5.9 HYDROLOGY AND WATER QUALITY

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential impacts to hydrology and water-quality conditions in the Project Area from implementation of the Proposed Project. Hydrology deals with the distribution and circulation of water, both on land and underground. Water quality deals with the quality of surface and groundwater. Surface water is aboveground and includes lakes, rivers, streams, and creeks. Groundwater is below the surface of the earth.

5.9.1 Environmental Setting

5.9.1.1 REGULATORY SETTING

Federal Regulations

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the United States Environmental Protection Agency (EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The CWA authorizes the EPA to implement water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under Section 402(p) of the CWA controls water pollution by regulating storm water discharges into the waters of the U.S. California has an approved state NPDES program. The EPA has delegated authority for water permitting to the State Water Resources Control Board (SWRCB), which has nine regional boards. The Lahontan Regional Water Quality Control Board (RWQCB - Region 6V) and the Los Angeles RWQCB (Region 4) regulate water quality in the Project Area.

Sections 401 and 404 of the CWA are administered through the Regulatory Program of the U.S. Army Corps of Engineers (USACE) and regulate the water quality of all discharges of fill or dredged material into waters of the United States including wetlands and intermittent stream channels. Section 401, Title 33, Section 1341 of the CWA sets forth water-quality certification requirements for "any applicant applying for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters." If there are ephemeral drainages and wetlands identified in the Proposed Area Plan area, construction and other activities may require the acquisition of a permit from the USACEunder Section 404 of the CWA and water quality certification from the RWQCB under Section 401 of the CWA. Section 401 certification is required from the RWQCB prior to final issuance of Section 404 permits by the USACE.

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish a Total Maximum Daily Load (TMDL) for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards.

Typically, TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The intent of the 303(d) list is to identify water bodies that require future development of a TMDL to maintain water quality. In accordance with Section 303(d), the Lahontan and Los Angeles RWQCB's have identified impaired water bodies within their respective jurisdictions, and the pollutant or stressor responsible for impairing the water quality. There are several lakes, reservoirs, rivers, and creeks within the Project Area that are on the 303(d) impaired water bodies list, as discussed in further detail in the water quality section of this chapter. Therefore, future development pursuant to the Proposed Project within the Project Area could adversely impact these impaired water bodies.

National Pollutant Discharge Elimination System

The NPDES permit program was established by the CWA to regulate municipal and industrial discharges to surface waters of the United States from their municipal separate storm sewer systems (MS4s). Under the NPDES Program, all facilities which discharge pollutants into waters of the US are required to obtain an NPDES permit. Requirements for storm water discharges are also regulated under this program. In California, the NPDES permit program is administered by the SWRCB through the nine RWQCBs.

The Project Area lies within the jurisdiction of Los Angeles RWQCB (Region 4) and the Lahontan RWQCB (Region 6V) and is subject to the waste discharge requirements of the Los Angeles County MS4 Permit (Order No. R4-2012-0175) and NPDES Permit No. CAS004001, as amended by Order No. R8-2010-0062. Los Angeles County, the Los Angeles County Flood Control District, and 84 incorporated cities within the coastal watersheds of Los Angeles County are co-permittees under the MS4 Permit, with the exception of the City of Long Beach, which is covered under a separate MS4 permit. Pursuant to the MS4 Permit, the co-permittees have the flexibility to develop Watershed Management Programs, which implement the requirements of the Permit on a watershed scale through customized strategies, control measures, and best management practices (BMPs). Watershed Management Programs (WMP) have been developed for the Upper Santa Clara River Watershed, the Upper Los Angeles River Watershed, and the Upper San Gabriel River Watershed, all of which encompass part of the Project Area. No management program has been adopted for the Antelope Valley Watershed. The MS4 Permit also requires the municipalities to develop and implement low impact development (LID) ordinances and green streets policies in at least 50 percent of the area covered by the WMP.

The MS4 Permit also requires that new development or significant redevelopment projects use BMPs, including site design planning, source control, and treatment techniques, to ensure that the water quality of receiving waters is protected. These requirements are detailed in the Los Angeles County's 2014 Low Impact Development Standards Manual. Within the Project Area, any new development Designated and Non-Designated projects must meet the requirements of the LID Standards Manual. To ensure that the LID measures are maintained, the Los Angeles County Department of Public Works (DPW) may require submittal of a Maintenance Plan and execution of a Maintenance Agreement with the owner/operator of the stormwater quality control measures.

State Regulations

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Act (Water Code Sections 13000 et seq.) is the basic water-quality control law for California. Under this Act, the SWRCB has ultimate control over state water rights and water-quality policy. In California, the EPA has delegated authority to issue NPDES permits to the SWRCB. The State is divided into nine regions related to water quality and quantity characteristics. The SWRCB, through its nine RWQCBs carries out the regulation, protection, and administration of water quality in each region. Each regional board is required to adopt a Water Quality Control Plan or Basin Plan that recognizes and reflects the regional differences in existing water quality, the beneficial uses of the region's ground and surface water, and local water-quality conditions and problems.

The Project Area lies within the Los Angeles RWQCB, Region 4 and the Lahontan RWQCB, Region 6V. A very small portion of the northwest corner of Project Area is within the Central Valley RWQCB, Region 5. The Water Quality Control Plan for Region 4 was adopted in 1994; the Water Quality Control Plan for Region 6 was adopted in 1995. These Basin Plans give direction on the beneficial uses of the state waters within the two regions, describe the water quality that must be maintained to support such uses, and provide programs, projects, and other actions necessary to achieve the standards established in the Basin Plans. Waste discharge requirements for discharges to municipal storm drain systems in the Los Angeles Water Board Region are set down in Order No. R4-2012-0175 ("MS4 Permit") issued by the Los Angeles Regional Water Quality Control Board in 2012.[1]

County of Los Angeles Regulations

County of Los Angeles Grading Ordinance

Requirements for erosion and sediment control for grading operations are set forth in the Grading Code Ordinance and Regulations of the County Code. All construction sites are required to implement BMPs to control erosion, debris, and construction-related pollutants. All active grading projects with grading activities proposed during the rainy season (October 15 to April 15) require an Erosion and Sediment Control Plan (ESCP) to be submitted to the DPW prior to the issuance of grading permits. All non-residential sites, residential sites of 6 stories or greater, and projects with a disturbed (graded) area of one acre or greater are also required to prepare and submit an ESCP.

Grading sites that disturb one acre or more may use a state stormwater pollution prevention plan (SWPPP) to meet the ESCP requirements. All projects that disturb one acre or more during grading must also file Permit Registration Documents (PRDs) with the SWRCB, as discussed in further detail in the Storm Water Pollution Prevention Plans section of this chapter. The PRDs are submitted electronically to the SWRCB via the Storm Water Multiple Application and Report Tracking System (SMARTS) website.

The ESCP must include appropriate BMPs for general site management, construction materials and waste management, and erosion and sediment controls. These BMPs must be provided for both the wet and dry

[1]Order No. R4-2012-0175 applies to the part of the Project Area within the Los Angeles RWQCB.

seasons. The ESCP must be revised every year and approved prior to the start of the rainy season (October 15) throughout the site grading operations. All BMPs must be installed prior to the beginning of the rainy season or as determined by the County's building official.

Los Angeles County Flood Control District Code

Chapter 21 of the County Flood Control District Code, Stormwater and Runoff Pollution Control, sets requirements regulating discharges to Los Angeles County Flood Control District (LACFCD) storm drains. The purpose of this chapter is to protect the storm drain facilities, the water quality of downstream receiving water bodies, and the quality of water stored in groundwater aquifers. The following discharges to County storm drains are prohibited:

- Discharges of stormwater containing pollutant concentrations that exceed or contribute to the exceedance of a water quality standard.
- Nonstormwater discharges unless authorized by an NPDES Permit and by a permit issued by the Chief Engineer.
- Discharges of sanitary or septic waste or sewage from any property or residence, any type of recreational vehicle, camper, bus, boat, holding tank, portable toilet, vacuum truck or other mobile source, or any waste holding tank, container or device.
- Pollutants, leaves, dirt, or other landscape debris (County Flood Control District Code Sections 21.07 and 21.09).

Applicable Plans and Programs

Storm Water Pollution Prevention Plans

Pursuant to the CWA, in 2012, the SWRCB issued a statewide general NPDES Permit for stormwater discharges from construction sites (Order No. 2012-0006-DWQ; NPDES No. CAS000002). Under this Statewide General Construction Activity permit, discharges of stormwater from construction sites with a disturbed area of one or more acres are required to either obtain individual NPDES permits for stormwater discharges or to be covered by the General Permit. Coverage by the General Permit is accomplished by completing and filing PRDs, which include a Notice of Intent, risk assessment, site map, Erosion and Sediment Control Plan (ESCP), annual fee, and signed certification statement. The PRDs are submitted electronically to the SWRCB via the SMARTS website. Each applicant under the General Construction Activity Permit must ensure that an ESCP is prepared prior to grading and is implemented during construction. The ESCP must list BMPs implemented on the construction site to protect stormwater runoff. The SWRCB is the permitting agency and depending on the location of the new development or redevelopment within the Project Area, the Los Angeles or Lahontan RWQCB would provide local oversight and enforcement.

