, and from the presence of humans and construction/drilling equipment during project implementation.

Potential Impacts to Special-Status Fish Species from Project Activities

Construction of the well drilling pad would result in significant impacts to special-status fish species (i.e., Delta smelt, Chinook salmon, Central Valley steelhead, and Sacramento splittail) if the project site is flooded during construction of the well pad. Impacts could consist of direct mortality if special-status fish species are present on the project site when filling activities are being conducted. However, the project proponent is proposing to construct the well pad when the project site is in a fallow state and is not flooded. Therefore, no impacts to special-status fish species are anticipated.

Potential Impacts to Wetland Habitat from Project Activities

Construction of the well drilling pad would result in the impact of fresh emergent wetland. This impact is considered potentially significant because of the designation of wetland habitats as sensitive, protected habitats.

Potential Impacts to Wildlife Migration or Dispersal Corridors from Project Activities

The proposed project area occurs within the Pacific flyway. The Pacific Flyway comprises the western Arctic, including Alaska and the Aleutian Islands and the Rocky Mountain and Pacific coast regions of Canada, the United States and Mexico, south to where it becomes blended with other flyways in Central and South America. The project site does not occur within any other identified minor or major or identified migration or dispersal corridors.

Although the project site occurs within the Pacific flyway, it occurs within a small portion of the flyway. In addition, the proposed project will be implemented between the months of May and October when the migration of birds will be very low to non-existent. Therefore, impacts to wildlife and dispersal corridors are considered less than significant, and no mitigation measures are proposed.

Potential Impacts to Giant Garter Snake from Project Activities

Giant garter snakes (GGS) have the potential to be present within a drainage ditch and associated levees adjacent to the western boundary of the proposed well site during implementation of the proposed project. GGS also have the potential to be present within the proposed well pad area during periods when rice crops are grown (rice fields are currently not in production), or during other periods when the well site is flooded. Drainage ditches along portions of the access roadway/proposed pipeline alignment also have the potential to provide potential habitat. GGS typically inhabit sloughs, marshes, and drainage canals characterized by slow flowing or standing water, permanent summer water, mud bottoms, earthen banks, and an abundance of preferred forage species. The GGS is highly aquatic, but avoids areas of dense riparian overstory, preferring stands of emergent aquatic vegetation, such as bulrushes and cattails, and herbaceous terrestrial cover composed of annual and perennial grasses, blackberry, and mustard. This vegetation, along with burrows, undercut banks, and large rocks, provide escape cover. In addition, areas devoid of overstory shading are required for

basking areas for thermoregulation.

GGS rely on canals and ditches as movement corridors. These corridors are vital to giant garter snake dispersal and, most importantly, for continuing genetic exchange between subpopulations. Un-vegetated canals may be used as disposal corridors, but they typically do not remain in exposed canals due to increased vulnerability to predators.

Essential habitat components of the giant garter snake consist of the following:

- Adequate water during the snake's active period (early spring through mid-fall) to provide a prey base and cover;
- Emergent, herbaceous wetland vegetation, such as cattail and bulrushes, for escape cover and foraging habitat; and
- Upland habitat for basking, cover, and retreat sites, and refuge from flood waters.

Potential Impacts to Nesting Special-Status Avian Species (Including Raptors) from Project Activities

Implementation of the proposed project could potentially result in significant impacts on special-status avian species by causing abandonment of nests, nesting colony sites, and the destruction of active nest sites. Tri-colored blackbird, western burrowing owl, Swainson's hawk, white-tailed kite, and purple martin could potentially occur within the project site or study area during implementation of the proposed project. In addition, other raptor species protected by the MBTA and state and federal raptor protection acts may be present within the project study area during project activities.

Potential Impacts to Nesting Migratory Song Birds from Project Activities

Implementation of the proposed project could potentially result in significant impacts on nesting migratory songbirds present in the project study area during implementation of the proposed project by causing abandonment of nests, nesting colony sites, and the destruction of active nest sites. Migratory bird species are protected by the MBTA and the California Fish and Game Code.

Potential Impacts to Common Wildlife Species from Project Activities

Direct mortality or injury to common wildlife and plant populations could occur during ground disturbance activities associated with installation of the proposed well pad, production facility, and pipeline. Project implementation has the potential to impact small vertebrate species, and increased human activity and vehicle traffic in the vicinity may disturb some wildlife species. Common wildlife species observed at or within the project area likely have acclimated to on-going human activities (recreational use of the project area by the public). Species most likely to be affected by habitat disturbance are relatively sedentary such as plants,

small mammals and reptiles. Other more mobile wildlife species, such as most birds and larger mammals, can avoid project-related activities by moving to other adjacent areas temporarily.

A short-term increase in project-related traffic is anticipated during project implementation. This will result in a short-term increase in associated noise, which may cause temporary disturbance to local common wildlife. Species intolerant of human activities may use the project site significantly less when humans are regularly present in the area. More tolerant species may adapt to and even take advantage of close human contact. Increased vehicular traffic can cause direct mortality to species or impede daily activities or dispersal.

Because such wildlife species are locally and regionally common, impacts are considered less than significant and short-term in nature. Therefore, no mitigation measures are proposed.

2.7.3 Mitigation Measures

The following mitigation measures will be implemented during project implementation to avoid or reduce potential environmental impacts to a less than significant level.

Mitigation Measure 2.7.3a

A Qualified Biologist will conduct an Environmental Awareness Training of Construction and Drilling Personnel. A Qualified Biological Monitor Shall be Present During All Ground Disturbing and Drilling Activities.

A pre-construction environmental awareness training shall be conducted with all construction and drilling personnel, and should consist of a brief presentation in which persons knowledgeable in local sensitive habitats and wildlife, and regulatory protection should discuss environmental concerns. All personnel working on the project should understand the sensitivity of adjacent habitats and wildlife species.

A qualified biologist shall be present on site during the all ground disturbing activities and during the drilling of the exploratory well. The biological monitor will be responsible for ensuring that construction and personnel follow the mitigation measures outlined in this document, as well as all conditions set forth in any environmental and use permits issued for the project. Results of the monitoring effort shall be documented in monitoring notes and summarized in a final report. The final report will be submitted to all regulatory agencies who issue permits or clearances for the project.

Mitigation Measure 2.7.3b

Conduct Pre-Construction Botanical Surveys for Special-Status Plant Species.

A qualified botanist will conduct pre-construction field surveys to identify any populations of threatened, endangered, rare, and other special-status plants located within the proposed disturbance areas as identified within Table 2-4. These surveys shall be conducted prior to the initiation of any construction activities and coincide with the appropriate flowering period of the special status plant species with the potential to occur in the area. If any special-status

plant species populations are identified within or adjacent to the proposed disturbance area, Kebo shall implement the following measures:

- If any population(s) of special-status plant species is identified adjacent to the proposed project site, a qualified biologist retained by Kebo will clearly delineate the location of the plant population. If the plant population is directly adjacent to the proposed disturbance zone, the project proponent will install protective fencing between the disturbance zone and the plant population to ensure that the plant population is adequately protected.
- If a special-status plant population is identified within the proposed disturbance zone, Kebo will consult with CDFG and USFWS to determine the appropriate measures to avoid or mitigate for impacts to the species or population. Kebo will adjust the boundaries of the disturbance zone, where feasible, to avoid impacts to the plant species/population. Where avoidance is not feasible, Kebo will implement one or more of the following measures:
 - (1) transplant potentially affected plants to areas not planned for disturbance. If a plant is transplanted, two more plants should be planted. Plantings shall be managed and monitored by the applicant and shall survive to 5 years after planting;
 - (2) seed or purchase plants and place them in an area adjacent to the disturbance zone;
 - (3) purchase credits at an approved mitigation bank at a ratio approved by CDFG, USFWS, and Kebo.

Mitigation Measure 2.7.3c

Conduct Pre-Construction Surveys for Nesting Herons, Swallows, Tri-colored Blackbird, Western Burrowing Owl, Swainson's Hawk, Northern Harrier Hawks, Short-eared Owls, White-tailed Kite, Purple Martin, Raptor Species, Nesting and Wintering Waterfowl and Shorebirds, and Migratory Song Birds.

Pre-construction surveys will be conducted for protected avian species nesting in the project area. Surveys for nesting Swainson's hawks will be conducted in appropriate nesting habitat within 1,320 feet of the proposed well pad and pipeline route. All other special-status bird species nests will be surveyed for within 500 feet of the proposed well pad and pipeline route. If exploratory drilling or construction activities take place beyond August, pre-construction surveys will be conducted for wintering waterfowl as well. Pre-construction surveys will occur prior to the implementation of the proposed project. A qualified biologist will survey suitable habitat for the presence of these species.

If a special-status bird species is found or suspected to be nesting, a buffer area will be established to avoid impacts on the nest. If no nesting special-status avian species are found, project activities may proceed and no further mitigation measures will be required. If nesting sites are found, *Mitigation Measure 2.7.3d* has been incorporated to reduce potential impacts

to a less than significant level.

Results of pre-construction surveys for all species shall be provided to CDFG and USFWS prior to staging and construction implementation.

Mitigation Measure 2.7.3d

Establish Exclusion Buffer Areas around Special-status Avian Species Nest Sites.

Where protected bird species' nest sites are identified or suspected to occur during pre-construction surveys, the qualified biologist will establish the following buffer zones around nest sites, and no project activities occur within these buffer zones until young birds have fledged.

Nesting Herons

Nesting herons typically nest and rear young from late February through August. In order to avoid and minimize impacts on nesting herons, a 400-foot buffer will be established around active nesting sites when project activities will occur during their breeding period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Nesting Swallows

Nesting swallows typically nests and rears young from May through July. In order to avoid and minimize impacts on nesting swallows, a 200-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests.

Tri-colored Blackbird

Tri-colored blackbird typically nests and rears young from mid April through late July. In order to avoid and minimize impacts on nesting tri-colored blackbirds, a 200-foot buffer will be established around active nests. No project related activities will be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests.

Western Burrowing Owl

Western burrowing owl typically nests and rears young from February through August. Burrowing owls also occupy nesting sites during the non-breeding season (September through January). If an occupied burrow is identified within 160 feet of the project disturbance area during the non-breeding season, or within 250 feet of the disturbance area during the breeding season, Kebo will consult with CDFG to determine the appropriate method to passively

relocate owls. Project related activities would be allowed to proceed after owls are passively relocated. If passive relocation of owls is necessary, it shall occur outside of the nesting season. For each occupied burrow that is passively relocated, compensation will consist of preserving 6.5 acres of foraging habitat. The 6.5 acres shall be contiguous with known, occupied burrowing owl burrows.

White-Tailed Kite

White-tailed kites typically nest and rear young from mid-February through June. In order to avoid and minimize impacts on white-tailed kites, a 1,320-foot buffer will be established around active nests. No project related activities will be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to June if a qualified biologist determines that all juveniles have fledged from occupied nests.

Purple Martin

Purple martins typically nest and rear young from March through August. In order to avoid and minimize impacts on purple martins, a 200-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Swainson's Hawk

Swainson's hawk typically nests and rears young from March through August. In order to avoid and minimize impacts on nesting Swainson's hawks, a 1,320-foot buffer will be established around active nesting sites. No project related activities will be allowed to occur within this zone. A biological monitor will monitor the nest site on a regular schedule to ensure no impacts are occurring to nesting Swainson's hawks. Monitoring protocol shall be determined in consultation with CDFG. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Other Raptor Species

Raptor species typically nests and rear young from March through August. In order to avoid and minimize impacts on nesting raptor species, a 500-foot buffer will be established around active nesting sites when project related activities will not be allowed to occur within this area. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Nesting and Wintering Waterfowl/Shorebirds.

The typical breeding season for waterfowl and shorebirds occurs between February and July. In order to avoid impacts to these resources, a 200-foot buffer will be established around

active nesting sites when project related activities will not be allowed to occur within this area. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests. Additionally, construction activities will occur between May and October, which will reduce the impacts to nesting and wintering waterfowl and shorebirds.

Migratory Song Birds

Nesting migratory song birds typically nest and rear young from April through August. In order to avoid and minimize impacts on nesting migratory song birds, a 100-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Mitigation Measure 2.7.3e

Conduct Pre-activity Surveys for GGS. Avoid Impacts to GGS.

In accordance with *Standard Avoidance and Minimization Measures for Construction Activities in Giant Garter Snake Habitat* (USFWS 1997), the following mitigation measures shall be implemented during implementation of the proposed project to avoid impacts to GGS:

- 24-hours prior to construction activities, the project area should be surveyed for GGS. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during surveys, Kebo shall report the sighting(s) immediately by telephone to the USFWS at (916) 414-6600 and CDFG at (209) 948-7163.
- Construction activities will be conducted between May 1 and October 1. This is the active period for GGS and direct mortality is lessened, because snakes are expected to actively move and avoid danger.
- If any construction activities will take place between October 2 and April 30, the USFWS Sacramento Fish and Wildlife Office and CDFG will be consulted with to determine if additional measures are necessary to minimize and avoid take.
- Vegetative clearing will be confined to the minimal area necessary to facilitate construction of project components. Potential GGS habitat within and adjacent to the pipeline corridor shall be flagged and posted to avoid encroachment by construction personnel.
- All Movement of construction equipment and vehicles will be confined to existing roadways and the proposed well pad footprint.

- A qualified biologist will be on-site during all construction and earthmoving activities near GGS habitat. In the event GGS are observed near or in the construction area, the biologist will have the authority to stop construction until the snake has left the area. Physical removal of snakes from the project area will only be conducted with agency authorization, and will be conducted by a biologist qualified and listed by USFWS to handle this species. The biologist will contact CDFG and USFWS if any GGS are encountered, or if any incidental take occurs. The biologist will record all relevant environmental, biological, and behavior data observed, and submit summary reports to CDFG and USFWS.
- All project related traffic will observe a speed limit of 15 mph to ensure that any giant garter snakes crossing or basking on access roadways will have time to move out of the way of traffic.
- Kebo shall restore the well site to its original condition prior to project implementation after all project components are complete.

These mitigation measures do not preclude additional measures that may be imposed by the USFWS and/or CDFG during consultation to obtain regulatory permits.

Mitigation Measure 2.7.3f

Minimize Physical Disturbance in Sensitive Wetland Habitat. Restore Disturbed Wetland Habitat and Provide Wetland Mitigation to Offset Impacts.

The project proponent will minimize impacts to wetland habitat on the proposed well pad where feasible. Kebo will restore disturbed wetlands to pre-disturbance conditions after project activities are complete. The goal of the site restoration phase is to restore the site to its condition or better than that observed at the time of project initiation. Once the well is abandoned and plugged, surface equipment will be removed from the site. Any sand and or gravel used to build up the site will then be removed from the site. Contours will be re-established to near grade conditions present at the time of project initiation. As the site will return to use for rice production, no wetland vegetation will be planted.

Wetland creation activities will also take place as part of the proposed project. In order to mitigate for the permanent impacts to 0.48 acres of freshwater emergent wetlands for placement of the production pad and access driveway to the site from an existing levee roadway, approximately 1.0 acre of wetlands will be created. The site for wetland creation also occurs within the Yolo Bypass Wildlife Area, approximately 1.5 miles southwest of the proposed well pad. The wetland creation area is part of CDFG's Pacific Flyway Demonstration Area, and has been designated as an area for creation of wetlands by CDFG as part of their Yolo Bypass Land Management Plan. Kebo has prepared a compensatory wetland mitigation plan that includes the above wetland restoration activities. This plan has been submitted to the USACE, CDFG, and RWQCB, and the plan will be subject to the approval of the USACE, the San Francisco Bay Regional Water Quality Control Board (RWQCB), and CDFG.

Mitigation Measure 2.7.3g

Place sediment fencing around project site.

Sediment fencing should be placed around the project area prior to commencement of project activities to ensure that project-related materials are not outside of approved work areas. Sediment barrier fencing or other erosion control materials shall not contain any monofilament. Sediment fencing will reduce risks of project site material (non-wetland soils) from escaping the work site and spilling into wetland habitats. Project area boundaries should be clearly delineated by stakes, flagging and /or rope or cord to minimize inadvertent degradation or loss of adjacent wildlife habitats during construction. Project related vehicles must be restricted to approved travel paths/roads and the well pad site.

Mitigation Measure 2.7.3h

Restrict equipment storage and parking.

All equipment storage and parking during all project activities should be confined to the project area or to previously disturbed off site areas that are not habitat for listed species. Parking areas shall be clearly marked. Previously disturbed sites elsewhere in the Yolo Bypass Wildlife Area shall not be used for parking or equipment storage.

Mitigation Measure 2.7.3i

Establish traffic control.

The Kebo project representative should establish traffic restraints and erect signs to restrict construction-related traffic to approved access roads, construction areas, storage areas, staging and parking areas. Off-road traffic outside of designated project areas must be prohibited. Project-related vehicles should observe a 15-mph speed limit in all project areas except on County roads and State and Federal highways.

Mitigation Measure 2.7.3j

Provide escape ramps for wildlife species.

To prevent entrapment of endangered species or other animals during the construction phase of the project, all excavated, steep-walled holes or trenches in excess of 1 foot in depth or greater should be provided with one or more escape ramps constructed of earth fill if wildlife proof barricade fencing is not used at the well pad site. Ramps should be at less than 45°. Trenches should be inspected for entrapped wildlife each working day. Before such holes or trenches are filled, they should be thoroughly inspected for entrapped animals. Any animals so discovered should be allowed to escape voluntarily, without harassment, before construction activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

Mitigation Measure 2.7.3k

Inspect all construction pipes, culverts, or similar structures.

All construction pipes, culverts, or similar structures that are stored at the construction site overnight should be thoroughly inspected for trapped animals before the subject pipe is buried, capped, or otherwise used or moved. Pipes laid in trenches overnight should be capped. If during construction an animal is discovered inside a pipe, that section of pipe should not be capped or buried until the animal has escaped.

Mitigation Measure 2.7.3l

No pets permitted on-site.

To prevent harassment, mortality, or destruction of sensitive species and/or their habitat by domestic dogs and cats, no pets should be permitted on-site. Mitigation measures proposed in Section 2.4 (Water Resources) and in Section 2.9 (Hazards) will also help minimize potential impacts to biological resources.

2.8 Energy and Mineral Resources

2.8.1 Environmental Setting

The Sacramento Delta (including the Yolo Bypass) serve as an important regional source of natural gas, and natural gas transmission pipelines are located near the proposed project area. No other known mineral resources have been identified within the vicinity of the proposed project area.

2.8.2 Environmental Impacts

The proposed project will have a significant adverse effect on energy and mineral resources if it will:

- a) conflict with adopted energy conservation plans;
- b) use non-renewable resources in a wasteful and inefficient manner; or
- c) result in loss of availability of known mineral resources that will be of future value to the region and the residents of the State.

The following is a discussion of potential effects of the proposed project for each of these significance criteria.

- a) **Conflict with adopted energy conservation plans.** No impact. Implementation of the proposed project will not conflict with any adopted energy conservation plans. The purpose of the survey is to locate future sources of energy.
- b) **Use non-renewable resources in a wasteful and inefficient manner.** No impact. Implementation of the proposed project will not use non-renewable resources in a

wasteful and inefficient manner. Energy in the form of diesel fuel and gasoline would be used to power drilling and construction related equipment. However, this usage would be short-term.

- c) **Result in loss of availability of a known mineral resource that will be of future value to the region and the residents of the state.** No impact. Implementation of the proposed project will not result in loss of any known mineral resource within the project area.

2.8.3 Mitigation Measures

Because implementation of the proposed project will not result in significant adverse effects on energy and mineral resources, no mitigation measures are required.

2.9 Hazards

2.9.1 Environmental Setting

The purpose of the proposed project is to drill an exploratory natural gas well. If economic quantities of natural gas are discovered, a natural gas pipeline will be constructed to transport the natural gas from the well site to an interconnect with existing natural gas transmission lines located in the vicinity of the project area. Figure 2 illustrates the location of these facilities. Project activities are described further in **Section 1.5, Project Description**.

Hazardous materials associated with the use of internal combustion engines and hydraulic equipment including fuels, coolant liquids, oils, and lubricants will be used and/or stored onsite during drilling operations. The amount of diesel fuel temporarily stored onsite will not exceed 5,000 gallons at any time. Drilling mud proposed for use by the project proponent will consist of bentonite, a natural clay compound. Additives (diesel fuel, ligno-sulfates, etc.) are sometimes mixed with bentonite to keep the mud emulsified in the event that drilling is temporarily halted.

During the production phase, production water and condensate will be stored on site in tanks for offsite disposal. In addition, small quantities of diesel fuel and/or lubricant may also be stored on site during the production phases.

Existing natural vegetation within the project area presents a potential fire hazard, but no extensive fuel loads are known to be present in the project area.

Prior to implementation of the proposed project, Kebo will prepare a spill prevention and response plan that will provide measures to deal with and clean up any spills of hazardous materials on the project site. Kebo will present the plan to CDFG for approval.

2.9.2 Environmental Impacts

The proposed project will have a significant adverse impact if it will result in one or more of the following:

- a) a risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals, or radiation);
- b) possible interference with an emergency response plan or emergency evacuation plan;
- c) the creation of any health hazard or potential health hazard;
- d) exposure of people to existing sources of potential health hazards; or
- e) increased fire hazard in areas with flammable brush, grass, or trees.

The following is a discussion of potential impacts of the proposed project for each of these significance criteria.

- a) **A risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals, or radiation).** Less than significant impact with mitigation incorporated. Natural gas well drilling and operation of the proposed pipeline have the potential to produce hazards including a blow out during drilling operations or a natural gas explosion from rupture or failure of the pipeline system. However, DOGGR regulates oil and gas well drilling and associated pipelines. In particular, it should be noted that DOGGR regulations require use of blowout protection during natural gas well drilling operations.

The potential also exists for a release of hazardous materials associated with internal combustion engines and hydraulic equipment including fuels, coolant liquids, oils, and lubricants during drilling and construction operations. A release of drilling mud would not be considered a release of hazardous materials unless additives (i.e., diesel fuel, ligno-sulfates, etc.) are mixed with the bentonite to keep the mud emulsified.

Potential also exists for a release of hazardous materials stored on site during the production phase (such as production water, condensate, diesel fuel and/or lubricants). The project proponent has indicated that the production platform/production pad will be constructed in such a manner such that sheet piling will be installed, and will provide secondary containment during production operations.

- b) **Possible interference with an emergency response plan or emergency evacuation plan.** No impact. No project activity will block roads or bridges, or in any other way interfere with an emergency response or evacuation plan.
- c) **The creation of any health hazard or potential health hazard.** Less than significant with mitigation incorporated. The possibility exists that project activities could expose residents to hazards within the immediate work areas such as the drill site, staging area, and/or pipeline construction area. Project activities could cause exposure of the public to safety hazards associated with project activities, such as

falling into trenches and pits, exposure to hazardous chemicals, and explosions that could occur during project implementation. However, access to areas where project activities will occur will be restricted and closely monitored.

- d) **Exposure of people to existing sources of potential health hazards.** Less than significant impact. As previously noted, hazardous materials will be stored, handled and used during project related activities. However, all project activities will occur in accordance with applicable federal, state and local laws, including Cal-OSHA requirements.
- e) **Increased fire hazard in areas with flammable brush, grass, or trees.** No impact. Vegetation within the drill site will be cleared during the site preparation phase. In addition, all drilling activities will be restricted to the drill site. Pipeline construction will occur within an existing roadway. Site preparation, drilling crews, and pipeline construction crews will be equipped with fire extinguishers in case of accidental fire.

2.9.3 Mitigation Measures

Implementation of the following mitigation measures will reduce project impacts to less than significant:

Mitigation Measure 2.9.3a

Provide secondary containment. The drilling site will be constructed in such a manner that secondary containment is provided for drilling and production activities.

Mitigation Measure 2.9.3b

Restrict access to project staging, construction, and other work areas. Project work areas shall be identified with flagging and will have signs posted restricting access to the areas. In areas where the public access cannot be controlled by posted signs, safety fencing will be installed to provide a physical barrier to unauthorized entry to work areas. In addition, all trenches and pits left unfilled during evening hours, will be properly signed and safety fencing will be erected to prevent access to these areas.

The mitigation measures described in Section 2.4 (Water Resources) above will also minimize potential hazards.

2.10 Noise

2.10.1 Environmental Setting

Noise is often defined as unwanted sound. Sound is a mechanical form of radiant energy transmitted by pressure waves in the air. It is characterized by two parameters: amplitude (loudness) and frequency (tone). Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale and is interpreted by the ear as corresponding to different degrees of

loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person (Federal Highway Administration 1982). Frequency is the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz), which equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA.

The intensity of environmental noise fluctuates over time and several descriptors of time-averaged noise levels are used. Three most commonly used are L_{eq} , L_{dn} , and CNEL. The energy equivalent noise level, L_{eq} , is a measure of the average energy content (intensity) of noise over any given period of time. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn} , is the 24-hour average of the noise intensity, with a 10 dBA “penalty” added for nighttime noise (10:00 PM to 7:00 AM) to account for the greater sensitivity to noise during this period. CNEL, the community noise equivalent level, is similar to L_{dn} but adds an additional 5 dBA penalty to evening noise (7:00 to 10:00 PM).

Noise generated by stationary sources, such as construction sites, machinery, and industrial operations, typically attenuate at a rate between 6.0 to about 7.5 dBA per doubling of distance. Noise generated by mobile sources, such as automobiles, trucks and airplanes, typically attenuates at a rate between 3.0 to 4.5 dBA per doubling of distance.

Regulatory Setting

The State Office of Noise Control, in *Guidelines for the Preparation and Content of Noise Elements of the General Plan* (February 1976), provided guidance for the acceptability of designated land uses within specific CNEL contours. Residential uses are normally unacceptable in areas exceeding 70 dBA CNEL and conditionally acceptable within 60 to 70 dBA CNEL. Commercial/professional office buildings and businesses are normally acceptable in areas up to 70 dBA CNEL and normally unacceptable in areas exceeding 75 dBA CNEL. Between 67 and 77 dBA CNEL, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements.

Yolo County has adopted a Noise Element as part of its General Plan. The objective of this noise element is to minimize the amount of noise that future development creates and the amount of noise to which the community is exposed. The noise ordinance establishes 60 dBA L_{dn} as the standard for outdoor noise levels in residential areas. The Noise Element also requires construction activities to be concentrated during the hours of the day that are not noise-sensitive for adjacent land uses and should be commissioned to occur during normal work hours of the day to provide relative quiet during the more sensitive evening and early morning periods (Yolo County 1983).

Existing Noise Environment and Sensitive Receptors

The primary contributors to noise in the vicinity of the project area are vehicular traffic on gravel roads. In addition, seasonal noise is produced by a duck hunting clubs in the general vicinity of the project site.

The proposed drill site location is within an unincorporated area of Yolo County. No noise sensitive land uses are located within the immediate vicinity of proposed drill site. The nearest residence to the proposed well site is located approximately 2.4 miles (12,700 feet) northwest. The closest residence to the pipeline alignment is 1.3 miles (6,900 feet) to the west.

2.10.2 Environmental Impacts

Implementation of the proposed project would have a significant adverse effect due to noise impacts if it were to result in one or more of the following:

- a) increase in existing noise levels; or
- b) expose people to severe noise levels.

Thresholds of Significance. Appendix G of the State CEQA Guidelines states that a project may be deemed to have a significant effect on the environment if it increases substantially the ambient noise levels for adjoining areas. For purposes of this analysis, a significant impact would result if one or more of the following would occur with implementation of the project:

- Short-term construction noise levels that violate Yolo County exterior noise standards; or
- Long-term operational increases in existing noise levels that exceed Yolo County exterior noise standards; or
- Exposure of people to severe noise levels.

The following is a discussion of potential impacts of the proposed project for each of these significance criteria.

- a-b) **Less than significant impact.** The potential noise effects of the project include short-term impacts associated with vehicle and equipment operation during the site preparation phase, drilling and testing phase, site restoration phase, and construction activities associated with the production phase. Potential noise effects also include long-term impacts associated with the production phase if economic quantities of natural gas are discovered.

Short-term noise increases would be anticipated on and around the project site during the site preparation phase, drilling and testing phase, site restoration phase, and construction activities associated with the production phase. These activities would last for approximately one to two months depending upon the success of drilling.

Short term noise would be generated by construction related equipment and drilling equipment. The U.S. Environmental Protection Agency has found that the noisiest equipment types operating at construction sites typically range from 88 dBA to 101 dBA at a distance of 50 feet. Table 2-4 lists noise levels typically generated by construction equipment.

In order to determine typical sound levels associated with natural gas well drilling operations, RAB Consulting reviewed and utilized data from two noise studies for natural gas well projects in Yolo and Solano Counties. These two studies are described in further detail below.

The first study reviewed was the Paul Graham Drilling Truk Sunset 1-10 project. A sound survey was conducted on August 8, 1998. Weather conditions at the time were clear with temperatures warm to hot and wind speed from 15 to 20 mph from the southeast. The results of the survey are presented below in Table 2-5.

Table 2-5
Noise Levels Generated by Construction Equipment

Type of Equipment	Typical Sound Level (dBA at 50 feet)
Pump	76
Generator	76
Air Compressor	81
Concrete Mixer (truck)	85
Pneumatic Tools	85
Backhoe	85
Excavator	86
Dozer	87
Front-End Loader	88
Dump Truck	88
Jack Hammer	88
Scraper	88
Paver	89

Sources: *U.S. Environmental Protection Agency 1974; Noise Control for Building and Manufacturing Plants, BBN Layman Miller Lecture Notes 1987.*

**Table 2-6
 Drill Rig Sound Survey**

Distance (feet)	North		South		West		East		Downwind	
	High	Low	High	Low	High	Low	High	Low	High	Low
100	61 dBA	57 dBA	75 dBA	70 dBA	69 dBA	58 dBA	75 dBA	73 dBA	79 dBA	73 dBA
200	59 dBA	54 dBA	68 dBA	63 dBA	59 dBA	56 dBA	73 dBA	70 dBA	71 dBA	67 dBA
300	59 dBA	52 dBA	57 dBA	62 dBA	68 dBA	55 dBA	70 dBA	64 dBA	66 dBA	63 dBA
400	57 dBA	<50 dBA	69 dBA	60 dBA	66 dBA	50 dBA	64 dBA	58 dBA	67 dBA	62 dBA
500	54 dBA	<50 dBA	69 dBA	60dBA	62 dBA	<50 dBA	66 dBA	56 dBA	68dBA	57 dBA

Source: Paul Graham Drilling, August 8, 1998. Sound Survey "Truk Sunset" 1-10 Well. Yolo County, California.

The site preparation phase, drilling and testing phase, site restoration phase, and construction activities associated with the production phase are expected to include the use the following types of equipment: drilling equipment, truck-mounted crane, pumps, pneumatic tools loaders, dump trucks, and a variety of miscellaneous equipment including air compressors and pneumatic tools. The number and type of equipment used during project activities would vary from day to day.

