3.5 Geology and Soils

This section describes the geologic, seismic, and soil conditions in the vicinity of the proposed project, and assesses the impact of project implementation on these conditions.

3.5.1 Setting

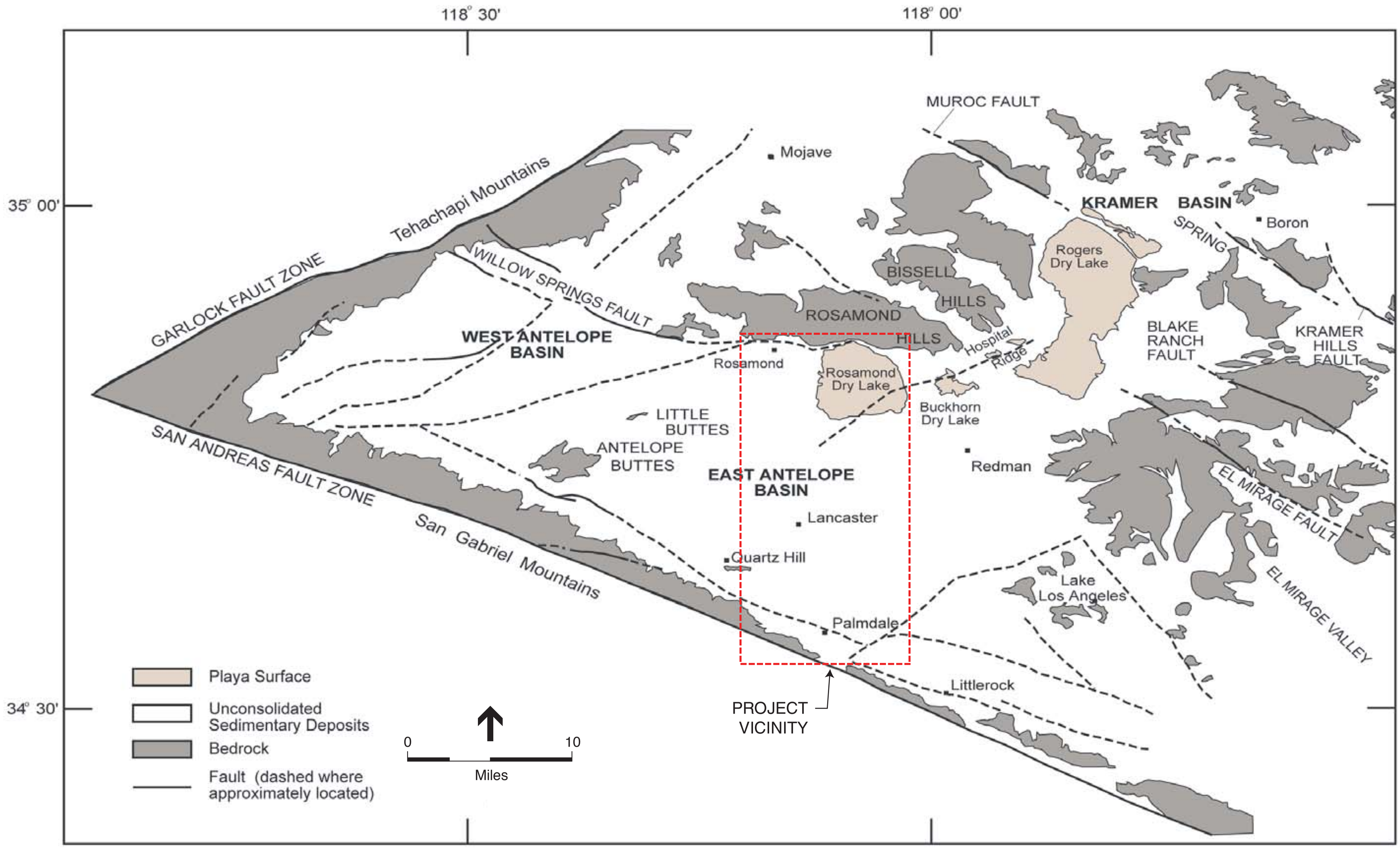
Geology & Soils

The project is located in the Antelope Valley, which encompasses approximately 2,400 square miles in northern Los Angeles County, southern Kern County, and western San Bernardino County. The Antelope Valley represents a large topographic and groundwater basin in the western part of the Mojave Desert in southern California. It is an undrained, closed basin. The region occupies part of a structural depression that has been downfaulted between the Garlock, Cottonwood-Rosamond, and San Andreas Fault Zones (**Figure 3.5-1**). The Valley is bound on the southwest by the San Andreas Fault and San Gabriel Mountains, the Garlock Fault and Tehachapi Mountains to the northwest, and San Bernardino County to the east. Consolidated rocks that yield virtually no water underlie the basin and crop out in the highlands that surround the basin. They consist of igneous and metamorphic rocks of pre-Tertiary age that are overlain by indurated continental rocks of Tertiary age interbedded with lava flows (USGS, 1995).