Low Impact Development Standards Manual

Los Angeles County recently published the Low Impact Development Standards Manual to comply with the requirements of the NPDES MS4 Permit for stormwater and non-stormwater discharges within the coastal watersheds of Los Angeles County. All development occurring within unincorporated portions of the County must comply with the LA County Code, Title 12, Chapter 12.84, Low Impact Development Standards, and the NPDES permit. The goal of LID is to mimic the undeveloped runoff conditions of the development site with the post-development conditions. The LID Standards Manual provides guidance for the implementation of stormwater quality control measures in new development and redevelopment projects with the intent of improving water quality and mitigating potential water quality impacts from stormwater and non-stormwater discharges.

The project applicant must submit an LID Plan for review and approval by the Director of LACDPW that provides a comprehensive, technical discussion of how the proposed project will comply with the requirements of the County Code and LID Standards Manual. The LID Plan must include the following information:

- Identification of whether the proposed project is a Designated or Non-Designated Project. If the proposed project is a Designated Project, identification of the project category;
- Feasibility of infiltration including a percolation report as part of a geotechnical report prepared by a geotechnical engineer;
- Source control measure(s) to be implemented
- Calculation of the Stormwater Quality Design Volume;
- Discussion on whether stormwater runoff harvest and use is feasible;
- Stormwater quality control measure(s) to be implemented;
- Discussion of how the applicable water quality standards and total maximum daily loads will be addressed (off-site mitigation projects only);
- Proposed hydromodification controls and calculations (if necessary);
- Proposed maintenance plan (if necessary).

The LID Plan will be:

- A section of or appendix to the Hydrology Report that must be submitted to LACDPW;
- A section of or appendix to the Grading Report submitted to the Building and Safety Division; or

- A separate plan.

If a project intends to implement privately maintained stormwater quality control measure(s), the specific BMPs will be reviewed during the grading stage. If the project intends to implement publicly maintained stormwater quality control measure(s), the specific BMPs will be shown on water quality plans that are submitted separate from but concurrently with the hydrology study/drainage concept.

National Flood Insurance Program

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 mandate the Federal Emergency Management Agency (FEMA) to evaluate flood hazards. FEMA provides Flood Insurance Rate Maps (FIRMs) for local and regional planners to promote sound land use and floodplain development, identifying potential flood areas based on the current conditions. To delineate a FIRM, FEMA conducts engineering studies referred to as Flood Insurance Studies (FISs). The most recent FIRMs were completed and published for Los Angeles County on September 26, 2008. Using information gathered in these studies, FEMA engineers and cartographers delineate Special Flood Hazard Areas (SFHAs) on FIRMs.

The Flood Disaster Protection Act (FDPA) requires owners of all structures in identified SFHAs to purchase and maintain flood insurance as a condition of receiving federal or federally related financial assistance, such as mortgage loans from federally insured lending institutions. Community members within designated areas are able to participate in the National Flood Insurance Program (NFIP) afforded by FEMA. The NFIP is required to offer federally subsidized flood insurance to property owners in those communities that adopt and enforce floodplain management ordinances that meet minimum criteria established by FEMA. The National Flood Insurance Reform Act of 1994 further strengthened the NFIP by providing a grant program for state and community flood mitigation projects. The act also established the Community Rating System (CRS), a system for crediting communities that implement measures to protect the natural and beneficial functions of their floodplains, as well as managing erosion hazards.

The design standard for flood protection established by FEMA is the 100-year flood event, also described as a flood that has a 1-in-100 chance of occurring in any given year. The County has participated in the NFIP since 1980 and has created standards and policies to ensure flood protection. The program is voluntary based on a mutual agreement between the federal government and Los Angeles County. Participation in the program makes flood insurance available to County unincorporated area residents and allows them to obtain direct Federal relief loans following federally declared flood disasters. Los Angeles County has an ongoing Floodplain Management program, which includes mapping of flood hazard areas, adopting associated ordinances, and regulating and enforcing safe building practices. It is the combination of these activities that promote flood protection to the Project Area and maintains the County's eligibility to participate in the NFIP.

5.9.1.2 EXISTING CONDITIONS

Watersheds

A watershed is an area of land that contains a common set of small streams, rivers, or creeks that all drain into a larger body of water, such as a river, lake, or ocean. The Project Area includes parts of four major watersheds, described below and shown on Figure 5.9-1, *Major Watersheds*.

Antelope Valley Watershed

The Antelope Valley Watershed occupies 3,369 square miles in northern Los Angeles County, southeast Kern County, and the west end of San Bernardino County. The watershed includes the Antelope Valley; the northern slopes of the San Gabriel Mountains and part of the Northern Transverse Ranges; the southeast-facing slopes of the Tehachapi Mountains; and the El Paso Mountains. The Antelope Valley Watershed spans most of the Project Area. Numerous streams drain from the mountain ranges along the rim of the watershed into the Antelope Valley. The watershed has no outlet to the ocean. Surface water generally evaporates from the surface rather than infiltrating into groundwater or enters three dry lakes in the center of the watershed: Rogers Dry Lake, Rosamond Dry Lake, and Buckhorn Dry Lake, all within Edwards Air Force Base. The watershed typically lacks defined natural and improved channels outside of the foothills and is subject to unpredictable sheet flow patterns.

Santa Clara River Watershed

The Santa Clara River Watershed spans 1,030 square miles in northwest Los Angeles County, Ventura County, and a small portion of Kern County. The watershed includes part of the northern Transverse Ranges; the Santa Clarita Valley in Los Angeles County; the Santa Clara River Valley and Oxnard Plain in Ventura County; and the northwest part of the Santa Monica Mountains in Ventura County. The Santa Clara River, the principal stream in the watershed, extends 83 miles from northwest Los Angeles County to its mouth on the Pacific Ocean at the south end of the City of Ventura. The Santa Clara River Watershed includes parts of the western portion of the Project Area.

Los Angeles River Watershed

The Los Angeles River Watershed spans 834 square miles of western, central, and southern Los Angeles County and some small areas of eastern Ventura County. The watershed extends from the San Gabriel Mountains on the northeast; to the Santa Susana Mountains and Santa Monica Mountains on the northwest and west, respectively; and extends south to the mouth of the Los Angeles River in the City of Long Beach. The watershed includes all of the San Fernando Valley, much of central Los Angeles, and parts of south Los Angeles. The Los Angeles River, the primary stream in the watershed, extends 48 miles from the confluence of Bell Creek and the Arroyo Calabasas in the southwest San Fernando Valley to the Pacific Ocean at the City of Long Beach. The Los Angeles River Watershed includes the southwest part of the Project Area.

San Gabriel River Watershed

The San Gabriel River Watershed spans 640 square miles of east-central and southeast Los Angeles County and part of northwest Orange County. The watershed extends from the San Gabriel Mountains on the north, encompasses the east half of the San Gabriel Valley, the Puente Hills, and much of the southeast Los Angeles Basin, and extends south to the mouth of the San Gabriel River in the City of Seal Beach on the Orange County-Los Angeles County boundary. The San Gabriel River, the primary stream in the watershed, extends about 61 miles from the San Gabriel Mountains to the ocean. The San Gabriel River Watershed includes the southeast portion of the Project Area.

Regional Drainage

The Antelope Valley Watershed is a closed topographic basin with no outlet to the ocean. All water that enters the Project Area either infiltrates into the groundwater basin, evaporates, or flows toward three dry lakes on Edward Air Force Base: Rosamond, Buckhorn, and Rogers Dry Lakes. The drainage system consists of channels, creeks, and washes that carry soils from the steep mountain slopes onto the Antelope Valley floor, forming large alluvial fans of deposited sediment, mostly along the Valley's southern edge. The mountain streams, creeks, channels, and washes meander across the fans in undefined and often changing paths. As a result, much of the Antelope Valley floor is subject to flood hazard during periods of heavy rain or melting snow pack from the surrounding mountains. Many areas experience sheet flow during prolonged periods of rain storms. The following is a description of the major points of the drainage system.