Based on sound levels presented in Tables 2-4 and 2-5, equipment associated with the construction of drill site and production facility and drilling operations could produce noise levels in excess of 88 dBA at a distance of 50 feet from the proposed drill site. However, the nearest residence is located approximately 12,700 feet northwest of the drill site. Based on the sound levels presented in Table 2-4 and 2-5 and an attenuation algorithm of 6 dBA per doubling of distance, maximum outdoor noise levels are expected to be less than 40 dBA at these residences. Projected noise levels would not exceed the Yolo County exterior noise standard of 60 dB L_{dn} , and, as a result, are considered less than significant.

Typical construction operations associated with the development of the new pipeline are expected to include the use of trucks, truck-mounted crane, excavator, backhoe, and dozer. The number and type of equipment would vary from day to day. Equipment used during construction of the pipeline would result in instantaneous noise levels ranging from approximately 76 to 86 dB at a distance of 50 feet. However, the nearest residences are located approximately 6,900 feet west of the drill site. Based on the sound levels presented in Table 2-4 and 2-5 and an attenuation algorithm of 6 dBA per doubling of distance, maximum outdoor noise levels are

expected to be less than 44 dBA at these residences. Projected noise levels would not exceed the Yolo County exterior noise standard of 60 dB L_{dn}, and, as a result, are considered less than significant.

Operation of production equipment could result in long-term noise. The primary source of noise associated with operating production equipment is from the compressor including its engine and cooling fan. However, use of a compressor is dependent upon the pressure of the well. Accordingly, until well pressure is tested, the need for compression at the well site cannot be determined. Likewise a well that does not require compression early in its life cycle may require compression at some later point in time.

In January of 2001, Bollard & Brennan, Inc. conducted a noise study for submittal to Solano County of the Suisun Community 25 Natural Gas Well Site. Noise levels recorded at the natural gas well are presented below in Table 2-6.

Based on sound levels presented in Tables 2-6, equipment associated with long-term production operations could produce maximum noise levels of 70 dBA at a distance of 50 feet from the proposed production facility. As previously stated, the nearest residence is located approximately 12,700 feet southeast of the drill site. Based on an attenuation algorithm of 6 dBA per doubling of distance, maximum outdoor noise levels are expected to be less than 22 dBA at these residences. Projected noise levels would not exceed the Yolo County exterior noise standard of 60 dB L_{dn}, and, as a result, are also considered less than significant.

Table 2-7
Natural Gas Well Measurement Results

Site #	Distance	Location	Comments	Sound Level, L _{eq}
1	1'	Radiator	Noise source was primarily engine noise.	95.1 dBA
2	1'	Muffler	Primarily engine noise and some compressor noise	83.0 dBA
3	1'	Cooling Fan	Noise source was primarily cooling fan.	86.0 dBA
4	50'	50-feet from site	Noise source was overall operations of well site.	69.7 dBA
5	100'	100-feet from site	Noise source was overall operations of well site.	63.5 dBA
6	200'	200-feet from site	Noise source was overall operations of well site.	57.1 dBA
7	200'	200-feet from site	Noise source was overall operations of well site.	56.3 dBA
8	~700'	~700-feet from site	Primary noise source included well site, distant traffic and wave action on shoreline	46.6 dBA
9	~1,800'	At nearest residence	Well was barely audible. Primary noise source was due to distant traffic, and wave action.	42.3 dBA

Source: Bollard & Brannan, Inc. 2001. *Environmental Noise Analysis*. Suisun Community 25 Gas Well. Solano County, CA.

2.10.3 Mitigation Measures

Implementation of the project as proposed will not result in significant adverse impacts to noise; therefore, no mitigation measures are required.

2.11 Public Services

2.11.1 Environmental Setting

The project area has a system of governmental services that are generally provided by Yolo County and the Cities of Woodland and West Sacramento. The proposed project is located within the Yolo County Office of Emergency Services (OES) area, which is a division of the Yolo County Communications Emergency Service Agency (YCCESA), a Joint Powers Agency created by the County of Yolo and the Cities of West Sacramento, Winters, Woodland, and Davis. The Yolo County Sheriffs Department and the California Highway Patrol provide police services in the project area. School facilities are provided by various unified school districts in the county. Road maintenance is provided by Caltrans and Yolo County.

2.11.2 Environmental Impacts

The proposed project will have a significant adverse effect on public services if it will result in a need for new or altered government services in any of the following areas:

- a) fire protection,
- b) police protection,
- c) schools,
- d) maintenance of public facilities, including roads, or
- e) other governmental services.

The following is a discussion of potential effects of the proposed project for each of these significance criteria.

- a) **Fire protection.** Less than significant impact. If economic quantities of natural gas are discovered, the project will involve construction of production facilities that will require fire protection. However, production facilities will be unmanned. Existing fire protection services are capable of responding to any accidental fire or medical emergency associated with the project. The Yolo County Office of Emergency Services, Cities of Davis and West Sacramento Fire Departments, or the East Davis Fire Protection District would likely respond to any emergency at the project site. The closest fire station is located at 530 Fifth Street in Davis, California. This fire station is approximately 4.5 miles west of the of the proposed project area. Additionally, mitigation measures recommended in Section 2.9.3 will also minimize the need for fire protection.

- b) **Police protection.** No impact. Security for project related activities and equipment is not expected to require any police response. Existing police protection services are capable of responding to any emergency associated with project activities.
- c) **Schools.** No impact. The project will not require relocation of personnel or their families to the project area as drilling and construction related activities are short-term. Production facilities will be unmanned. Accordingly, no school services will be needed.
- d) **Maintenance of public facilities, including roads.** Less than significant impact. The project will result in the use of local roadways by trucks during site preparation, drilling, and construction activities. Such use could result in increased wear and could result in minor road damage. During production minimal road use, approximately one light pickup truck trip per day, is anticipated.
- e) **Other governmental services.** No impact. No other need for governmental services is expected.

2.11.3 Mitigation Measures

Implementation of the project as proposed will not result in significant adverse impacts to public services; therefore, no mitigation measures are required.

2.12 Utilities and Service Systems

2.12.1 Environmental Setting

Electrical power lines are located along the Interstate 80 corridor and Chiles Road. Electrical power lines also traverse approximately 1.0 mile west of the project site. Natural gas resources are described above in the "Energy and Mineral Resources" section.

2.12.2 Environmental Impacts

Implementation of the proposed project will have a significant adverse effect on utilities and service systems if it results in a need for new systems of supplies, or substantial alterations to the following utilities:

- a) power or natural gas,
- b) communication systems,
- c) local or regional water treatment or distribution facilities,
- d) sewer or septic tanks,
- e) storm water drainage,
- f) solid waste disposal, or
- g) local or regional water supplies.

The following is a discussion of potential effects of the proposed project for these significance criteria.

- a-g) **No impact.** Implementation of the proposed project will not induce growth or result in a need for new utilities and services. The project will not result in alterations to, or interfere with, utilities or service systems. During drilling and construction, water needed for operations will be hauled on site. Chemical toilets will be used and waste will be hauled off site for disposal at an applicable facility.

2.12.3 Mitigation Measures

Implementation of the project as proposed will not result in significant adverse impacts to utilities and service systems; therefore, no mitigation measures are required.

2.13 Aesthetics

2.13.1 Environmental Setting

The area surrounding the proposed project site is composed primarily of undeveloped lands aside from levees and gravel roadways. Due to the proposed project location in a primarily undeveloped area, project related activities are not visible from any scenic highway or scenic vista.

2.13.2 Environmental Impacts

The proposed project will have significant adverse affect on visual quality if it will:

- a) affect a scenic vista or scenic highway,
- b) have a demonstrable negative aesthetic effect, or
- c) create light or glare.

The following is a discussion of the potential effects of the proposed project for each of these significance criteria.

- a) **Affect a scenic vista or scenic highway.** No impact. The Yolo County General Plan identifies Scenic Routes in the County. A scenic route is defined as a road, street or freeway which traverses a scenic corridor of relatively high visual or cultural value. Neither the proposed drill site or the pipeline corridor are located along a scenic route as designated in the Yolo County General Plan. The closest designated scenic highway or vista is State Highway 16 in the Capay Valley, approximately 20 miles to the north of the project area. No scenic vistas or highways currently exist in the general area of the project site. Therefore, no aesthetic impacts to a scenic vista or scenic highway would occur.

- b) **Have a demonstrable negative aesthetic effect.** Less than significant with mitigation incorporated. The most visible aspect of the project will be the drilling rig. However drilling activities are considered short term. Should commercial quantities of gas be found, the applicant will establish a permanent production facility. The production pad will contain a minimum number of structures and equipment. A production facility typically includes water tanks, a dehydrator, heater/separator, and the wellhead itself. No onsite facilities will be extend taller than 25 feet. The nearest residence to either site is over 2.0 miles away from the proposed facilities.
- c) **Create light or glare.** Less than significant. Night lighting will be required during the drilling and testing phase. Lighting on the drilling platform will consist of directional lighting to minimize potential impacts to nocturnal wildlife and off site sensitive uses. However, vertical fluorescent lighting will be required on the drilling mast for safety purposes. Additionally, drilling activities are considered short term. Should commercial quantities of gas be found, the applicant will establish a permanent production facility. However no lighting will be required during production.

2.13.3 Mitigation Measures

Impacts to visual resources will be less than significant providing the following mitigation measures are implemented:

Mitigation Measure 2.13.3a

Paint production facilities. All production facilities shall be painted camouflage or an earthen tone to blend in with the environs and to prevent glare.

2.14 Cultural Resources

2.14.1 Setting

The project area is in the border area of territories occupied historically by Patwin and Plains Miwok groups (Bennyhoff 1977, Johnson 1978, Kroeber 1925, and Levy 1978). Patwin and Miwok were, traditionally, gatherer-hunter-fisher peoples that subsisted on the abundant biological resources of the Sacramento–San Joaquin River Delta. Early historical accounts indicate many Native American villages along the shores of the Sacramento River and tributaries, with populations numbering in the hundreds in the larger villages.

Native American cultures have existed in the Delta for more than 8,000 years based on archaeological evidence (Moratto 1984). A number of prehistoric cultural adaptations and cultures are evident in the prehistoric record. Archaeologists have developed a variety of models to express culture change throughout known prehistory, attempting to relate both technological aspects of developing adaptive strategies, as well as other manifestations of culture change. In one scheme, culture change is depicted in terms of Early Horizon (ca. 6,000 to 2,000 BC), Middle Horizon (2,000 BC to AD 500), and Late Horizon (AD 500 to European contact), characterized by changes in technology, burial patterns, artifact style, and settlement systems. Prehistoric manifestations of historic Native American cultures in the

region (i.e., Patwin and Miwok) are recognized in the archaeological record by AD 1,500.

Native American populations in the region were severely reduced by European diseases introduced by Spanish missionaries and explorers. Major epidemics had swept through the region by 1833, leaving Native American populations at perhaps less than 25% of their pre-contact numbers. In the historic period Native Americans were indentured into the mission labor system, forced to labor on farms and ranches in the American period, and actively discriminated against socially, economically, and politically during these periods.

Euro-American settlement and use of the project area dates from the late 18th century, beginning with missionary efforts by the Spanish. Beginning in 1842, the Mexican government issued eleven land grants in Yolo County. Only five of these grants were recognized by the American government in 1846. The county, including the project area, continued to be devoted primarily to agriculture throughout the mid 19th century (Hoover et. al 1990), and still is devoted primarily to agriculture today. The project area has become more urban in the 20th and 21st Centuries, with the City of Davis, primarily, becoming a major urban area.

A review of available archival and other literature sources for the proposed project site was conducted by Pacific Legacy, Inc. A records search was completed on May 22, 2007, by the Northwest Information Center of the California Historical Resources Information System (CHRIS). The records search obtained: (1) records of previously documented sites within the project area and 0.5-miles beyond the project area boundaries; (2) a list of archaeological/historical studies previously conducted within the project area and 0.5-miles beyond the project area boundaries; (3) a map depicting previously reported sites and studied areas; (4) copies of resource records for any previously documented historical sites, structures, and buildings; (5) copies of study report bibliographical references; and (6) listings of historical resources in the National Register of Historic Places, California Register of Historical Resources, California Historical Landmarks, and California Points of Historical Interest.

Pacific Legacy reviewed published archaeological, ethnographic, and historical sources to determine if any documented historical resources are present in the study area and to define the historical context of any cultural resources. Pacific Legacy also requested a search of the "Sacred Lands Inventory" maintained by the Native American Heritage Commission (NAHC) on May 30, 2007. The search of the Sacred Lands Inventory by the NAHC did not reveal any recorded resources within the project area. Pacific Legacy was provided with a list of potential interested Native Americans on May 31, 2007. Letters of inquiry were sent out to these parties on June 1, 2007. Any responses will be forwarded to RAB Consulting.

The record and information search revealed that three cultural resource studies that included the project area have been conducted. Seven more cultural resource studies have been completed within 0.5 miles of the project area. The record search also revealed that no historic properties, either prehistoric or historic, are known to exist within the project area. One historic site, P-57-000400, has been identified within 0.5 miles of the project area. This

site is identified as the Southern Pacific Railroad line between Vallejo and Davis. This line was originally constructed by the California Pacific Railroad between 1866 and 1868 (Nelson et al. 1999). The portion of this line directly north of the project area is also listed in the Yolo County Historic Resources Survey as YOL-HRI-6/193 (Les 1986). This portion of the Southern Pacific Railroad line consists of a railroad trestle spanning the Yolo Bypass.

On May 29, 2007, an archaeological survey of the project site was performed by Pacific Legacy. The area surveyed consisted of the canal access road, which forms the proposed pipeline route, with a 20-meter buffer on each side and the entire well pad location with a 20 meter buffer where possible. The project area was surveyed in transects spaced 10 meters apart. The surveyed area included the west side of the canal access road in the southernmost project corridor area, the north side of the canal access road and the canal along the east/west trending road within the project corridor area, and the east side of the wetlands viewing area along the wetlands access road. The visibility in these areas ranged from 20% in areas with vegetation to 100% in the recently plowed agricultural fields. The northwest/southeast trending area was not surveyed because of marsh-water and heavy vegetation resulting in zero ground visibility. The project corridor area has been greatly impacted by agricultural activity, including plowing and the building of roads, canals and berms. No historic or prehistoric material culture remains were observed during the pedestrian survey.

A copy of the archeological resources survey report is attached to this document as Appendix C.

2.14.2 Environmental Impacts

Criteria for Determining Significance

California Environmental Quality Act. According to the California Environmental Quality Act (CEQA), an impact is considered significant if it would adversely affect a historical or archaeological resource. Actions that would change the significance of a historical or archaeological resource include demolition, replacement, substantial alteration, and relocation of historic properties. The State CEQA Guidelines define three ways that a property may qualify as a historical resource for the purposes of CEQA review:

- 1) The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR).
- 2) The resource is included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey that meets the requirements of Section 5024.1(g) of the Public Resources Code, unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- 3) The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record (14 CCR, Division 6, Chapter 3, Section 15064.5[a]).

These three conditions for qualifying as a historical resource under CEQA are related to the eligibility criteria for inclusion in the CRHR (Public Resources Code, Sections 5020.1[k], 5024.1, 5024.1[g]). A cultural resource may be eligible for inclusion in the CRHR if it:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP) are considered eligible for listing in the CRHR, and thus are significant historical resources for the purposes of CEQA (Public Resources Code, Section 5024.1[d][1]).

The proposed project will have a significant effect on cultural resources if it will:

- disturb paleontological resources,
- affect historical resources,
- have potential to cause a physical change which will affect unique ethnic cultural values, or
- restrict existing religious or sacred uses within the potential impact area.

The following is a discussion of potential effects of the proposed project:

- Disturb paleontological resources.** No impact. The geology of the project area and the superficial nature of project-related drilling are expected to preclude disturbance of paleontological resources.
- Disturb archaeological resources.** Less than significant with mitigation. No archaeological resources were identified within the project site. However, if archaeological resources are discovered during construction, potentially significant impacts to archeological resources could result. Therefore, mitigation measures are proposed to reduce impacts to a less than significant level.
- Affect historical resources.** Less than significant with mitigation. No historical resources were identified within the project site. However, if historcal resources are discovered during construction, potentially significant impacts to these resources could

result. Therefore, mitigation measures are proposed to reduce impacts to a less than significant level.

- d) **Have the potential to cause a physical change, which will affect unique ethnic cultural values.** No impact. The project, as proposed, will not affect unique ethnic cultural values.
- e) **Restrict existing religious or sacred uses within the potential impact area.** No impact. No aspect of the project is known to restrict existing religious or sacred uses.

2.14.3 Mitigation Measures

To ensure that construction of the various project components will not affect known or potentially unknown cultural resources, including historic sites, prehistoric sites, buildings, and other structures, the following mitigation measures are proposed:

Mitigation Measure 2.14.3a

Avoidance of cultural resources. The project proponent will seek to avoid cultural resources as the preferred mitigation measure. Avoidance of cultural resources would result in a less-than-significant levels of impacts to identified and unidentified cultural resources. Facilities, staging areas, and any activity involving ground disturbance will be located to avoid cultural resources.

Mitigation Measure 2.14.3b

Determine eligibility of resource for listing on the CRHR. The project proponent shall retain a qualified archaeologist to evaluate any potentially significant cultural resources discovered during project implementation for CEQA “importance”, or eligibility for the CRHR.

Mitigation Measure 2.14.3c

Halt work immediately if cultural resources are discovered. All project personnel involved in any form of ground disturbance shall be advised of the possibility of encountering subsurface cultural resources. If such resources are encountered or suspected (such as chipped or ground stone debitage, historic debris, building foundations, human bone, remnants of village structure, lithic scatters, etc.), work shall be halted immediately. A professional archaeologist shall be consulted to assess any discoveries and develop appropriate management recommendations for treatment of historical resources. If bones are encountered and appear to be human, California law requires that the County coroner and Native American Heritage Commission be contacted. If Native American remains are involved, a Most Likely Descendant (MLD) shall be identified by the Native American Heritage Commission. The MLD and landowner upon whose property any human remains are found shall consult to determine the treatment of the remains.

2.15 Recreation

2.15.1 Environmental Setting

The proposed project area, including the drill site and proposed pipeline route, are located on public property owned by the State of California, the Resources Agency, CDFG. The project area and areas immediately adjacent to the proposed project area afford many recreational opportunities, including duck hunting and a driving tour. The tour route is a graveled road and is the access roadway that will be used by project personnel to access the project site during project implementation. Bird and wildlife watching, as well as hiking are conducted in the project area throughout the year.

2.15.2 Environmental Impacts

The proposed project will have a significant adverse effect on recreation if it will:

- a) increase the demand for neighborhood or regional parks or other recreational facilities,
or
- b) affect existing recreational opportunities.

The following is a discussion of potential effects of the proposed project for each of these significance criteria.

- a) **Increase the demand for neighborhood or regional parks or other recreational facilities.** No impact. Implementation of the proposed project will not increase the demand for recreational facilities. As previously discussed above, implementation of the proposed project will not result in increased population that will lead to increased demand for recreational opportunities.
- b) **Affect existing recreational opportunities.** Less than significant with mitigation. Implementation of the proposed project during drilling operation, installation of production equipment, and the installation of the proposed pipeline could temporary impact recreation activities within the project area. Implementation of the proposed project will increase vehicle traffic and use of heavy trucks on roadways within the Wildlife Area. Increased vehicle use of these roadways could cause wear to these gravel roadways. However, these impacts would be short-term in nature. Therefore, impacts are considered less than significant.

2.15.3 Mitigation Measures

To ensure that implementation of the proposed project will not significantly affect recreational resources, the following mitigation measures are proposed:

Mitigation Measure 2.15.3a

Re-gravel Access Roadway. Kebo will re-gravel 1 mile of the access roadway in the Yolo

Bypass Wildlife Area. Location and timing of gravelling will be coordinated and approved by CDFG.

2.16 Mandatory Findings of Significance

Does the project have 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?

The proposed project will have only temporary and minor impacts on the environment. Fish and wildlife habitat will not be reduced and no significant mortality of fish or wildlife is anticipated. Project activities could cause physical impacts to sensitive plant communities and behavior changes in some wildlife species during critical periods and in critical locations. However, these impacts are expected to be less than significant with implementation of mitigation measures identified above. The proposed project will not affect the number or range of rare or endangered species or eliminate important cultural resources.

Does the project have potential to achieve short-term goals, to the disadvantage of long-term environmental goals?

The proposed project would not compromise long-term environmental goals to achieve short-term goals. No impact is anticipated.

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

Construction emissions and fugitive dust generated by the proposed project would contribute to the existing exceedance of air quality standards in project area. However, due to the small scale of the project, limited duration of construction, and implementation of adopted mitigation measures, the project contribution to this cumulative impact would be less than significant.

Does the project have environmental effects, which will cause substantial adverse effects on humans either directly or indirectly?

The proposed project has no identified direct or indirect environmental effects that would cause substantial adverse effects on humans. Potential health and safety related impacts are temporary and are expected to be less than significant if the project is implemented as proposed.

3.0 REPORT PREPARATION

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3.2 Information Contacts

Table 3-1 lists the people who were contacted and consulted with during the preparation of this document.

3.3 List of Initial Study and Mitigated Negative Declaration Preparers

A consultant team of technical personnel headed by Robert A. Booher Consulting prepared this document. Table 3-2 presents the preparers and technical reviewers of this document and their qualifications.

**Table 3-1
 Information Contacts**

Agency/Organization	Name	Issue
Bollard and Brennan, Inc.	Jim Brennan	Acoustics
California Department of Fish and Game	Dave Feliz	Consulted During Preparation
	Anna Holmes	Consulted During Preparation
California Department of Water Resources Permit Section	Sam Brandon	Consulted During Preparation
Irani Engineering/Kebo Oil Inc.	Mary Halpin	Natural Gas Operations
Paul Graham Drilling	Kevin Graham	Drilling Operations and Safety
Glide Foundation	Yvonne LeMaitre	Site History
U.S. Army Corps of Engineers	Mike Finan	Consulted During Preparation
Yolo County Planning Department	Sarjit Dhaliwal	Consulted During Preparation

**Table 3-2
 Document Preparers and Technical Reviewers**

Firm	Personnel Name and Title	Education	Years Experience	Issue Area(s)
Robert A. Booher Consulting	Robert A. Booher, Principal	B.S. Environmental Studies/Applied Mathematics	32	Principal in Charge
	Cord E. Hute, Environmental Planner	B.S. Biology and Environmental Sciences	13	Biological Resources, Land Use, Population and Housing, Transportation and Circulation, Hazards, Public Services, Aesthetics, Recreation, Noise
	Fred Cooper, Air Resources Specialist	B.S. Chemistry	32	Air Quality
	Jeff Monroe Geologist	B.S. Geology/Geograohy	18	Geology, Hazards, Land Use, Water Resources
Pacific Legacy, Inc.	John Holson, Principal Archaeologist	B.A. Anthropology M.A. Cultural Resources Management	27	Cultural Resources

Appendices

Appendix A
Site Photographs



Photograph 1

Proposed exploratory natural gas drill pad location. Photograph looking east from western edge of proposed drill pad.



Photograph 2

Proposed exploratory natural gas drill pad. Photograph looking south from northern edge of proposed well pad.



Photograph 3
Proposed exploratory natural gas drill pad. Photograph looking east
from center of proposed well pad.



Photograph 5
Drainage ditch with wetland vegetation traversing parallel to the
access roadway/pipeline alignment. Photograph looking north from
drainage ditch.



Photograph 6

Check dam adjacent to the northern edge of proposed well pad.
Photograph looking west from access roadway.



Photograph 7

Drainage ditch with wetland vegetation traversing parallel to the
access roadway/pipeline alignment. Photograph looking north from
drainage ditch.



Photograph 8

Existing access road to proposed drill pad. Roadway will provide access to proposed well pad during project activities. Proposed pipeline will be installed in this roadway. Photograph looking north from access roadway.

Appendix B
Biological Assessment Report

Revised
Biological Assessment
Kebo Oil & Gas, Inc.
Glide 14-1 Exploratory Natural Gas Well Project
Yolo County, California

Prepared for:

U.S. Army Corps of Engineers
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December 2007

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1.0 PROJECT OVERVIEW

1.1 Project Proponent

Kebo Oil & Gas, Inc. (Kebo)
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Portland, TX 78374

Agent for Project:

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2625 Fair Oaks Boulevard, Suite 10
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Telephone: (916) 482-2847

1.2 Regional Setting

The proposed Kebo Glide # 14-1 Natural Gas Exploration Project (the project) is located within in Yolo County, California. The location of the proposed project site is identified in Figure 1 (Site Vicinity Map) and Figure 2 (Site Location Map).

The proposed project is located on public lands owned by the State of California, the Resources Agency, California Department of Fish and Game (CDFG). The proposed project area, which includes the proposed well pad and natural gas pipeline, is located within an unincorporated area of Yolo County, California. The proposed drill site is located in Section 14 (Township 8 North, Range 3 East) adjacent to an existing north-south trending public access roadway. The project site is located approximately four (4) miles west of West Sacramento, California, and approximately 4.5 miles east of Davis, California. The Sacramento River Deep Water Channel is located approximately 1.8 miles east of the proposed project area.

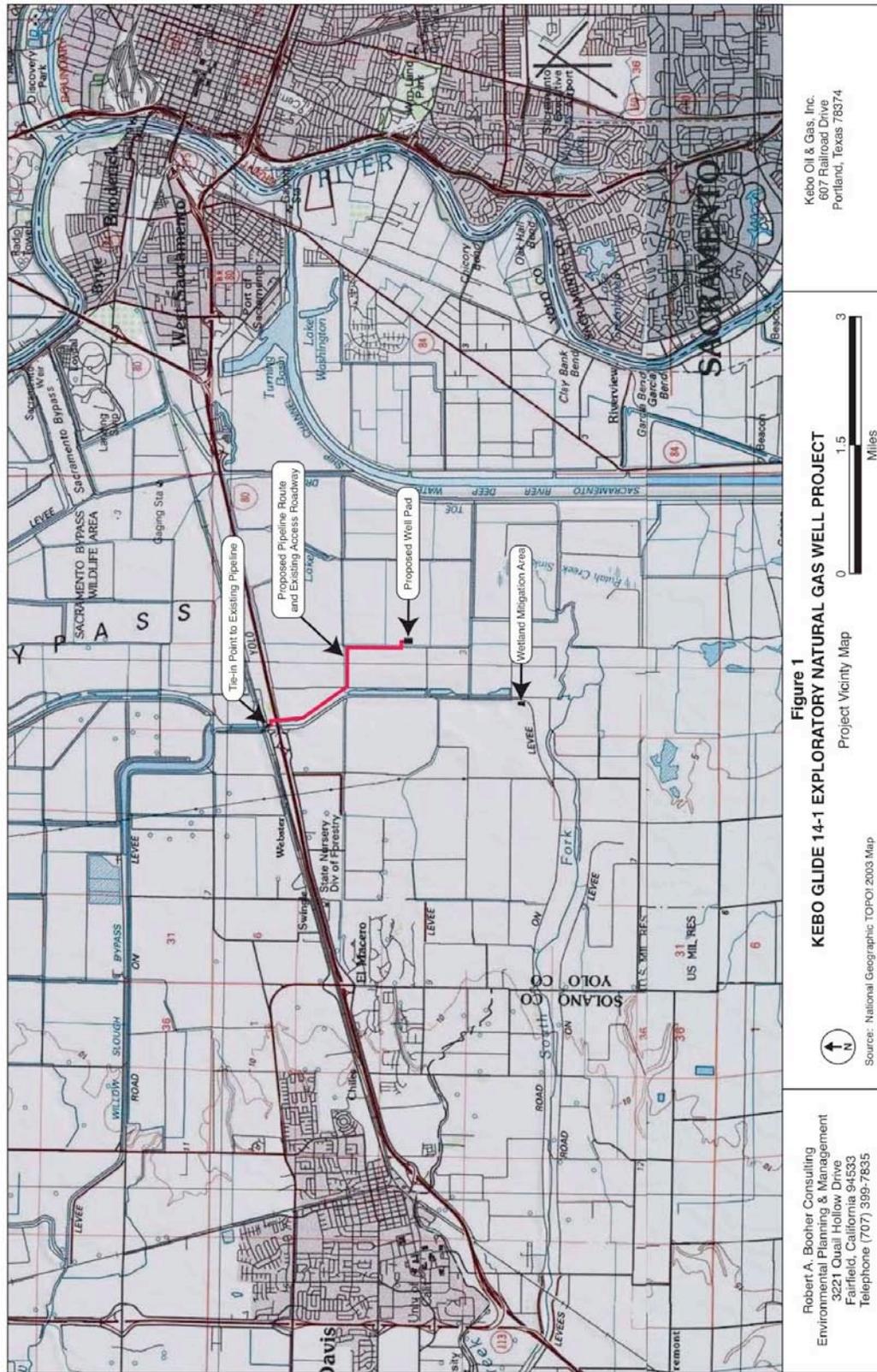
The general project area is utilized mainly for recreational purposes including hunting, hiking, wildlife viewing. Farming is also present, as are scattered rural residences.

1.3 Purpose and Need

The proposed project is needed to develop additional natural gas reserves in the State of California. The objective of the proposed project is to locate untapped natural gas sources with potential for development.