Alluvium and interbedded lacustrine deposits of Quaternary age form the important aquifers within the closed basin and have accumulated to a thickness of as much as 1,600 feet. The alluvium is unconsolidated to moderately consolidated, poorly sorted gravel, sand, silt, and clay. Older units of the alluvium are somewhat coarser grained, and are more compact and consolidated, weathered, and poorly sorted than the younger units. The rate at which water moves through the alluvium, also known as the hydraulic conductivity of the alluvium, decreases with increasing depth (USGS, 1995).

During the depositional history of the Antelope Valley region, a large intermittent lake occupied the central part of the basin and was the site of accumulation of fine-grained material. The rates of deposition varied with the rates of precipitation. During periods of relatively heavy precipitation, massive beds of blue clay formed in a deep perennial lake. During periods of light precipitation, thin beds of clay and evaporative salt deposits formed in playas or in shallow intermittent lakes. Individual beds of the massive blue clay can be as much as 100 feet thick and are interbedded with lenses of coarser material as much as 20 feet thick. The clay yields virtually no water to wells, but the interbedded, coarser material can yield considerable volumes of water.

Soils within the area are derived from downslope migration of loess and alluvial materials, mainly from granitic rock sources originating along the eastern slopes of the Tehachapi and San Gabriel Mountains.



SOURCE: Londquist, 1993.

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Figure 3.5-1
Regional Faults

Geologic Subunits

The complex Antelope Valley Groundwater Basin (AVGB) is divided by the USGS into twelve subunits. Groundwater basins are generally divided based upon differential groundflow patterns, recharge characteristics, and geographic location, as well as controlling geologic structures. The AVGB's subunits[1] are: Finger Buttes, West Antelope, Neenach, Willow Springs, Gloster, Chaffee, Oak Creek, Pearland, Buttes, Lancaster, North Muroc, and Peerless. Refer to Chapter 3.7, Hydrology and Water Quality for descriptions of these subunits.

Topography

The Antelope Valley region is a closed topographic basin with no outlet to the ocean. Land slopes gently inward from the slopes encircling the basin towards three playas (dry lake beds) located in the lowest portions of the valley floor. All water that enters the region either infiltrates into the groundwater basin, evaporates, or flows toward the three dry lakes on Edwards Air Force Base (EAFB): Rosamond Lake, Buckhorn Lake, and Rogers Lake. Elevations range from a high of 2,385 feet above mean sea level (amsl) to approximately 2,273 feet amsl on Rosamond Dry Lake. In general, groundwater flows northeasterly from the mountain ranges to the dry lakes.