Amargosa Creek

Amargosa Creek collects runoff from the Sierra Pelona Mountains and the San Andreas Rift zone at the southwest end of the Antelope Valley. The creek begins at the mouth of the San Francisquito Canyon and travels the length of Leona Valley, where it generally flows to the east-southeast. After emerging from Leona Valley, the creek changes direction and then drains to the north through Palmdale and Lancaster, terminating at Rosamond Dry Lake. The natural course of the creek has been altered with man-made channels and detention basins.

Anaverde Creek

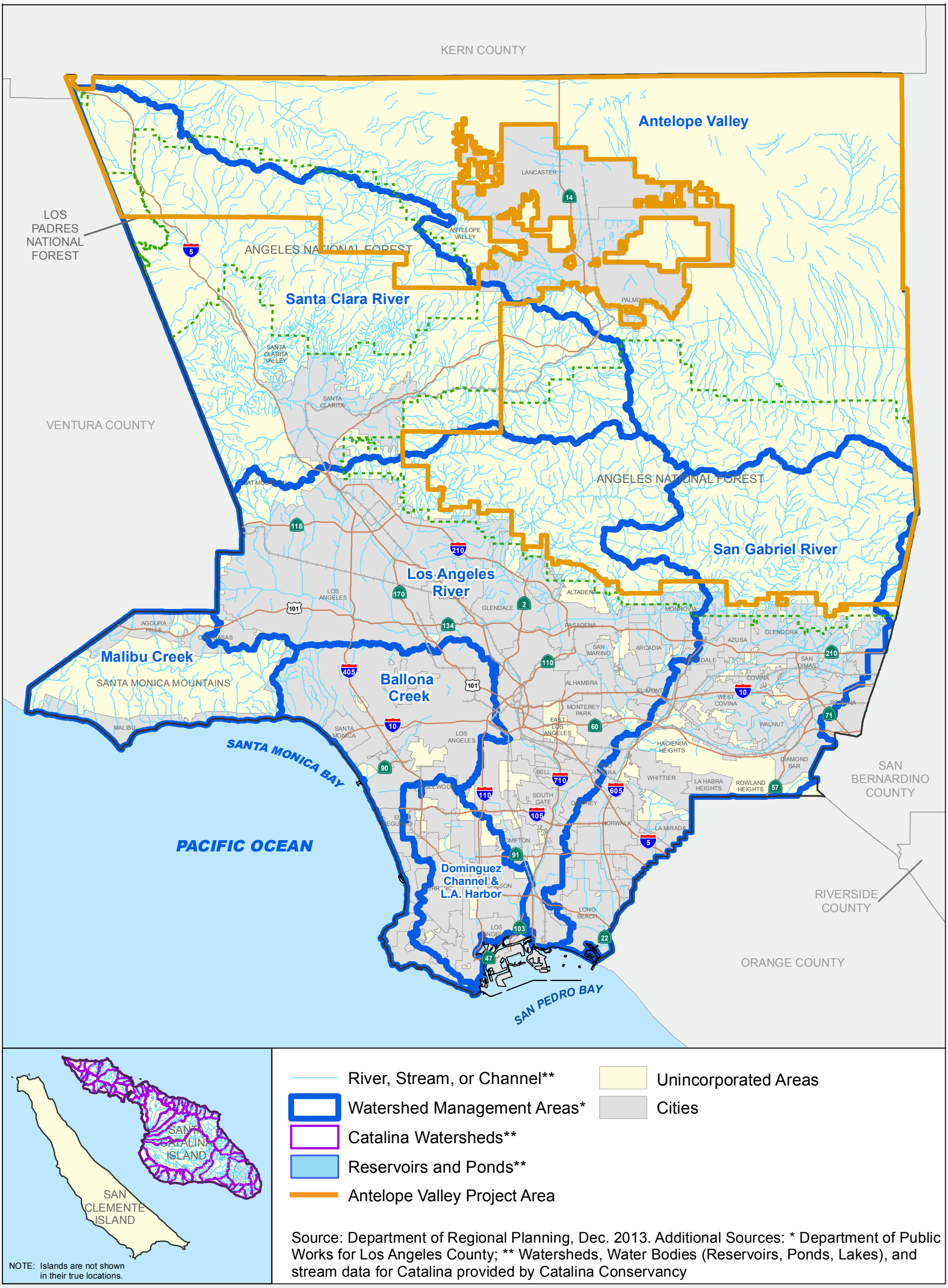
Runoff from the Sierra Pelona Mountains is collected by Anaverde Creek and flows easterly through the Anaverde Valley. It flows along the western edge of Palmdale and northerly along the Sierra Highway, where the flow is collected in the Lockheed Drainage Channel at the US Air Force Base Flight Production Center (Plant 42) and held in a retention basin. Flow that exceeds the capacity of the detention basin eventually merges with Amargosa Creek.

Big Rock Wash

Big Rock Wash collected runoff from the San Gabriel Mountains in the southern end of the Antelope Valley and flows northerly from Holcomb Ridge and also the east side of the community of Pearblossom. It then continues north until it reaches Rogers Dry Lake.

MAJOR WATERSHEDS

FIGURE 5.9-1



PLACEWORKS

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Little Rock Wash

Little Rock Wash is an ephemeral wash that receives runoff from the San Gabriel Mountains. It flows north along the west side of the community of Littlerock, east of Palmdale and the Palmdale Regional Airport to its termination at Rosamond Dry Lake. The wash is characterized as a well-defined channel in the southern end of the Antelope Valley and becomes less defined as it reaches Rosamond Dry Lake. During high flows, Little Rock Wash produces sheet flow into Rosamond Dry Lake.

Rosamond Dry Lake, Rogers Dry Lake, and Buckhorn Dry Lake

Rosamond Dry Lake covers about 21 square miles and is one of three terminal water bodies in the Antelope Valley. Rogers Dry Lake, located farther to the east, is approximately 35 square miles. Buckhorn Dry Lake is located between these two lakes and encompasses about 3 square miles. The lakebeds are usually dry and are flat playas, covered with water only during heavy winter storms. Storm water runoff collected in these lakes typically evaporates from the surface rather than infiltrating into groundwater.

California Aqueduct

The California Aqueduct is a system of canals, tunnels, and pipelines that conveys water from the Sierra Nevada Mountains and Central California Valley to southern California. It is operated and maintained by the California Department of Water Resources (DWR) and is part of the State Water Project (SWP). The West Branch of the California Aqueduct carries water over the Tehachapi Mountains to Quail Lake. The water flows to the south via gravity to Pyramid Lake in the southwest corner of the Project Area. Water is then released through the Angeles Tunnel to Castaic Lake, where it is distributed to municipalities in Los Angeles and Ventura County. The East Branch of the California Aqueduct also passes through the Project Area in a southeasterly direction, taking water from the Techachapi Forebay to Silverwood Lake in the San Bernardino National Forest, providing water for cities and farms in the Inland Empire, Orange County, and other areas south of Los Angeles.

Los Angeles Aqueduct

The Los Angeles Aqueduct also passes through the Project Area. This system of open canals, concrete tunnels, and siphons uses gravity alone to move water from the Owens Valley to Los Angeles. It is operated by the Los Angeles Department of Water & Power. It enters the Project Area from the north, crosses the California Aqueduct, and continues to flow in a southeasterly direction to Fairmont Reservoir and then south to Lake Elizabeth. It then trends south and follows San Francisquito Canyon Road before exiting the Project Area.

Drainage Facilities

The Antelope Valley is unique in comparison to the other watersheds in the Project Area in that it lacks an ocean outlet or well-defined natural channels. Most of the area does not have a subsurface storm drain system with drainage pipes and catch basins. The LACFCD boundary only extends as far north as Avenue S. Regional flood control facilities are limited and generally located in urban areas, such as the cities of Palmdale and Lancaster. The valley floor is essentially an alluvial fan, making much of it subject to inundation and

shallow flooding with unpredictable flow paths. Urban drainage facilities generally consist of local detention basins, street drainage inlets, underground storm drain pipes, and culverts. There are no regional flood management facilities in the Project Area.

Los Angeles County formed the LACFCD to provide flood control services throughout the County and to enable the County to collect a fee for these services. The funding of the drainage facilities is by the payment of fees for new development in the Project Area, as per LA County Municipal Code 21.32.400, Fees for Drainage Facilities, Antelope Valley Drainage Area. As discussed previously, the LACFCD boundary extends only to Avenue S and does not include the remainder of the Project Area, which is not subject to any flood control district.

The LACDPW published the Antelope Valley Comprehensive Plan for Flood Control and Water Conservation in 1987 to address area-wide flood hazards with a regional program. The strategy consists of 1) constructing detention and retention basins at the mouths of large canyons to reduce peak storm water discharge, 2) identifying the major flow paths in rural areas and retaining these areas as natural unobstructed courses for flood flows, and 3) constructing open channels and a storm drain infrastructure in the urban areas. The planned structural improvements in the urbanizing areas include eight retention/detention basins, 119 miles of open channel, and 72 miles of storm drains, although there currently are not sufficient funds to implement a comprehensive flood control program.