1.4 Project Description

Kebo proposes to drill a natural gas well from a site located on public lands within the CDFG Yolo Bypass Wildlife Area in Yolo County, California. If economic quantities of natural gas



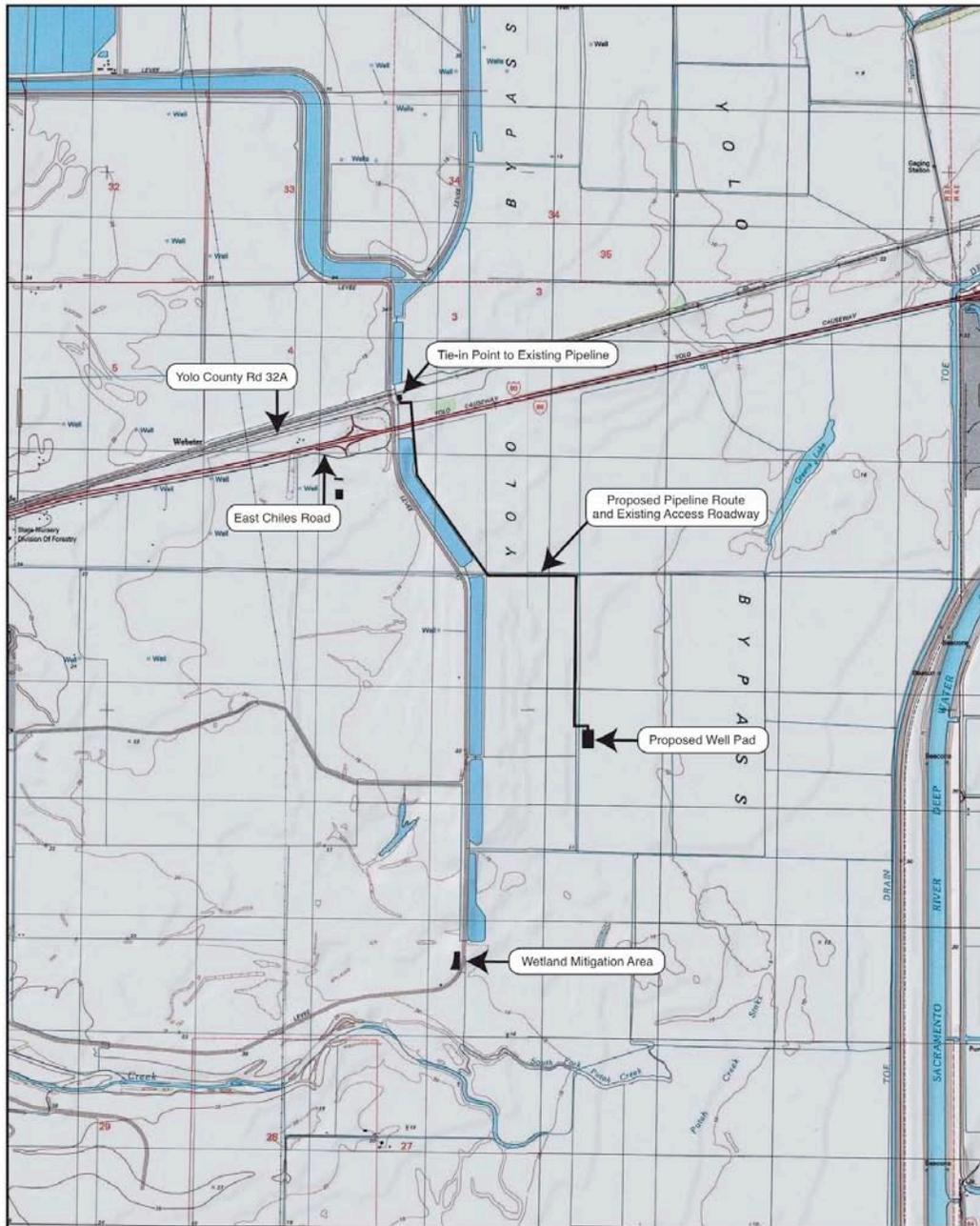


Figure 2
KEBO GLIDE 14-1 EXPLORATORY NATURAL GAS WELL PROJECT
 Project Location Map

<p>Robert A. Booher Consulting Environmental Planning & Management 3221 Quail Hollow Drive Fairfield, California 94533 Telephone (707) 399-7835</p>	<p>0 0.5 1 Miles</p> <p>Sources: National Geographic TOPO! 2003 and CNDDB 2007</p>	<p>Kebo Oil & Gas, Inc. 607 Railroad Drive Portland, Texas 78374</p>
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are discovered, the well will be completed, the drill pad will be reduced in size, a raised production platform will be installed, and a natural gas pipeline approximately 2.65 miles in length will be installed to connect the production facility with an existing natural gas collection system located north of the well site.

The proposed project includes four (4) phases: a site preparation phase, a drilling and testing phase, a production phase, and a site restoration phase. A detailed description of each phase is presented below.

1.4.1 Site Preparation Phase

Prior to initiating site preparation activities, all workers will be given an environmental orientation to ensure that those working in the project area understand the sensitivity of the areas adjacent to the project drill sites and the necessity of avoiding disturbance to these areas. The environmental orientation will include a discussion of emergency response guidelines.

Drill site boundaries will be clearly delineated by a project biologist to ensure all activities are confined to the project site. A sediment barrier fence will then be installed around the boundary of the delineated drill site to ensure all project activities are restricted to the work area. The proposed drill site will be cleared of vegetation, and the drill pad will be built up with fill materials. Gravel will be applied to the surface of the well pad to complete the preparation of the pad. Fill materials will be obtained from a qualified source outside of the Yolo Bypass Wildlife Area, and will be transported via dump truck to the proposed well pad. An access roadway approximately 50 feet in length will be constructed from an existing upland check dam to the proposed well pad to provide access. The proposed well pad would measure 460 feet by 250 feet (115,000 square feet, or 2.64 acres). The construction site and access roadways will be watered by a water truck periodically to reduce the amount of dust that is generated during project implementation.

The project proponent estimates that approximately 7 to 10 days will be needed to prepare the site.

1.4.2 Drilling and Testing Phase

The drilling and testing phase of the project will require approximately 20 to 25 total truck trips to mobilize drilling equipment to the site. Equipment will then be rigged and drill activities initiated. Approximately 3 to 4 truck trips a day will be required to support drilling operations. The construction site and access roadways will be watered by a water truck periodically to reduce the amount of dust that is generated during project implementation.

All drilling and production testing equipment (i.e. drilling rig, mud pumps, mud system equipment, portable water tanks, waste tanks, fuel tanks, portable toilets, pipe racks, and pipe baskets) will be temporarily contained within the proposed drill site. No sump will be

excavated; all drilling muds and cuttings will be contained in portable tanks. Drilling muds and cuttings will be transported offsite to an appropriate disposal facility.

Temporary directional lighting will be used during drilling operations. Directional lighting is used to minimize impacts of lighting to nocturnal animals.

Drilling activities will operate 24 hours per day, and each well may require approximately 20 to 30 days to drill and complete. Approximately 12 to 15 personnel will be on site at any given time during drilling operations. After the well is drilled, and the well is either completed or abandoned, the drilling rig (and related equipment) will be removed.

1.4.3 Production Phase

If economic quantities of natural gas are discovered, the well will be completed and production facilities will be installed. Only a limited portion of a drill site will be required for a production pad. Dimensions of production facilities will be 100 feet by 200 feet. The remaining portion of a drill site will be returned to natural grade and restored to wetland habitat.

Production facilities will include a wellhead gas meter, a heater/separator, production water and condensate storage tanks and the pipeline. The wellhead will be enclosed in a steel cage and production equipment will be elevated on a production platform in order to prevent any damage associated with flooding during the growing of rice crops. The production platform would measure approximately 20 feet by 30 feet (600 square feet, or 0.01 acres). No dehydrator will be required for the well. If compression is required, a portable compressor with an engine size less than 100 hp will be used. The project proponent proposes to paint all production equipment in camouflage or an earthen tone to blend in with the environment and to prevent glare.

Natural gas will be metered for customer sales and the production facility will be inspected on a daily basis. By-products including production water and condensates will be stored temporarily in 300 barrel capacity storage tanks that are approximately 12 feet in diameter.

By-products will be periodically transported from the facility by truck for off site disposal and/or recycling at an applicable facility. Typically a maximum of one truck trip per week will be required to transport by-products offsite. During the producing life of a well, a workover service rig (a small mobile drilling rig) may be occasionally required to improve production.

A natural gas pipeline will also be installed during the installation of production equipment. The proposed pipeline will be installed using traditional open-cut trench methods.

Trenching requires the use of a backhoe to establish an open trench of approximately four feet to six feet deep and approximately two feet wide. Pipe will be four inches in diameter or less

and will be placed beside the trench by the stringing crew. Pipe joints will be bonded together and all joint connections will be inspected and tested prior to laying pipe into the trench. Pipe will be lowered into the trench by a small side-boom crane. The pipe will then be covered with soils that were excavated during trenching and the ground compacted above the pipe. After the pipeline is buried, the construction corridor will be re-contoured to approximately the same grade or slope that existed prior to pipeline installation.

The pipeline will be approximately 2.65 miles (14,000 feet) in length, and will connect to an existing Pacific Gas and Electric natural gas pipeline north of the proposed well site. The pipeline will be installed within an existing gravel roadway in order to avoid impacts to adjacent wetlands. Approximately six to ten personnel working approximately seven to fourteen days will be required to operate equipment and install the proposed production facility including the pipeline. The proposed pipeline route is shown on Figures 1 and 2.

At conclusion of the wells economic life (production), each well will be abandoned and plugged according to the State of California, Department of Conservation, Division of Oil, Gas and Geothermal Resources regulations.

1.4.4 Site Restoration Phase and Wetland Creation

The goal of the site restoration phase is to restore the site to its condition or better than that observed at the time of project initiation. Once the well is abandoned and plugged, surface equipment will be removed from the site. Any sand and or gravel used to build up the site will then be removed from the site. Contours will be re-established to near grade conditions present at the time of project initiation. Wetland vegetation will be planted to provide erosion control and improve habitat. The project proponent will submit a restoration and revegetation plan to the appropriate agencies for approval prior to initiating site restoration.

Wetland creation activities will also take place as part of the proposed project. In order to mitigate for the permanent impacts to 0.48 acres of freshwater emergent wetlands for placement of the production pad and access driveway to the site from an existing levee roadway, approximately 1.0 acre of wetlands will be created. The site for wetland creation also occurs within the Yolo Bypass Wildlife Area, approximately 1.5 miles southwest of the proposed well pad (see Figure 1 and 2). The wetland creation area is part of CDFG's Pacific Flyway Demonstration Area, and has been designated as an area for creation of wetlands by CDFG as part of their *Yolo Bypass Land Management Plan* (CDFG 2007b). Kebo is currently preparing a compensatory wetland mitigation plan that will include the above wetland restoration activities. This plan will be subject to the approval of the U.S. Army Corps of Engineers, Sacramento District (USACE), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and CDFG.

1.5 Project Schedule

The exploratory well will be drilled during the 2008 drilling season between May 1 and October 31. Production activities will occur for an undetermined period depending on the results of exploratory drilling.

1.6 Summary of Mitigation Measures Incorporated into the Project

The proposed project has been designed to reduce or avoid potentially significant environmental impacts to the greatest degree practicable. Following is a summary of mitigation measures that have been incorporated into the project to avoid potentially significant impacts to biological resources or to reduce them to a less than significant level:

- *Mitigation Measure 2.3.2.1. Conduct an Environmental Awareness Training of Construction and Drilling Personnel.*
- *Mitigation Measure 2.3.2.2. Conduct Pre-Construction Botanical Surveys for Special-Status Plant Species.*
- *Mitigation Measure 2.3.2.3. Conduct Pre-Construction Surveys for Nesting Herons, Swallows, Tri-colored Blackbird, Western Burrowing Owl, Swainson's Hawk, White-tailed Kite, Purple Martin, Raptor Species, Nesting Waterfowl and Shorebirds, and Migratory Song Birds.*
- *Mitigation Measure 2.3.2.4. Establish Exclusion Buffer Areas around Special-status Avian Species Nest Sites.*
- *Mitigation Measure 2.3.2.5. Conduct Pre-activity Surveys for Giant Garter Snake. Avoid Impacts to Giant Garter Snake.*
- *Mitigation Measure 2.3.2.6. Minimize Physical Disturbance in Sensitive Wetland Habitat. Restore Disturbed Wetland Habitat and/or Provide Wetland Mitigation to Offset Impacts.*

2.0 BIOLOGICAL RESOURCES IN THE PROJECT AREA

Biological resources considered in this assessment include terrestrial and aquatic habitats, migratory and wintering wildlife populations, and special-status plant and wildlife species known or having potential to occur during project implementation. Vegetation communities and common wildlife found in the project area, as well as known and potentially occurring special-status plant and wildlife species are described in the setting section below. A description of potential impacts that the proposed project could have on biological resources within the project area, and mitigation measures to minimize or avoid potential impacts are also described.

2.1 Methods

Information reviewed and techniques utilized to prepare this biological assessment included the following:

- a search of the California Natural Diversity Database (CNDDDB) (CDFG 2007a), the California Native Plant Society's (CNPS) *Electronic Inventory of Rare and Endangered Plants* (CNPS 2007), and the U.S. Fish and Wildlife Service (USFWS) online electronic database of special-status species (USFWS 2007). The findings of these searches are depicted on Figure 3;
- a wetland delineation conducted on March 29 and April 11, 2007, to delineate waters of the United States. The findings of this investigation are discussed in a wetland delineation report, which is attached as Appendix C;
- a reconnaissance-level biological survey conducted by Robert A. Booher Consulting (RAB Consulting) biologists on March 29 and April 11, 2007 at the proposed well site and along the pipeline alignment, and on December 14, 2007 at the proposed wetland creation area to determine the presence or absence of special-status wildlife species, and to collect data on habitats and common wildlife species present;
- contact with regulatory agencies and others with knowledge of biological resources within the project area; and
- a review of the Jepson Manual: Higher Plants in California (Hickman 1996).

2.2 Setting

2.2.1 Major Vegetation Communities

Three (3) biological communities were documented in the project area: ruderal/disturbed, fresh emergent wetland, and annual grassland. For the purposes of this biological assessment, these communities correspond to those described in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). Each of these communities is described further below.

Ruderal/Disturbed

The ruderal/disturbed vegetative community type was identified within the project study area wherever disturbed soils occurred, active land uses were present, or active land uses were absent where disturbance had occurred in the recent past. This vegetative community was primarily observed along the existing access roadways /pipeline route. This community was also observed covering the entire proposed wetland creation area. Common vegetative

species found in this community were composed of weedy non-native species. Common species identified during the field visit included: redroot pigweed (*Amaranthus retroflexus* L.), field mustard (*Brassica campestris*), black mustard (*Brassica nigra* L. Koch), yellow-star thistle (*Centaurea solstitialis*), poison hemlock (*Conium maculatum*), large crabgrass (*Digitaria sanguinalis* (L.) Scop.), quackgrass (*Elytrigia repens* (L.) Nevski), common willow herb (*Epilobium ciliatum* ssp. *ciliatum*), red-stemmed filaree (*Erodium cicutarium*), fennel (*Foeniculum vulgare*), California mustard (*Guillenia lasiophylla*), cow parsnip (*Heracleum lanatum*), prickly lettuce (*Lactuca serriola* L.), common mallow (*Malva neglecta* Wallr.), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), white sweetclover (*Melilotus alba*), wild radish (*Rhaphanus sativus*), perennial sowthistle (*Sonchus arvensis* L.), and annual sowthistle (*Sonchus oleraceus*).

Although often comprised of non-native plant species, ruderal habitats, particularly at edges of natural communities, can provide foraging habitat for many species of birds and mammals. In the Sacramento Delta, these habitats can be occupied by California ground squirrels and other rodents, and can potentially support burrowing owl (*Athene cunicularia*) nest sites.

Fresh Emergent Wetland

The fresh emergent wetland vegetative community was observed within the footprint of the proposed well pad, within drainage ditches and wetland areas along the proposed pipeline route/existing access route, and along the western perimeter of the proposed wetland creation area. Fresh emergent wetlands are characterized by erect, rooted herbaceous hydrophytes. Dominant vegetation generally consists of perennial monocots up to 6.6 feet tall. All emergent wetlands are flooded frequently, enough so that the roots of the vegetation prosper in an anaerobic environment. The acreage of Fresh Emergent Wetlands in California has decreased dramatically since the turn of the century due to drainage and conversion to other uses, primarily agriculture.

Vegetative species observed during field surveys included water plantain (*Alisma plantago-aquatica*), coyote bush (*Baccharis piliaris*), poison hemlock (*Conium maculatum*), California sedge (*Carex californica*), oakleaf goosefoot (*Chenopodium glaucum* L.), Pacific golden-saxifrage (*Chrysosplenium glechomifolium* Nutt.), tall flatsedge (*Cyperus eragrostis*), Baltic rush (*Juncus Balticus*), toad rush (*Juncus bufonius* L.), common rush (*Juncus effusus*), Mexican rush (*Juncus mexicanus* Willd.), miner's lettuce (*Montia perfoliata* (Donn) T.J. Howell), white-head navarretia (*Navarretia leucocephala* Benth.), swamp smartweed (*Polygonum amphibium*), rabbitsfoot grass (*Polypogon monspeliensis* L. Desf), California rose (*Rosa californica*), Himalayan blackberry (*Rubus discolor*), California blackberry (*Rubus ursinus*), clustered dock (*Rumex conglomeratus*), curly dock (*Rumex crispus* L.), common tule (*Scirpus acutus*), California bulrush (*Scirpus californicus*), bulrush (*Scirpus microcarpus*), duckweed (*Spirodela oligorrhiza*), narrow-leaved cattail (*Typha angustifolia*), broad-leaved cattail (*Typha latifolia*), and cocklebur (*Xanthium strumarium* L.).

Fresh emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds and numerous mammals, reptiles, and amphibians. Many species rely on fresh emergent wetlands for their entire life cycle. Wildlife species commonly found in this community include song sparrows (*Melospiza melodia*), red-winged blackbirds (*Agelaius phoeniceus*), raccoons (*Procyon lotor*), California voles (*Microtus californicus*), California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), black-tailed deer (*Odocoileus hemionus columbianus*), and skunks (*Mephitis* sp.). This community is a sensitive community because of historic and continuing loss of wetland habitats from agricultural conversion, urbanization, and flood control development. At the time of our field visit, this wetland feature contained no standing water.

Annual Grassland

California annual grassland was observed along portions of the shoulder of the proposed access roadway/pipeline alignment. Common species found in this community were composed of introduced grasses and broadleaf weedy species, which quickly re-colonize disturbed areas.

Common species identified during the field visit included wild oat (*Avena fatua*), black mustard (*Brassica nigra* L. Koch), ripgut (*Bromus rigidus* Roth), soft cheat grass (*Bromus secalinus* L.), soft chess (*Bromus mollis*), yellow-star thistle (*Centaurea solstitialis*), California mustard (*Guillenia lasiophylla*), foxtail barley (*Hordeum leporinum*), Mediterranean barley (*Hordeum marinum*), perennial rye grass (*Lolium perenne*), common mallow (*Malva neglecta* Wallr.), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), bristly ox-tongue (*Picris echioides*), and wild radish (*Rhaphanus sativus*).

Grasslands support a variety of mammals, birds, and reptiles, and provide foraging habitat for raptors. Many species use the grassland for only part of their habitat requirements, foraging in the grassland and seeking cover in surrounding tree and scrub cover. Grassland cover provides foraging, nesting, and denning opportunities for resident species such as western fence lizard (*Sceloporus occidentalis*), northern alligator lizard (*Elgaria coerulea*), gopher snake (*Pituophis melanoleucus*), western meadowlark (*Sturnella neglecta*), goldfinch (*Carduelis tristis*), ring-necked pheasant (*Phasianus colchicus*), red-winged blackbird (*Agelaius phoeniceus*), California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), pocket gophers (*Thomomys* spp.), black-tailed jackrabbit (*Lepus californicus*), and occasionally black-tailed deer (*Odocoileus hemionus columbianus*).

The rodent, bird, and reptile populations offer foraging opportunities for avian predators such as the northern harrier hawk (*Circus cyaneus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), golden eagle (*Aquila chrysaetos*), barn owl (*Tito alba*), and great horned owl (*Bubo virginianus*). Mammalian predators which utilize grasslands include gray fox (*Urocyon cinereoargenteus*) and long-tailed weasel (*Mustela frenata*). Foraging activity of these predatory species, which tend to require relatively undisturbed habitat, is generally

limited to the undeveloped fringes of the Project Area where habitat fragmentation has not occurred and human activity is limited.

2.2.2 Sensitive Habitats and Special-Status Species

Sensitive habitats are especially diverse, regionally uncommon, considered sensitive habitats (as defined by the CNDDDB), or regulated by federal or state agencies (e.g., Section 404 of the Clean Water Act). Most sensitive habitats are given special consideration because they provide important ecological functions, including filtering of surface waters (wetlands) and providing essential habitat for common and special-status plant and wildlife species. The only habitat type described previously that qualifies as a sensitive habitat in the proposed project area is fresh emergent wetland. No naturally occurring vernal pools were identified during the wetland assessment.

Special-status species are plants and animals that are legally protected under state and federal Endangered Species Acts (ESAs) or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. Special-status plants and animals are species that fall into the following categories:

- plants or animals listed or proposed for listing as threatened or endangered under the federal ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants], 1711 [listed animals] and various notices in the Federal Register [FR][proposed species]);
- plants or animals that are candidates for possible future listing as threatened or endangered under the federal ESA (61 FR 40, February 28, 1996);
- plants or animals designated as "species of special concern" by CDFG and USFWS;
- plants or animals listed or proposed for listing by the State of California as threatened;
- endangered under the California ESA (14 California Code of Regulations [CCR] 670.5);
- plants listed as rare or endangered under the California Native Plant Protection Act (CDFG Code, Section 1900 et seq.);
- plants that meet the definitions of rare or endangered under California Environmental Quality Act (CEQA) [State CEQA Guidelines, Section 15380];
- animals fully protected in California (CDFG Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]);
- plants considered under the CNPS to be "rare, threatened, or endangered in California" (Lists I B and 2 in CNPS 2007); and

- plants listed by CNPS as plants about which more information is needed to determine their status and plants of limited distribution (Lists 3 and 4 in CNPS 2007), which may be included as special-status species on the basis of local significance or recent biological information.

Special-status species known to occur or with potential to occur in the proposed project area were determined based on:

- a search of the CNDDDB (CDFG 2007a), the CNPS *Electronic Inventory of Rare and Endangered Plants* (CNPS 2007), and the USFWS online electronic database of special-status species (USFWS 2007). The findings of these searches are depicted on Figure 3;
- a wetland delineation conducted on March 29 and April 11, 2007, to delineate waters of the United States. The findings of this investigation are discussed in a wetland delineation report, which is attached as Appendix C;
- a reconnaissance-level biological survey conducted by RAB Consulting biologists on March 29, April 11, and December 14, 2007, to determine the presence or absence of special-status wildlife species, and to collect data on habitats and common wildlife species present;
- contact with regulatory agencies and others with knowledge of biological resources within the project area; and
- a review of the Jepson Manual: Higher Plants in California (Hickman 1996).

Special-status plant species potentially occurring in the proposed project area were defined as those special-status species with known populations in or near the proposed project area and those known from habitats either identical to or similar to those found in the proposed project area. Figure 3 illustrates special-status species occurrences within the proposed project area and vicinity.

35 special-status species were identified as potentially occurring within the general vicinity of the project study area. Of these 35 species, 4 species have been documented within the project study area, 18 of the species have a low to high potential of occurring within the project study area, while 17 of the special-status species were determined to have no potential of occurring within the study area.

Table 1 presents information on the special-status species (plants and wildlife) that have been documented within the general vicinity of the proposed project site. Table 1 also provides a likelihood of occurrence analysis for each species that may have potential to occur at the project site.

Table 1
Special-Status Species Recorded or Potentially Occurring Within The Vicinity Of The
Proposed Project Site, Yolo County, California.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
<i>Birds</i>					
Tri-colored blackbird	<i>Agelaius tricolor</i>	-	CSC	Highly colonial species. Most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	Moderate potential. No individual tri-colored blackbirds observed during surveys. CDFG has documented sightings of fairly large numbers of this species within the project area. Suitable nesting and foraging habitat exists within the project study area.
Western burrowing owl	<i>Athene cunicularia hypugea</i>	-	CSC	Open grasslands, prairies, farmlands, deserts.	Low potential. Potential nesting and foraging habitat present within the project study area. No individual owls or sign of their presence observed during survey of project study area. No appropriate nesting burrows observed in the project study area.
Swainson's hawk	<i>Buteo swainsoni</i>	-	CT	Inhabits grassland, shrubland, and agricultural areas where it has open areas to forage for its small prey and where roost sites are available. In breeding season, also requires nesting trees, usually trees bordering agricultural fields, in wetland borders, and on abandoned farms. Forages by soaring over open areas and by searching from perches.	Moderate to high potential. No individual Swainson's hawks observed during surveys. This species has been sighted in the vicinity of the project study area. Suitable foraging and nesting habitat exists within project area.
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	FT	CSC	Nests on sandy beaches, salt pond levees, and the shores of large alkali lakes. Requires sandy, gravelly, or friable soils for nesting.	Low potential. No appropriate habitat for this species present within the project study area. This species has been observed nesting at 2 locations within 0.5 miles of the project site according to CDFG.
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	FC	CE	Nesting habitat consists of cottonwood willow riparian forest. Also may be found nesting in walnut and almond orchards.	No potential. No appropriate habitat for this species present within the project study area.
White-tailed kite	<i>Elanus leucurus</i>	-	Fully Protected	Nests in rolling foothills and valley margins with scattered oaks and river bottomlands, or marshes next to deciduous woodland. Require open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Moderate potential. No individual kites observed during surveys. This species has been documented within the project area by CDFG. Suitable foraging and nesting habitat exists within the project area.

Table 1
Special-Status Species Recorded or Potentially Occurring Within The Vicinity Of The Proposed Project Site, Yolo County, California.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Peregrine falcon	<i>Falco peregrinus</i>	-	CE/Fully Protected	Peregrines generally feed and breed near water. This species nests on protected ledges of high cliffs, banks, dunes, and mounds in woodland, forest, and coastal habitats. However, pairs are also known to nest on human-made structures such as bridges and buildings. Riparian areas and coastal and inland wetlands are important yearlong habitats. Peregrine falcons forage over most wetland habitats, including salt ponds that harbor many bird species it uses as prey. Peregrines prey on bird species such as ducks, shorebirds, and doves.	Moderate potential. No nesting habitat for peregrine falcons was observed within the project area. However, this species may forage in the project area at any time. This species has been observed foraging in the general project area.
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT	CE	Nests and winters near ocean shores, lake margins and rivers. Nests in large, old-growth, or dominant live trees with open branches, especially Ponderosa pine. Roosts communally in winter.	No potential. No appropriate habitat for this species present within the project study area.
Purple Martin	<i>Progne subis</i>	-	CSC	Open or semi-open areas such as farmland, meadows, fields, parks, and residential areas. Usually found near open water.	Low potential. Potential nesting and foraging habitat present within the project study area. No individual purple martins observed during survey of project study area.
Mammals					
Pallid bat	<i>Antrozous pallidus</i>	-	CSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
American badger	<i>Taxidea taxus</i>	-	CSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Require sufficient food, friable soils, and open uncultivated ground. Prey on burrowing rodents. Dig their own burrows.	No potential. No appropriate habitat for this species present within the project study area.
Fish					
Sacramento perch	<i>Archoplites interruptus</i>	-	CSC	Formerly inhabited sloughs, slow-moving rivers, and lakes of the Central Valley. Now mostly found in reservoirs and farm ponds. Often associated with beds of rooted, submerged, and emergent vegetation and other submerged objects. Aquatic vegetation is especially essential for the young-of-year which remain close to it and/or in shallow areas. Sacramento perch are able to tolerate a wide range of physicochemical water conditions.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.

Table 1
Special-Status Species Recorded or Potentially Occurring Within The Vicinity Of The
Proposed Project Site, Yolo County, California.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Delta smelt	<i>Hypomesus transpacificus</i>	FT	CT	Delta smelt are found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties. Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the mixing zone and disperse widely into river channels and tidally-influenced backwater sloughs. They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone. Most spawning happens in tidally-influenced backwater sloughs and channel edgewater. Although spawning has not been observed in the wild, the eggs are thought to attach to substrates such as cattails, tules, tree roots and submerged branches.	Moderate to high potential. May occur within the project study area during flooding events in the Yolo Bypass Wildlife Area.
Chinook salmon (Sacramento River Winter-Run, Central Valley Spring-Run, Central Valley Fall- and Late Fall-Run)	<i>Oncorhynchus tshawytscha</i>	FE / FT / FSC	SE/ST/-	Adult winter-run Chinook salmon leave the ocean and migrate through the Sacramento-San Joaquin River Delta into the Sacramento River from November through July. Juvenile winter-run Chinook salmon rear and emigrate in the lower Sacramento River from October through March. Adult spring-run Chinook salmon enter the Sacramento and San Joaquin River main streams in February through July. Spring-run Chinook salmon appear to emigrate at 3 different life stages: as fry, fingerlings, or yearlings. Fry may occur between December and January, fingerlings occur from February through May, and yearling spring-run Chinook salmon emigrate from October through February, with abundance peaking in November. Fall-run Chinook salmon were historically the most abundant run of Central Valley Chinook salmon. They occupy the major Central Valley river systems. After 2 to 4 years of maturation in the ocean, adult fall-run Chinook salmon return to their natal freshwater streams to spawn. Adult fall-run Chinook salmon enter the Sacramento River system from July through December and spawn from October through December. Juvenile fall-run and late fall-run Chinook salmon may rear from January to June.	Moderate to high potential. May occur within the project study area during flooding events in the Yolo Bypass Wildlife Area
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	FT	-	After maturing for 1 to 3 years in the ocean, adult steelhead typically begin their spawning migration into the Sacramento and San Joaquin Delta System in fall and winter. Adult steelhead enter the mainstream Sacramento River in July, peak in abundance in the fall, and continue migrating through February and March. Juvenile steelhead will remain in fresh water and continue to rear for 1 to 3 years before migrating to the ocean in November through May to mature. Smolt typically migrate to the ocean during march through June.	Moderate to high potential. May occur within the project study area during flooding events in the Yolo Bypass Wildlife Area

Table 1
Special-Status Species Recorded or Potentially Occurring Within The Vicinity Of The Proposed Project Site, Yolo County, California.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Sacramento splittail	<i>Pogonichthys macrolepidotus</i>	-	CSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay, associated marshes, slow moving river sections, and dead end sloughs. Require flooded vegetation for spawning and foraging for young.	Moderate to high potential. May occur within the project study area during flooding events in the Yolo Bypass Wildlife Area
Invertebrates					
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE	-	Endemic to the grasslands of the northern two-thirds of the Central Valley. Found in large, turbid pools. Inhabit astatic pools located in swales formed by old braided alluvium filled by winter and spring rains.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	-	Endemic to the grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains in astatic rain-filled pools. Inhabit small clear-water sandstone-depression pools and grassed swales, earth slumps, or basalt-flow depression pools.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Sacramento Valley tiger beetle	<i>Cicindela hirticollis abrupta</i>	-	-	Sandy floodplain habitat in the Sacramento Valley. Found on terraced floodplains or low sandy water edge flats.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FE	-	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for stressed elderberry shrubs.	No potential. No habitat (I.e., elderberry bushes) for this species is present within the project study area.
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	-	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud-bottomed and highly turbid.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
California linderiella	<i>Linderiella occidentalis</i>	-	-	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Antioch multilid wasp	<i>Myrmosula pacifica</i>	-	-	Not Available. Last documented sighting in 1945.	No potential. Species not found in association with agricultural fields or ruderal habitat.
Amphibians/Reptiles					
California tiger salamander	<i>Ambystoma californiense</i>	FT	CSC	Primarily inhabit non-native grassland providing underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	No potential. No grassland habitat (potential aestivation habitat) currently occurs within the general project area.
California red-legged frog	<i>Rana aurora draytonii</i>	FT	CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to aestivation habitat, consisting of small mammal burrows and moist leaf litter.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.