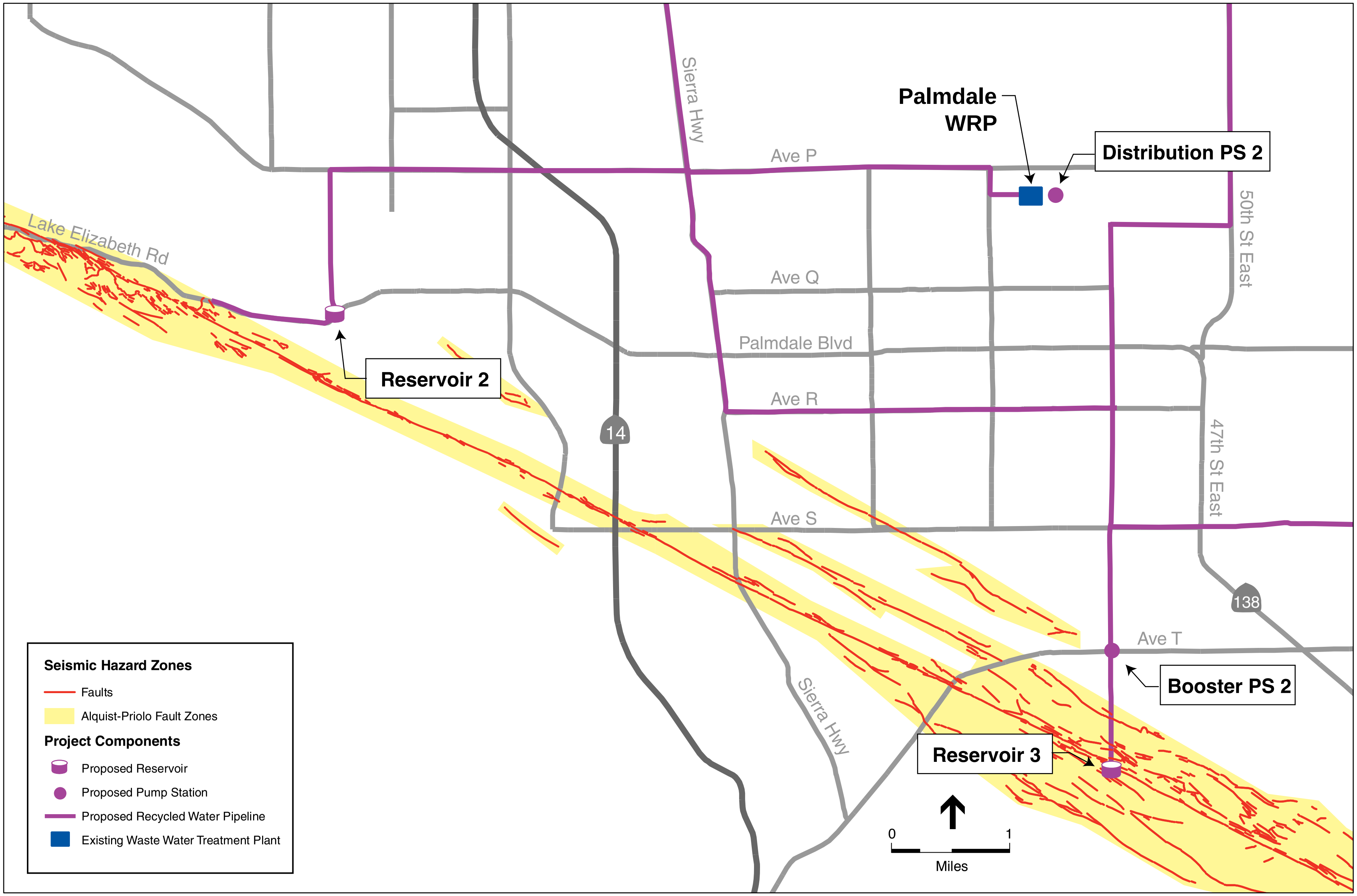
Seismic Hazards

Seismically-induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different segments of the same fault. Ground rupture is considered more likely along active faults. The California Geological Survey (CGS), formerly the California Division of Mines and Geology (CDMG), has identified active fault zones in California in compliance with the 1972 Alquist-Priolo Special Studies Zone Act. The purpose of this Act is to mitigate the hazard of surface faulting to structures for human occupancy (CGS, 2007a). The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. Alquist-Priolo Earthquake Fault Zones are regulatory zones around active faults. Active faults are defined as having surface rupture in the last 11,000 years (CGS, 2007a).

A review of the Alquist-Priolo Earthquake Fault Maps for the Palmdale (CDMG, 1979a) and Ritter Ridge (CDMG, 1979b) Quadrangles indicates that the project intersects Alquist-Priolo Earthquake Fault Zones in two locations (**Figure 3.5-2**):

- The southernmost portion of the project along 40th Street East from East Avenue T6 to the southwest reservoir is within an Alquist-Priolo Earthquake Fault Zone associated with the San Andreas Fault.
- The westernmost portion of the project along Elizabeth Lake Road runs parallel to the same Zone and intersects the Zone at the project's western terminus.

[1] The AVGB is currently undergoing an adjudication process. As part of information being complied during the adjudication, the Basin may be divided into different subunits and potentially subbasins in the future.



SOURCE: California Geologic Survey, 2008.

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Figure 3.5-2
Alquist-Priolo Fault Zones

Ground Shaking

Areas most susceptible to intense ground shaking are those located closest to the earthquake-generating fault, and areas underlain by thick, loosely unconsolidated and saturated sediments. Ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material.