Surface Water Quality

As previously discussed, the Project Area is within the jurisdiction of both the Los Angeles RWQCB and the Lahontan RWQCB. The Los Angeles RWQCB adopted the Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (LA Basin Plan) in 1995 and amended it in 2014. The Lahontan RWQCB adopted the Water Quality Control Plan for the Lahontan Region (Lahontan Basin Plan) in 1995 with amendments in 2011, 2013, and 2014. Both Basin Plans list potential and beneficial uses for surface waters in the Project Area, as summarized in Table 5.9-1.

Table 5.9-1 Designated Beneficial Uses of Water Bodies

Water Body	Designated Beneficial Use
LA RWQCB Basin Plan	
Piru Creek	MUN(P), IND, PROC, AGR, GWR, FRSH, WARM, COLD, WILD, RARE (condor refuge), MIGR, SPWN, WET, REC-1, REC-2
Pyramid Lake	MUN, IND, PROC, AGR, GWR, FRESH (P), POW, WARM, COLD, WILD, RARE, REC-1, REC-2
Gorman Creek	MUN (I), AGR (I), GWR(I), WARM (I), COLD (I), WILD, RARE (P), REC-1 (I), REC-2 (I)
Canada de los Alamos	MUN (I), AGR (I), GWR (I), FRSH (I), WARM (I), COLD (I), WILD, RARE, REC-1 (I), REC-2 (I)
Castaic Creek (above Fish Canyon)	MUN (I), IND (I), PROC (I), AGR (I), GWR (I), FRSH (I), WARM (I), WILD, RARE, REC-1 (I), REC-2
Elizabeth Lake Canyon	MUN (I), IND (I), PROC (I), AGR (I), GWR (I), FRSH (I), WARM (I), WILD, REC-1 (I), REC-2
San Francisquito Canyon	MUN (I), IND (I), PROC (I), AGR (I), GWR (I), FRSH (I), WARM (I), WILD, RARE, SPWN (I), WET, , REC-1 (I), REC-2 (I)
Bouquet Reservoir	MUN, IND, PROC, AGR, GWR, FRSH, POW (P), WARM, WILD, REC-2

Table 5.9-1 Designated Beneficial Uses of Water Bodies

Water Body	Designated Beneficial Use
Lake Hughes	MUN (P), IND (P), PROC (P), AGR (P), GWR (P), FRSH (P), WARM, WILD, REC-1, REC-2
Munz Lake	MUN (P), IND (P), PROC (P), AGR (P), GWR (P), FRSH (P), WARM, WILD, REC-1, REC-2
Lake Elizabeth	MUN (P), IND (P), PROC (P), AGR (P), GWR (P), FRSH (P), WARM, WILD, RARE, REC-1, REC-2
Lahontan RWQCB Basin Plan – Antelope Hydrologic Unit	
Rogers Lake Wetlands	MUN, REC-1, REC-2, WARM, SAL, WILD, WQE, FLD
Little Rock Creek	MUN, GWR, REC-1, REC-2, COMM, COLD, WILD
Big Rock Creek	MUN, AGR, IND, GWR, REC-1, REC-2, COMM, COLD, WILD, SPWN
Mescal Creek	MUN, AGR, GWR, REC-1, REC-2, COMM, COLD, WILD, SPWN
Fairmont Reservoir	MUN, AGR, IND, GWR, REC-1, REC-2, COMM, WARM, WILD
Harold Reservoir	MUN, AGR, IND, GWR, REC-1, REC-2, COMM, WARM, WILD
Little Rock Reservoir	MUN, AGR, IND, GWR, REC-1, REC-2, COMM, COLD, WILD
Lake Palmdale	MUN, AGR, GWR, REC-1, REC-2, COMM, COLD, WILD
Minor Surface Waters	MUN, AGR, GWR, REC-1, REC-2, COMM, WARM, COLD, WILD
Minor Wetlands	MUN, AGR, GWR, FRSH, REC-1, REC-2, WARM, WILD, WQE, FLD
Lahontan RWQCB Basin Plan – Neenach Hydrologic Area	
Minor Surface Waters	MUN, AGR, GWR, REC-1, REC-2, COMM, WARM, COLD, WILD
Minor Wetlands	MUN, AGR, GWR, FRSH, REC-1, REC-2, WARM, WILD, WQE, FLD
Lahontan RWQCB Basin Plan - Lancaster Hydrologic Area	
Amargosa Creek above LACSD Discharge	MUN, AGR, GWR, FRSH, REC-1, REC-2, COMM, WARM, COLD, WILD
Amargosa Creek below LACSD Discharge	AGR, GWR, FRSH, REC-2, WARM, WILD
Piute Ponds	AGR, GWR, FRSH, REC-2, WARM, WILD, BIOL, RARE
Piute Ponds Wetlands	AGR, GWR, FRSH, REC-2, WARM, WILD, BIOL, RARE, WQE, FLD
Rosamond Dry Lake	GWR, REC-2, WARM, SAL, WILD
Minor Surface Waters	MUN, AGR, GWR, REC-1, REC-2, COMM, WARM, COLD, WILD
Minor Wetlands	MUN, AGR, GWR, FRSH, REC-1, REC-2, WARM, WILD, WQE, FLD
Lahontan RWQCB Basin Plan – Buttes Hydrologic Area	
Minor Surface Waters	MUN, AGR, GWR, REC-1, REC-2, COMM, WARM, COLD, WILD
Minor Wetlands	MUN, AGR, GWR, FRSH, REC-1, REC-2, WARM, WILD, WQE, FLD
Lahontan RWQCB Basin Plan – Rock Creek Hydrologic Area	
Minor Surface Waters	MUN, AGR, GWR, REC-1, REC-2, COMM, WARM, COLD, WILD
Minor Wetlands	MUN, AGR, GWR, FRSH, REC-1, REC-2, WARM, WILD, WQE, FLD

Source: LARWQCB, 1995. Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties. Lahontan RWQCB, 1995. Water Quality Control Plan for the Lahontan Region.
(P) = Potential beneficial use; (I) = Intermittent beneficial use; if not otherwise specified, the beneficial use is E = existing.

The abbreviations for the potential and existing beneficial uses are as follows:

- AGR – Agricultural Supply
- BIOL – Preservation of biological habitats of special significance
- COLD – Cold freshwater habitat
- COMM – Commercial and sport fishing

- EST – Estuarine habitat
- FLD – Flood peak attenuation/flood water storage
- FRSH – Freshwater replenishment
- GWR – Groundwater recharge
- IND – Industrial service supply
- MIGR –Migration of aquatic organisms and fish
- MUN – Municipal and domestic supply
- POW – Hydropower generation
- PROC – Industrial process supply
- RARE – Preservation of rare and endangered species
- REC-1 – Water contact recreation
- REC-2 – Non-contact water recreation
- SAL – Inland saline water habitat
- SPWN –Spawning, reproduction, and development
- WARM – Warm freshwater habitat
- WILD – Wildlife habitat
- WQE – Water quality enhancement

In accordance with Section 303(d) of the Clean Water Act, the State must present the EPA with a list of impaired water bodies that do not meet water quality standards. The impaired water bodies within the Project Area are listed in Table 5.9-2. Once a water body has been placed on the 303(d) list of impaired waters, states are required to develop a Total Maximum Daily Load to address each pollutant causing impairment. A TMDL defines how much of a pollutant a water body can tolerate and still meet water quality standards.

Table 5.9-2 Section 303(d) List of Impaired Water Bodies in Project Area

Water Body	Pollutant	Potential Source	Status of TMDL Plan/Expected Adoption
Piru Creek (from gaging station below Santa Felicia Dam to headwaters)	Chloride	Source unknown	Planned (2019)
	pH	Conservation discharge releases, nonpoint source	Planned (2019)
Pyramid Lake	Mercury	Natural sources, source unknown, unknown nonpoint sources	Planned (2021)
Little Rock Reservoir	Manganese	Source unknown	Planned (2021)
San Gabriel River, East Fork	Trash	Nonpoint source	Approved by USEPA - 2000
Lake Hughes	Algae	Nonpoint source	Planned (2019)
	Eutrophic	Nonpoint source	Planned (2019)
	Fish kills	Nonpoint source	Planned (2019)
	Odor	Nonpoint source	Planned (2019)
	Trash	Agricultural storm runoff, recreation and tourism activities (non-boating), urban runoff/storm sewers	Approved by USEPA - 2008
Munz Lake	Eutrophic	Nonpoint source	Planned (2019)
	Trash	Agricultural storm runoff, recreation and tourism activities (non-boating), urban runoff/storm sewers	Approved by USEPA - 2008
Elizabeth Lake	Eutrophic	Nonpoint source	Planned (2019)
	Organic enrichment/low dissolved oxygen	Nonpoint source	Planned (2019)
	pH	Nonpoint source	Planned (2019)
	Trash	Agricultural storm runoff, recreation and tourism activities (non-boating), urban runoff/storm sewers	Approved by USEPA - 2008
Crystal Lake	Organic enrichment/low dissolved oxygen	Nonpoint source	Planned (2019)
San Antonio Creek	pH	Source unknown	Planned (2021)

Source: State Water Resources Control Board. 2010 Integrated Report, Clean Water Act, Section 303(d) List, Accessed on July 16, 2014, http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

Groundwater

The Project Area lies within the Antelope Valley Groundwater Basin, which spans 1,580 square miles in northern Los Angeles County, southeast Kern County, and westernmost San Bernardino County. There is a very small portion of the El Mirage Valley Groundwater Basin and Middle Mojave River Valley Groundwater Basin that lies within the northeast corner of the Project Area, but this discussion is focused on the Antelope Valley Groundwater Basin. Figure 5.9-2 shows the extent of the Antelope Valley Groundwater Basin.