Table 1
Special-Status Species Recorded or Potentially Occurring Within The Vicinity Of The
Proposed Project Site, Yolo County, California.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Giant garter snake	<i>Thamnophis gigas</i>	FT	CT	Prefer freshwater marsh and low gradient streams. Have adapted to drainage canals and irrigation ditches.	Medium to high potential. Potential foraging and aestivation habitat present within project study area. Giant garter snake has been observed within the general area of the project site.
Plants					
Alkali milk-vetch	<i>Astragalus tener</i> var. <i>tener</i>	-	List 1B	Alkali playa, valley and foothill grassland, and vernal pools. Low ground, alkali flats, and flooded lands in annual grassland or in playas or vernal pools. Elevational range: 1 to 170 meters. Blooming period: March through June.	Medium to high potential. May occur along canal areas adjacent to the project site and study area.
Heartscale	<i>Atriplex cordulata</i>	-	List 1B	Alkaline flats and scalds in the Central valley or sandy soils in chenopod scrub, valley or foothill grassland, and meadows. Elevational range: 1-150 meters. Blooming period: Apr through October.	No potential. Unlikely to occur due to lack of suitable habitat within the project study area.
Brittlescale	<i>Atriplex depressa</i>	-	List 1B	Chenopod scrub, meadows, playas, valley and foothill grassland, vernal pools. Usually found in alkali scalds or alkali clay soils in meadows or annual grassland. Rarely associated with riparian, marsh, or vernal pool habitat. Elevational range: 1 to 320 meters. Blooming period: May through October.	Medium potential. May occur along canal areas adjacent to the project site and study area.
San Joaquin spearscale	<i>Atriplex joaquiniana</i>	-	List 1B	Chenopod scrub, alkali meadow, and foothill grassland. Found in seasonal wetlands with <i>Distichlis spicata</i> and <i>Frankenia</i> . Elevational range: 1 to 320 meters. Blooming period: April through October.	Low to medium potential. May occur in marsh habitat within the project study area. Plant species was not observed during field surveys at the site.
Rose-mallow	<i>Hibiscus lasiocarpus</i>	-	List 2	Marshes and swamps (freshwater). Moist, freshwater-soaked river banks and low peat islands in sloughs. Elevational range: 0 to 150 meters. Blooming period: June through September.	Low to medium potential. May occur in marsh habitat within the project study area. Plant species was not observed during field surveys at the site.
Northern California black walnut	<i>Juglans californica</i> var. <i>hindsii</i> Jepson	-	List 1B	Riparian forest and woodlands. Found in deep alluvial soil associated with creeks and streams. Elevational range: 0 to 395 meters. Blooming period: April through May.	No potential. Suitable habitat for this species does not occur within the project study area.
Heckard's pepper-grass	<i>Lepidium latipes</i> var. <i>heckardii</i>	-	List 1B	Valley and foothill grassland and vernal pools. Found on alkaline soils. Elevational range: 3 to 30 meters. Blooming period: March through May.	Medium potential. May occur along canal areas adjacent to the project site and study area.
Colusa grass	<i>Neostapfia colusana</i>	FT	CE/List 1B	Vernal pools. Elevational range: 5 to 200 meters. Blooming period: May through August.	Medium potential. May occur along canal areas adjacent to the project site and study area.
Solano grass	<i>Tuctoria mucronata</i>	FE	CE/List 1B	Vernal pools. Elevational range: 5 to 10 meters. Blooming period: April through August.	Medium potential. May occur along canal areas adjacent to the project site and study area.

Table 1
Special-Status Species Recorded or Potentially Occurring Within The Vicinity Of The
Proposed Project Site, Yolo County, California.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
<i>Sensitive Habitats</i>					
Elderberry Savanna (not present)					
Great Valley Cottonwood Riparian Forest (not present)					
FEDERAL	FE FT FC	Federally listed as Endangered Federally listed as Threatened Federal Candidate Species (former Category 1 candidates)			
STATE	CE CT CR CSC	State listed as Endangered State listed as Threatened State designated as Rare California Department of Fish and Game designated "Species of Special Concern"			
CNPS	CNPS List 1b CNPS List 2 CNPS List 3 CNPS List 4	Plants that are rare, threatened, or endangered in California and elsewhere Plants that are rare, threatened, or endangered in California, but are more common elsewhere Plants about which we need more information – a review list Plants of limited distribution – a watch list			

Source: CDFG 2007a, CNPS 2007, and USFWS 2007.

Other Sensitive Biological Resources

Other sensitive biological resources also occur in the project area and are presented below.

Nesting Swallows

Several swallow species nest and forage within the project area. Nesting swallows are protected under the Migratory Bird Treaty Act (MBTA). Nesting swallow species present within the project area include cliff swallows (*Hirundo pyrrhonota*), barn swallows (*Hirundo rustica*), bank swallows (*Riparia riparia*), and tree swallows (*Tachycineta bicolor*).

Nesting and Foraging Herons

Nesting heron rookeries have been identified within the general vicinity of the project site. These rookeries normally occur within wetland, riparian, or watercourse habitats. Most of these rookeries include mixed species, such as great blue herons (*Ardea herodias*) and great egrets (*Ardea alba*). Each of these species begins nesting in late March and most young have fledged by July 1. No heron rookeries were identified within the project study area.

Nesting and Wintering Waterfowl/Shorebirds

The Yolo Bypass, and specifically the Yolo Bypass Wildlife Area, is managed for wildlife, primarily waterfowl. The Yolo Bypass lies within the Pacific Flyway, a major flight corridor for many types of birds. Large concentrations of waterfowl occur in the managed wetlands on both private and public lands during the winter months. Abundant species include northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), American widgeon (*Anas americana*), green-winged teal (*Anas crecca*), lesser scaup (*Aythya affinis*), ring-necked duck (*Aythya collaris*), and white-fronted geese (*Anser albifrons*). These managed wetlands also support shorebirds, including American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), dowitcher (*Limnodromus scolopaceus*), western (*Calidris mauri*) and least sandpipers (*Calidris minutilla*), and dunlin (*Calidris alpina*).

2.3 Analysis of Potential Environmental Impacts

2.3.1 Significance Criteria

Significant impacts on biological resources would occur if implementation of the proposed project results in:

- Adversely affect, either directly or through habitat modifications, any endangered, rare, or threatened species, as listed in Title 14 of the CCR (sections 670.2 or 670.5) or in Title 50, CFR;
- Have a substantial adverse impact, 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 CDFG or USFWS;
- Cause a reduction in the area or habitat value of critical habitat areas designated under the federal ESA;
- Substantially fragment or isolate wildlife habitats or movement corridors, especially riparian and wetland habitats, or impede the use of wildlife nurseries;
- Have a substantial adverse impact, such as a reduction in area or geographic range, on any riparian habitat, other sensitive natural community, or significant natural areas identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;
- Adversely affect federally protected wetlands (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;

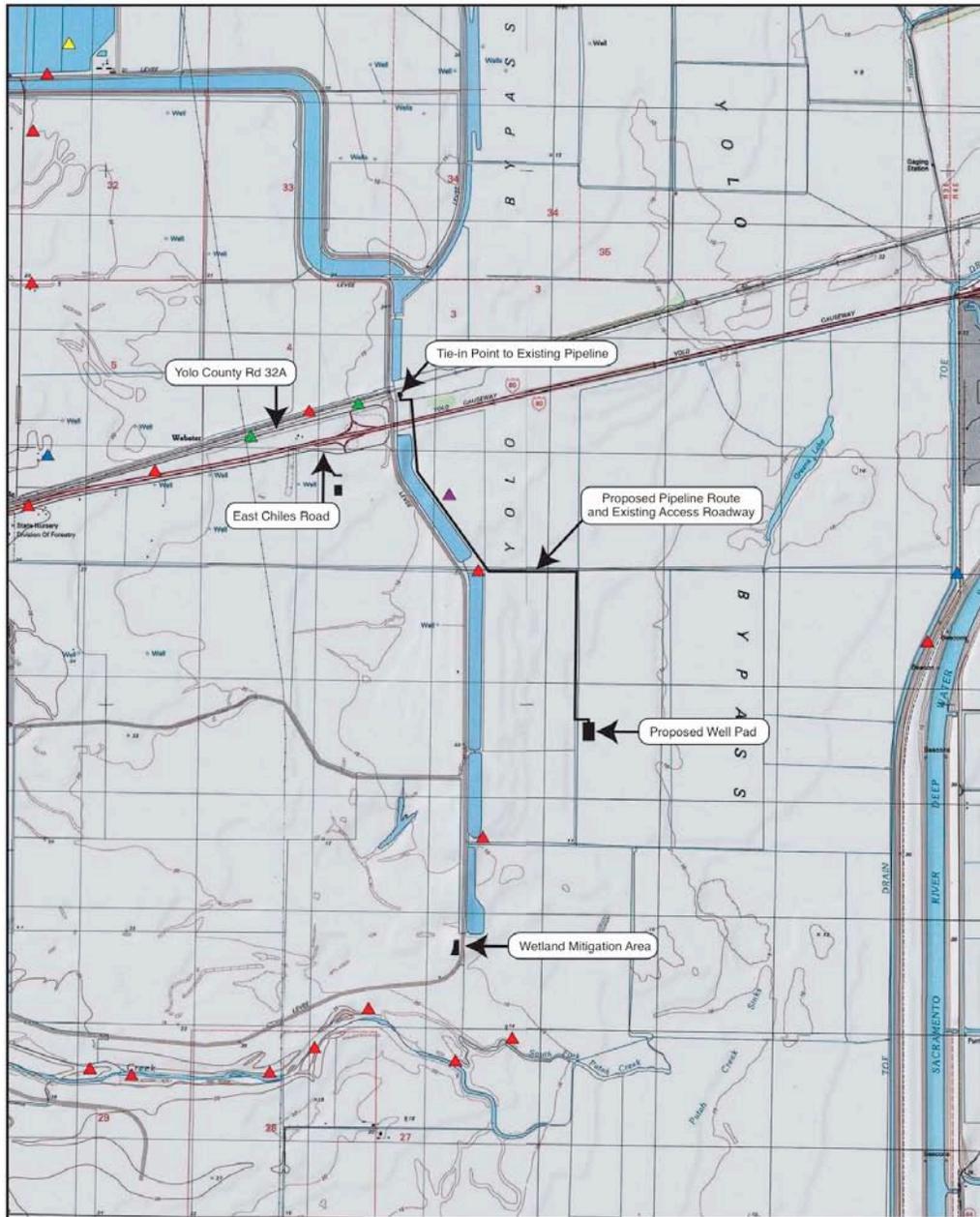


Figure 3
KEBO GLIDE 14-1 EXPLORATORY NATURAL GAS WELL PROJECT
 CNDDDB Occurrences in the Project Area

LEGEND			
▲ Swainson's hawk	▲ Giant garter snake	▲ Burrowing owl	
▲ Western snowy plover	▲ California linderiella		
CNDDDB Occurrences Common Names			

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Sources: National Geographic TOPOI 2003
 and CNDDDB 2007

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- Substantially decrease the size of important native upland wildlife habitats or wildlife use areas;
- Substantially decrease the amount of available forage, including forage from agricultural lands for wintering waterfowl;
- Impact locally designated species (e.g., heritage trees and wildlife populations unique to the project area); and
- Cause avoidance of fish or biologically important habitat for substantial periods, which may increase mortality or reduce reproductive success.

Potential Impacts to Common Vegetative Communities/Wildlife Habitat from Project Activities

Potential impacts to common vegetative communities/wildlife habitats (i.e., ruderal/disturbed and annual grassland) within the proposed disturbance area would occur during installation of the proposed pipeline and access roadway, and construction of the wetland creation area. Vegetation in the disturbance zone would be completely removed during site preparation activities. Because such vegetative communities/wildlife habitats, and associated plant species are locally and regionally common, impacts are considered less than significant. Therefore, no mitigation measures are proposed.

Potential Impacts to Special-Status Plant Species from Project Activities

Implementation of the proposed project could potentially result in significant impacts on endangered, threatened, rare, or other special-status plant species (as identified in Table 1) located in the proposed disturbance area (wetland habitat within the disturbance area for the well pad). Direct impacts could result from ground disturbance activities during construction of the well and production pads. These impacts could result in the direct mortality of individuals or small populations of these plant species. Potential impacts would be avoided or reduced to a less-than-significant level through the implementation of *Mitigation Measures 2.3.2.1* and *2.3.2.2*.

Potential Impacts to Nesting Swallows and Herons from Project Activities

Implementation of the proposed project could result in potentially significant impacts on nesting swallows occurring within the project area. Impacts would occur from construction-related noise during installation of the drill and production pads, and installation of the natural gas pipeline. Because swallows are a migratory species, and are protected under the MBTA, project-related impacts that cause nesting failure would be considered a significant impact. *Mitigation Measures 2.3.2.1, 2.3.2.3, and 2.3.2.4* have been incorporated into the project to ensure that potential impacts on nesting swallows are avoided or reduced to a less than-significant level.

Proposed project activities could also result in potentially significant impacts on nesting herons utilizing upland habitats adjacent to foraging areas (i.e., wetlands, marshes, watercourses) if project related activities destroy nests or cause reproductive failure. Heron rookeries are protected under CDFG code 3503.5. *Mitigation Measures 2.3.2.1, 2.3.2.3, and 2.3.2.4* have been incorporated into the project to ensure that potential impacts on nesting herons are avoided or reduced to a less than-significant level.

Potential Impacts to Nesting and Wintering Waterfowl/Shorebirds from Project Activities

Implementation of the proposed project could result in potentially significant impacts on nesting and wintering waterfowl and shorebirds occurring within the project area. Impacts to these species would occur due to noise created during construction of the drilling and production pads, drilling of the well, installation of the proposed natural gas pipeline, construction of the wetland creation area, and from the presence of humans and construction/drilling equipment during project implementation. *Mitigation Measures 2.3.2.1, 2.3.2.3, and 2.3.2.4* have been incorporated into the project to ensure that potential impacts on nesting waterfowl and shorebirds are avoided or reduced to a less than-significant level.

Potential Impacts to Special-Status Fish Species from Project Activities

Construction of the well drilling pad would result in significant impacts to special-status fish species (i.e., Delta smelt, Chinook salmon, Central Valley steelhead, and Sacramento splittail) if the project site is flooded during construction of the well pad. Impacts could consist of direct mortality if special-status fish species are present on the project site when filling activities are being conducted. However, the project proponent is proposing to construct the well pad when the project site is in a fallow state and is not flooded. Therefore, no impacts to special-status fish species are anticipated.

Potential Impacts to Wetland Habitat from Project Activities

Construction of the well drilling pad would result in the impact of fresh emergent wetland. This impact is considered potentially significant because of the designation of wetland habitats as sensitive, protected habitats. *Mitigation Measure 2.3.2.6* has been incorporated into the project to reduce potential impacts to a less-than-significant level.

Potential Impacts to Wildlife Migration or Dispersal Corridors from Project Activities

The proposed project area occurs within the Pacific flyway. The Pacific Flyway comprises the western Arctic, including Alaska and the Aleutian Islands and the Rocky Mountain and Pacific coast regions of Canada, the United States and Mexico, south to where it becomes blended with other flyways in Central and South America. The project site does not occur within any other identified minor or major or identified migration or dispersal corridors.

Although the project site occurs within the Pacific flyway, it occurs within a small portion of the flyway. In addition, the proposed project will be implemented between the months of May and October when the migration of birds will be very low to non-existent. Therefore, impacts to wildlife and dispersal corridors are considered less than significant, and no mitigation measures are proposed.

Potential Impacts to Giant Garter Snake from Project Activities

Giant garter snakes (GGS) have the potential to be present within a drainage ditch and associated levees adjacent to the western boundary of the proposed well site during implementation of the proposed project. GGS also have the potential to be present within the proposed well pad area during periods when rice crops are grown (rice fields are currently not in production), or during other periods when the well site is flooded. Drainage ditches along portions of the access roadway/proposed pipeline alignment also have the potential to provide potential habitat. GGS typically inhabit sloughs, marshes, and drainage canals characterized by slow flowing or standing water, permanent summer water, mud bottoms, earthen banks, and an abundance of preferred forage species. The GGS is highly aquatic, but avoids areas of dense riparian overstory, preferring stands of emergent aquatic vegetation, such as bulrushes and cattails, and herbaceous terrestrial cover composed of annual and perennial grasses, blackberry, and mustard. This vegetation, along with burrows, undercut banks, and large rocks, provide escape cover. In addition, areas devoid of overstory shading are required for basking areas for thermoregulation.

GGS rely on canals and ditches as movement corridors. These corridors are vital to giant garter snake dispersal and, most importantly, for continuing genetic exchange between subpopulations. Un-vegetated canals may be used as disposal corridors, but they typically do not remain in exposed canals due to increased vulnerability to predators.

Essential habitat components of the giant garter snake consist of the following:

- Adequate water during the snake's active period (early spring through mid-fall) to provide a prey base and cover;
- Emergent, herbaceous wetland vegetation, such as cattail and bulrushes, for escape cover and foraging habitat; and
- Upland habitat for basking, cover, and retreat sites, and refuge from flood waters.

Mitigation Measure 2.3.2.5 has been incorporated into the project to ensure that potential impacts on these species is avoided.

Potential Impacts to Nesting Special-Status Avian Species (Including Raptors) from Project Activities

Implementation of the proposed project could potentially result in significant impacts on special-status avian species by causing abandonment of nests, nesting colony sites, and the destruction of active nest sites. Tri-colored blackbird, western burrowing owl, Swainson's hawk, white-tailed kite, and purple martin could potentially occur within the project site or study area during implementation of the proposed project. In addition, other raptor species protected by the MBTA and state and federal raptor protection acts may be present within the project study area during project activities. *Mitigation Measures 2.3.2.1, 2.3.2.3, and 2.3.2.4* have been incorporated into the project to ensure that potential impacts on these species are avoided or reduced to a less-than significant level.

Potential Impacts to Nesting Migratory Song Birds from Project Activities

Implementation of the proposed project could potentially result in significant impacts on nesting migratory songbirds present in the project study area during implementation of the proposed project by causing abandonment of nests, nesting colony sites, and the destruction of active nest sites. Migratory bird species are protected by the MBTA and the California Fish and Game Code. *Mitigation Measures 2.3.2.1, 2.3.2.3, and 2.3.2.4* have been incorporated into the project to ensure that potential impacts on these species are avoided or reduced to a less-than significant level.

Potential Impacts to Common Wildlife Species from Project Activities

Direct mortality or injury to common wildlife and plant populations could occur during ground disturbance activities associated with installation of the proposed well pad, production facility, pipeline, and the wetland creation area. Project implementation has the potential to impact small vertebrate species, and increased human activity and vehicle traffic in the vicinity may disturb some wildlife species. Common wildlife species observed at or within the project area likely have acclimated to on-going human activities (recreational use of the project area by the public). Species most likely to be affected by habitat disturbance are relatively sedentary such as plants, small mammals and reptiles. Other more mobile wildlife species, such as most birds and larger mammals, can avoid project-related activities by moving to other adjacent areas temporarily.

A short-term increase in project-related traffic is anticipated during project implementation. This will result in a short-term increase in associated noise, which may cause temporary disturbance to local common wildlife. Species intolerant of human activities may use the project site significantly less when humans are regularly present in the area. More tolerant species may adapt to and even take advantage of close human contact. Increased vehicular traffic can cause direct mortality to species or impede daily activities or dispersal.

Because such wildlife species are locally and regionally common, impacts are considered less than significant and short-term in nature. Therefore, no mitigation measures are proposed.

2.3.2 Mitigation Measures

The following mitigation measures will be implemented during project implementation to reduce potential environmental impacts to a less than significant level.

Mitigation Measure 2.3.2.1. A Qualified Biologist will conduct an Environmental Awareness Training of Construction and Drilling Personnel. A Qualified Biological Monitor Shall be Present During All Ground Disturbing and Drilling Activities.

A pre-construction environmental awareness training shall be conducted with all construction and drilling personnel prior to the implementation of any component of the proposed project, and should consist of a brief presentation in which persons knowledgeable in local sensitive habitats and wildlife, and regulatory protection should discuss environmental concerns. All personnel working on the project should understand the sensitivity of adjacent habitats and wildlife species.

A qualified biologist shall be present on site during the all ground disturbing activities and during the drilling of the exploratory well. The biological monitor will be responsible for ensuring that construction and personnel follow the mitigation measures outlined in this document, as well as all conditions set forth in any environmental and use permits issued for the project. Results of the monitoring effort shall be documented in monitoring notes and summarized in a final report. The final report will be submitted to all regulatory agencies who issue permits or clearances for the project.

Mitigation Measure 2.3.2.2. Conduct Pre-Construction Botanical Surveys for Special-Status Plant Species.

A qualified botanist will conduct pre-construction field surveys to identify any populations of threatened, endangered, rare, and other special-status plants located within the proposed disturbance areas as identified within Table 2-4. These surveys shall be conducted prior to the initiation of any construction activities and coincide with the appropriate flowering period of the special status plant species with the potential to occur in the area. If any special-status plant species populations are identified within or adjacent to the proposed disturbance area, Kebo shall implement the following measures:

- If any population(s) of special-status plant species is identified adjacent to the proposed project site, a qualified biologist retained by Kebo will clearly delineate the location of the plant population. If the plant population is directly adjacent to the proposed disturbance zone, the project proponent will install protective fencing between the disturbance zone and the plant population to ensure that the plant population is adequately protected.

- If a special-status plant population is identified within the proposed disturbance zone, Kebo will consult with CDFG and USFWS to determine the appropriate measures to avoid or mitigate for impacts to the species or population. Kebo will adjust the boundaries of the disturbance zone, where feasible, to avoid impacts to the plant species/population. Where avoidance is not feasible, Kebo will implement one or more of the following measures: (1) transplant potentially affected plants to areas not planned for disturbance. If a plant is transplanted, two more plants should be planted. Plantings shall be managed and monitored by the applicant and shall survive to 5 years after planting; (2) seed or purchase plants and place them in an area adjacent to the disturbance zone; (3) purchase credits at an approved mitigation bank at a ratio approved by CDFG, USFWS, and Kebo.

Mitigation Measure 2.3.2.3. Conduct Pre-Construction Surveys for Nesting Herons, Swallows, Tri-colored Blackbird, Western Burrowing Owl, Swainson's Hawk, Northern Harrier Hawks, Short-eared Owls, White-tailed Kite, Purple Martin, Raptor Species, Nesting and Wintering Waterfowl and Shorebirds, and Migratory Song Birds.

Pre-construction surveys will be conducted for protected avian species nesting in the project area prior to implementation of any component of the project. If exploratory drilling or construction activities take place beyond August, pre-construction surveys will be conducted for wintering waterfowl as well. Pre-construction surveys will occur prior to the implementation of the proposed project. A qualified biologist will survey suitable habitat for the presence of these species.

If a special-status bird species is found or suspected to be nesting, a buffer area will be established to avoid impacts on the nest. If no nesting special-status avian species are found, project activities may proceed and no further mitigation measures will be required. If nesting sites are found, *Mitigation Measure 2.3.2.4* has been incorporated to reduce potential impacts to a less than significant level.

Results of pre-construction surveys for all species shall be provided to CDFG and USFWS prior to staging and construction implementation.

Mitigation Measure 2.3.2.4. Establish Exclusion Buffer Areas around Special-status Avian Species Nest Sites.

Where protected bird species' nest sites are identified or suspected to occur during pre-construction surveys, the qualified biologist will establish the following buffer zones around nest sites, and no project activities occur within these buffer zones until young birds have fledged.

Nesting Herons

Nesting herons typically nest and rear young from late February through August. In order to avoid and minimize impacts on nesting herons, a 400-foot buffer will be established around active nesting sites when project activities will occur during their breeding period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Nesting Swallows

Nesting swallows typically nests and rears young from May through July. In order to avoid and minimize impacts on nesting swallows, a 200-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests.

Tri-colored Blackbird

Tri-colored blackbird typically nests and rears young from mid April through late July. In order to avoid and minimize impacts on nesting tri-colored blackbirds, a 200-foot buffer will be established around active nests. No project related activities will be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests.

Western Burrowing Owl

Western burrowing owl typically nests and rears young from February through August. Burrowing owls also occupy nesting sites during the non-breeding season (September through January). If an occupied burrow is identified within 160 feet of the project disturbance area during the non-breeding season, or within 250 feet of the disturbance area during the breeding season, Kebo will consult with CDFG to determine the appropriate method to passively relocate owls. Project related activities would be allowed to proceed after owls are passively relocated. If passive relocation of owls is necessary, it shall occur outside of the nesting season. For each occupied burrow that is passively relocated, compensation will consist of preserving 6.5 acres of foraging habitat. The 6.5 acres shall be contiguous with known, occupied burrowing owl burrows.

White-Tailed Kite

White-tailed kites typically nest and rear young from mid-February through June. In order to avoid and minimize impacts on white-tailed kites, a 1,320-foot buffer will be established around active nests. No project related activities will be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can

be removed prior to June if a qualified biologist determines that all juveniles have fledged from occupied nests.

Purple Martin

Purple martins typically nest and rear young from March through August. In order to avoid and minimize impacts on purple martins, a 200-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Swainson's Hawk

Swainson's hawk typically nests and rears young from March through August. In order to avoid and minimize impacts on nesting Swainson's hawks, a 1,320-foot buffer will be established around active nesting sites. No project related activities will be allowed to occur within this zone. A biological monitor will monitor the nest site on a regular schedule to ensure no impacts are occurring to nesting Swainson's hawks. Monitoring protocol shall be determined in consultation with CDFG. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Other Raptor Species

Raptor species typically nests and rear young from March through August. In order to avoid and minimize impacts on nesting raptor species, a 500-foot buffer will be established around active nesting sites when project related activities will not be allowed to occur within this area. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Nesting and Wintering Waterfowl/Shorebirds.

The typical breeding season for waterfowl and shorebirds occurs between February and July. In order to avoid impacts to these resources, a 200-foot buffer will be established around active nesting sites when project related activities will not be allowed to occur within this area. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests. Additionally, construction activities will occur between May and October, which will reduce the impacts to nesting and wintering waterfowl and shorebirds.

Migratory Song Birds

Nesting migratory song birds typically nest and rear young from April through August. In order to avoid and minimize impacts on nesting migratory song birds, a 100-foot buffer will be established around active nesting sites when project activities will occur during their

nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Mitigation Measure 2.3.2.5. Conduct Pre-activity Surveys for GGS. Avoid Impacts to GGS.

In accordance with *Standard Avoidance and Minimization Measures for Construction Activities in Giant Garter Snake Habitat* (USFWS 1997), the following mitigation measures shall be implemented during implementation of the proposed project to avoid impacts to GGS:

- 24-hours prior to construction activities, the project area should be surveyed for GGS. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during surveys, Kebo shall report the sighting(s) to the USFWS and CDFG immediately by telephone at (916) 414-6600.
- Construction activities will be conducted between May 1 and October 1. This is the active period for GGS and direct mortality is lessened, because snakes are expected to actively move and avoid danger.
- If any construction activities will take place between October 2 and April 30, the USFWS Sacramento Fish and Wildlife Office and CDFG will be consulted with to determine if additional measures are necessary to minimize and avoid take.
- Vegetative clearing will be confined to the minimal area necessary to facilitate construction of project components. Potential GGS habitat within and adjacent to the pipeline corridor shall be flagged and posted to avoid encroachment by construction personnel.
- All Movement of construction equipment and vehicles will be confined to existing roadways and the proposed well pad footprint.
- A qualified biologist will be on-site during all construction and earthmoving activities near GGS habitat. In the event GGS are observed near or in the construction area, the biologist will have the authority to stop construction until the snake has left the area. Physical removal of snakes from the project area will only be conducted with agency authorization, and will be conducted by a biologist qualified and listed by USFWS to handle this species. The biologist will contact CDFG and USFWS if any GGS are encountered, or if any incidental take occurs. The biologist will record all relevant environmental, biological, and behavior data observed, and submit summary reports to CDFG and USFWS.

- All project related traffic will observe a speed limit of 15 mph to ensure that any giant garter snakes crossing or basking on access roadways will have time to move out of the way of traffic.
- Kebo shall restore the well site to its original condition prior to project implementation after all project components are complete.

These mitigation measures do not preclude additional measures that may be imposed by the USFWS and/or CDFG during consultation to obtain regulatory permits.

Mitigation Measure 2.3.2.6. Minimize Physical Disturbance in Sensitive Wetland Habitat. Restore Disturbed Wetland Habitat and/or Provide Wetland Mitigation to Offset Impacts.

Kebo will minimize impacts to wetland habitat on the proposed well pad where feasible. Where wetland impacts are unavoidable, Kebo will restore disturbed wetlands to pre-disturbance conditions after project activities are complete.

In addition, Kebo will create freshwater emergent wetland to compensate for the permanent impacts to 0.48 acres of freshwater emergent wetlands for placement of the production pad and access driveway to the site from an existing levee roadway. Approximately 1.0 acre of wetlands will be created. Kebo is currently preparing a compensatory wetland mitigation plan that will include the above wetland restoration activities. This plan will be subject to the approval of the U.S. Army Corps of Engineers, Sacramento District (USACE), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and CDFG.

3.0 PROJECT INCREMENTAL ANALYSIS

The Endangered Species Handbook (USFWS 1998) states that cumulative effects under ESA include all future nonfederal actions “reasonably certain to occur” in the project area. Future federal actions that are unrelated to the proposed project are not considered in the cumulative effects analysis because these actions would require separate consultation pursuant to Section 7 of ESA.

The proposed project is an exploratory well drilling program for evaluating natural gas resources. Once drilling and testing of the well has been completed, Kebo will evaluate results and determine if producing the well is feasible. If economical quantities of natural gas are discovered, Kebo will complete the well. Kebo will drill only one natural gas well from the pad.

The project area is currently utilized as a state wildlife refuge, and serves primarily as a recreational resource to the public. Natural gas and exploration activities are considered a compatible use with open space lands. Additional natural gas wells are likely be drilled in the general project area in the foreseeable future. The impacts of these projects combined with the proposed project have the potential to affect sensitive resources within the project area.

However, these projects would be spread over a large area, and other natural gas companies would be required to reduce the overall impacts of their projects during the permitting process for individual wells. As such, impacts would be less than significant.

4.0 ALTERNATIVES ANALYSIS

In addition to the proposed action the following alternatives were considered.

4.1 No Action

Under the no action alternative, the project, as proposed, would not be implemented. Accordingly, there would be no resultant impacts. As a result, Kebo would not be able to develop potential natural gas reserves. Because this scenario does not meet the objectives of Venoco, the proposed project was chosen.

4.2 Construction of Well Site Closer to Bottom Hole Target

Under this alternative, the well pad would be constructed closer to the bottom hole target for the proposed exploratory well. In this scenario, additional access roadway would need to be constructed within wetland habitat, thus leading to further wetland impacts. Impacts to sensitive habitats (and sensitive species within wetland habitat) under this alternative would be much greater than under the preferred alternative (the proposed project). Due to the possibility of greater impacts under this alternative, Kebo choose the proposed project.

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Appendices

Appendix A



Photograph 1
Proposed exploratory natural gas drill pad location. Photograph looking east from western edge of proposed drill pad.



Photograph 2
Proposed exploratory natural gas drill pad. Photograph looking south from northern edge of proposed well pad.



Photograph 3
Proposed exploratory natural gas drill pad. Photograph looking east from center of proposed well pad.



Photograph 4
Proposed exploratory natural gas drill pad. Photograph looking south from center of proposed well pad.



Photograph 5

Drainage ditch with wetland vegetation traversing parallel to the access roadway/pipeline alignment. Photograph looking north from drainage ditch.



Photograph 6

Check dam adjacent to the northern edge of proposed well pad. Photograph looking west from access roadway.



Photograph 7

Drainage ditch with wetland vegetation traversing parallel to the access roadway/pipeline alignment. Photograph looking north from drainage ditch.



Photograph 8

Existing access road to proposed drill pad. Roadway will provide access to proposed well pad during project activities. Proposed pipeline will be installed in this roadway. Photograph looking north from access roadway.



Photograph 9

Upland area proposed for wetland mitigation. Area is disturbed and vegetated with ruderal vegetation. Photograph looking southwest from levee roadway to the east of mitigation area.