While the earthquake magnitude is a measure of the energy released in an earthquake, intensity is a measure of the ground shaking effects at a particular location. Areas underlain by bedrock typically experience less severe ground shaking than those underlain by loose, unconsolidated materials. The Modified Mercalli Intensity (MMI) scale is commonly used to measure earthquake effects due to ground shaking. The MMI values range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage. The unconsolidated nature of underlying soils in portions of the project area, although located relatively distant from faults, can intensify ground shaking. Peak ground acceleration at the site is anticipated to be approximately equivalent to MMI VIII (very strong) ground shaking. Ground shaking of this intensity would likely cause some degree of damage to project facilities; however, well-designed structures are not anticipated to experience serious damage or collapse.

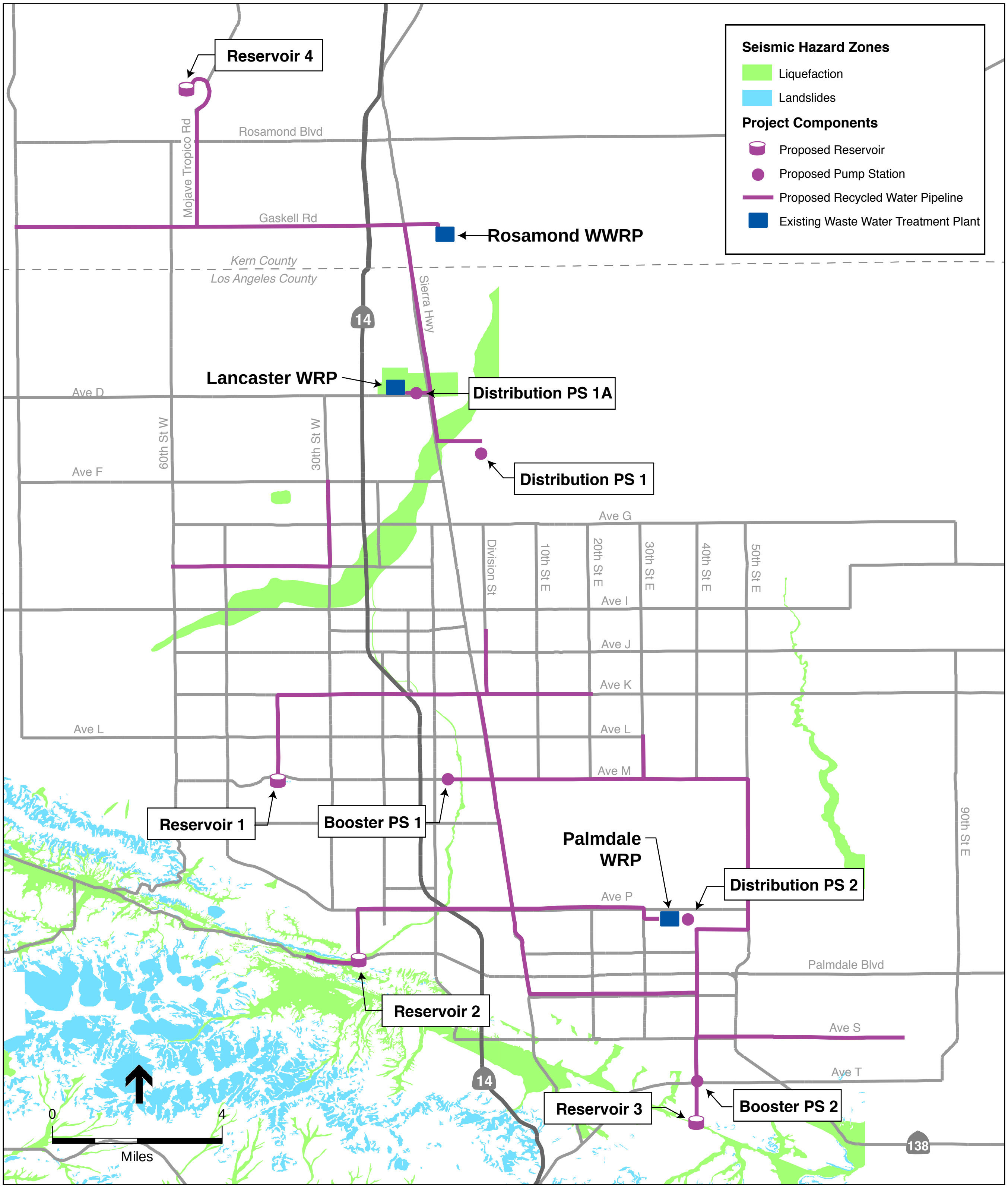
A review of the information provided by the CGS Probabilistic Seismic Hazards Mapping Program indicates that seismic hazards due to ground shaking at the project tend to increase from north to south with proximity to the San Andreas Fault. In the southernmost part of the project area, peak ground accelerations in unconsolidated alluvium can reach 0.738 g, with a 10 percent probability of being exceeded in 50 years (CGS, 2007b). In comparison, the northernmost part of the project area could experience peak ground accelerations that reach only 0.318 g, with the same probability of exceedance (CGS, 2007b).

