Section 3.7
Hydrology and Water Quality

This section describes the geophysical history and present flows of surface water and groundwater resources in the Phase II project area. It also examines possible effects of the proposed Phase II project components on the quality and quantity of surface waters and on the quality, availability, and flow of groundwater in the area.

Environmental Setting

Climate

The North Pacific High Pressure System produces northerly winds along the entire west coast of the United States during most of the year and dominates the project region's large-scale meteorology. The climate in the project area is characterized by hot, dry summers and cool, wet winters. The average annual precipitation in the project area varies annually and is strongly influenced by the Diablo Range in Contra Costa County. Most precipitation is associated with rainstorms that generally occur from October through April. These storms originate over the Pacific Ocean and carry considerable moisture. The duration of rainfall is usually 1–4 days. Severe thunderstorm cells often are embedded in the rainstorms. These storms can produce high peak flows and large flow volumes that can cause extensive flooding. Precipitation in the summer is infrequent and is usually limited to scattered thunderstorms.

Surface Water

Surface water in the Phase II project area includes the seasonal wetlands along the Kirby Hills access road and the brackish marsh wetlands that occur in the Suisun Marsh Primary Management Area.

Groundwater

The project area is located primarily within the Suisun/Fairfield Valley groundwater basin. Groundwater plays an important role in meeting the water needs of people and agriculture in Solano County. Many of the residences in the

project area rely on wells for their drinking water supply; other than the domestic wells that are near landowner's homes, no groundwater wells are located within the project area.

Water Quality

The Basin Plan for the San Francisco Bay region designates water bodies with beneficial water uses. The Sacramento River, Montezuma Slough, and Suisun Marsh provide beneficial uses related to fish habitat, water supply, and recreation. The San Francisco Regional Water Quality Control Board (SFRWQCB) maintains lists of impaired water bodies. Suisun Bay is listed for high levels of polychlorinated biphenyls and mercury, and the Suisun Marsh is listed for urban runoff and storm sewer drainages. Some of the Suisun wetlands also are listed as impaired (State Water Resources Control Board 2002).

Flood Hazard Zones

The Federal Emergency Management Agency (FEMA) designates the 100-year flood zone under the National Flood Insurance Program. The brackish marsh wetlands may be subject to stormwater and tidal inundation as part of the FEMA-designated 100-year floodplains.

Regulatory Setting

Federal Regulations

Clean Water Act (Sections 401 and 404)

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

National Pollutant Discharge Elimination System

Created under the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program applies to stormwater and point source discharges.

The EPA has delegated regulatory authority for the NPDES program to the nine regional water quality control boards. The SFRWQCB has jurisdiction over the project area. A provision of the NPDES permit requires that a SWPPP be developed and that it be implemented concurrently with construction.

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

State Regulations

Porter-Cologne Water Quality Control Act

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

Local Plans, Programs, and Policies

Solano County

The Land Use and Circulation Element of the Solano County General Plan establishes specific policies for the protection of the Suisun Marsh Management Area, including

> Agricultural uses consistent with protection of the Suisun Mash, such as grazing and grain production, would be maintained in the Secondary Management Area. In the event such uses become infeasible, other uses compatible with protection of the marsh should be permitted.

The Solano County Grading and Erosion Control Ordinance requires that projects excavating more than 8,000 square feet, or moving or filling more than 100 cubic yards at any site, obtain a grading permit from the Department of Resource Management (Solano County 2004). The ordinance also recommends that grading activities be conducted during the drier months (May through October) to allow soil stabilization and revegetation in advance of the rainy seasons. To continue grading past October, applicants must request an extension from the Department of Resource Management. A SWPPP also is required as part of the grading permit application.

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

Impact Analysis

Significance Criteria

Criteria for determining the significance of hydrology and water quality impacts were developed based on questions contained in the environmental checklist form in Appendix G of the State CEQA Guidelines. Based on the checklist questions, a project may have a significant effect on the environment if it would result in:

- Violation of federal, state, or local agency water quality standards or objectives or conflicts with the goals and policies of the Solano County General Plan;
- Surface water degradation during construction that exceeds standards of the NPDES; or
- Degradation of water quality that exceeds standards or objectives set forth in the SFRWQCB Basin Plan

Impacts

IMPACT 3.7-1: POTENTIAL DEGRADATION OF SURFACE WATER QUALITY DURING CONSTRUCTION OF THE PROPOSED PROJECT

The severity of construction-related water quality impacts depends on soil erosion potential; construction practices; the frequency, magnitude, and duration of precipitation events; and proximity to stream channels. Construction activities would expose disturbed and loosened soils to erosion from rainfall, water, and wind erosion. Soil erosion, which is described in Section 3.6, *Geology and Soils,* is the process by which soil particles are removed from the land surface by wind, water, or gravity. Construction activities remove the protective cover of vegetation and lessen the natural soil resistance to rainfall impact erosion.

Sedimentation occurs when the velocity of water in which soil particles are suspended is slowed sufficiently to allow particles to settle out. Larger particles, such as gravel and sand, settle out more rapidly than fine particles, such as silt and clay. Sediment is considered a pollutant by the SFRWQCB and also transports other adsorbed pollutants such as nutrients, hydrocarbons, and metals. Excessive sediment can cause increased turbidity and reduced light penetration, resulting in a reduction in prey capture for sight-feeding predators, reduction of light available for photosynthesis, smothering of bottom-dwelling organisms, changes in substrate composition, and reduction in aesthetic values. Concentrations of nutrients and other pollutants associated with sediment particles, such as metals, also could increase. Although these effects are usually short term and greatly diminish after revegetation, sediment and sediment-borne pollutants may be remobilized under suitable hydraulic conditions.