Appendix B

Common Name	Scientific Name	Family
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Animals

Northern Pintail	<i>Anas acuta</i>	Anatidae
Green-winged teal	<i>Anas carolinensis</i>	Anatidae
Northern shoveler	<i>Anas clypeata</i>	Anatidae
Cinnamon teal	<i>Anas cyanoptera</i>	Anatidae
Mallard	<i>Anas platyrhynchos</i>	Anatidae
Great blue heron	<i>Ardea herodias</i>	Ardeidae
Canvasback	<i>Aythya valisineria</i>	Anatidae
Cattle egret	<i>Bubulcus ibis</i>	Ardeidae
Red-tailed hawk	<i>Buteo jamaicensis</i>	Accipitridae
American goldfinch	<i>Carduelis tristis</i>	Fringillidae
House finch	<i>Carpodacus mexicanus</i>	Fringillidae
Turkey vulture	<i>Cathartes aura</i>	Cathartidae
Killdeer	<i>Charadrius vociferous</i>	Charadriidae
American crow	<i>Corvus brachyrhynchos</i>	Corvidae
Common raven	<i>Corvus corax</i>	Corvidae
Common opossum	<i>Didelphis virginiana</i>	Didelphidae
Snowy egret	<i>Egretta thula</i>	Ardeidae
American Coot	<i>Fulica Americana</i>	Rallidae
Barn swallow	<i>Hirundo rustica</i>	Hirundinidae
Black-tailed jackrabbit	<i>Lepus californicus</i>	Leporidae
Striped skunk	<i>Mephitis mephitis</i>	Mephitidae
House mouse	<i>Mus musculus</i>	Muridae
Ruddy duck	<i>Oxyura jamaicensis</i>	Anatidae
House sparrow	<i>Passer domesticus</i>	Passeridae
Ring-necked pheasant	<i>Phasianus colchicus</i>	Phasianidae
Raccoon	<i>Procyon lotor</i>	Procyonidae
Western fence lizard	<i>Sceloporus occidentalis</i>	Phrynosomatidae
Western meadowlark	<i>Sturnella neglecta</i>	Icteridae
Mourning dove	<i>Zenaida macroura</i>	Columbidae

Plants

Water plantain	<i>Alisma plantago-aquatica</i>	Alismataceae
Redroot pigweed	<i>Amaranthus retroflexus</i> L.	Amaranthaceae
Wild oat	<i>Avena fatua</i>	Poaceae
Coyote bush	<i>Bacharis piliaris</i>	Asteraceae
Field mustard	<i>Brassica campestris</i>	Brassicaceae
Black mustard	<i>Brassica nigra</i> L. Koch	Brassicaceae
Ripgut	<i>Bromus rigidus</i> Roth	Poaceae
Soft cheat grass	<i>Bromus secalinus</i> L.	Poaceae
Soft chess	<i>Bromus mollis</i>	Poaceae
Yellow-star thistle	<i>Centaurea solstitialis</i>	Asteraceae
California sedge	<i>Carex californica</i>	Cyperaceae
Oakleaf goosefoot	<i>Chenopodium glaucum</i> L.	Chenopodiaceae

Common Name	Scientific Name	Family
Pacific golden-saxifrage	<i>Chrysosplenium glechomifolium</i> Nutt.	Saxifragaceae
Poison hemlock	<i>Conium maculatum</i> L.	Apiaceae
Tall flatsedge	<i>Cyperus eragrostis</i>	Cyperaceae
Large crabgrass	<i>Digitaria sanguinalis</i> (L.) Scop.	Poaceae
Quackgrass	<i>Elytrigia repens</i> (L.) Nevski	Poaceae
Common willow herb	<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	Onagraceae
Red-stemmed filaree	<i>Erodium cicutarium</i>	Geraniaceae
Fennel	<i>Foeniculum vulgare</i>	Asteraceae
California mustard	<i>Guillenia lasiophylla</i>	Brassicaceae
Cow parsnip	<i>Heracleum lanatum</i>	Apiaceae
Foxtail barley	<i>Hordeum leporinum</i>	Poaceae
Mediterranean barley	<i>Hordeum marinum</i>	Poaceae
Baltic rush	<i>Juncus Balticus</i>	Juncaceae
Toad rush	<i>Juncus bufonius</i> L.	Juncaceae
Common rush	<i>Juncus effusus</i>	Juncaceae
Mexican rush	<i>Juncus mexicanus</i> Willd.	Juncaceae
Prickly lettuce	<i>Lactuca serriola</i> L.	Asteraceae
Perennial rye grass	<i>Lolium perenne</i>	Poaceae
Common mallow	<i>Malva neglecta</i> Wallr.	Malvaceae
Cheeseweed	<i>Malva parviflora</i>	Malvaceae
Bur clover	<i>Medicago polymorpha</i>	Fabaceae
White sweetclover	<i>Melilotus alba</i>	Fabaceae
Miner's lettuce	<i>Montia perfoliata</i> (Donn) T.J. Howell	Portulacaceae
White-head navarretia	<i>Navarretia leucocephala</i> Benth.	Polemoniaceae
Bristly ox-tongue	<i>Picris echioides</i>	Asteraceae
Swamp smartweed	<i>Polygonum amphibium</i>	Polygonaceae
Rabbitsfoot grass	<i>Polypogon monspeliensis</i> (L.) Desf.	Poaceae
Wild radish	<i>Rhaphanus sativus</i>	Brassicaceae
California rose	<i>Rosa californica</i>	Rosaceae
Himalayan blackberry	<i>Rubus discolor</i>	Rosaceae
California blackberry	<i>Rubus ursinus</i>	Rosaceae
Clustered dock	<i>Rumex conglomeratus</i>	Polygonaceae
Curly dock	<i>Rumex crispus</i> L.	Polygonaceae
Common tule	<i>Scirpus acutus</i>	Cyperaceae
California bulrush	<i>Scirpus californicus</i>	Cyperaceae
Bulrush	<i>Scirpus microcarpus</i>	Cyperaceae
Perennial sowthistle	<i>Sonchus arvensis</i> L.	Asteraceae
Annual sowthistle	<i>Sonchus oleraceus</i>	Asteraceae
Duckweed	<i>Spirodela oligorrhiza</i>	Lemnaceae
Narrow-leaved cattail	<i>Typha angustifolia</i>	Typhaceae
Broad-leaved cattail	<i>Typha latifolia</i>	Typhaceae
Cocklebur	<i>Xanthium strumarium</i> L.	Asteraceae

Appendix C



uniting the human and natural environments

June 28, 2007

Mr. Marc Fugler
Project Manager
U.S. Army Corps of Engineers, Sacramento District
1325 J Street, Room 1480
Sacramento, CA 95814

**RE: Results of Wetland Delineation and Assessment, Kebo Oil and Gas, Inc.
Glide # 14-1 Exploratory Natural Gas Well Project, Yolo County,
California.**

Dear Mr. Fugler:

Synthesis Environmental Planning (Synthesis) was retained by the Robert A. Booher Consulting (RAB Consulting) to conduct a delineation of wetlands of a proposed exploratory natural gas well [the Kebo Oil & Gas, Inc. (Kebo) Glide 14-1 Exploratory Natural Gas Well Project], located within the Yolo Bypass, Yolo County, California (please refer to Appendix A for a Project Vicinity Map). RAB Consulting was retained by Irani Engineering and Kebo to direct environmental studies at the project site, and to secure all necessary environmental permits and clearances required to conduct the proposed project.

Synthesis is submitting this letter report to present the findings of this delineation and assessment. Synthesis requests that the U.S. Army Corps of Engineers (USACE), Sacramento District review the enclosed information, and concur with the findings of the delineation.

Synthesis has attached the following appendices to assist the USACE in their review of the proposed project:

- Appendix A – Project Vicinity Map
- Appendix B – Site Photographs
- Appendix C – Waters of the United States Delineation Map
- Appendix D – Delineation Data Forms
- Appendix E – Yolo County Soil Survey Map
- Appendix F – Plant Species Observance List

Project Description

Kebo proposes to drill a natural gas well from a site located on public lands within the California Department of Fish and Game Yolo Bypass Wildlife Area in Yolo County, California. If economic quantities of natural gas are discovered, the well will be



completed, the drill pad will be reduced in size, a raised production platform will be installed, and a natural gas pipeline approximately 2.65 miles in length will be installed to connect the production facility with an existing natural gas collection system located north of the well site.

The proposed project includes four (4) phases: a site preparation phase, a drilling and testing phase, a production phase, and a site restoration phase. A detailed description of each phase is presented below.

Site Preparation Phase

Prior to initiating site preparation activities, all workers will be given an environmental orientation to ensure that those working in the project area understand the sensitivity of the areas adjacent to the project drill sites and the necessity of avoiding disturbance to these areas. The environmental orientation will include a discussion of emergency response guidelines.

Drill site boundaries will be clearly delineated by a project biologist to ensure all activities are confined to the project site. A sediment barrier fence will then be installed around the boundary of the delineated drill site to ensure all project activities are restricted to the work area. The proposed drill site will be cleared of vegetation, and the drill pad will be built up with fill materials. Gravel will be applied to the surface of the well pad to complete the preparation of the pad. An access roadway will be constructed from an existing upland check dam to the proposed well pad to provide access. The proposed well pad would measure 460 feet by 250 feet (115,000 square feet, or 2.64 acres).

The project proponent estimates that approximately 7 to 10 days will be needed to prepare the site.

Drilling and Testing Phase

The drilling and testing phase of the project will require approximately 20 to 25 total truck trips to mobilize drilling equipment to the site. Equipment will then be rigged and drill activities initiated. Approximately 3 to 4 truck trips a day will be required to support drilling operations.

All drilling and production testing equipment (i.e. drilling rig, mud pumps, mud system equipment, portable water tanks, waste tanks, fuel tanks, portable toilets, pipe racks, and pipe baskets) will be temporarily contained within the proposed drill site. No sump will be excavated; all drilling muds and cuttings will be contained in portable tanks. Drilling muds and cuttings will be transported offsite to an appropriate disposal facility.

Temporary directional lighting will be used during drilling operations. Directional lighting is used to minimize impacts of lighting to nocturnal animals.

Drilling activities will operate 24 hours per day, and each well may require approximately 20 to 30 days to drill and complete. Approximately 12 to 15 personnel



will be on site at any given time during drilling operations. After the well is drilled, and the well is either completed or abandoned, the drilling rig (and related equipment) will be removed.

Production Phase

If economic quantities of natural gas are discovered, the well will be completed and production facilities will be installed. Only a limited portion of a drill site will be required for a production pad. Dimensions of production facilities will be 100 feet by 200 feet. The remaining portion of a drill site will be returned to natural grade and restored to wetland habitat.

Production facilities will include a wellhead gas meter, a heater/separator, production water and condensate storage tanks and the pipeline. The wellhead will be enclosed in a steel cage and production equipment will be elevated on a production platform in order to prevent any damage associated with flooding during the growing of rice crops. The production platform would measure approximately 20 feet by 30 feet (600 square feet, or 0.01 acres). No dehydrator will be required for the well. If compression is required, a portable compressor with an engine size less than 100 hp will be used. The project proponent proposes to paint all production equipment in camouflage or an earthen tone to blend in with the environment and to prevent glare.

Natural gas will be metered for customer sales and the production facility will be inspected on a daily basis. By-products including production water and condensates will be stored temporarily in 300 barrel capacity storage tanks that are approximately 12 feet in diameter.

By-products will be periodically transported from the facility by truck for off site disposal and/or recycling at an applicable facility. Typically a maximum of one truck trip per week will be required to transport by-products offsite. During the producing life of a well, a workover service rig (a small mobile drilling rig) may be occasionally required to improve production.

A natural gas pipeline will also be installed during the installation of production equipment. The proposed pipeline will be installed using traditional open-cut trench methods.

Trenching requires the use of a backhoe to establish an open trench of approximately four feet to six feet deep and approximately two feet wide. Pipe will be four inches in diameter or less and will be placed beside the trench by the stringing crew. Pipe joints will be bonded together and all joint connections will be inspected and tested prior to laying pipe into the trench. Pipe will be lowered into the trench by a small side-boom crane. The pipe will then be covered with soils that were excavated during trenching and the ground compacted above the pipe. After the pipeline is buried, the construction corridor will be re-contoured to approximately the same grade or slope that existed prior to pipeline installation.



The pipeline will be approximately 2.65 miles (14,000 feet) in length, and will connect to an existing Pacific Gas and Electric natural gas pipeline north of the proposed well site. The pipeline will be installed within an existing gravel roadway in order to avoid impacts to adjacent wetlands. Approximately six to ten personnel working approximately seven to fourteen days will be required to operate equipment and install the proposed production facility including the pipeline. The proposed pipeline route is shown on Figures 1 and 2.

At conclusion of the wells economic life (production), each well will be abandoned and plugged according to the State of California, Department of Conservation, Division of Oil, Gas and Geothermal Resources regulations.

Site Restoration Phase

The goal of the site restoration phase is to restore the site to its condition or better than that observed at the time of project initiation. Once the well is abandoned and plugged, surface equipment will be removed from the site. Any sand and or gravel used to build up the site will then be removed from the site. Contours will be re-established to near grade conditions present at the time of project initiation. Wetland vegetation will be planted to provide erosion control and improve habitat. The project proponent will submit a restoration and revegetation plan to the appropriate agencies for approval prior to initiating site restoration.

Delineation Methodology

The delineation of wetlands on the project site was conducted by Mr. Cord Hute, a wetland ecologist, on April 11, 2007. Synthesis applied the methodology identified and developed by the USACE in their *1987 Wetlands Delineation Manual* (USACE 1987) to conduct the delineation. The proposed drill pad and an buffer area 200 feet around the south and east periphery of the well site were examined for the presence or absence of wetlands. Levees form the west and northern boundaries of the study area, and were used as arbitrary boundaries for the wetland delineation. The study area totaled approximately 319,829 square feet, or 7.342 acres in size.

Generally, the presence or absence of a wetland feature is determined by examining the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. In order to determine that a feature is a jurisdictional wetland under Section 404 of the Clean Water Act (CWA), all three parameters must be satisfied.

Methods used to evaluate hydrophytic vegetation, hydric soils, and wetland hydrology are described below.

Determination of Hydrophytic Vegetation

Hydrophytic vegetation is defined as:

“the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present” (USACE 1987).



Hydrophytic and upland vegetation was identified in the field by visual observation of dominant plant species (defined as plants that comprise 20 percent or more of the cover value observed at a site). At each data point, vegetation was analyzed within an approximate 5-foot radius. Visually dominant plant species were recorded. The indicator status of each species was confirmed by the United States Fish and Wildlife Services' (USFWS) *National List of Plant Species that Occur in Wetlands* (USFWS 1988). For species not listed by the USFWS, taxonomic literature was used to determine if the species is associated with wetland or non-wetland conditions. An area was considered to have hydrophytic vegetation when more than 50 percent of the dominant species were OBL, FACW, or FAC (excluding FAC-). Indicator status categories are defined further below.

Plant Indicator Status Categories

Indicator Category*	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability >99 %) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1%) in non-wetlands.
Facultative Wetland Plants	FACW	Plants that occur usually (estimated probability >67%) in wetlands, but also occur (estimated probability 1% to 33%) in non-wetlands.
Facultative Plants	FAC	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands.**
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1% to <33%) in wetlands, but occur more often (estimated probability >67% to 99%) in non-wetlands.
Upland Plants	UPL	Plants that occur rarely (estimated probability <1%) in wetlands, but occur almost always (estimated probability >99%) in non-wetlands under natural conditions.

* Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel. **The three facultative categories are further subdivided by (+) and (-) modifiers

Determination of Hydric Soils

Hydric soils are defined as:

“a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil strata” (USACE 1987).

Hydric soils are commonly identified by soil taxonomy and field indicators identified by the Natural Resources Conservation Service (NRCS). In addition, NRCS maintains a list of soils considered to be hydric under certain environmental conditions.



Synthesis collected soil samples from the project site during the delineation, and identified the soil type(s) using a Munsell soil chart (Munsell Color 1975) and the NRCS Yolo County Soil Survey (Andrews 1972). A soil was considered hydric if it fulfilled one or more of the following criteria:

- Organic soils where more than 50 percent of the material is organic material in the upper 32 inches.
- A histic epipedon is present.
- The soil has a sulfur smell caused by the presence of hydrogen sulfide (rotten egg odor).
- An aquic or peraquic moisture regime is present.
- Reducing soil conditions are present as determined by a ferrous iron test kit.
- Soil is gleyed or has a low-chroma matrix with or without bright mottles (matrix chroma of 1 or less, or matrix chroma of 2 or less with mottles).
- Soil appears on the local or national hydric soils list.
- Soil has redox depletions.

Determination of Wetland Hydrology

Wetland hydrology is defined as:

“all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively” (USACE 1987).

Wetland hydrology was determined to be present if a site supported one or more of the following characteristics:

- Landscape position and surface topography (e.g., the position of the site relative to an upslope water source, location within a distinct wetland drainage pattern, or concave surface topography).
- Inundation or saturation for a long duration (defined by the NRCS as inundation in a single event that ranges from seven days to one month) either inferred based on field indicators or observed during field surveys.
- Residual evidence of ponding or flooding (e.g., scour marks, sediment deposits, algal matting, and drift lines).

Assessment of the hydrologic criterion was based on direct and indirect indicators. Direct indicators included observations of inundation, saturation, or flowing water. If the data point was situated above the level of seasonal inundation or saturation, the criteria were not met; conversely, if it was situated below the elevation of seasonal inundation or saturation, the criteria were considered met. Indirect indicators included wetland drainage patterns, watermarks, and sediment deposits.



Results of the Investigation

Results of the investigation are divided into three sections below: *Hydric Vegetation*, *Site Soils*, and *Wetland Hydrology*.

Hydric Vegetation

The following hydric plant species were observed within wetlands on the project site: Water plantain (*Alisma plantago-aquatica*), California sedge (*Carex californica*), oakleaf goosefoot (*Chenopodium glaucum* L.), Pacific golden-saxifrage (*Chrysosplenium glechomifolium* Nutt.), tall flatsedge (*Cyperus eragrostis*), common willow herb (*Epilobium ciliatum* ssp. *ciliatum*), Baltic rush (*Juncus Balticus*), toad rush (*Juncus bufonius* L.), common rush (*Juncus effusus*), Mexican rush (*Juncus mexicanus* Willd.), white-head navarretia (*Navarretia leucocephala* Benth.), swamp smartweed (*Polygonum amphibium*), rabbitsfoot grass (*Polypogon monspeliensis* L. Desf.), California rose (*Rosa californica*), clustered dock (*Rumex conglomeratus*), curly dock (*Rumex crispus* L.), common tule (*Scirpus acutus*), California bulrush (*Scirpus californicus*), bulrush (*Scirpus microcarpus*), duckweed (*Spirodela oligorrhiza*), narrow-leaved cattail (*Typha angustifolia*), broad-leaved cattail (*Typha latifolia*), and cocklebur (*Xanthium strumarium* L.). Wetland vegetation composition within project site wetlands meets the minimum 50 percent coverage of hydrophytic plant species as required under the *1987 USACE Wetlands Delineation Manual*. Wetland data forms containing more detailed coverage data are attached as Appendix D. A list of vegetative species observed during surveys is attached as Appendix F.

Two (2) upland vegetative communities were observed within the project area: ruderal/disturbed and annual grassland. The ruderal/disturbed vegetative community was identified within the project study area wherever disturbed soils occurred, active land uses were present, or active land uses were absent where disturbance had occurred in the recent past. Common vegetative species found in this community were composed of weedy non-native species. Common species identified during the wetland delineation included: redroot pigweed (*Amaranthus retroflexus* L.), field mustard (*Brassica campestris*), black mustard (*Brassica nigra* L. Koch), yellow-star thistle (*Centaurea solstitialis*), poison hemlock (*Conium maculatum*), large crabgrass (*Digitaria sanguinalis* (L.) Scop.), quackgrass (*Elytrigia repens* (L.) Nevski), red-stemmed filaree (*Erodium cicutarium*), fennel (*Foeniculum vulgare*), California mustard (*Guillenia lasiophylla*), cow parsnip (*Heracleum lanatum*), prickly lettuce (*Lactuca serriola* L.), common mallow (*Malva neglecta* Wallr.), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), white sweetclover (*Melilotus alba*), wild radish (*Rhaphanus sativus*), perennial sowthistle (*Sonchus arvensis* L.), and annual sowthistle (*Sonchus oleraceus*).

California annual grassland was observed along portions of the shoulder of the proposed access roadway/pipeline alignment. Common species found in this community were composed of introduced grasses and broadleaf weedy species, which quickly re-colonize disturbed areas.



Common species identified during the wetland delineation included wild oat (*Avena fatua*), black mustard (*Brassica nigra* L. Koch), ripgut (*Bromus rigidus* Roth), soft cheat grass (*Bromus secalinus* L.), soft chess (*Bromus mollis*), yellow-star thistle (*Centaurea solstitialis*), California mustard (*Guillenia lasiophylla*), foxtail barley (*Hordeum leporinum*), Mediterranean barley (*Hordeum marinum*), perennial rye grass (*Lolium perenne*), common mallow (*Malva neglecta* Wallr.), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), bristly ox-tongue (*Picris echioides*), and wild radish (*Rhaphanus sativus*).

Project Site Soils

Two distinct soil types were identified on the project site during Synthesis' delineation and investigation. Soils of the Sacramento Series were identified within wetlands of the project area (Andrews 1972). Fill materials were found in upland areas (i.e., man-made levees in the study area) (Andrews 1972). Both soil types are described in further detail below.

The first soil type occurring within the project area is the Sacramento Series, specifically Sacramento Flooded (Sg). The Sacramento Series consists of nearly level, poorly drained soils within river basins. These soils formed from mixed alluvium sources. Permeability is slow. A copy of the NRCS Yolo County Soil Survey Map is attached as Appendix E.

A representative profile of the Sacramento Soil Series, Flooded, is as follows:

- **Apg** 0 to 7 inches. Gray (5Y 5/1) clay that has common, fine, distinct mottles of strong brown (7.5YR 5/6); very dark gray (5Y 3/1) and has common, fine, distinct mottles of reddish brown (5YR 4/4) when moist; strong, medium and coarse, angular blocky structure and moderate, coarse, granular structure; hard, firm, sticky and very plastic; few very fine roots; common very fine tubular pores; medium acid (pH 6.0); abrupt, smooth boundary.
- **A11g** 7 to 16 inches. Gray (5Y 5/1) clay that has many, medium, distinct mottles of strong brown (7.5YR 5/6); very dark gray (5Y 3/1) and has many, medium, distinct mottles of dark reddish brown (5YR 3/4) when moist; massive; hard, very firm, sticky and very plastic; common micro and few very fine vertical roots; common micro tubular pores; continuous films on pressure faces; neutral (pH 6.7); clear, wavy boundary.
- **A12g** 16 to 31 inches. Gray (5Y 5/1) clay; common, fine, distinct mottles of strong brown (7.5YR 5/6); very dark gray (5Y 3/1) and common, fine, distinct mottles of brown (7.5YR 4/4) when moist; moderate, coarse, prismatic structure and moderate, coarse, angular blocky structure; hard, firm, sticky and very plastic; common micro and few very fine vertical roots; many micro and few very fine tubular pores; continuous films on pressure faces; moderately alkaline (pH 8.0); very slightly effervescent with disseminated lime; diffuse boundary.



- **A13g** 31 to 38 inches, mottled, gray (5Y 5/1), light olive-gray (5Y 6/2), and strong-brown (7.5YR 5/6) clay; very dark gray (5Y 3/1), olive (5Y 5/3), and reddish brown (5YR 4/4) when moist; moderate, coarse, prismatic structure and moderate coarse, angular blocky structure; hard, very firm, sticky and very plastic; common micro and few very fine vertical roots; many micro and few very fine tubular pores; continuous films on pressure faces; moderately alkaline (pH 8.0); very slightly effervescent with disseminated lime; clear, wavy boundary. (6 to 10 inches thick).
- **A14g** 38 to 53 inches, gray (5Y 5/1) clay; common, fine, distinct, strong-brown (7.5YR 5/6) mottles; very dark gray (5Y 3/1) and olive gray (5Y 5/2) and reddish-brown (5YR 4/4) mottles when moist; moderate, coarse, angular blocky structure; hard, very firm, sticky and very plastic; common micro and few very fine vertical roots; many micro and common very fine tubular pores; continuous films on pressure faces; very slightly effervescent with disseminated lime; moderately alkaline (pH 8.0); clear, wavy boundary. (12 to 17 inches thick).
- **Cg** 53 to 60 inches. Gray (5Y 5/1) clay; common, fine, distinct, strong-brown (7.5YR 5/6) mottles; very dark gray (5Y 3/1) and olive-gray (5Y 5/2) and reddish-brown (5YR 4/4) mottles when moist; massive; hard, firm, sticky and very plastic; few micro random roots; many micro and few very fine tubular pores; continuous films on pressure faces; very slightly effervescent with disseminated lime; moderately alkaline (pH 8.0).

Fill materials were documented in the project area where levees and check dams have been constructed. These features were constructed with soil fill materials. Levees were observed along the western boundary of the proposed well pad and to the north of the well pad.

Wetland Hydrology

The hydrology of the project site is the result of a number of human and naturally influenced factors. Historically, fresh water flowed through the Yolo Bypass from the northern half of the Sacramento Valley in a southerly direction. However, to control flooding of farmlands and cities within the Yolo Bypass area from the adjacent Sacramento River, and to provide water for agricultural purposes, the Yolo Bypass was diked with levees. Water is now diverted into the Yolo Bypass during periods of high rainfall and during storm events. Water flows are managed throughout the Yolo Bypass to provide wetland habitat for wildlife and for use by farmers growing rice within designated areas of the Yolo Bypass. This regulated water flow is part of the hydrology that creates and sustains wetlands on the project site.

Another source of hydrology on the project site is precipitation during the annual rain season from October through March of the year. Precipitation falls within the general project area, and pools in the lower elevation areas of the site, thus creating ideal conditions for the formation of wetlands.



The project site is generally flat, and elevation decrease gradually from an west to east direction. A levee exists on the northern and western boundaries of the project site, and elevation abruptly rises in this area. During the course of the delineation, direct and indirect hydrologic features (e.g., drainage patterns, scour marks, sediment deposits, algal matting, and drift lines) were observed.

Conclusions

Based on the findings described above from field investigations conducted on April 11, 2007, Synthesis concludes that 1 distinct wetland feature, as defined by the USACE and Section 404 of the CWA, are present within the project study area. This wetland features fall under the classification of fresh emergent wetland. Within the arbitrarily defined study area, the wetland feature measures approximately 318,525 square feet, or 7.312 acres in size. Approximately 116,465 square feet (2.673 acres) of wetlands will be impacted as a result of project implementation (installation of the drill pad and access roadway).

Kebo requests your concurrence with the delineated Waters of the United States as described in this report. In addition, Kebo requests a field visit at the project site at your earliest convenience to review the delineation line.

Please feel free to give Mr. Robert Booher of RAB or myself a call if you have any questions, or require further information to complete your analysis. Mr. Booher can be reached by phone at 707.399.7835, or by email at bbooher@pacbell.net. You can reach me by phone at 415.328.7923, or by email at cord@synthesisplanning.com.

Regards,

Cord Hute
Principal

CEH/RBC0087
Attachments

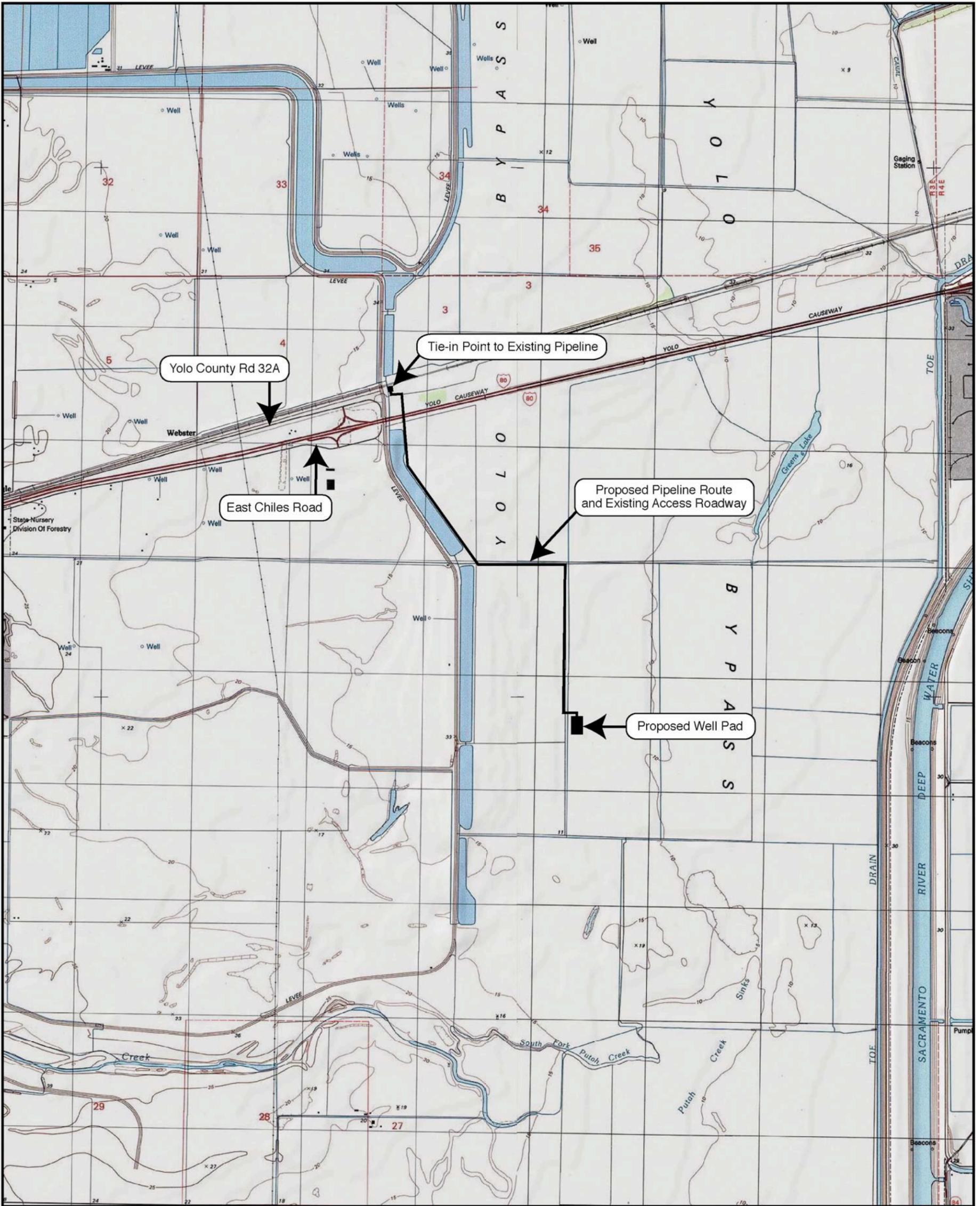
cc: Mr. Robert A. Booher, Robert A. Booher Consulting
Project File



References Cited and Reviewed

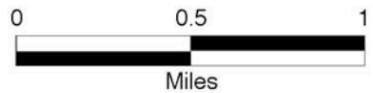
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Appendix A
Site Location Map



KEBO GLIDE 14-1 EXPLORATORY NATURAL GAS WELL PROJECT
Project Location Map

Robert A. Boher Consulting
Environmental Planning & Management
3221 Quail Hollow Drive
Fairfield, California 94533
Telephone (707) 399-7835



Sources: National Geographic TOPO! 2003
and CNDDDB 2007

Kebo Oil & Gas, Inc.
607 Railroad Drive
Portland, Texas 78374

Appendix B
Site Photographs



Photograph 1

Proposed exploratory natural gas drill pad location. Well site will be constructed in wetland habitat. Photograph looking across well site to the east from the western edge of proposed drill pad.