Liquefaction

Liquefaction is a phenomenon whereby unconsolidated and/or near saturated soils lose cohesion and behave as a fluid as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in the temporary fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, buildings with shallow foundations, and levees. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 40 feet. Saturated unconsolidated alluvium with earthquake intensities greater than MMI VII may be susceptible to liquefaction. This would include areas with shallow perched groundwater.

A review of the CGS Seismic Hazard Zones Maps indicates that the project intersects zones of potential liquefaction in four locations (**Figure 3.5-3**):

- The portion of the project along Sierra Highway where it crosses the LWRP is within a liquefaction zone that encompasses the ponds of the LWRP (CGS, 2005).
- The portion of the project along Sierra Highway and Avenue E is within a liquefaction zone (CGS, 2005).



SOURCE: State of California Seismic Hazard Zones

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Figure 3.5-3
Seismic Hazards

- The southernmost portion of the project along 40th Street East at the intersection of Barrel Springs Road is within a narrow liquefaction zone. The zone extends approximately 100 feet north and 100 feet south of Barrel Springs Road (CGS, 2003a).
- The westernmost portion of the project along Elizabeth Lake Road is in a liquefaction zone. This zone is approximately 570 feet wide and is collinear with Elizabeth Lake Road (CGS, 2003b).

Landslide Hazards

A landslide is a mass of rock, soil, and debris displaced down-slope by sliding, flowing, or falling. The susceptibility of land (slope) failure is dependent on the slope and geology as well as the amount of rainfall, excavation, or seismic activities. Factors that decrease resistance to movement in a slope include pore water pressure, material changes, and structure. Removing the lower portion (the toe) of a slope decreases or eliminates the support that opposes lateral motion in a slope. Shaking during an earthquake may lead materials in a slope to lose cohesion and collapse.

A review of the CGS Seismic Hazard Zones Maps indicates that the project is not located in an area that is considered susceptible to an earthquake-induced landslide (Figure 3.5-3). The westernmost portion of the project along Elizabeth Lake Road is located downslope of three landslide zones. One zone trends parallel to and approximately 500 feet north of Elizabeth Lake Road (CGS, 2003b); the other two landslide zones are smaller and are located between 200 and 400 feet south of Elizabeth Lake Road (CGS, 2003b).

Non-Seismic Geologic Hazards

Soil Salinity

Salinization is the process by which water-soluble salts accumulate in the soil. Salinization is a resource concern because excess salts hinder plant growth by causing nutrient imbalances and limiting a plant's ability to extract water from the soil. Salinization may occur from mineral weathering, fertilizers, soil amendments, and irrigation waters that are high in dissolved salts. Soil salinity is typically estimated by measuring the electrical conductivity (EC), in units of milliohms per centimeter (mmhos/cm), of solution extracted from water-saturated soil. EC increases in a solution in direct proportion to the total concentration of dissolved salts.

Salts often accumulate in the soils of arid or semi-arid regions because there is not enough rainfall to dissolve them and leach them down past the root zone. Leaching can be inhibited in soils with a high clay content or high water table. In semiarid areas, salinization often occurs on the rims of depressions and edges of drainages, at the base of hillslopes, and in flat, low-lying areas surrounding sloughs or shallow bodies of water. These areas may receive additional water from below the surface. When the waters evaporate, the salts are left behind near or at the soil surface. Portions of the project area are prone to naturally occurring salinization. Any process that affects the soil-water balance may affect the movement and accumulation of salts in the soil, including climate, subsurface hydrogeology, irrigation practices, drainage, plant cover and rooting characteristics, and farming practices. For salinization to occur, the following conditions need to occur together: the presence of soluble salts (sodium, calcium, magnesium, etc.), a high water table, a high rate of evaporation, and low annual rainfall.

Erosion

Erosion is the detachment and movement of soil materials through natural processes or human activities. The detachment of soil particles can be initiated through the suspension of material by wind or water. Silt-sized particles are the most easily removed particles, due to low particle mass and cohesiveness. Soils residing within the assessment area are susceptible to wind erosion, especially during the spring and fall months when wind speeds increase. Sporadic, torrential rains can cause major flash flood events that can create significant erosion in the Antelope Valley region, which includes portions of the Mojave Desert.