The Antelope Valley Groundwater Basin is bordered on the southwest by the San Gabriel Mountains, on the northwest by the Tehachapi Mountains, and on the east by a series of hills and buttes that generally follow

the Los Angeles County/San Bernardino County line. The Basin is further divided into twelve subbasins, based on faults, consolidated rocks, groundwater divides, and in some cases, arbitrary boundaries.

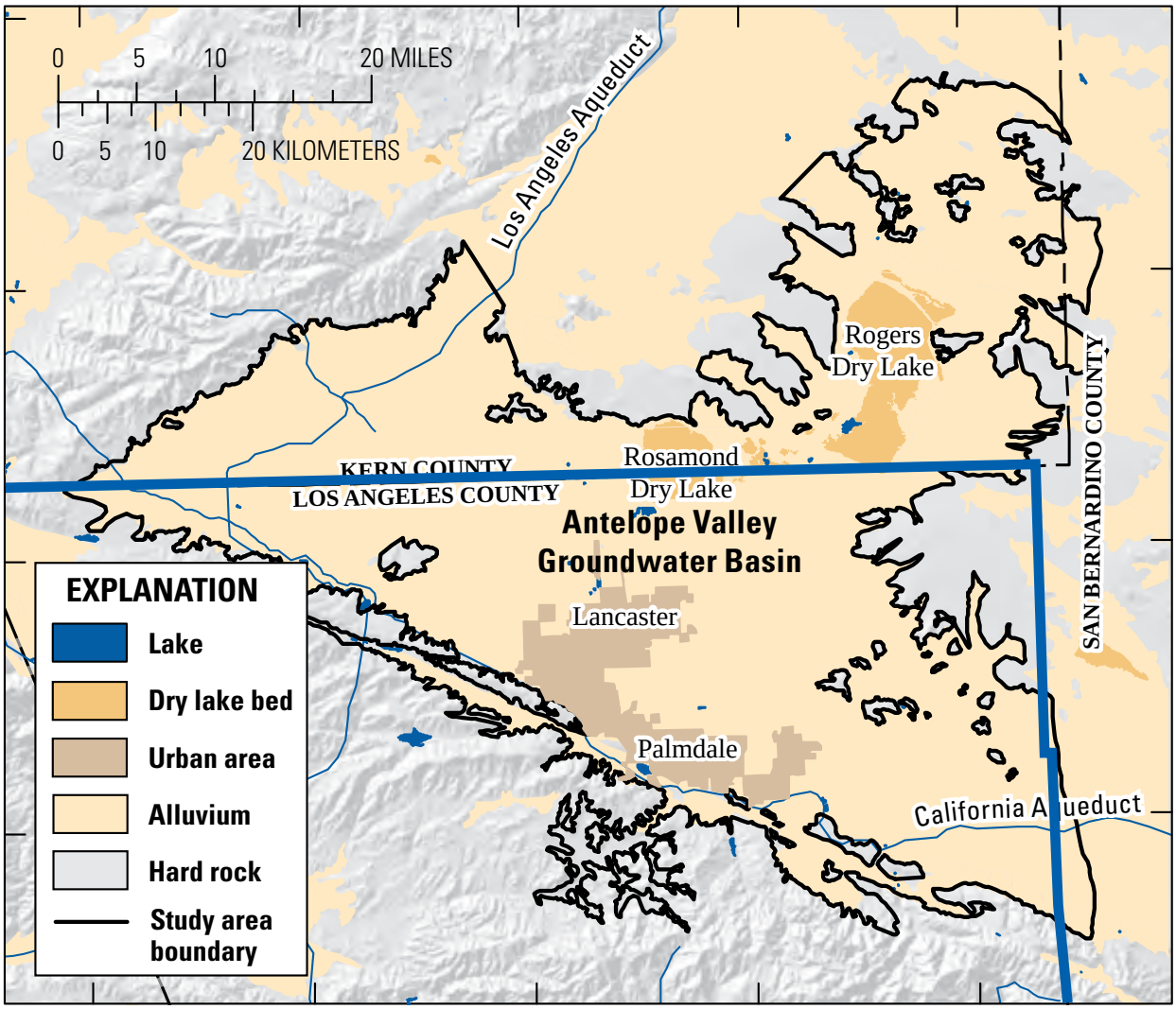
The Basin is composed of two primary aquifers: 1) the upper (principal) unconfined aquifer, which is the principal source of groundwater, and 2) the lower (deep) confined aquifer. Lake deposits of low permeability clay form an aquitard between the two aquifers. The principal aquifer is thickest in the southern portion of the Antelope Valley near the San Gabriel Mountains, whereas the deep aquifer is thickest in the vicinity of the three dry lakes in the northern portion of the Project Area. Groundwater flow is generally to the northeast from the foothills of the San Gabriel and Sierra Pelona Mountains toward Rosamond Dry Lake. This general flow direction is disturbed in areas of intense groundwater extraction, particularly within the cities of Lancaster and Palmdale.

Depth to groundwater varies, depending on the proximity to Rosamond Dry Lake. Close to the lake, groundwater typically occurs at depths of 50 to 100 feet below ground surface (bgs). Near the municipal extraction wells serving the cities of Lancaster and Palmdale, groundwater depths are over 300 feet bgs. Perched groundwater may occur in some areas at depths of less than 50 feet bgs after periods of heavy rain or depths of less than 25 feet bgs in areas that are heavily irrigated. Perched groundwater typically is found within the Lancaster area due to the presence of an ancient, alluvium-filled lakebed that lies beneath the ground surface. Natural recharge occurs through the infiltration of surface water from creeks and washes along the southern portion of the basin. However, evapotranspiration due to arid conditions and hot temperatures limits the amount of groundwater recharge.

Groundwater Quality

Groundwater quality in the Antelope Valley is typically excellent within the principal aquifer, but degrades toward the northern portion of the dry lakes areas. Groundwater is generally considered to be suitable for domestic, agricultural, and industrial uses; however, the water in the principal aquifer has total dissolved solids (TDS) concentrations ranging from 200 to 800 milligrams per liter (mg/l). (Schmitt, 2009) The secondary maximum contaminant level (MCL) for TDS, which is voluntary and a guideline for aesthetic purposes, is 500 mg/l. High TDS levels do not cause health concerns but generally indicate hard water, which makes it difficult for soap to lather, leaves spots on dishes, and can create a salty taste in the mouth.

Trace elements, including arsenic, vanadium, and boron, can be found in the primary aquifer in the Antelope Valley. Arsenic is closely monitored by the water purveyors and can be a naturally occurring inorganic contaminant in groundwater or have an anthropogenic source, including agricultural, industrial, and mining activities. Arsenic levels above the MCL of 10 parts per billion have been reported in the Antelope Valley Region. Water from wells with arsenic above the MCL is blended with water from other wells to yield water with arsenic concentrations below the MCL.



Antelope Valley Project Area

0 15
Scale (Miles)

Source: USGS, 2013

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An emerging contaminant of concern is hexavalent chromium or chromium-6. Chromium-6 can occur naturally in the environment from the erosion of natural chromium deposits, but can also be produced by industrial processes where it is used for chrome plating, dyes and pigments, and leather and wood preservation. This element is a known carcinogen and California has recently implemented a new lower MCL of 10 micrograms per liter. Twelve wells belonging to various water purveyors within the southern portion of the Antelope Valley have tested in excess of this MCL within the last 10 years; these wells are subject to continued monitoring (AVEKWA 2012).