Photograph 2

Proposed exploratory natural gas drill pad location. Well site will be constructed in wetland habitat. Photograph looking south from northern edge of proposed well pad.



Photograph 3

Proposed exploratory natural gas drill pad location. Well site will be constructed in wetlands shown in photograph. Photograph looking east from center of proposed well pad.



Photograph 4

Proposed exploratory natural gas drill pad location. Well site will be constructed in wetlands shown in photograph. Photograph looking south from center of proposed well pad.



Photograph 5

Check dam adjacent to the northern edge of proposed well pad.
Photograph looking west from access roadway.

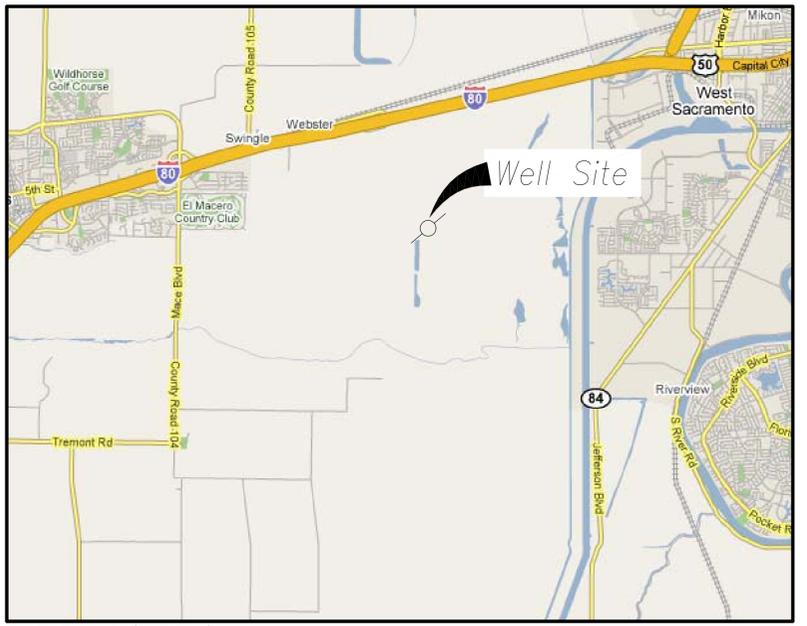
Appendix C
Waters of the United States
Delineation Map

Legend of Symbols

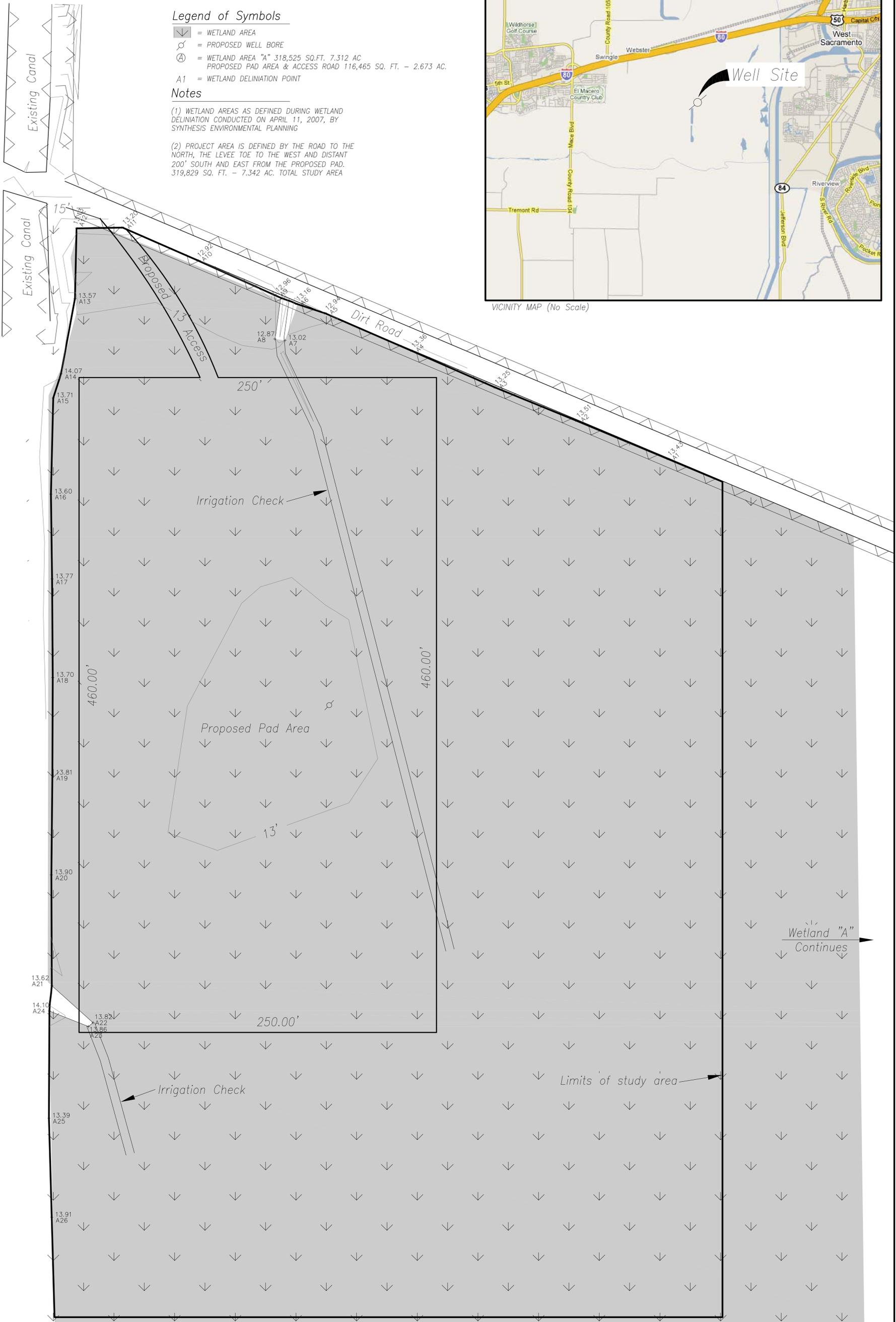
- ▾ = WETLAND AREA
- ⊙ = PROPOSED WELL BORE
- Ⓐ = WETLAND AREA "A" 318,525 SQ.FT. 7.312 AC
PROPOSED PAD AREA & ACCESS ROAD 116,465 SQ. FT. - 2.673 AC.
- A1 = WETLAND DELINEATION POINT

Notes

- (1) WETLAND AREAS AS DEFINED DURING WETLAND DELINEATION CONDUCTED ON APRIL 11, 2007, BY SYNTHESIS ENVIRONMENTAL PLANNING
- (2) PROJECT AREA IS DEFINED BY THE ROAD TO THE NORTH, THE LEVEE TOE TO THE WEST AND DISTANT 200' SOUTH AND EAST FROM THE PROPOSED PAD. 319,829 SQ. FT. - 7.342 AC. TOTAL STUDY AREA



VICINITY MAP (No Scale)



CTA Engineering • Surveying

3233 Monier Circle, Suite 1
Rancho Cordova, CA 95742
(916) 638-0919
(916) 638-2479 Fax



JURISDICTIONAL WETLAND DELINEATION MAP FOR:
Kebo Oil and Gas, Inc.

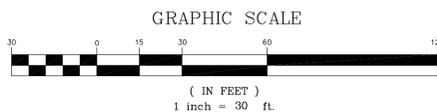
"Glide 14-1"

Projected Section 14, T 8 N, R 3 E, M.D.M.

YOLO COUNTY

CALIFORNIA

DATE: JUNE 2007
SCALE: 1" = 30'
DR. CHK. E.B.
D.G. E.B.
F.B. REF. 0702-17
JOB NO. 00000



Wetland "A"
Continues



Appendix D
Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: A1
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields (former Sacramento Delta marshlands) Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Sacramento Soil Series, Flooded NWI classification: Not Classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Feature is a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>30%</u> x 1 = <u>30</u> FACW species <u>20%</u> x 2 = <u>40</u> FAC species <u>10%</u> x 3 = <u>30</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>60</u> (A) <u>100</u> (B) Prevalence Index = B/A = <u>1.67</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Chenopodium glaucum L.</u>	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Polygonum amphibium</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Rumex Conglomeratus</u>	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Scirpus californicus</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
5. <u>Xanthium strumarium L.</u>	<u>10%</u>	<u>Yes</u>	<u>FAC+</u>	
6. <u>Typha angustifolia</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
Total Cover: <u>60%</u>				
<u>Woody Vine Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>40%</u> % Cover of Biotic Crust <u>0%</u>				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: Vegetation meets the requirements of the 1987 USACE Delineation Manual.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: A3
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields (former Sacramento Delta marshlands) Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Sacramento Soil Series, Flooded NWI classification: Not Classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Feature is a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>25</u> x 1 = <u>25</u> FACW species <u>35</u> x 2 = <u>70</u> FAC species <u>10</u> x 3 = <u>30</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>70</u> (A) <u>125</u> (B) Prevalence Index = B/A = <u>1.79</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Chenopodium glaucum L.</u>	<u>20%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Polygonum amphibium</u>	<u>15%</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Rumex Conglomeratus</u>	<u>15%</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Scirpus californicus</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
5. <u>Xanthium strumarium L.</u>	<u>10%</u>	<u>Yes</u>	<u>FAC+</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
Total Cover: <u>70%</u>				
<u>Woody Vine Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>30%</u> % Cover of Biotic Crust <u>0%</u>				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: Vegetation meets the requirements of the 1987 USACE Delineation Manual.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007

Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: A12

Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E

Landform (hillslope, terrace, etc.): Rice fields (former Sacramento Delta marshlands) Local relief (concave, convex, none): Concave Slope (%): nearly level

Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian

Soil Map Unit Name: Sacramento Soil Series, Flooded NWI classification: Not Classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Feature is a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>40</u> x 1 = <u>40</u> FACW species <u>20</u> x 2 = <u>40</u> FAC species <u>10</u> x 3 = <u>30</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>70</u> (A) <u>110</u> (B) Prevalence Index = B/A = <u>1.57</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Chenopodium glaucum</u> L.	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Polygonum amphibium</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Rumex Conglomeratus</u>	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Scirpus californicus</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
5. <u>Xanthium strumarium</u> L.	<u>10%</u>	<u>Yes</u>	<u>FAC+</u>	
6. <u>Typha angustifolia</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
7. <u>Typha latifolia</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
8. _____	_____	_____	_____	
Total Cover: <u>70%</u>				
<u>Woody Vine Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>30%</u> % Cover of Biotic Crust <u>0%</u>				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: Vegetation meets the requirements of the 1987 USACE Delineation Manual.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007

Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: A17

Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E

Landform (hillslope, terrace, etc.): Rice fields (former Sacramento Delta marshlands) Local relief (concave, convex, none): Concave Slope (%): nearly level

Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian

Soil Map Unit Name: Sacramento Soil Series, Flooded NWI classification: Not Classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Feature is a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>30</u> x 1 = <u>30</u> FACW species <u>30</u> x 2 = <u>60</u> FAC species <u>10</u> x 3 = <u>30</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>70</u> (A) <u>120</u> (B) Prevalence Index = B/A = <u>1.7</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Chenopodium glaucum L.</u>	<u>20%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Polygonum amphibium</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Rumex Conglomeratus</u>	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Scirpus californicus</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
5. <u>Xanthium strumarium L.</u>	<u>10%</u>	<u>Yes</u>	<u>FAC+</u>	
6. <u>Typha angustifolia</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
Total Cover: <u>70%</u>				
<u>Woody Vine Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>30%</u> % Cover of Biotic Crust <u>0%</u>				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: Vegetation meets the requirements of the 1987 USACE Delineation Manual.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: A20
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields (former Sacramento Delta marshlands) Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Sacramento Soil Series, Flooded NWI classification: Not Classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Feature is a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Sapling/Shrub Stratum</u>				Prevalence Index worksheet:
1. _____				Total % Cover of: _____ Multiply by: _____
2. _____				OBL species <u>20</u> x 1 = <u>20</u>
3. _____				FACW species <u>20</u> x 2 = <u>20</u>
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
				UPL species _____ x 5 = _____
Total Cover: <u>0%</u>				Column Totals: <u>40</u> (A) <u>40</u> (B)
<u>Herb Stratum</u>				Prevalence Index = B/A = <u>1.0</u>
1. <u>Chenopodium glaucum L.</u>	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators:
2. <u>Polygonum amphibium</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
3. <u>Rumex Conglomeratus</u>	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	<input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹
4. <u>Xanthium strumarium</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
5. _____				____ Problematic Hydrophytic Vegetation ¹ (Explain)
6. _____				
7. _____				
8. _____				
Total Cover: <u>40%</u>				¹ Indicators of hydric soil and wetland hydrology must be present.
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>60%</u> % Cover of Biotic Crust <u>0%</u>				
Remarks: Vegetation meets the requirements of the 1987 USACE Delineation Manual.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007

Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: A26

Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E

Landform (hillslope, terrace, etc.): Rice fields (former Sacramento Delta marshlands) Local relief (concave, convex, none): Concave Slope (%): nearly level

Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian

Soil Map Unit Name: Sacramento Soil Series, Flooded NWI classification: Not Classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Feature is a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>20%</u> x 1 = <u>20</u> FACW species <u>30%</u> x 2 = <u>60</u> FAC species <u>10%</u> x 3 = <u>30</u> FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: <u>60</u> (A) <u>110</u> (B) Prevalence Index = B/A = <u>1.83</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is >50% <input checked="" type="checkbox"/> Prevalence Index is ≤3.0 ¹ _____ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Chenopodium glaucum L.</u>	<u>20%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Polygonum amphibium</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Rumex Conglomeratus</u>	<u>10%</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Scirpus californicus</u>	<u>10%</u>	<u>Yes</u>	<u>OBL</u>	
5. <u>Xanthium strumarium L.</u>	<u>10%</u>	<u>Yes</u>	<u>FAC+</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
Total Cover: <u>60%</u>				
<u>Woody Vine Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>40%</u> % Cover of Biotic Crust <u>0%</u>				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: Vegetation meets the requirements of the 1987 USACE Delineation Manual.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: UP A1
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields and levees Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Artificial Fill NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Feature is not a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>100</u> x 5 = <u>500</u> Column Totals: <u>100</u> (A) <u>500</u> (B) Prevalence Index = B/A = <u>5</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Guilena lasiophyllai</u>	<u>30%</u>	<u>Yes</u>	<u>UPL</u>	
2. <u>Brassica nigra</u> L. Koch	<u>25%</u>	<u>Yes</u>	<u>UPL</u>	
3. <u>Melilotus alba</u>	<u>25%</u>	<u>Yes</u>	<u>UPL</u>	
4. <u>Malva parviflora</u>	<u>20%</u>	<u>Yes</u>	<u>UPL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
Total Cover: <u>100%</u>				
<u>Woody Vine Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>0%</u> % Cover of Biotic Crust <u>0%</u>				
Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks: No hydric vegetation observed during delineation.				

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: UP A3
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields and levees Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Artificial Fill NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Feature is not a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>90</u> x 5 = <u>450</u> Column Totals: <u>100</u> (A) <u>490</u> (B) Prevalence Index = B/A = <u>4.9</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Guilleana lasiophyllai</u>	20%	Yes	UPL	
2. <u>Brassica nigra</u> L. Koch	20%	Yes	UPL	
3. <u>Melilotus alba</u>	15%	Yes	UPL	
4. <u>Malva parviflora</u>	15%	Yes	UPL	
5. <u>Bromus rigidus</u> Roth	10%	Yes	UPL	
6. <u>Centaurea solstitialis</u>	10%	Yes	UPL	
7. <u>Sonchus arvensis</u> L.	10%	Yes	FACU	
8. _____	_____	_____	_____	
Total Cover: <u>100%</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>0%</u> % Cover of Biotic Crust <u>0%</u>				
Remarks: No hydric vegetation observed during delineation.				

SOIL

Sampling Point: UP A3

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Size / Contrast	Texture, Concretions, Structure, etc.
0 to 5 feet	Fill Material	Fill Material	None	None	Fill Material

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Vernal Pools (F9)
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Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present.
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Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No **X**

Remarks: Soils do not have characteristics of a wetland soil. Soil consists of fill material

HYDROLOGY

Wetland Hydrology Indicators:	Secondary Indicators (2 or more required)
<u>Primary Indicators (any one indicator is sufficient)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Biotic Crust (B12) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) <input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:

Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u>	Wetland Hydrology Present? Yes _____ No <u>X</u>
Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u>	
Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u> (includes capillary fringe)	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
 None.

Remarks:
 No wetland hydrological indicators were observed.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: UP A9
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields and levees Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Artificial Fill NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Feature is not a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>90</u> x 5 = <u>450</u> Column Totals: <u>100</u> (A) <u>490</u> (B) Prevalence Index = B/A = <u>4.9</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Guilleana lasiophyllai</u>	20%	Yes	UPL	
2. <u>Brassica nigra</u> L. Koch	20%	Yes	UPL	
3. <u>Melilotus alba</u>	15%	Yes	UPL	
4. <u>Malva parviflora</u>	15%	Yes	UPL	
5. <u>Bromus rigidus</u> Roth	10%	Yes	UPL	
6. <u>Centaurea solstitialis</u>	10%	Yes	UPL	
7. <u>Sonchus arvensis</u> L.	10%	Yes	FACU	
8. _____	_____	_____	_____	
Total Cover: <u>100%</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>0%</u> % Cover of Biotic Crust <u>0%</u>				
Remarks: No hydric vegetation observed during delineation.				

SOIL

Sampling Point: UP A9

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Size / Contrast	Texture, Concretions, Structure, etc.
0 to 5 feet	Fill Material	Fill Material	None	None	Fill Material

<p>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</p> <p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Vernal Pools (F9) <input type="checkbox"/> Sandy Gleyed Matrix (S4) </p>	<p>Indicators for Problematic Hydric Soils³:</p> <p> <input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks) </p> <p>³Indicators of hydrophytic vegetation and wetland hydrology must be present.</p>
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<p>Restrictive Layer (if present):</p> <p>Type: _____</p> <p>Depth (inches): _____</p>	<p>Hydric Soil Present? Yes _____ No <u>X</u></p>
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Remarks: Soils do not have characteristics of a wetland soil. Soil consists of fill material

HYDROLOGY

<p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (any one indicator is sufficient)</u></p> <p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Biotic Crust (B12) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Water-Stained Leaves (B9) </p>	<p><u>Secondary Indicators (2 or more required)</u></p> <p> <input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) </p>
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<p>Field Observations:</p> <p>Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u></p> <p>Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u></p> <p>Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u> (includes capillary fringe)</p>	<p>Wetland Hydrology Present? Yes _____ No <u>X</u></p>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None.

Remarks:

No wetland hydrological indicators were observed.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: UP A12
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields and levees Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Artificial Fill NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Feature is not a wetland as defined by the 1987 USACE Delineation Manual.			

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>90</u> x 5 = <u>450</u> Column Totals: <u>100</u> (A) <u>490</u> (B) Prevalence Index = B/A = <u>4.9</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
<u>Herb Stratum</u>				
1. <u>Guilena lasiophyllai</u>	<u>20%</u>	<u>Yes</u>	<u>UPL</u>	
2. <u>Brassica nigra</u> L. Koch	<u>20%</u>	<u>Yes</u>	<u>UPL</u>	
3. <u>Melilotus alba</u>	<u>15%</u>	<u>Yes</u>	<u>UPL</u>	
4. <u>Malva parviflora</u>	<u>15%</u>	<u>Yes</u>	<u>UPL</u>	
5. <u>Bromus rigidus</u> Roth	<u>10%</u>	<u>Yes</u>	<u>UPL</u>	
6. <u>Centaurea solstitialis</u>	<u>10%</u>	<u>Yes</u>	<u>UPL</u>	
7. <u>Sonchus arvensis</u> L.	<u>10%</u>	<u>Yes</u>	<u>FACU</u>	
8. _____	_____	_____	_____	
Total Cover: <u>100%</u>				
<u>Woody Vine Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>0%</u> % Cover of Biotic Crust <u>0%</u>				
Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks: No hydric vegetation observed during delineation.				

SOIL

Sampling Point: UP A12

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Size / Contrast	Texture, Concretions, Structure, etc.
0 to 5 feet	Fill Material	Fill Material	None	None	Fill Material

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR D)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Depleted Below Dark Surface (A11)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Thick Dark Surface (A12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Sandy Mucky Mineral (S1)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Soils do not have characteristics of a wetland soil. Soil consists of fill material

HYDROLOGY

Wetland Hydrology Indicators:		<u>Secondary Indicators (2 or more required)</u>
<u>Primary Indicators (any one indicator is sufficient)</u>		<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): NA

Water Table Present? Yes _____ No X Depth (inches): NA

Saturation Present? Yes _____ No X Depth (inches): NA
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None.

Remarks:

No wetland hydrological indicators were observed.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: UP A17
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields and levees Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Artificial Fill NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Feature is not a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>90</u> x 5 = <u>450</u> Column Totals: <u>100</u> (A) <u>490</u> (B) Prevalence Index = B/A = <u>4.9</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Guillena lasiophyllai</u>	20%	Yes	UPL	
2. <u>Brassica nigra</u> L. Koch	15%	Yes	UPL	
3. <u>Brassica campestris</u>	15%	Yes	UPL	
4. <u>Malva parviflora</u>	15%	Yes	UPL	
5. <u>Digitaria sanguinalis</u> L. Scop.	15%	Yes	UPL	
6. <u>Centaurea solstitialis</u>	10%	Yes	FACU	
7. <u>Sonchus arvensis</u> L.	10%	Yes	UPL	
8. _____	_____	_____	_____	
Total Cover: <u>100%</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>0%</u> % Cover of Biotic Crust <u>0%</u>				
Remarks: No hydric vegetation observed during delineation.				

SOIL

Sampling Point: UP A17

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Size / Contrast	Texture, Concretions, Structure, etc.
0 to 5 feet	Fill Material	Fill Material	None	None	Fill Material

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) (LRR C) <input type="checkbox"/> 1 cm Muck (A9) (LRR D) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Vernal Pools (F9)
--	---

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> 1 cm Muck (A9) (LRR C) <input type="checkbox"/> 2 cm Muck (A10) (LRR B) <input type="checkbox"/> Reduced Vertic (F18) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Other (Explain in Remarks)	<p>³Indicators of hydrophytic vegetation and wetland hydrology must be present.</p>
---	--

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Soils do not have characteristics of a wetland soil. Soil consists of fill material

HYDROLOGY

Wetland Hydrology Indicators:	<u>Secondary Indicators (2 or more required)</u>
<u>Primary Indicators (any one indicator is sufficient)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) (Nonriverine) <input type="checkbox"/> Sediment Deposits (B2) (Nonriverine) <input type="checkbox"/> Drift Deposits (B3) (Nonriverine) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Water Marks (B1) (Riverine) <input type="checkbox"/> Sediment Deposits (B2) (Riverine) <input type="checkbox"/> Drift Deposits (B3) (Riverine) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5)
<p>Field Observations:</p> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u> Water Table Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u> Saturation Present? Yes _____ No <u>X</u> Depth (inches): <u>NA</u> (includes capillary fringe)	<p>Wetland Hydrology Present? Yes _____ No <u>X</u></p>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: None.	
Remarks: No wetland hydrological indicators were observed.	

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: UP A20
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields and levees Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Artificial Fill NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Feature is not a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>15</u> x 4 = <u>60</u> UPL species <u>85</u> x 5 = <u>425</u> Column Totals: <u>100</u> (A) <u>485</u> (B) Prevalence Index = B/A = <u>4.85</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Guillena lasiophyllai</u>	<u>20%</u>	<u>Yes</u>	<u>UPL</u>	
2. <u>Brassica nigra</u> L. Koch	<u>20%</u>	<u>Yes</u>	<u>UPL</u>	
3. <u>Brassica campestris</u>	<u>15%</u>	<u>Yes</u>	<u>UPL</u>	
4. <u>Malva parviflora</u>	<u>15%</u>	<u>Yes</u>	<u>UPL</u>	
5. <u>Digitaria sanguinalis</u> L. Scop.	<u>15%</u>	<u>Yes</u>	<u>UPL</u>	
6. <u>Centaurea solstitialis</u>	<u>15%</u>	<u>Yes</u>	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
Total Cover: <u>100%</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>0%</u> % Cover of Biotic Crust <u>0%</u>				
Remarks: No hydric vegetation observed during delineation.				

SOIL

Sampling Point: UP A20

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Size / Contrast	Texture, Concretions, Structure, etc.
0 to 5 feet	Fill Material	Fill Material	None	None	Fill Material

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR D)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Depleted Below Dark Surface (A11)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Thick Dark Surface (A12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Sandy Mucky Mineral (S1)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Soils do not have characteristics of a wetland soil. Soil consists of fill material

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
<u>Primary Indicators (any one indicator is sufficient)</u>		<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): NA

Water Table Present? Yes _____ No X Depth (inches): NA

Saturation Present? Yes _____ No X Depth (inches): NA
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None.

Remarks:

No wetland hydrological indicators were observed.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Kebo Oil and Gas, Inc. Glide 14-1 Well Project City/County: Yolo County Sampling Date: April 11, 2007
 Applicant/Owner: Kebo Oil and Gas, Inc. State: CA Sampling Point: UP A26
 Investigator(s): Cord Hute Section, Township, Range: Section 14, Township 8N, Range 3E
 Landform (hillslope, terrace, etc.): Rice fields and levees Local relief (concave, convex, none): Concave Slope (%): nearly level
 Subregion (LRR): Mediterranean California (LRR C) Lat: 38° 32' 28" N Long: 121° 37' 12" W Datum: Mount Diablo Base and Meridian
 Soil Map Unit Name: Artificial Fill NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Feature is not a wetland as defined by the 1987 USACE Delineation Manual.	

VEGETATION

<u>Tree Stratum</u> (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
Total Cover: <u>0%</u>				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>10</u> x 4 = <u>40</u> UPL species <u>90</u> x 5 = <u>450</u> Column Totals: <u>100</u> (A) <u>490</u> (B) Prevalence Index = B/A = <u>4.9</u>
<u>Sapling/Shrub Stratum</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
<u>Herb Stratum</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Guilena lasiophyllai</u>	20%	Yes	UPL	
2. <u>Brassica nigra</u> L. Koch	20%	Yes	UPL	
3. <u>Brassica campestris</u>	15%	Yes	UPL	
4. <u>Malva parviflora</u>	15%	Yes	UPL	
5. <u>Digitaria sanguinalis</u> L. Scop.	10%	Yes	UPL	
6. <u>Centaurea solstitialis</u>	10%	Yes	FACU	
7. <u>Melilotus alba</u>	10%	Yes	UPL	
8. _____	_____	_____	_____	
Total Cover: <u>100%</u>				
<u>Woody Vine Stratum</u>				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
Total Cover: <u>0%</u>				
% Bare Ground in Herb Stratum <u>0%</u> % Cover of Biotic Crust <u>0%</u>				
Remarks: No hydric vegetation observed during delineation.				

SOIL

Sampling Point: UP A26

Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance / Size / Contrast	Texture, Concretions, Structure, etc.
0 to 5 feet	Fill Material	Fill Material	None	None	Fill Material

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR D)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Depleted Below Dark Surface (A11)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Thick Dark Surface (A12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Sandy Mucky Mineral (S1)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Soils do not have characteristics of a wetland soil. Soil consists of fill material

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (2 or more required)
<u>Primary Indicators (any one indicator is sufficient)</u>		<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Drift Deposits (B3) (Nonriverine)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): NA

Water Table Present? Yes _____ No X Depth (inches): NA

Saturation Present? Yes _____ No X Depth (inches): NA
(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

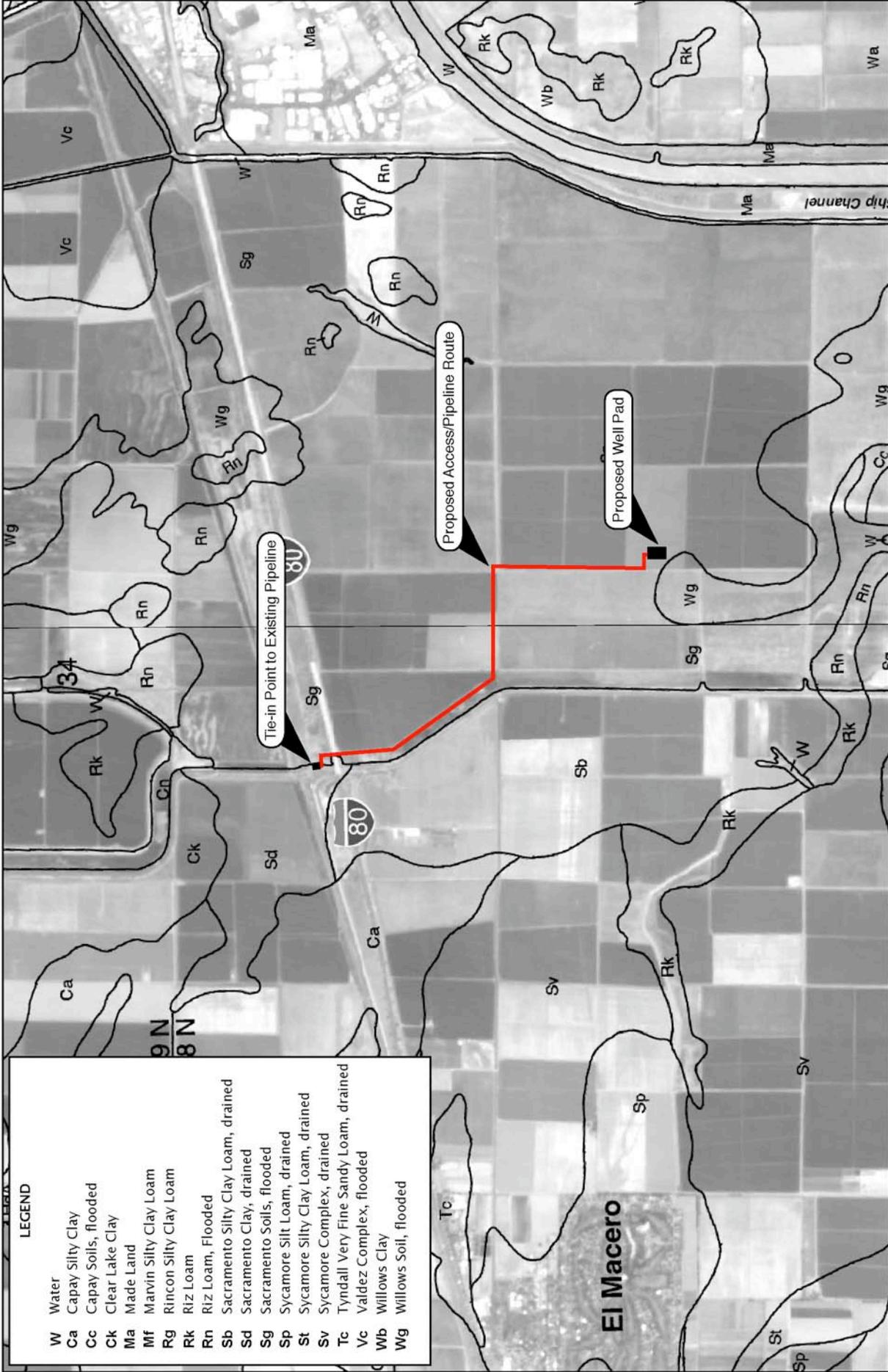
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

None.