Expansive Soils

Expansive soils possess a shrink-swell characteristic that can result in structural damage over a long period of time. Expansive soils are largely comprised of silicate clays, which expand in volume when water is absorbed and shrink when dried. Soils east of Nebeker Ranch to Rosamond Dry Lake exhibit greater shrink-swell characteristics than those farther west and east.

Settlement

Settlement of loose, unconsolidated soils generally occurs slowly, but can cause significant structural damage such as cracked foundations or misaligned or cracked walls and windows.

Land Subsidence and Fissures

Land subsidence can occur as a result of groundwater extraction. Underlying soils can compact when water is removed. The extraction of mineral or oil resources can also result in subsidence. Substantial subsidence caused by groundwater extraction has taken place in Lancaster since the 1950s. Development in the area is largely dependent upon groundwater supplies. Between 1930 and 1992, more than six feet of subsidence is estimated to have occurred in the Lancaster area. However, subsidence rates have not occurred uniformly throughout the Antelope Valley and Lancaster area, but are dependent upon underlying materials, the rate of water-level decline, and well locations. Multiple fissures have formed within Lancaster and at EAFB as a result of the lowered water table. In addition to causing structural problems, fissures can create a vertical conduit for surface contaminants to migrate to underlying groundwater, potentially degrading groundwater quality.

5.2 Regulatory Framework

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 requires the State Geologist to delineate zones along active faults in California so that structural development can be regulated to reduce the risk to humans and structures associated with seismic activity. The act prohibits the construction of structures intended for human occupancy within these zones (occupancy rate of more than 2,000 person-hours per year), as well as requires local agencies to regulate certain developments. Figure 3.5-2 identifies the Alquist-Priolo Zones in the project area.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. Figure 3.5-3 identifies the seismic hazard zones in the project area.

California Building Code (CBC)

The CBC is another name for the body of regulations known as the California Code of Regulations, Title 24, Part 2. Title 24 is assigned to the California Building Standards Commission which, by law, is responsible for administering, adopting, approving, publishing, and implementing all building standards in the state of California. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988). About one-third of the text within the California Building Code has been tailored for California earthquake conditions (Bolt, 1988).

Local

The Kern County General Plan contains a safety element which identifies geologic and seismic hazards within the county and provides policies and implementation measures to support the various goals.

The Rosamond Specific Plan contains a safety element which identifies seismic hazards and provides policies and implementation measures to support the various goals.

The County of Los Angeles General Plan, which is undergoing a comprehensive update of the 1980 countywide General Plan, contains a safety element, which identifies and assesses known geologic hazards and seismic hazards. The section identifies goals, and outlines corresponding policies and management actions to support the various goals.

Individual General Plans for the cities of Lancaster and Palmdale contain a Public Health and Safety Section and a Safety Element, respectively, which address geologic and seismic hazards. These General Plans identify safety goals and outline corresponding policies, implementation measures, and programs to support the various goals.

3.5.3 Impacts and Mitigation Measures

Significance Criteria

Criteria used to determine the significance of impacts related to hazards and hazardous materials are based on Appendix G of the *CEQA Guidelines*. The project would result in a significant impact if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of water.

Impacts Discussion

Impacts to geology and soils resulting from implementation of the proposed project at both the project level and program level are discussed below. The impacts are considered for all project components, including for short-term construction and long-term operational phases.

As described in the Initial Study, the project would not involve the use of septic tanks or alternative wastewater disposal systems. Therefore, no impact would result and that significance criterion is not discussed further.

No short-term or long-term impacts to geology and soils due to the use of recycled water for M&I applications, agricultural irrigation, or power plant cooling water are anticipated. These end uses are not discussed further in this section. However, the use of recycled water for groundwater recharge could affect geology and soils. The potential impacts associated with this end use are discussed below at a program level of detail.

Project-Level Impacts

Recycled Water Pipelines

Impact 3.5-1. In the event of a major earthquake within the region, underground pipelines could be subject to seismic hazards including surface rupture, liquefaction, landslide, and ground shaking capable of causing localized collapse or damage of engineered fills, structural damage, or pipeline rupture. Less than Significant with Mitigation.