Flood Hazards

Designated Flood Zones

FEMA determines floodplain zones in an effort to assist cities in mitigating flooding hazards through land-use planning, and outlines specific regulations for any construction within a 100-year floodplain. A 100-year floodplain is an area that has a 1 percent chance of being inundated during a 12-month period. This has been established as the base flood for purposes of floodplain management measures. FEMA also prepares maps for 500-year floods, which means that in any given year, the risk of flooding in the designated area is 0.2 percent.

The areas within the Project Area that are within the 100-year floodplain or 500-year floodplain are shown on Figure 5.9-3, *Flood Hazard Zones*. Most of the 100-year flood zones are located along the northern border of the Project Area or east of the cities of Palmdale and Lancaster, mainly along Big Rock Wash, Rock Creek, and Little Rock Wash. Smaller areas along several tributaries of the Santa Clara River, along several streams extending out of the San Gabriel Mountains into the Antelope Valley, and along several small desert washes east of the City of Lancaster and tributary to Big Rock Wash are also designated 100-year flood zones.

Seismically Induced Dam Inundation

Several reservoirs in the area present the remote risk of downstream inundation in the event of a dam failure as the result of an earthquake or other catastrophic event. The California Governor's Office of Emergency Services has directed dam operators to delineate areas likely to be inundated in the event of a catastrophic dam failure. According to dam inundation maps provided by OES, the Project Area is in the dam inundation zones of four reservoirs:

- Bouquet Reservoir
- Fairmont Reservoir
- Palmdale Lake, formerly known as Harold Reservoir
- Little Rock Reservoir

Although Pyramid Lake is within the Project Area, the dam inundation zone falls outside of the project boundaries.

Bouquet Reservoir is in the corner of the Project Area and only a very small portion of the dam inundation zone falls within the project boundaries. The inundation zone is in a mountainous region with no planned development and there should be no impact with implementation of the Proposed Project.

The inundation zone for Fairmont Reservoir is located east from the dam and runs through undeveloped land until it reaches 130 Street West. The path continues east and widens, encompassing portions of the city of Lancaster before turning north and terminating at Rosamond Dry Lake.

The inundation path for Palmdale Lake has two branches which are located northeast and east from the dam. The inundation zone is entirely within the city limits of Palmdale and occupies approximately 3 square miles.

The inundation path for Little Rock Reservoir begins north of the dam and follows the path of Little Rock Wash before fanning out and occupying approximately 4.5 square miles in the eastern part of Palmdale.

Most of the inundation zones of the reservoirs within the Project Area, excluding the cities of Palmdale and Lancaster, are in rugged terrain or stream beds/washes, which are not planned for future development. All dams must meet safety requirements and are inspected annually by the Division of Safety of Dams of the California DWR.

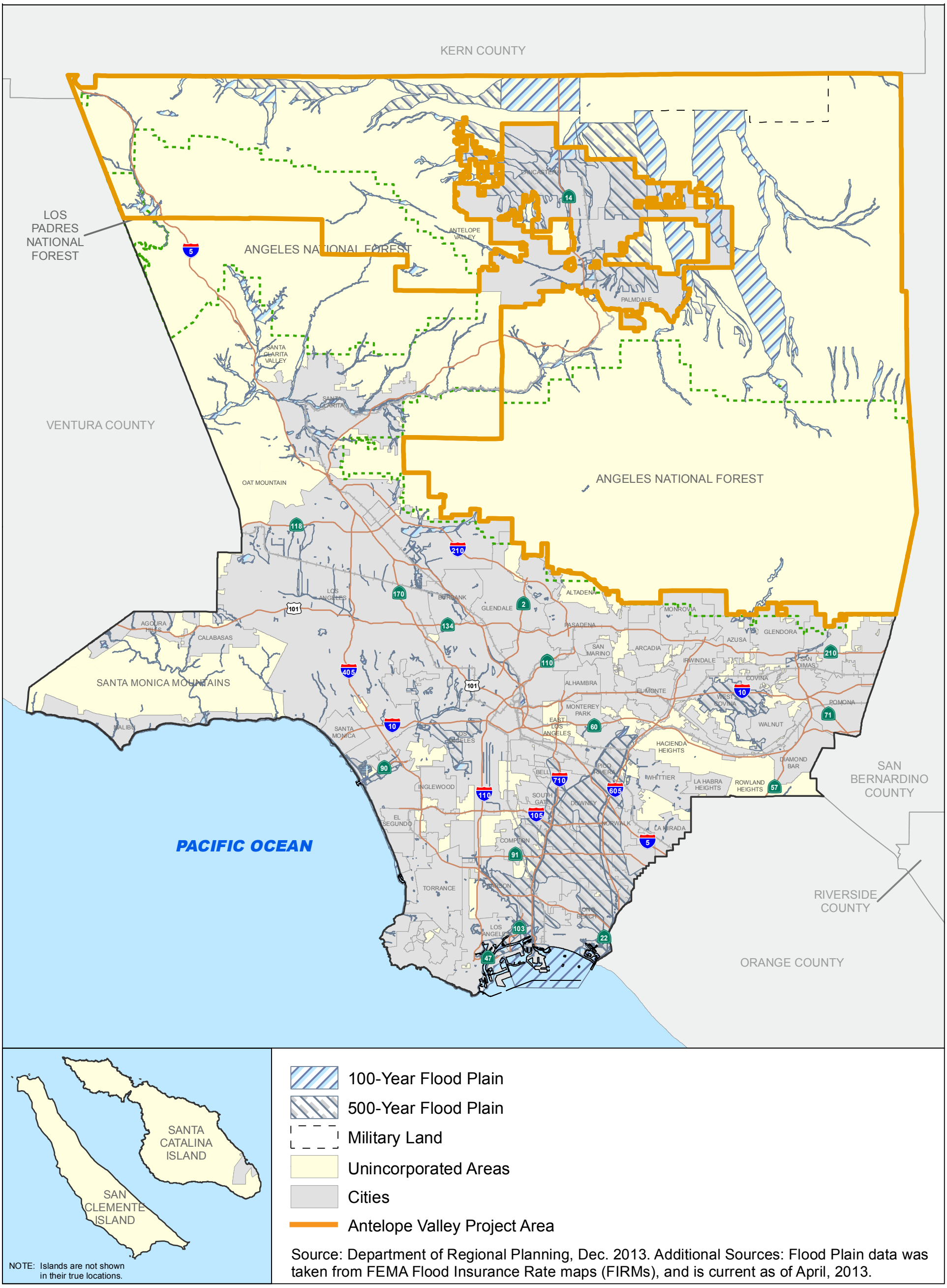
Tsunamis, Seiches, and Mudflows

A tsunami is a sea wave caused by a sudden displacement of the ocean floor, most often due to earthquakes. The Project Area is more than 20 miles from the Pacific Ocean and is well outside of a tsunami inundation zone. Therefore, there should be minimal to no impact with implementation of the Proposed Project.
Seiches are waves that oscillate in enclosed water bodies, such as reservoirs, lakes, ponds, or semi-enclosed bodies of water. Seiches may be triggered by moderate or large submarine earthquakes or sometimes by large onshore earthquakes. There are several reservoirs within the Project Area that could potentially cause flooding due to a seiche. However, these reservoirs already have been mapped to determine flooding associated with potential dam failures, and any impact due to an earthquake-induced seiche would occupy an area much less than the mapped inundation zones.

Mud and debris flows are mass movements of dirt and debris that occur after intense rainfall, earthquakes, and severe wildfires. The speed of a slide depends on the amount of precipitation, steepness of the slope, and alternate freezing and thawing of the ground. The most common cause of mud or debris flows is a combination of heavy rainfall, steep slopes, and loose soil. Areas of the Project Area that are susceptible to mudflows include the areas along the base of the Sierra Pelona and San Gabriel Mountains, and the areas immediately downstream of creeks and washes. LACFCD has constructed numerous debris basins and debris inlets upstream of many foothill communities, which provide attenuation of flood flows and flood protection. Cleanout of these facilities is necessary to maintain their flood protection function. The United States Geological Survey has prepared Seismic Hazard Zone Maps that encompass the Project Area and show areas with the potential for earthquake-induced landslides.

FLOOD HAZARD ZONES

FIGURE 5.9-3



PLACEWORKS

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5.9.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

HYD-1 Violate any water-quality standards or waste-discharge requirements.

HYD-2 Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted.

HYD-3 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in a substantial erosion or siltation on- or off-site.

HYD-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

HYD-5 Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

HYD-6 Otherwise substantially degrade water quality.

HYD-7 Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

HYD-8 Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

HYD-9 Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.

HYD-10 Be subject to inundation by seiche, tsunami, or mudflow.

5.9.3 Relevant Area Plan Goals and Policies

Following is a list of the goals and policies from the Proposed Project that are intended to reduce potentially significant adverse effects related to hydrology and water quality.