Remarks:

No wetland hydrological indicators were observed.

Appendix E
Yolo County Soil Survey Map



LEGEND

W	Water
Ca	Capay Silty Clay
Cc	Capay Soils, flooded
Ck	Clear Lake Clay
Ma	Made Land
Mf	Marvin Silty Clay Loam
Rg	Rincon Silty Clay Loam
Rk	Riz Loam
Rn	Riz Loam, Flooded
Sb	Sacramento Silty Clay Loam, drained
Sd	Sacramento Clay, drained
Sg	Sacramento Soils, flooded
Sp	Sycamore Silt Loam, drained
St	Sycamore Silty Clay Loam, drained
Sv	Sycamore Complex, drained
Tc	Tyndall Very Fine Sandy Loam, drained
Vc	Valdez Complex, flooded
Wb	Willows Clay
Wg	Willows Soil, flooded

Kebo Oil & Gas, Inc.
 607 Railroad Drive
 Portland, Texas 78374

KEBO GLIDE 14-1 EXPLORATORY NATURAL GAS WELL PROJECT
 Soil Survey Map

Source: Andrews, 1972.

Synthesis Environmental Planning
 6 Carmen Court
 Novato, California 94945

Appendix F
Plant Species Observance List

Common Name	Scientific Name	Wetland Indicator Status
Water plantain	<i>Alisma plantago-aquatica</i>	OBL
Redroot pigweed	<i>Amaranthus retroflexus</i> L.	FACU
Wild oat	<i>Avena fatua</i>	---
Coyote bush	<i>Bacharis piliaris</i>	---
Field mustard	<i>Brassica campestris</i>	---
Black mustard	<i>Brassica nigra</i> L. Koch	---
Ripgut	<i>Bromus rigidus</i> Roth	---
Soft cheat grass	<i>Bromus secalinus</i> L.	FACU-
Soft chess	<i>Bromus mollis</i>	---
Yellow-star thistle	<i>Centaurea solstitialis</i>	---
California sedge	<i>Carex californica</i>	FAC+
Oakleaf goosefoot	<i>Chenopodium glaucum</i> L.	FACW
Pacific golden-saxifrage	<i>Chrysosplenium glechomifolium</i> Nutt.	OBL
Poison hemlock	<i>Conium maculatum</i> L.	FAC
Tall flatsedge	<i>Cyperus eragrostis</i>	FACW
Large crabgrass	<i>Digitaria sanguinalis</i> (L.) Scop.	FACU
Quackgrass	<i>Elytrigia repens</i> (L.) Nevski	FAC
Common willow herb	<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	FACW+
Red-stemmed filaree	<i>Erodium cicutarium</i>	---
Fennel	<i>Foeniculum vulgare</i>	FACU-
California mustard	<i>Guillenia lasiophylla</i>	---
Cow parsnip	<i>Heracleum lanatum</i>	---
Foxtail barley	<i>Hordeum leporinum</i>	---
Mediterranean barley	<i>Hordeum marinum</i>	---
Baltic rush	<i>Juncus Balticus</i>	FACW+
Toad rush	<i>Juncus bufonius</i> L.	FACW+
Common rush	<i>Juncus effusus</i>	FACW+
Mexican rush	<i>Juncus mexicanus</i> Willd.	FACW
Prickly lettuce	<i>Lactuca serriola</i> L.	FAC
Perennial rye grass	<i>Lolium perenne</i>	FAC
Common mallow	<i>Malva neglecta</i> Wallr.	---
Cheeseweed	<i>Malva parviflora</i>	---
Bur clover	<i>Medicago polymorpha</i>	FACU-
White sweetclover	<i>Melilotus alba</i>	---
Miner's lettuce	<i>Montia perfoliata</i> (Donn) T.J. Howell	---
White-head navarretia	<i>Navarretia leucocephala</i> Benth.	FACW
Bristly ox-tongue	<i>Picris echioides</i>	FAC
Swamp smartweed	<i>Polygonum amphibium</i>	OBL
Rabbitsfoot grass	<i>Polypogon monspeliensis</i> (L.) Desf.	FACW+
Wild radish	<i>Rhaphanus sativus</i>	---
California rose	<i>Rosa californica</i>	FAC+
Himalayan blackberry	<i>Rubus discolor</i>	FAC+
California blackberry	<i>Rubus ursinus</i>	FAC+
Clustered dock	<i>Rumex conglomeratus</i>	FACW
Curly dock	<i>Rumex crispus</i> L.	FACW+
Common tule	<i>Scirpus acutus</i>	OBL
California bulrush	<i>Scirpus californicus</i>	OBL
Bulrush	<i>Scirpus microcarpus</i>	OBL
Perennial sowthistle	<i>Sonchus arvensis</i> L.	FACU
Annual sowthistle	<i>Sonchus oleraceus</i>	---
Duckweed	<i>Spirodela oligorrhiza</i>	OBL
Narrow-leaved cattail	<i>Typha angustifolia</i>	OBL
Broad-leaved cattail	<i>Typha latifolia</i>	OBL
Cocklebur	<i>Xanthium strumarium</i> L.	FAC+

Appendix C

Pacific Legacy, Inc. Archeological Resources Survey Report



Bay Area Division
900 Modoc Street
Berkeley, California 94707

Phone: 510.524.3991
Fax: 510.524.4419
www.pacificlegacy.com

June 22, 2007

Robert A. Booher
Robert A. Booher Consulting
3221 Quail Hollow Drive
Fairfield, CA 94533

Re: Archaeological Survey of the Kebo Glide 14-1 Exploratory Natural Gas Project between Davis and West Sacramento (PL 822-38), Yolo County, California.

Dear Mr. Booher:

This letter report presents the results of a literature search, Native American consultation and archaeological survey for the proposed Kebo Glide 14-1 Exploratory Natural Gas Project and associated pipeline located between Davis and West Sacramento, Yolo County. Investigations were completed under contract number 822-38 between Robert Booher Consulting and Pacific Legacy, Inc. The purpose of the study was to identify historic or prehistoric resources that may be adversely impacted by the project, as stipulated under the California Environmental Quality Act (CEQA).

Project Location and Description

The proposed project area, which includes the proposed well pad and a natural gas pipeline, is located with the Yolo Bypass Wildlife Area (Tule Ranch) in an unincorporated area of Yolo County, California. The project location, depicted in Figure 1 on the Sacramento West 7.5' USGS Quadrangle, is located in Township 8N; Range 3E; Section 14.

Kebo Oil and Gas Inc. (Kebo) proposes to drill a natural gas well on a pad measuring 460 feet by 250 feet and to install a natural gas pipeline approximately 2.65 miles in length. The proposed well pad would be prepared by clearing the area of vegetation, building it up with fill, and topping it with gravel. In addition to the pad itself, a 50-foot access road would be constructed to provide access from an existing upland check dam. The Area of Potential Effects (APE) for the project includes the well pad, pipeline route, and access road.

Archival Research

Kathryn Killacey of Pacific Legacy completed a record and information search for the proposed Kebo Glide 14-1 Exploratory Natural Gas Project and associated pipeline on May 22, 2007 at the Northwest Information Center (NWIC) of the California Historical Resources Information System located at Sonoma State University in Rohnert Park. This included a review of the:

- National Register of Historic Places (*Directory of Determinations of Eligibility*, California Office of Historic Preservation, Volumes I and II, 2001);
- *California Inventory of Historic Resources* (State of California 1976);
- *California Historical Landmarks* (State of California 1996);
- *California Points of Historical Interest* listing (State of California 1992);
- Historic Property Data File (State of California 2005);

- CALTRANS *State and Local Bridge Survey* (State of California 1989);
- *Survey of Surveys* (State of California 1989), and
- Other pertinent historic data on file with Pacific Legacy was inspected.

The record and information search revealed that three cultural resource studies that included the project area have been conducted. Seven more cultural resource studies have been completed within ½ mile of the project area (Table 1). The record search also revealed that no historic properties, either prehistoric or historic, are known to exist within the project area. One historic site, P-57-000400, has been identified within ½ mile of the project area. This site is the Southern Pacific Railroad line between Vallejo and Davis. This line was originally constructed by California Pacific Railroad between 1866 and 1868 (Nelson et al. 1999). The portion of this line directly north of the project area is also listed in the Yolo County Historic Resources Survey as YOL-HRI-6/193 (Les 1986). This portion of the Southern Pacific Railroad line consists of a railroad trestle spanning the Yolo Bypass.

Table 1. Previous Archaeological Studies

NWIC Study Number	Author	Date	Study Type	In Project Area?
S-012191	Glover and Bouey	1990	Archaeological Survey	No
S-012467	Berg and Bouey	1991	Archaeological Survey	No
S-022464	Glover and Bouey	1999	Archaeological Survey	No
S-022736	Glover and Bouey	2000	Archaeological Survey	No
S-022817	Nelson, Carpenter and Costello	2000	Archaeological Survey	No
S-023920	William Self Associates	2001	Archaeological Survey	No
S-025311	Martin and Self	2002	Archaeological Survey	Yes
S-025654	Reutter	2002	Archaeological Survey	No
S-028381	Martin, Brown and Self	2004	Archaeological Survey	Yes
YOL-HRI	Les	1986	Historic Resources Inventory	Yes

Native American Consultation

Pacific Legacy requested a search of the “Sacred Lands Inventory” maintained by the Native American Heritage Commission (NAHC) on May 30, 2007. In a response dated May 31, 2007, Debbie Pilas-Treadway indicated that no known areas of concern exist within the project area. Pacific Legacy was provided with a list of potentially interested Native Americans for Yolo County on May 31, 2007. Letters of inquiry were sent to Kesner Flores, Elaine Patterson, Thelma Brafford, Bill Combs, Marshall McKay, Leland Kinter, Cynthia Clarke and the Wintun Environmental Protection Agency on June 1, 2007. No responses have been received to date. Any future responses will be forwarded to Robert Booher Consulting as they become available. The Native American correspondence is included as Attachment B.

Archaeological Survey

A pedestrian survey of the project area was conducted by Francisco Arellano and Kathryn Killackey on May 29, 2007.

The proposed project area is located south of the South Pacific Railroad line in the Yolo Bypass Area of Yolo County. The approximately 2.65 mile linear project corridor is located in wetlands and agricultural fields. The area surveyed consisted of the canal access road, which forms the proposed pipeline route, with a 20 meter buffer on each side and the entire well pad location with a 20 meter buffer where possible. The project area was surveyed in transects spaced 10 meters apart. The surveyed area included the west side of the canal access road in the southernmost project corridor area, the north side of the canal access road and the canal along

the east/west trending road within the project corridor area, and the east side of the wetlands viewing area along the wetlands access road. The visibility in these areas ranged from 20% in areas with vegetation to 100% in the recently plowed agricultural fields. The northwest/southeast trending area was not surveyed because of marsh-water and heavy vegetation resulting in zero ground visibility. The project corridor area has been greatly impacted by agricultural activity, including plowing and the building of roads, canals and berms. No historic or prehistoric material culture remains were observed during the pedestrian survey.

Results and Recommendations

The record search and literature review revealed that no previously recorded ethnographic, historic, or archaeological sites were located within the project area. A pedestrian survey of the APE did not result in the discovery of any prehistoric or historic resources. It is our opinion that no further studies within the APE should be necessary unless: 1) project plans change to include unsurveyed areas; 2) project plans change to include the construction of additional facilities; or 3) cultural materials are encountered during construction.

Our study attempted to determine if archaeological deposits were present in the project area. Although none were located, ground disturbing activities have the potential to uncover buried cultural deposits undetectable through surface inspections. Prior to the initiation of construction or ground-disturbing activities, all field personnel should be alerted to the possibility of buried cultural remains (i.e., prehistoric and/or historic resources). Personnel should be instructed that upon discovery of buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be contacted immediately. Once the find has been identified, plans for treatment and for the evaluation and mitigation of impacts to the find will need to be developed, if it is found to be eligible for listing on the National Register of Historic Places or the California Register of Historical Resources. Prehistoric or historic cultural materials that may be encountered during ground-disturbing activities include the following:

- Historic artifacts, such as glass bottles and fragments, tin cans, nails, ceramic and pottery sherds, and other metal objects;
- Historic structural or building foundations, walkways, cisterns, pipes, and other structural elements;
- Flaked-stone artifacts and debitage, consisting of obsidian, basalt, and/or CCS;
- Groundstone artifacts, such as mortars, pestles, and grinding slabs;
- Dark, almost black, soil with a “greasy” texture that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire-affected rock; and,
- Human remains.

If human remains are encountered during ground disturbing activities, work in that area must halt and the Yolo County Coroner must be notified immediately. If the remains are determined to be Native American, then the Native American Heritage Commission (NAHC) is to be notified within 24 hours as required by Public Resources Code 5097. The NAHC will contact the designated Most Likely Descendant who will provide recommendations for the treatment of the remains within 48 hours of being granted access to the site.

Should you require any further information, I may be reached at (510) 524-3991 ex. 4.

Sincerely,



Kari Jones
Archaeologist
Bay Area Division

Attachments: Attachment A: Figure 1. Project Location
Attachment B: Native American Consultation Correspondence
Attachment C: Photographic Documentation

References Cited

Berg, John E. and Paul D. Bouey

- 1991 Supplement to the Sacramento Metropolitan Area Cultural Resources Survey, Sacramento and Yolo Counties, California [Contract No. DACW0591P1192] (Maps 1 through 5). S-12467 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

California, State of

- 1976 *California Inventory of Historic Resources*. Department of Parks and Recreation, Office of Historic Preservation, Sacramento.
- 1989 *CALTRANS State and Local Bridge Survey*. Department of Parks and Recreation, Office of Historic Preservation, Sacramento.
- 1989 *Survey of Surveys*. Department of Parks and Recreation, Office of Historic Preservation, Sacramento.
- 1992 *California Points of Historical Interest*. May 1992 and updates. Department of Parks and Recreation, Office of Historic Preservation, Sacramento.
- 1996 *California Historical Landmarks*. Department of Parks and Recreation, Office of Historic Preservation, Sacramento.
- 2001 National Register of Historic Places. *Directory of Determinations of Eligibility*, California Office of Historic Preservation, Volumes I and II.
- 2005 Historic Property Data File (Office of Historic Preservation Computer Listing dated 5-02-2005).

Glover, L., and P. Bouey

- 1990 Sacramento Metropolitan Area Cultural Resources Survey, Sacramento and Yolo Counties, California. S-12191 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.
- 1999 Cultural Resource Inventory Report for the Williams Communications, Inc. Fiber Optic Cable System Installation Project, Pittsburg to Sacramento, California. S-

22464 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

- 2000 Final Cultural Resources Inventory Report for the Proposed Fiber Optic Cable Routes between Point Arena and Robbins and Point Arena and Sacramento, California: Volume 1. S-22736 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

Les, K.

- 1986a Yolo County Historic Resources Survey. On file at the Northwest Information Center, Sonoma State University, Rohnert Park.
- 1986b Historic Resources Inventory. HRI 6/193 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

Martin, L., and W. Self

- 2002 Cultural Resources Assessment Report: SFPP, L.P. Proposed Concord to Sacramento Pipeline Project. S-25311 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

Martin, L., K. Brown, and W. Self

- 2004 Cultural Resources Assessment Report: Proposed Construction Yards Nos. 1, 2, 3, and 4, SFPP, L. P. Concord to Sacramento Pipeline Project. S-28381 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

Nelson, J., H. Davis, S. Dies, and K. Syda

- 1999 Site record for P-57-000400. On file at the Northwest Information Center, Sonoma State University, Rohnert Park.

Nelson, W., M. Carpenter, and J. Costello

- 2000 Cultural Resources Survey for the Level (3) Communications Long Haul Fiber Optics Project, Segment WSO1: Sacramento to Oakland. S-22817 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

Reutter, S.

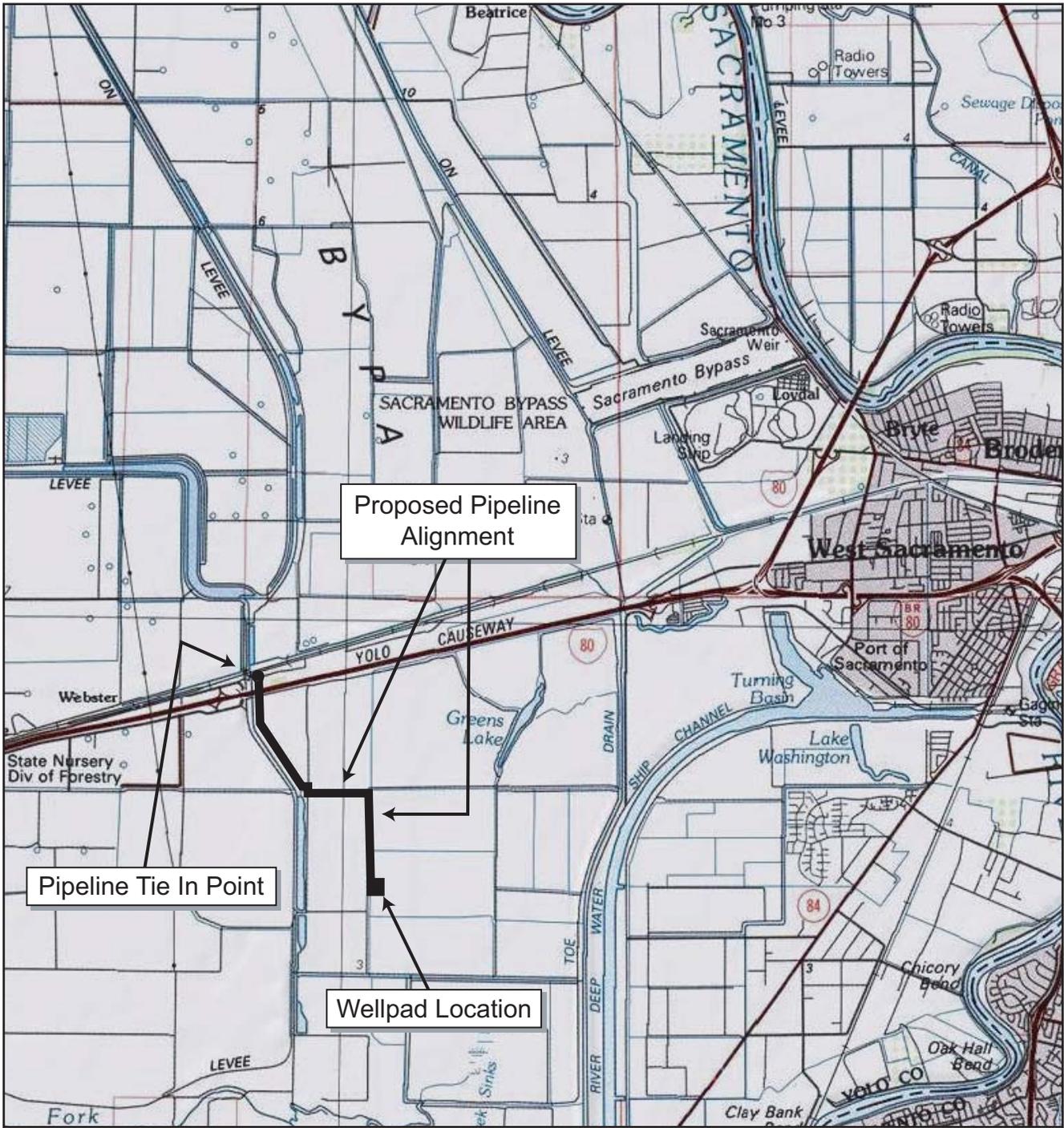
- 2002 Archaeological Resources Survey for the Proposed PG&E West Sacramento-Davis Reconductoring Project, Yolo County, California. S-25654 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

William Self Associates

- 2001 Inspection of Line Section 25, Solano and Yolo Counties, California. S-23920 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

Attachment A:

Figure 1. Project Location and Survey Area



SOURCE: TOPO! National Geographic Holdings, California CD-ROM, USGS 7.5' Sacramento West, CA 1992.



QUADRANGLE LOCATION

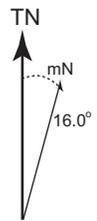
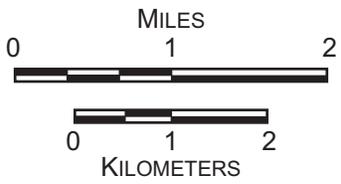


Figure 1. Project Location Map.

Attachment B:
Native American Correspondence

STATE OF CALIFORNIAArnold Schwarzenegger, Governor**NATIVE AMERICAN HERITAGE COMMISSION**

915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov



May 31, 2007

Kathryn Killackey
Archaeologist
Bay Area Division
PACIFIC LEGACY
900 Modoc St.
Berkeley, CA 94707

Sent by Fax: 510-524-4419

Number of Pages: 2

Re: Proposed Kebo Glide 14-1 Exploratory natural Gas project, Yolo County.

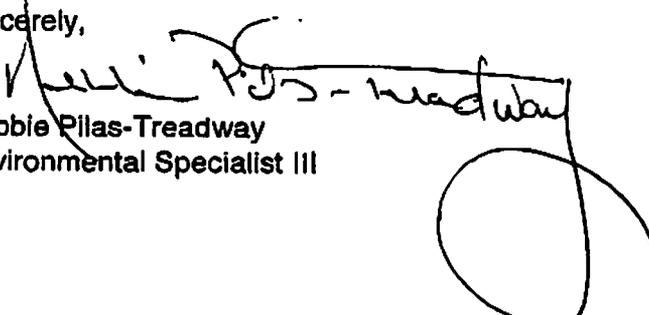
Dear Ms. Killackey:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,


Debbie Pilas-Treadway
Environmental Specialist III

Native American Contacts

Yolo County

May 31, 2007

<p>Kesner Flores PO Box 1047 Wheatland , CA 95692 calnagpra@hotmail.com 925-586-8919</p>	Wintun / Patwin	<p>Rumsey Indian Rancheria of Wintun Marshall McKay, Chairperson P.O. Box 18 Brooks , CA 95606 mmckay@rumseywintu-nsn. (530) 796-3400 (530) 796-2143 Fax</p>	Wintun (Patwin)
<p>Cortina Band of Indians Elaine Patterson, Chairperson PO Box 1630 Williams , CA 95987 (530) 473-3274 - Voice (530) 473-3190 - Voice (530) 473-3301 - Fax</p>	Wintun / Patwin	<p>Rumsey Indian Rancheria of Wintun Leland Kinter, Native Cultural Renewal Committee P.O. Box 18 Brooks , CA 95606 (530) 979-6346 (530) 796-3400 - office (530) 796-2143 Fax</p>	Wintun (Patwin)
<p>Cortina Band of Indians Thelma Brafford, Tribal Administrator P.O. Box 1630 Williams , CA 95987 (530) 473-3274 (530) 437-3301 FAX</p>	Wintun/Patwin	<p>Rumsey Indian Rancheria of Wintun Cynthia Clarke, Native Cultural Renewal Committee P.O. Box 18 Brooks , CA 95606 (530) 796-3400 - office (530) 796-2143 Fax</p>	Wintun (Patwin)
<p>Cortina Band of Indians Bill Combs, Vice Chairperson PO Box 1630 Williams , CA 95987 (530) 473-3274 - Voice (530) 473-3190 - Voice (530) 473-3301 - Fax</p>	Wintun / Patwin	<p>Wintun Environmental Protection Agency P.O. Box 1839 Williams , CA 95987 corwepa@hotmail.com (530) 473-3318 (530) 473-3319 (530) 473-3320 - Fax</p>	Wintun (Patwin)

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Kebo Gilde 14-1 Exploratory Natural Gas project, Yolo County.

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Sent To Mr. Kesner Flores
 Street, Apt. or PO Box PO Box 1047
 City, State Wheatland, CA 95692
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 PO Box 1630
 City, State Williams, CA 95987
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Sent To Mr. Marsnaff McKay
 Street, Apt. or P.O. Box Rumsey Indian Rancheria of Wintun
 P.O. Box 18
 City, State Brooks, California 95606
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Sent To Ms. Thelma Brafford
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 PO Box 1630
 City, State Williams, California 95987
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Sent To: Mrs. Cynthia Clarke
 Rumsey Indian Rancheria of
 Wintun
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 City, State: Brooks, CA 95606

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Total Postage	\$3.06		06/01/2007

Sent To: Mr. Leland Kunter
 Rumsey Indian Rancheria of
 Wintun
 Street, Apt or PO Box: PO Box 18
 City, State: Brooks, CA 95606

PS Form 3800, Instructions



Bay Area Division
900 Modoc St.
Berkeley, California 94707

Phone: 510.524.3991
Fax: 510.524.4419
www.pacificlegacy.com

June 1, 2007

Mr. Kesner Flores
PO Box 1047
Wheatland, CA 95692

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

Dear Mr. Flores,

We have been retained by Robert A. Booher Consulting to conduct an archaeological assessment for a property located between Davis and West Sacramento in Yolo County, California for a proposed installation of a natural gas pipeline.

The attached map depicts the project area on the Davis and West Sacramento, CA 7.5' USGS Quadrangles.

The Sacred Lands Inventory on file with the Native American Heritage Commission (NAHC) has been reviewed. This review failed to indicate the presence of cultural resources in the immediate project area. The NAHC provided us with your name as a contact to identify any locations of concern to local Native American Groups within the project area. If appropriate, please provide us with any information you may have regarding locations of concern in the project area. This information will be used for project planning and will be kept confidential. If you do not feel it is appropriate to divulge the type of resource, it can be noted as "environmentally sensitive area".

You may respond by mail, email, phone, or visit our office in Berkeley to inspect our research files. We anticipate receiving your reply within 14 days. At present, we are unaware of any fixed date for the start of construction. If you have any questions, please contact me, at (510) 524-3991 ext. 109. Thank you for your kind attention to this matter.

Sincerely,

Kathryn Killackey, M.A.
Archaeologist
Bay Area Division
killackey@pacificlegacy.com

Attachment: Project Area on the Davis and West Sacramento Island 7.5' USGS Quadrangles



Bay Area Division
900 Modoc St.
Berkeley, California 94707

Phone: 510.524.3991
Fax: 510.524.4419
www.pacificlegacy.com

June 1, 2007

Ms. Elaine Patterson
Cortina Band of Indians
PO Box 1630
Williams, CA 95987

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

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Sincerely,

Kathryn Killackey, M.A.
Archaeologist
Bay Area Division
killackey@pacificlegacy.com

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Bay Area Division
900 Modoc St.
Berkeley, California 94707

Phone: 510.524.3991
Fax: 510.524.4419
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June 1, 2007

Mr. Bill Combs
Cortina Band of Indians
PO Box 1630
Williams, CA 95987

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

Dear Mr. Combs,

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Sincerely,

Kathryn Killackey, M.A.
Archaeologist
Bay Area Division
killackey@pacificlegacy.com

Attachment: Project Area on the Davis and West Sacramento Island 7.5' USGS Quadrangles



Bay Area Division
900 Modoc St.
Berkeley, California 94707

Phone: 510.524.3991
Fax: 510.524.4419
www.pacificlegacy.com

June 1, 2007

Wintun Environmental Agency
PO Box 1839
Williams, CA 95987

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

Dear Sir or Madam,

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The attached map depicts the project area on the Davis and West Sacramento, CA 7.5' USGS Quadrangles.

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You may respond by mail, email, phone, or visit our office in Berkeley to inspect our research files. We anticipate receiving your reply within 14 days. At present, we are unaware of any fixed date for the start of construction. If you have any questions, please contact me, at (510) 524-3991 ext. 109. Thank you for your kind attention to this matter.

Sincerely,

Kathryn Killackey, M.A.
Archaeologist
Bay Area Division
killackey@pacificlegacy.com

Attachment: Project Area on the Davis and West Sacramento Island 7.5' USGS Quadrangles



Bay Area Division
900 Modoc St.
Berkeley, California 94707

Phone: 510.524.3991
Fax: 510.524.4419
www.pacificlegacy.com

June 1, 2007

Mr. Marshall McKay
Rumsey Indian Rancheria of Wintun
P.O. Box 18
Brooks, California 95606

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

Dear Mr. McKay,

We have been retained by Robert A. Booher Consulting to conduct an archaeological assessment for a property located between Davis and West Sacramento in Yolo County, California for a proposed installation of a natural gas pipeline.

The attached map depicts the project area on the Davis and West Sacramento, CA 7.5' USGS Quadrangles.

The Sacred Lands Inventory on file with the Native American Heritage Commission (NAHC) has been reviewed. This review failed to indicate the presence of cultural resources in the immediate project area. The NAHC provided us with your name as a contact to identify any locations of concern to local Native American Groups within the project area. If appropriate, please provide us with any information you may have regarding locations of concern in the project area. This information will be used for project planning and will be kept confidential. If you do not feel it is appropriate to divulge the type of resource, it can be noted as "environmentally sensitive area".

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June 1, 2007

Ms. Thelma Brafford
Cortina Band of Indians
PO Box 1630
Williams, California 95987

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

Dear Ms. Brafford,

We have been retained by Robert A. Booher Consulting to conduct an archaeological assessment for a property located between Davis and West Sacramento in Yolo County, California for a proposed installation of a natural gas pipeline.

The attached map depicts the project area on the Davis and West Sacramento, CA 7.5' USGS Quadrangles.

The Sacred Lands Inventory on file with the Native American Heritage Commission (NAHC) has been reviewed. This review failed to indicate the presence of cultural resources in the immediate project area. The NAHC provided us with your name as a contact to identify any locations of concern to local Native American Groups within the project area. If appropriate, please provide us with any information you may have regarding locations of concern in the project area. This information will be used for project planning and will be kept confidential. If you do not feel it is appropriate to divulge the type of resource, it can be noted as "environmentally sensitive area".

You may respond by mail, email, phone, or visit our office in Berkeley to inspect our research files. We anticipate receiving your reply within 14 days. At present, we are unaware of any fixed date for the start of construction. If you have any questions, please contact me, at (510) 524-3991 ext. 109. Thank you for your kind attention to this matter.

Sincerely,

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Archaeologist
Bay Area Division
killackey@pacificlegacy.com

Attachment: Project Area on the Davis and West Sacramento Island 7.5' USGS Quadrangles



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June 1, 2007

Mr. Leland Kinter
Rumsey Indian Rancheria of Wintun
PO Box 18
Brooks, CA 95606

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

Dear Mr. Kinter,

We have been retained by Robert A. Booher Consulting to conduct an archaeological assessment for a property located between Davis and West Sacramento in Yolo County, California for a proposed installation of a natural gas pipeline.