As shown in Figure 3.5-2, two areas of the project are located in Alquist-Priolo Earthquake Fault Zones:

- The southernmost portion of the project along 40th Street East from East Avenue T6 to the southwest reservoir is within an Alquist-Priolo Earthquake Fault Zone associated with the San Andreas Fault.
- The westernmost portion of the project along Elizabeth Lake Road runs parallel to the same Zone and intersects the Zone at the project's western terminus.

Seismic hazards due to ground shaking at the project area located along the pipeline alignment tend to increase from north to south with proximity to the San Andreas Fault. In the southernmost part of the project area, peak ground accelerations in unconsolidated alluvium can reach 0.738 g, with a 10 percent probability of being exceeded in 50 years.

The project is located in potential liquefaction zones in four places:

- The portion of the project along Sierra Highway where it crosses the LWRP is within a liquefaction zone that encompasses the ponds of the LWRP.
- The portion of the project along Sierra Highway and Avenue E is within a liquefaction zone.
- The southernmost portion of the project along 40th Street East at the intersection of Barrel Springs Road is within a narrow liquefaction zone. The zone extends approximately 100 feet north and 100 feet south of Barrel Springs Road.
- The westernmost portion of the project along Elizabeth Lake Road is in a liquefaction zone. This zone is approximately 570 feet wide and is collinear with Elizabeth Lake Road.

Construction occurring in these zones could potentially be subject to liquefaction, which could cause the recycled water pipelines to bend, crack, and/or rupture, which would be a significant impact.

The project is not located in an area that is considered susceptible to an earthquake-induced landslide. The westernmost portion of the project along Elizabeth Lake Road is located downslope of three landslide zones. One zone trends parallel to and approximately 500 feet north of Elizabeth Lake Road. The other two landslide zones are smaller; they are located between 200 and 400 feet south of Elizabeth Lake Road.

A segment of pipeline traverses an Alquist-Priolo Zone south of Palmdale along the San Andreas Fault Zone (Figure 3.3-2). Rupture along the Alquist-Priolo Zone would subject the proposed pipeline to ground motion, and under extreme conditions, could cause material failure or connection failure leading to rupture and release of the recycled water, which would be a significant impact. The pipeline would be designed to accommodate site-specific ground motions. Standard geotechnical and structural design criteria used to reduce excessive earthquake response and potential damage or collapse would minimize earthquake ground shaking impacts. For elements of the project within the Alquist-Priolo Zone, facility designs would be subject to Special Publication 117, “Guidelines for Evaluating and Mitigating Seismic Hazards in California.” Conformance with this publication in addition to the CBC requirements would provide for protection from earthquake ground shaking impacts.

A geotechnical investigation would be conducted for pipeline segments within seismic hazard zones. Specific design recommendations would be identified in the geotechnical investigation report that would incorporate CBC requirements for construction in the region and may include such aspects as flexible pipe joints, shortened pipe lengths, automatic isolation valves, installation of the pipelines inside a protective casing, and shallow or above-ground installation of the pipelines. Because the project would be designed in accordance with the recommendations of a site-specific geotechnical investigation, in compliance with the CBC, the potential impact would be less than significant.

Mitigation Measures

> **Mitigation Measure 3.5-1:** Prior to the approval of construction plans for the project, a design-level geotechnical investigation, including collection of site specific subsurface data shall be completed by the implementing agency. The geotechnical evaluation shall identify density profiles, approximate maximum shallow groundwater levels, a characterization of the vertical and lateral extent of the saturated sand/silt layers that could undergo liquefaction during strong ground shaking, and development of site-specific design criteria to mitigate potential risks. Recommendations made as a result of these investigations to protect new structures from seismic hazards shall become part of the proposed project.

Significance after Mitigation: Less than significant.

Impact 3.5-2: Construction of the proposed recycled water pipelines could result in substantial soil erosion or loss of topsoil, which would result in a significant impact. Less than Significant with Mitigation.

Project construction would result in land disturbance greater than one acre. All soils removed or disturbed during excavation and grading during construction of the storage reservoirs and pump stations would be replaced prior to site restoration. The proposed pipelines would be installed under existing roadways and thus would not affect surface soils. The proposed project would not contribute to the loss of topsoil and the impact is considered less than significant. However, soils in the region are highly susceptible to water or wind erosion or both. Therefore, if any construction related grading activities are required for installation of the recycled water pipelines, short-term losses of topsoil and subsoil due to wind and water erosion could be substantial. Implementation of Mitigation Measure 3.5-2 would ensure water and wind erosion of soils would be minimized to less than significant levels.