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

The proximity of construction activities to surface water increases the potential for a spilled toxic substance to enter the water. Washwater from batch facilities, equipment and tools, and other waste dumped or spilled on the construction site can easily lead to seepage of pollutants into watercourses. Accidental spillage of construction chemicals into a watercourse also may occur.

The impact of toxic construction-related materials on water quality is largely determined by the duration and time of the activities. Construction occurring in the dry season has a low potential for soil and channel erosion, and for runoff of

toxic chemicals into the drainages that cross through the project area because it will be dry.

Potential impacts regarding stormwater during construction will be reduced or controlled through implementation of the existing project SWPPP, as described in Chapter 2, *Project Description.* Compliance with the NPDES permit requires that structural and operational BMPs be used where necessary to minimize water quality impacts associated with construction and industrial operations. Grading will be designed to direct runoff from disturbed areas away from surface waters, and temporary settling basins or other filtering mechanisms will be used to control sediment discharges. In addition, visual monitoring of runoff water quality and quantitative analytical testing of runoff samples will be used to identify potential impacts, and corrective measures could then be implemented, if necessary. As described in Chapter 2, a Hazardous Materials Contingency Plan will be implemented if an accidental spill occurs or if any subsurface hazardous materials are encountered during construction. This will minimize potential impacts from construction-related chemicals.

Because LGS will implement the APMs described above and is required to comply with the permits described above, this impact is considered less than significant. No mitigation is required.

IMPACT 3.7-2: POTENTIAL DEGRADATION OF SURFACE WATER QUALITY DURING HYDROSTATIC TESTING OF THE PIPELINE

During construction of the well field flow line, approximately 21,000 gallons of water would be pumped from existing public or private water supplies for hydrostatic testing of the pipeline. The hydrostatic test water will be discharged and filtered through hay bales in annual grasslands. Hydrostatic testing will be conducted in accordance with the requirements of U.S. DOT pipeline safety regulations *49 CFR Part 192*, LGS testing specifications, and applicable permits. Water for hydrostatic testing will be obtained from existing public or private water supplies. Although the source has not yet been identified, it is anticipated that the majority of the water needed for hydrostatic testing would be purchased. Pumping rates, intake locations, and controls will be established in coordination with the water purveyor, DFG, USFWS,, SFRWQCB, and the Corps to prevent impacts on local agricultural operations, prevent channel erosion, minimize disturbance of sediment, and protect aquatic species.

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

the pipeline following hydrostatic testing will be disposed of at an appropriate facility.

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

IMPACT 3.7-3: POTENTIAL DEGRADATION OF GROUNDWATER QUALITY DURING WELL DRILLING

As part of the Phase II project, the wells will be directionally drilled from the well pads into the storage formation. Groundwater contamination may include introduction of drilling fluid contaminants to the potable water aquifers overlying the well field, and creation of potential conduits for cross-contamination between potable water aquifers and the underlying saline and nonpotable aquifers.

The DOGGR is responsible for wells drilled into an underground gas storage facility. Before receiving a permit to drill the wells and operate the project, LGS will complete engineering and geology studies and an injection plan and submit them to the division for approval. These studies will describe the well drilling and abandonment plans; reservoir characteristics; all geologic units, aquifers, and oil and gas zones; and the monitoring system to ensure that injected gas is confined to the intended zone. In addition, division staff will oversee well drilling and testing to ensure that the wells are completed as designed and permitted to prevent movement of groundwater between aquifer layers. LGS has posted a bond with DOGGR to ensure proper completion or abandonment of any well drilled.

Because of the oversight and requirements by DOGGR, this impact is considered less than significant. No mitigation is required.

IMPACT 3.7-4: POTENTIAL DEGRADATION OF WATER QUALITY DURING OPERATION OF THE PROJECT

Operation of the Phase II project components could lead to degradation of shallow groundwater and surface waters. The use of hazardous material onsite could lead to contamination of surface water and groundwater if proper precautions are not taken. Accidental spills or leakage of these materials may impair water quality. As described in Chapter 2, *Project Description* (under *Hazardous Materials Measures*), LGS will develop a Hazardous Materials Contingency Plan that will be implemented if an accidental spill occurs or if any subsurface hazardous materials are encountered during construction.

Saline water produced from the gas storage formations when the project is withdrawing gas would be separated, stored in tanks, and either reinjected into the same formations or trucked off location to a properly licensed commercial disposal location. The gas storage formations are greater than 1,000 feet below the potable water aquifers in the area and are separated by several impervious

shale formations. The DOGGR regulates the design, drilling, and operation of these reinjection wells to ensure that water is reinjected only into the desired formations. Based on the stringent requirements and oversight of that department, the reinjection of produced water into the gas storage formations would not affect potable groundwater quality.

Because LGS will implement APMs (as described in Chapter 2) to avoid and minimize potential degradation of surface water quality during operation of the project, this impact is considered less than significant. No mitigation is required.

Applicant-Proposed Measures and Mitigation Measures

LGS will implement APMs (described in Chapter 2, *Project Description*) as part of the proposed project to avoid and minimize potentially significant impacts on hydrology and water quality. As described in the Regulatory Setting, LGS also is required to obtain permits for activities with the potential to adversely affect groundwater and surface water resources. Therefore, no mitigation is required.