The attached map depicts the project area on the Davis and West Sacramento, CA 7.5' USGS Quadrangles.

The Sacred Lands Inventory on file with the Native American Heritage Commission (NAHC) has been reviewed. This review failed to indicate the presence of cultural resources in the immediate project area. The NAHC provided us with your name as a contact to identify any locations of concern to local Native American Groups within the project area. If appropriate, please provide us with any information you may have regarding locations of concern in the project area. This information will be used for project planning and will be kept confidential. If you do not feel it is appropriate to divulge the type of resource, it can be noted as "environmentally sensitive area".

You may respond by mail, email, phone, or visit our office in Berkeley to inspect our research files. We anticipate receiving your reply within 14 days. At present, we are unaware of any fixed date for the start of construction. If you have any questions, please contact me, at (510) 524-3991 ext. 109. Thank you for your kind attention to this matter.

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Archaeologist
Bay Area Division
killackey@pacificlegacy.com

Attachment: Project Area on the Davis and West Sacramento Island 7.5' USGS Quadrangles



Bay Area Division
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June 1, 2007

Ms. Cynthia Clarke
Rumsey Indian Rancheria of Wintun
PO Box 18
Brooks, CA 95606

Re: Kebo Glide 14-1 Exploratory Natural Gas Project, Yolo County, PL 822-38

Dear Ms. Clarke,

We have been retained by Robert A. Booher Consulting to conduct an archaeological assessment for a property located between Davis and West Sacramento in Yolo County, California for a proposed installation of a natural gas pipeline.

The attached map depicts the project area on the Davis and West Sacramento, CA 7.5' USGS Quadrangles.

The Sacred Lands Inventory on file with the Native American Heritage Commission (NAHC) has been reviewed. This review failed to indicate the presence of cultural resources in the immediate project area. The NAHC provided us with your name as a contact to identify any locations of concern to local Native American Groups within the project area. If appropriate, please provide us with any information you may have regarding locations of concern in the project area. This information will be used for project planning and will be kept confidential. If you do not feel it is appropriate to divulge the type of resource, it can be noted as "environmentally sensitive area".

You may respond by mail, email, phone, or visit our office in Berkeley to inspect our research files. We anticipate receiving your reply within 14 days. At present, we are unaware of any fixed date for the start of construction. If you have any questions, please contact me, at (510) 524-3991 ext. 109. Thank you for your kind attention to this matter.

Sincerely,

Kathryn Killackey, M.A.
Archaeologist
Bay Area Division
killackey@pacificlegacy.com

Attachment: Project Area on the Davis and West Sacramento Island 7.5' USGS Quadrangles

Attachment C:
Photographic Documentation

Pacific Legacy Photographic Documentation

Client: Robert A. Booher

Prepared by: Kathryn Killackey

Location: Kebo Glide 14-1 Exploratory Natural Gas Project

Photographer: Francisco Arellano

Photograph Date: May 29, 2007

Photograph No. 1

Direction:

North

Description:

Fields on east side of canal in southern project area



Photograph No. 2

Direction:

North

Description:

Road along west side of canal in southern project area



Pacific Legacy Photographic Documentation

Client: Robert A. Booher

Prepared by: Kathryn Killackey

Location: Kebo Glide 14-1 Exploratory Natural Gas Project

Photographer: Francisco Arellano

Photograph Date: May 29, 2007

Photograph No. 3

Direction:

North

Description:

Vegetation in northern project area with I-80 in background



Photograph No. 4

Direction:

Plan view

Description:

Ground visibility in areas with heavy vegetation



Appendix D

CEQA Environmental Impact Assessment Checklist

Appendix D
 CEQA Environmental Impact Assessment Checklist

I. Land Use and Planning. Would the proposal:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with general plan designation or zoning?				X
b. Conflict with applicable environmental goals and or policies adopted by agencies with jurisdiction over the project?				X
c. Be incompatible with existing land use in the vicinity?			X	
d. Affect agricultural resources or operations (e.g., impacts on soils or farmlands, or impacts from incompatible land uses)?			X	X
e. Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)?				X

II. Population and Housing. Would the proposal:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cumulatively exceed official regional or local population projections?				X
b. Induce substantial growth in an area either directly or indirectly (e.g., through project in an undeveloped area or extension of major infrastructure)?				X
c. Displace existing housing, especially affordable housing?				X

III. Geologic Problems. Would the proposal result in or expose people to potential impacts involving:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Fault rupture?				X
b. Seismic ground shaking?				X
c. Seismic ground failure, including liquefaction?				X
d. Seiche, tsunami, or volcanic hazard?				X
e. Landslides or mudflows?				X
f. Erosion, changes in topography or unstable soil conditions from excavation, grading, or fill?		X		
g. Subsidence of the land?		X		
h. Expansive soils?				X
i. Unique geologic or physical features?				X

Appendix D
 CEQA Environmental Impact Assessment Checklist

IV. Water. Would the proposal result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?			X	
b. Exposure of people or property to water related hazards such as flooding?		X		
c. Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen or turbidity)?		X		
d. Changes in the amount of surface water in any water body?				X
e. Changes in currents, or the course or direction of water movements?				X
f. Change in the quantity of ground water, either through direct additions or withdrawals, or through inception of an aquifer by cuts or excavations, or through substantial loss of ground water recharge capability?				X
g. Altered direction or rate of flow of ground water?				X
h. Impacts on ground water quality?				X
i. Substantial reduction in the amount of ground water otherwise available for public water supplies?				X

V. Air Quality. Would the proposal:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Violate any air quality standard or contribute to an existing or projected air quality violation?		X		
b. Expose sensitive receptors to pollutants?		X		
c. Alter air movement, moisture, or temperature, or cause any change in climate?				X
d. Create objectionable odors?			X	

VI. Transportation Circulation. Would the proposal result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Increased vehicle trips or traffic congestion?			X	
b. Hazards to safety from design features (e.g., sharp curves or dangerous intersection) or incompatible uses (e.g., farm equipment)?				X
c. Inadequate emergency access or access to nearby uses?			X	
d. Insufficient parking capacity onsite or offsite?				X
e. Hazards or barriers for pedestrians or bicyclists?			X	
f. Conflicts with adopted policies supporting alternative transportation (e.g., bus turnouts and bicycle racks)?				X
g. Railway and air traffic impacts?				X
h. Waterborne traffic impacts?				X

Appendix D
 CEQA Environmental Impact Assessment Checklist

VII. Biological Resources. Would the proposal result in impacts to:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Endangered, threatened, or rare species or their habitats (including but not limited to wildlife species, aquatic species, and plant species)?		X		
b. Locally designated species (e.g., heritage trees)?			X	
c. Locally designated natural communities (e.g., oak forest and coastal habitat)?			X	
d. Wetland habitat (e.g., marsh, riparian, and vernal pool)?		X		
e. Wildlife dispersal or migration corridors?				X

VIII. Energy and Mineral Resources. Would the proposal:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with adopted energy conservation plan				X
b. Use nonrenewable resources in a - wasteful and inefficient manner?				X
c. Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the state?				X

IX. Hazards. Would the proposal involve:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. A risk of accidental explosion or release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation)?		X		
b. Possible interference with an emergency response plan or emergency evacuation plan?				X
c. The creation of any health hazard or potential health hazard?		X		
d. Exposure of people to existing sources of potential health hazards?			X	
e. Increase fire hazard in areas with flammable brush, grass, or trees?				X

X. Noise. Would the proposal result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Increases in existing noise levels?			X	
b. Exposure of people to severe noise levels?			X	

Appendix D
 CEQA Environmental Impact Assessment Checklist

XI. Public Services. Would the proposal have an effect upon, or result in a need for new or altered government services, in any of the following areas:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Fire protection?			X	
b. Police protection?				X
c. Schools?				X
d. Maintenance of public facilities, including roads?			X	
e. Other governmental services?				X

XII. Utilities and Service Systems. Would the proposal result in a need for new systems or supplies, or substantial alterations to the following utilities:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Power or natural gas?				X
b. Communications systems?				X
c. Local or regional water treatment or distribution facilities?				X
d. Sewer or septic tanks?				X
e. Storm water drainage?				X
f. Solid waste disposal?				X
g. Local or regional water supplies?				X

XII. Aesthetics. Would the proposal:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Affect a scenic vista or scenic highway?				X
b. Have a demonstrable negative aesthetic effect?		X		
c. Create light or glare?			X	

XIII. Cultural Resources. Would the proposal:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Disturb paleontological resources?				X
b. Disturb archeological resources?		X		
c. Affect historical resources?		X		
d. Have the potential to cause a physical change, which would affect unique ethnic cultural values?				X
e. Restrict existing religious or sacred uses within the potential impact area?				X

XIV. Recreation. Would the proposal:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Parks or other recreational facilities?				X
b. Affect existing recreational opportunities?			X	

Appendix D
 CEQA Environmental Impact Assessment Checklist

XV. Mandatory Findings 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?		X		
b. Does the project have the potential to achieve short-term goals to the disadvantage of long-term environmental goals?				X
c. 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 effect of past projects, effects of other current projects, and the effects of other probable future projects.)			X	
d. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?			X	

Appendix E
Mitigation Monitoring and Reporting Program

MITIGATION MONITORING AND REPORTING PROGRAM

In accordance with Section 15074(d) of the CEQA Guidelines, the following Mitigation Monitoring and Reporting Program (MMRP) identifies the mitigation measures for the Kebo Oil & Gas, Inc. Glide 14-1 natural gas well project. The MMRP includes the reporting provisions that will be required to ensure proper implementation of these measures.

The California Department Fish and Game, as lead agency, is responsible for compliance, monitoring, and verification. Compliance monitoring will be carried out by a monitor hired by the Applicant and subject to approval by the California Department of Fish and Game. Reports will be prepared weekly by the compliance monitor(s) once field activities are initiated and will continue through project completion. These compliance reports will be sent to the California Department of Fish and Game.

Water Resources

Mitigation Measure 2.4.3a

Elevate and enclose production equipment. Production equipment will be elevated above the 100-year flood levels and well heads will be enclosed with metal cages.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Water quality is maintained at pre-project levels

Mitigation Measure 2.4.3b

Properly dispose of generated waste. Waste generated during project activities shall be stored in designated waste collection containers away from waterways and shall be disposed of according to applicable regulatory requirements.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Water quality is maintained at pre-project levels

Mitigation Measure 2.4.3c

Properly maintain vehicles and equipment. Vehicles and equipment shall be maintained properly to prevent leakage of hydrocarbons and other automotive fluids. All maintenance shall occur in designated areas located away from waterways.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.

Performance Criteria: Water quality is maintained at pre-project levels

Mitigation Measure 2.4.3d

Locate fueling areas to minimize risk of water contamination. An earthen berm will be constructed around the drill sites to prevent the possibility of any spilled hydrocarbons from reaching surface water adjacent to the site.

Responsible Parties: Kebo Oil & Gas, Inc.
Monitoring Authority: California Department of Fish and Game
Implementation Schedule: Ongoing through project completion
Monitoring Schedule: Weekly
Funding: Kebo Oil & Gas, Inc.
Performance Criteria: Water quality is maintained at pre-project levels

Mitigation Measure 2.4.3e

Maintain accessibility to spill prevention and response equipment. Spill prevention and response equipment, including drip pans, drop cloths, and absorbent materials, shall be kept at all designated maintenance and fueling areas. Steel sheet-piling will be used as an effective secondary containment for any potential surface spill.

Responsible Parties: Kebo Oil & Gas, Inc.
Monitoring Authority: California Department of Fish and Game
Implementation Schedule: Ongoing through project completion
Monitoring Schedule: Weekly
Funding: Kebo Oil & Gas, Inc.
Performance Criteria: Water quality is maintained at pre-project levels

Mitigation Measure 2.4.3f

Promptly clean up spills and notify responsible agencies. Any accidental spill of hydrocarbons or other vehicle fluids shall be cleaned up immediately. Crewmembers shall use absorbent material to prevent a spill from entering waterways. Responsible agencies shall be notified immediately in the event of an accidental spill to ensure proper clean up and disposal of the spilled material.

Responsible Parties: Kebo Oil & Gas, Inc.
Monitoring Authority: California Department of Fish and Game
Implementation Schedule: Ongoing through project completion
Monitoring Schedule: Weekly
Funding: Kebo Oil & Gas, Inc.
Performance Criteria: Water quality is maintained at pre-project levels

Air Quality

Mitigation Measure 2.5.3a

Minimize fugitive dust emissions. To minimize the generation of fugitive dust emissions, the project proponent shall implement the following dust control measures:

- Water all active construction areas, as needed.

- Cover all trucks hauling soil, sand, or other loose materials or require all trucks to maintain at least two feet of freeboard.
- Apply water on all unpaved access roads, parking areas, and staging areas, as needed.
- Sweep (with water sweepers) all paved access roads, parking areas and staging areas, as needed.
- Sweep public streets (with water sweepers) if visible soil material is carried onto adjacent public streets.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Compliance with dust control measures

Biological Resources

Mitigation Measure 2.7.3a

A Qualified Biologist will conduct an Environmental Awareness Training of Construction and Drilling Personnel. A Qualified Biological Monitor Shall be Present During All Ground Disturbing and Drilling Activities. A pre-construction environmental awareness training shall be conducted with all construction and drilling personnel, and should consist of a brief presentation in which persons knowledgeable in local sensitive habitats and wildlife, and regulatory protection should discuss environmental concerns. All personnel working on the project should understand the sensitivity of adjacent habitats and wildlife species.

A qualified biologist shall be present on site during the all ground disturbing activities and during the drilling of the exploratory well. The biological monitor will be responsible for ensuring that construction and personnel follow the mitigation measures outlined in this document, as well as all conditions set forth in any environmental and use permits issued for the project. Results of the monitoring effort shall be documented in monitoring notes and summarized in a final report. The final report will be submitted to all regulatory agencies that issue permits or clearances for the project.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Prior to Site Preparation
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Sensitive habitats and associated plant and wildlife species are protected

Mitigation Measure 2.7.3b

Conduct Pre-Construction Botanical Surveys for Special-Status Plant Species. A qualified botanist will conduct pre-construction field surveys to identify any populations of threatened, endangered, rare, and other special-status plants located within the proposed disturbance areas as identified within Table 2-4. These surveys shall be conducted prior to the initiation of any construction activities and coincide with the appropriate flowering period

of the special status plant species with the potential to occur in the area. If any special-status plant species populations are identified within or adjacent to the proposed disturbance area, Kebo shall implement the following measures:

- If any population(s) of special-status plant species is identified adjacent to the proposed project site, a qualified biologist retained by Kebo will clearly delineate the location of the plant population. If the plant population is directly adjacent to the proposed disturbance zone, the project proponent will install protective fencing between the disturbance zone and the plant population to ensure that the plant population is adequately protected.
- If a special-status plant population is identified within the proposed disturbance zone, Kebo will consult with CDFG and USFWS to determine the appropriate measures to avoid or mitigate for impacts to the species or population. Kebo will adjust the boundaries of the disturbance zone, where feasible, to avoid impacts to the plant species/population. Where avoidance is not feasible, Kebo will implement one or more of the following measures:
 - (1) transplant potentially affected plants to areas not planned for disturbance. If a plant is transplanted, two more plants should be planted. Plantings shall be managed and monitored by the applicant and shall survive to 5 years after planting;
 - (2) seed or purchase plants and place them in an area adjacent to the disturbance zone;
 - (3) purchase credits at an approved mitigation bank at a ratio approved by CDFG, USFWS, and Kebo.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Prior to Site Preparation
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Sensitive plant species are protected

Mitigation Measure 2.7.3c

Conduct Pre-Construction Surveys for Nesting Herons, Swallows, Tri-colored Blackbird, Western Burrowing Owl, Swainson’s Hawk, Northern Harrier Hawks, Short-eared Owls, White-tailed Kite, Purple Martin, Raptor Species, Nesting and Wintering Waterfowl and Shorebirds, and Migratory Song Birds.

Pre-construction surveys will be conducted for protected avian species nesting in the project area. If exploratory drilling or construction activities take place beyond August, pre-construction surveys will be conducted for wintering waterfowl as well. Pre-construction surveys will occur prior to the implementation of the proposed project. A qualified biologist will survey suitable habitat for the presence of these species.

If a special-status bird species is found or suspected to be nesting, a buffer area will be established to avoid impacts on the nest. If no nesting special-status avian species are found,

project activities may proceed and no further mitigation measures will be required. If nesting sites are found, *Mitigation Measure 2.7.3d* has been incorporated to reduce potential impacts to a less than significant level.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Prior to Site Preparation
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Special-status avian species are protected

Mitigation Measure 2.7.3d

Establish Exclusion Buffer Areas around Special-status Avian Species Nest Sites. Where protected bird species' nest sites are identified or suspected to occur during pre-construction surveys, the qualified biologist will establish the following buffer zones around nest sites, and no project activities occur within these buffer zones until young birds have fledged.

Nesting Herons

Nesting herons typically nest and rear young from late February through August. In order to avoid and minimize impacts on nesting herons, a 400-foot buffer will be established around active nesting sites when project activities will occur during their breeding period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Nesting Swallows

Nesting swallows typically nests and rears young from May through July. In order to avoid and minimize impacts on nesting swallows, a 200-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests.

Tri-colored Blackbird

Tri-colored blackbird typically nests and rears young from mid April through late July. In order to avoid and minimize impacts on nesting tri-colored blackbirds, a 200-foot buffer will be established around active nests. No project related activities will be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests.

Western Burrowing Owl

Western burrowing owl typically nests and rears young from February through August. Burrowing owls also occupy nesting sites during the non-breeding season (September through January). If an occupied burrow is identified within 160 feet of the project disturbance area during the non-breeding season, or within 250 feet of the disturbance area during the breeding

season, Kebo will consult with CDFG to determine the appropriate method to passively relocate owls. Project related activities would be allowed to proceed after owls are passively relocated. If passive relocation of owls is necessary, it shall occur outside of the nesting season. For each occupied burrow that is passively relocated, compensation will consist of preserving 6.5 acres of foraging habitat. The 6.5 acres shall be contiguous with known, occupied burrowing owl burrows.

White-Tailed Kite

White-tailed kites typically nest and rear young from mid-February through June. In order to avoid and minimize impacts on white-tailed kites, a 1,320-foot buffer will be established around active nests. No project related activities would be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to June if a qualified biologist determines that all juveniles have fledged from occupied nests.

Purple Martin

Purple martins typically nest and rear young from March through August. In order to avoid and minimize impacts on purple martins, a 200-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Swainson's Hawk

Swainson's hawk typically nests and rears young from March through August. In order to avoid and minimize impacts on nesting Swainson's hawks, a 1,320-foot buffer will be established around active nesting sites. No project related activities will be allowed to occur within this zone. A biological monitor will monitor the nest site on a regular schedule to ensure no impacts are occurring to nesting Swainson's hawks. Monitoring protocol shall be determined in consultation with CDFG. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Other Raptor Species

Raptor species typically nests and rear young from March through August. In order to avoid and minimize impacts on nesting raptor species, a 500-foot buffer will be established around active nesting sites when project related activities would not be allowed to occur within this area. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Nesting and Wintering Waterfowl/Shorebirds.

The typical breeding season for waterfowl and shorebirds occurs between February and July. In order to avoid impacts to these resources, a 200-foot buffer will be established around active nesting sites when project related activities would not be allowed to occur within this

area. The buffer area can be removed prior to July if a qualified biologist determines that all juveniles have fledged from occupied nests. Additionally, construction activities will occur between May and October, which will reduce the impacts to nesting and wintering waterfowl and shorebirds.

Migratory Song Birds

Nesting migratory song birds typically nest and rear young from April through August. In order to avoid and minimize impacts on nesting migratory song birds, a 100-foot buffer will be established around active nesting sites when project activities will occur during their nesting period. No project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Prior to Site Preparation
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Special-status avian species are protected

Mitigation Measure 2.7.3e

Conduct Pre-activity Surveys for GGS. Avoid Impacts to GGS. In accordance with *Standard Avoidance and Minimization Measures for Construction Activities in Giant Garter Snake Habitat* (USFWS 1997), the following mitigation measures shall be implemented during implementation of the proposed project to avoid impacts to GGS:

- 24-hours prior to construction activities, the project area should be surveyed for GGS. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during surveys, Kebo shall report the sighting(s) to the USFWS and CDFG immediately by telephone at (916) 414-6600.
- Construction activities will be conducted between May 1 and October 1. This is the active period for GGS and direct mortality is lessened, because snakes are expected to actively move and avoid danger.
- If any construction activities will take place between October 2 and April 30, the USFWS Sacramento Fish and Wildlife Office and CDFG will be consulted with to determine if additional measures are necessary to minimize and avoid take.
- Vegetative clearing will be confined to the minimal area necessary to facilitate construction of project components. Potential GGS habitat within and adjacent to the pipeline corridor shall be flagged and posted to avoid encroachment by construction personnel.
- All Movement of construction equipment and vehicles will be confined to existing roadways and the proposed well pad footprint.

- A qualified biologist will be on-site during all construction and earthmoving activities near GGS habitat. In the event GGS are observed near or in the construction area, the biologist will have the authority to stop construction until the snake has left the area. Physical removal of snakes from the project area will only be conducted with agency authorization, and will be conducted by a biologist qualified and listed by USFWS to handle this species. The biologist will contact CDFG and USFWS if any GGS are encountered, or if any incidental take occurs. The biologist will record all relevant environmental, biological, and behavior data observed, and submit summary reports to CDFG and USFWS.
- All project related traffic will observe a speed limit of 15 mph to ensure that any giant garter snakes crossing or basking on access roadways will have time to move out of the way of traffic.
- Kebo shall restore the well site to its original condition prior to project implementation after all project components are complete.

These mitigation measures do not preclude additional measures that may be imposed by the USFWS and/or CDFG during consultation to obtain regulatory permits.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Prior to Site Preparation
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Giant garter snakes are protected

Mitigation Measure 2.7.3f

Minimize Physical Disturbance in Sensitive Wetland Habitat. Restore Disturbed Wetland Habitat and/or Provide Wetland Mitigation to Offset Impacts.

The project proponent will minimize impacts to wetland habitat on the proposed well pad where feasible. Kebo will restore disturbed wetlands to pre-disturbance conditions after project activities are complete. The goal of the site restoration phase is to restore the site to its condition or better than that observed at the time of project initiation. Once the well is abandoned and plugged, surface equipment will be removed from the site. Any sand and or gravel used to build up the site will then be removed from the site. Contours will be re-established to near grade conditions present at the time of project initiation. Wetland vegetation will be planted to provide erosion control and improve habitat. The project proponent will submit a restoration and revegetation plan to the appropriate agencies for approval prior to initiating site restoration.

Wetland creation activities will also take place as part of the proposed project. In order to mitigate for the permanent impacts to 0.48 acres of freshwater emergent wetlands for placement of the production pad and access driveway to the site from an existing levee roadway, approximately 1.0 acre of wetlands will be created. The site for wetland creation also occurs within the Yolo Bypass Wildlife Area, approximately 1.5 miles southwest of the

proposed well pad. The wetland creation area is part of CDFG's Pacific Flyway Demonstration Area, and has been designated as an area for creation of wetlands by CDFG as part of their Yolo Bypass Land Management Plan. Kebo is currently preparing a compensatory wetland mitigation plan that will include the above wetland restoration activities. This plan will be subject to the approval of the U.S. Army Corps of Engineers, Sacramento District (USACE), the San Francisco Bay Regional Water Quality Control Board (RWQCB), and CDFG.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Prior to Site Preparation
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wetland impacts are reduced to the minimum necessary for project implementation. Wetland habitat impacts are mitigated for

Mitigation Measure 2.7.3g

Place sediment fencing around project site. Sediment fencing should be placed around the project area prior to commencement of project activities to ensure that project-related materials are not outside of approved work areas. Sediment barrier fencing or other erosion control materials shall not contain any monofilament. Sediment fencing will reduce risks of project site material (non-wetland soils) from escaping the work site and spilling into wetland habitats. Project area boundaries should be clearly delineated by stakes, flagging and /or rope or cord to minimize inadvertent degradation or loss of adjacent wildlife habitats during construction. Project related vehicles must be restricted to approved travel paths/roads and the well pad site.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wildlife species and their habitats are protected

Mitigation Measure 2.7.3h

Restrict equipment storage and parking. All equipment storage and parking during all project activities should be confined to the project area or to previously disturbed off site areas that are not habitat for listed species. Parking areas shall be clearly marked. Previously disturbed sites elsewhere in the Yolo Bypass Wildlife Area shall not be used for parking or equipment storage.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wildlife species and their habitats are protected

Mitigation Measure 2.7.3i

Establish traffic control. The Kebo project representative should establish traffic restraints and

erect signs to restrict construction-related traffic to approved access roads, construction areas, storage areas, staging and parking areas. Off-road traffic outside of designated project areas must be prohibited. Project-related vehicles should observe a 15-mph speed limit in all project areas except on County roads and State and Federal highways.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wildlife species and their habitats are protected

Mitigation Measure 2.7.3j

Provide escape ramps for wildlife species. To prevent entrapment of endangered species or other animals during the construction phase of the project, all excavated, steep-walled holes or trenches in excess of one foot in depth or greater should be provided with one or more escape ramps constructed of earth fill if wildlife proof barricade fencing is not used at the well pad site. Ramps should be at less than 45°. Trenches should be inspected for entrapped wildlife each working day. Before such holes or trenches are filled, they should be thoroughly inspected for entrapped animals. Any animals so discovered should be allowed to escape voluntarily, without harassment, before construction activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wildlife species and their habitats are protected

Mitigation Measure 2.7.3k

Inspect all construction pipes, culverts, or similar structures. All construction pipes, culverts, or similar structures that are stored at the construction site overnight should be thoroughly inspected for trapped animals before the subject pipe is buried, capped, or otherwise used or moved. Pipes laid in trenches overnight should be capped. If during construction an animal is discovered inside a pipe, that section of pipe should not be capped or buried until the animal has escaped.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wildlife species and their habitats are protected

Mitigation Measure 2.7.3l

No pets permitted on-site. To prevent harassment, mortality, or destruction of sensitive species and/or their habitat by domestic dogs and cats, no pets should be permitted on-site. Mitigation measures proposed in Section 2.4 (Water Resources) and in Section 2.9 (Hazards)

will also help minimize potential impacts to biological resources.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wildlife species and their habitats are protected

Hazards

Mitigation Measure 2.9.3a

Provide secondary containment. The drilling sites will be constructed in such a manner that secondary containment is provided for drilling and production activities.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Wetland areas and water resources are protected

Mitigation Measure 2.9.3b

Restrict access to project staging, construction, and other work areas. Project work areas shall be identified with flagging and will have signs posted restricting access to the areas. In areas where the public access cannot be controlled by posted signs, safety fencing will be installed to provide a physical barrier to unauthorized entry to work areas. In addition, all trenches and pits left unfilled during evening hours will be properly signed and safety fencing will be erected to prevent access to these areas.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing through project completion
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Access by non-project personnel is restricted

Aesthetics

Mitigation Measure 2.13.3a

Paint production facilities. All production facilities shall be painted camouflage or an earthen tone to blend in with the environs and to prevent glare.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Upon completion of constructing production equipment
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Equipment blends in with environment and glare is prevented

Cultural Resources

Mitigation Measure 2.14.3a

Avoidance of cultural resources. The project proponent will seek to avoid cultural resources as the preferred mitigation measure. Avoidance of cultural resources would result in a less-than-significant levels of impacts to identified and unidentified cultural resources. Facilities, staging areas, and any activity involving ground disturbance will be located to avoid cultural resources.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing during site preparation and construction related activities
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas
Performance Criteria:	Sensitive cultural resources are avoided

Mitigation Measure 2.14.3b

Determine eligibility of resource for listing on the CRHR. The project proponent shall retain a qualified archaeologist to evaluate any potentially significant cultural resources discovered during project implementation for CEQA “importance”, or eligibility for the CRHR.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	Ongoing during site preparation and construction related activities
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Sensitive cultural resources are avoided

Mitigation Measure 2.14.3c

Halt work immediately if cultural resources are discovered. All project personnel involved in any form of ground disturbance shall be advised of the possibility of encountering subsurface cultural resources. If such resources are encountered or suspected (such as chipped or ground stone debitage, historic debris, building foundations, human bone, remnants of village structure, lithic scatters, etc.), work shall be halted immediately. A professional archaeologist shall be consulted to assess any discoveries and develop appropriate management recommendations for treatment of historical resources. If bones are encountered and appear to be human, California law requires that the County coroner and Native American Heritage Commission be contacted. If Native American remains are involved, a Most Likely Descendant (MLD) shall be identified by the Native American Heritage Commission. The MLD and landowner upon whose property any human remains are found shall consult to determine the treatment of the remains.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game

Implementation Schedule:	Ongoing during site preparation and construction related activities
Monitoring Schedule:	Weekly
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Sensitive cultural resources are avoided

Recreational Resources

Mitigation Measure 2.15.3a

Re-gravel Access Roadway. Kebo will re-gravel 1 mile of the access roadway in the Yolo Bypass Wildlife Area. Location and timing of gravelling will be coordinated and approved by CDFG.

Responsible Parties:	Kebo Oil & Gas, Inc.
Monitoring Authority:	California Department of Fish and Game
Implementation Schedule:	After exploratory drilling and pipeline activities are complete
Monitoring Schedule:	After exploratory drilling and pipeline activities are complete
Funding:	Kebo Oil & Gas, Inc.
Performance Criteria:	Access to recreational area is maintained.

Notice of Determination

Appendix D

To:

Office of Planning and Research
For U.S. Mail: P.O. Box 3044 Sacramento, CA 95812-3044
Street Address: 1400 Tenth St. Sacramento, CA 95814

County Clerk
County of:
Address:

From:

Public Agency: Department of Fish and Game - Bay Delta Region
Address: P.O. Box 47 Yountville, Ca 94599
Contact: Ms. Anna Holmes
Phone: (209) 948-7163

Lead Agency (if different from above):
Address:
Contact:
Phone:

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2008042078

Project Title: Glide 14-1 Natural Gas Well Project, Kebo Oil & Gas, Inc.

Project Location (include county): Yolo Bypass Wildlife Area, Yolo County

Project Description:

The applicant proposes to drill a natural gas well from a site located on public lands within the California Department of Fish and Game Yolo Bypass Wildlife Area located in Yolo County. If economic quantities of gas are discovered, the well will be completed, a production platform constructed, and an approximately 2.65 mile pipeline will be installed.

This is to advise that the Department of Fish and Game - Bay Delta Region has approved the above described project on 6/16/08 and has made the following determinations regarding the above described project:

- 1. The project [] will [X] will not have a significant effect on the environment.
2. [] An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA. [X] A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [X] were [] were not made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [X] was [] was not adopted for this project.
5. A statement of Overriding Considerations [] was [X] was not adopted for this project.
6. Findings [X] were [] were not made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at: 7329 Silverado Trail, Napa, CA 94558 and 45211 County Road 32B (Chiles Rd), Davis, CA 95618

Signature (Public Agency) [Signature] For Title Regional Manager, Bay Delta Region
Date June 17, 2008 Date Received for filing at OPR