Mitigation Measures

Mitigation Measure 3.5-2: To control water and wind erosion during construction of the project, the implementing agencies, shall ensure that contractors implement Best Management Practices (BMPs) to control wind and water erosion during and shortly after construction of the project and permanent BMPs to control erosion and sedimentation once construction is complete. The BMPs could include, but would not be limited to, sediment barriers and traps, silt basins, and silt fences.

Significance after Mitigation: Less than significant.

Impact 3.5-3: The presence of yet undetermined local expansive soils in the project area could result in structural damage to the recycled water pipelines. Less than Significant with Mitigation.

None of the soils in the project area are classified as expansive according to Table 18-1B of the Uniform Building Code. However, if local areas with expansive soils were encountered, engineered project facilities would be designed according to the Uniform Building Code to prevent structural damage from soil expansion and contraction. Mitigation Measure 3.5-3 requires geologic investigations to be conducted for the specific locations for the proposed pipeline alignments prior to construction. The geologic investigation would include an assessment of the potential for site specific expansive soils. If expansive soils are found, recommendations made as part of the geological investigation would be followed. Implementation of Mitigation Measure 3.5-3 would reduce impacts to project facilities due to expansive soils to less than significant levels.

Mitigation Measures

Mitigation Measure 3.5-3: The implementing agencies shall require the preparation of site specific geotechnical investigations along the proposed pipeline alignments. These investigations shall identify appropriate engineering considerations, as recommended by a certified engineering geologist or registered geotechnical engineer for planned facilities, including engineering considerations to mitigate the effects of expansive soils. Recommendations made as a result of these investigations to protect new structures from expansive soils shall become part of the proposed project.

Significance after Mitigation: Less than significant.

Program-Level Impacts

Storage Reservoirs and Pump Stations

Impact 3.5-4: Construction of the proposed storage reservoirs and pump stations could result in substantial soil erosion or loss of topsoil, which would result in a significant impact. Less than Significant with Mitigation.

Excavation and grading during construction would re-contour the storage reservoir and pump station sites to create foundations. The surrounding areas affected by construction would be restored or landscaped following construction of the facilities. The proposed project would not contribute to the loss of topsoil and the impact is considered less than significant. However, soils in the region are highly susceptible to water or wind erosion or both. Therefore, for any construction related grading activities, short-term losses of topsoil and subsoil due to wind and water erosion could occur. Implementation of Mitigation Measure 3.5-2 would ensure water and wind erosion of soils would be minimized to less than significant levels.

Mitigation Measures

Implementation of Mitigation Measure 3.5-2.

Significance after Mitigation: Less than significant.

Impact 3.5-5: In the event of a major earthquake within the region, storage reservoirs and pump stations could be subject to seismic hazards including surface rupture, liquefaction, landslide, and ground shaking capable of causing localized collapse or damage of engineered fills or structural damage. Less than Significant with Mitigation.

The proposed storage reservoirs and pump stations could be impacted by surface rupture, ground shaking, expansive soils, liquefaction, and settlement. Storage Reservoir 3 and Pump Station 2 would be located within the San Andreas Alquist-Priolo Zone. Surface rupture and intense ground shaking in this area could significantly affect the proposed structures, resulting in damage to the facilities or structural failure. The project would be designed in accordance with the recommendations of a site-specific geotechnical investigation, in compliance with the CBC and Special Publication 117. With implementation of Mitigation Measures 3.5-1 through 3.5-3, impacts would be reduced to less-than-significant levels. Site-specific impact analysis would be required in subsequent project-level CEQA analysis for each pump station and storage reservoir.

Mitigation Measures

Implementation of Mitigation Measures 3.5-1 through 3.5-3.

Significance after Mitigation: Less than significant.

Recycled Water End Users

Impact 3.5-6: Ground shaking, expansive soils, liquefaction, settlement, erosion and corrosive soils could damage recycled water end uses including the power plant cooling water system and the groundwater recharge basins and appurtenant facilities. Less than Significant with Mitigation.

The power plant and the groundwater recharge basins and associated facilities required for a groundwater recharge project could be impacted by geologic hazards including seismic ground shaking, expansive soils, liquefaction, settlement, and corrosive soils. With implementation of Mitigation Measures 3.5-1 through 3.5-3, impacts would be less than significant. Site-specific impact analysis would be required in subsequent project-level CEQA analysis for the power plant cooling water system and the groundwater recharge facilities.

Mitigation Measures

Implementation of Mitigation Measure 3.5-1 through 3.5-3.

Significance after Mitigation: Less than significant.