Goal PS 3: Protection of the public through flood hazard planning and mitigation.

- **Policy PS 3.1:** Limit the amount of potential development in Flood Zones designated by the Federal Emergency Management Agency through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.

- **Policy PS 3.2:** Require onsite stormwater filtration in all new developments through use of appropriate measures, such as permeable surface coverage, permeable paving of parking and pedestrian areas, catch basins, and other low impact development strategies.

- **Policy PS 3.3:** Review the potential local and regional drainage impacts of all development proposals to minimize the need for new drainage structures.

- **Policy PS 3.4:** Ensure that new drainage structures are compatible with the surrounding environment by requiring materials and colors that are consistent with the natural landscape. Discourage concrete drainage structures.

5.9.4 Environmental Impacts

The following impact analysis addresses Appendix G thresholds of significance. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.9-1	Implementation of the Proposed Project would comply with water quality standards and waste discharge requirements and would not substantially degrade water quality. [Threshold H-1]

Impact Analysis: Proposed Project buildout would involve soil disturbance, construction, and operation of developed land uses that could each generate pollutants affecting stormwater. Proposed Project buildout would result approximately 81,441 additional housing units compared to existing conditions. These new units would generate about 311,290 additional residents. Buildout of the Proposed Project would also result in a 39 percent increase in non-residential (commercial and industrial) space with an additional 37.1 million square feet. New land uses would result in an increase of 102,513 more jobs than under existing conditions.

Discharges from Construction Sites to Stormwater

Buildout of the Project Area could result in changes to the amount of storm water runoff and water quality during construction activities. Storm water runoff could contain pollutants such as soil and sediments that are released during grading and excavation activities and petroleum-related pollutants due to spills or leaks from heavy equipment and machinery. Other common pollutants that can result from construction activities include solid or liquid chemical spills; concrete and related cutting or curing residues; wastes from paints, stains, sealants, solvents, detergents, flues, acids, lime, plaster, and cleaning agents; and heavy metals from equipment. The storm water runoff flows through streets, drainage ditches, washes, and creeks within the Project Area and eventually discharges into Rosamond, Buckhorn, or Rogers Dry Lakes. Although there is no direct discharge to impaired water bodies within the Project Area, some of these water bodies could be impacted from the indirect discharge of pollutants in storm water.

However, all projects within the Project Area that involve construction activities disturbing one or more acres of land would be required to obtain an NPDES permit from the SWRCB. Coverage under the permit requires the submittal of PRDs, risk assessment, site map, SWPPP, annual fee, and signed certification statement. The PRDs are submitted electronically to the SWRCB via the SMARTS website. The SWPPP includes BMPs to reduce water quality impacts, including various measures to control on-site erosion; reduce sediment flows into storm water; to control wind erosion; reduce tracking of soil and debris into adjacent roadways and off-site areas; and manage wastes, materials, wastewater, liquids, hazardous materials, stockpiles, equipment, and other site conditions to prevent pollutants from entering the storm drain system. Inspections, reporting, and storm water sampling and analysis are also required to ensure that visible and non-visible pollutants are not discharged off-site. Categories of BMPs used in SWPPPs are described below in Table 5.9-3.

Table 5.9-3 Construction BMPs

Category	Purpose	Examples
Erosion Controls and Wind Erosion Controls	Cover and/or bind soil surface, to prevent soil particles from being detached and transported by water or wind.	Mulch, geotextiles, mats, hydroseeding, earth dikes, swales.
Sediment Controls	Filter out soil particles that have been detached and transported in water.	Barriers such as straw bales, sandbags, fiber rolls, and gravel bag berms; desilting basin; cleaning measures such as street sweeping.
Tracking Controls	Minimize the tracking of soil offsite by vehicles.	Stabilized construction roadways and construction entrances/exits; entrance/outlet tire wash.
Nonstorm Water Management Controls	Prohibit discharge of materials other than stormwater, such as discharges from the cleaning, maintenance, and fueling of vehicles and equipment. Conduct various construction operations, including paving, grinding, and concrete curing and finishing, in ways that minimize nonstorm water discharges and contamination of any such discharges.	BMPs specifying methods for: paving and grinding operations; cleaning, fueling, and maintenance of vehicles and equipment; concrete curing; concrete finishing.
Waste Management and Controls (i.e., good-housekeeping practices)	Management of materials and wastes to avoid contamination of stormwater.	Spill prevention and control, stockpile management, and management of solid wastes and hazardous wastes.

In addition, the County of Los Angeles has requirements for erosion and sediment control for grading operations, as set forth in the Grading Code Ordinance and Regulations of the County Code. All construction sites are required to implement BMPs to control erosion, debris, and construction-related pollutants. All active grading projects with grading activities proposed during the rainy season (October 15 to April 15) are required to submit an Erosion and Sediment Control Plan to the LACDPW prior to the issuance of grading permits. All non-residential sites, residential sites of 6 stories or greater, and projects with a disturbed (graded) area of one acre or greater are also required to prepare and submit an ESCP. The ESCP must include appropriate BMPs for general site management, construction materials and waste management, and erosion and sediment controls. These BMPs must be provided for both the wet and dry seasons, and the ESCP must be revised every year and approved prior to the start of the rainy season.

Implementation of the provisions of the NPDES permit and compliance with County grading requirements would minimize construction impacts from future development within the Project Area by implementing BMPs that reduce construction-related pollutants. This would ensure that any impacts to downstream receiving water bodies resulting from construction activities associated with the Proposed Project would be less than significant. Full compliance with applicable local, State, and federal regulations would reduce water quality impacts associated with construction to a less than significant level.

Discharges from Developed Land Uses (Post-construction) to Stormwater

Potential pollutants that could be generated by maximum build out of the Project Area include bacteria/viruses, heavy metals, nutrients, pesticides, organic compounds, sediment, trash and debris, oxygen-demanding substances, and oil and grease. Specific pollutants would depend on the type of land use and site improvements proposed by individual projects.

All applicants for future development within the Project Area would be required to comply with the LA County Code, Title 12, Chapter 12.84, Low Impact Development Standards, and the NPDES MS4 permit. The LID Standards Manual provides guidance for implementing stormwater quality control measures in new development and redevelopment projects with the intent of improving water quality and mitigating potential water quality impacts from stormwater and non-stormwater discharges. Each applicant for new development or significant redevelopment within the Project Area must submit an LID Plan for review and approval by LACDPW that provides a comprehensive, technical discussion of how the proposed project will comply with the requirements of the County Code and LID Standards Manual.

The LID Plan would identify permanent site design, source-control, and treatment-control BMPs that would be implemented as part of the project, including pollutant removal and protection of downstream water resources. Preparation and implementation of LID Plans for new development and redevelopment projects would satisfy MS4 permit requirements and would ensure that the project complies with water quality standards for storm water runoff.

Implementation of these programs and regulatory requirements would reduce storm water pollutants that could affect water quality within the Project Area, thus reducing impacts related to storm water pollution and water quality to less than significant levels.

Impact 5.9-2 Future development pursuant to the Proposed Project could interfere with groundwater recharge

Impact Analysis: Future development within the Project Area would result in an increase in impervious surfaces by adding 81,441 housing units and 37.1 million square feet of commercial/industrial space. Increases in impervious surfaces would reduce infiltration, which could lead to reduced groundwater recharge. However, applicants for new development or significant redevelopment would be required to submit LID Plans to the LACDPW prior to the issuance of grading and building permits, with the goal of matching undeveloped runoff conditions of the site with post-development conditions. The treatment control BMPs would also include, to the extent feasible, infiltration features that will contribute to

groundwater recharge and minimize storm water runoff. Please refer to Section 5.17.2, *Water Supply and Distribution Systems,* for additional information on future water supply and demand.

While impervious areas would be added in the Project Area with implementation of the Proposed Project, the increase in impervious areas would still be a small fraction of the Project Area. About 97.6 percent of the Project Area is designated for either Open Space or Rural uses; the maximum permitted density in the Rural designation is one residential unit per acre. Therefore, buildout of the Project Area would not substantially interfere with groundwater recharge due to an increase in impervious areas.

Groundwater typically occurs at depths of at least 50 to 100 feet bgs. Therefore, it is not expected that construction activities would encounter groundwater and require dewatering.

Groundwater continues to be an important resource for water supply in the Project Area. Prior to 1972, groundwater provided more than 90 percent of the total water supply. Since 1972, it provides 50 percent to 90 percent of the total water supplied to the Project Area. In terms of groundwater recharge, only about 5 percent of the precipitation that falls in the Antelope Valley each year percolates to the groundwater basin, while the remaining water is lost to precipitation. There is an overdraft of groundwater in this region in the past, resulting in subsidence and earth fissures in the Lancaster and Edwards Air Force Base areas.

The 2013 Antelope Valley Integrated Regional Water Management Plan (AVIRWMP) forecasts that groundwater resources combined with existing and new imported SWP water, surface water, and recycled water supplies will be sufficient to meet the population needs of the Antelope Valley, including the Project Area, through the year 2035, assuming a population increase to 547,000 by 2035. Most of the implementation projects to address water supply issues in the AVIRWMP come directly from local planning documents. Altogether, the projects included in the AVIRWMP directly implement elements of a number of local plans and studies, including Urban Water Management Plans (UWMPs), Water Recycling Master Plans, Water Conservation Master Plans, and Master Facilities Plans.

Impact 5.9-3: Buildout of the Proposed Project would not substantially alter drainage patterns and would not result in substantial erosion or siltation. [Threshold HYD-3].

Impact Analysis: Buildout of the proposed Project Area has the potential to result in an increase in impervious surfaces by adding 81,441 housing units and 37.1 million square feet of commercial/industrial space,, thus creating an increase in stormwater runoff, higher peak discharges to drainage channels, and the potential to cause erosion or sedimentation in drainage swales and streams. Increased runoff volumes and velocities could create nuisance flooding in areas without adequate drainage facilities.

Under the Los Angeles County MS4 Permit, certain categories of development and redevelopment projects are required to mimic predevelopment hydrology through infiltration, evapotranspiration, and rainfall harvest and use. Projects in the Project Area for which LID Plans are required must limit post-development peak stormwater runoff rates to predevelopment rates for developments where the increased peak stormwater runoff rates will result in an increased potential for downstream erosion. While impervious areas would be added with implementation of the Proposed Area Plan, the increase in impervious area would still be a small

fraction of the total land area. Approximately 97.6 percent of the Project Area is designated for either Open Space or Rural uses, with a maximum density of one residential unit per acre.

Construction projects with disturbed areas of one acre or more must implement BMPs for erosion and sediment control pursuant to the General Construction Permit, as discussed under Impact 5.9-1. Also, the majority of grading projects in the unincorporated area of Los Angeles County would require submittal of an Erosion and Sediment Control Plan to the LACDPW prior to the issuance of grading permits. This will further reduce the potential for erosion or siltation to occur with construction at the new development sites.

Projects developed under the Proposed Project would comply with existing regulations for avoiding or minimizing erosion and sedimentation, and impacts would be less than significant.

Impact 5.9-4: Development pursuant to the Proposed Project would not substantially change drainage patterns in Los Angeles County. While such development could increase rates or volumes of surface runoff, the changes would not result in substantial increases that would result in on-site or off-site flooding. [Threshold HYD-4]

Impact Analysis: Implementation of the Proposed Project would not significantly change existing drainage patterns within the Project Area. Under the MS4 Permit, certain categories of development and redevelopment projects are required to mimic predevelopment hydrology through infiltration, evapotranspiration, and rainfall harvest and use. Projects subject to LID requirements are required to limit post-development peak stormwater runoff rates to no greater than the pre-development rates for developments where the increased peak stormwater rate will result in increased potential for downstream erosion.

Flooding in the Antelope Valley is caused largely by runoff from the San Gabriel and Sierra Pelona Mountains to the south, with heavy discharges prevalent along Big Rock Creek, Little Rock Creek, and Anaverde Creek. Proposed zoning in the areas susceptible to flooding will be primarily open land, agricultural land, or rural residential, which should not result in a substantial increase in surface runoff or contribute to additional flooding due to the limited increase in impervious surfaces. In summary, development as part of the Proposed Project would not substantially increase runoff rates or volumes or contribute to increases in flooding. Therefore, impacts would be less than significant.

Impact 5.9-5: Implementation of the Proposed Project could place structures within 100-year flood hazard areas. [Thresholds HYD-7 and HYD-8]

Impact Analysis: Proposed Area Plan land-use designations within 100-year flood zones are shown below in Table 5.9-4, *Land-Use Designations in 100-Year Flood Zones, Antelope Valley Area Plan*. Approximately 73,927 acres out of 1,130,544 acres, or about 6.5 percent of land within the Project Area are located within a 100–year flood zone. About 5,879 acres, or 8 percent of areas in the 100-year flood zones, are designated as open space. The remainder of the 100-year flood zones is designated for development, mostly residential development at maximum densities of 0.5 units per acre or higher.

Table 5.9-4 Land-Use Designations in 100-Year Flood Zones, Antelope Valley Area Plan

Land-Use Designation	Acres
CR – Rural Commercial	153
MU-R – Rural Commercial/Mixed Use	234
H2 – Residential 2	410
H5 – Residential 5	1,119
H9 – Residential 9	99
H18 – Residential 18	2
H30 – Residential 30	0
IH – Heavy Industrial	599
IL – Light Industrial	304
OS-BLM – Bureau of Land Management	426
OS-C – Conservation	834
ML – Military Land	30
OS-NF – Open Space National Forest	1,577
OS-PR – Parks and Recreation	276
W – Water	2,766
P – Public and Semi-Public	6,235
RL1 – Rural Land 1	787
RL2 – Rural Land 2	1,616
RL5 – Rural Land 5	1,380
RL10 – Rural Land 10	13,618
RL20 – Rural Land 20	41,462
Total	73,927

Source: DRP 2014.

Although portions of the Project Area within the current 100-year floodplain are proposed for development, the County has an ongoing Floodplain Management program, which includes mapping of flood hazard areas, adopting new and/or updated ordinances, and regulating and enforcing safe building practices. Future development within 100-year flood zones would require submittal of a Letter of Map Revision (LOMR) application to FEMA for review and approval. LOMR application submittals also must be coordinated with the LACDPW. All new development would be required to meet federal floodplain regulations, including that the lowest floor of the structure be raised above the 100-year base flood elevation. Flood insurance available through the NFIP would also be required.

Impact 5.9-6: Parts of the Project Area are within dam inundation areas. [Threshold HYD-9]

Impact Analysis: According to OES dam inundation maps, portions of the Project Area are within the dam inundation zones of Bouquet Reservoir, Fairmont Reservoir, Palmdale Lake, and Little Rock Reservoir. However, most of the dam inundation zones are not in areas planned for development, and most of the dams impound relatively small amounts of water, as shown below:

- Palmdale Lake – 3,870 acre-feet

- Little Rock Reservoir –4,600 acre-feet
- Fairmont Reservoir – 7,507 acre-feet
- Bouquet Reservoir – 36,505 acre-feet

There is only a small area of the dam inundation area for Bouquet Reservoir that is within the Project Area and this portion of the Project Area is zoned as watershed, with no plans for development. The dam inundation zone for Fairmont Reservoir passes through land zoned for open space and agricultural use before reaching the City of Lancaster. The Palmdale Lake dam inundation zone passes through open space designated as the San Andreas Rift Zone Significant Ecological Area (SEA) and then is contained within the city limits of Palmdale before terminating at Palmdale Boulevard. For the dam inundation area between the City of Lancaster and Rosamond Lake, the proposed zoning is agricultural and manufacturing. Therefore, implementation of the Proposed Project would allow for some structures within existing dam inundation areas.

The Little Rock Reservoir dam inundation zone first passes through an area zoned as watershed and the Antelope Valley SEA before turning east and then north passing through land zoned agricultural. It passes through the west side of the Little Rock community, a portion of which has a proposed zoning designation of A-2and and could include new housing as part of the Proposed Project, before entering the city limits of Palmdale where it terminates.

The probability of dam failure is extremely low and the Project Area has never been impacted by a major dam failure. Dams in California are continually monitored and inspected by various governmental agencies, including the California Division of Safety of Dams. Dam owners are required to maintain Emergency Action Plans (EAPs) that include procedures for damage assessment and emergency warnings and the County addresses the possibility of dam failure in the Safety Element of the General Plan and Hazard Mitigation Plan.

Due to the small amount of water behind the dams in the Project Area and the limited amount of new housing that will occur in dam inundation areas, implementation of the Proposed Project would not expose people or structures to a significant risk of loss, injury, or death in the case of dam failure, and impacts are considered to be less than significant.

Impact 5.9-7: Parts of the Project Area are subject to inundation by seiche or mudflow. [Threshold HYD-10]

Impact Analysis:

Seiche

Hazards from dam inundation resulting from seiches are addressed above in Impact 5.9-6. Released water from a seiche would result in much smaller footprints than the dam inundation zones and the probability of this occurring is extremely low.

There are few above ground storage tanks in the Project Area, since most of the residents rely on groundwater wells and imported surface water. In addition, the County of Los Angeles requires risk assessments of flooding from failure of aboveground water storage tanks for projects down gradient from these storage tanks. Where such assessments determined that a proposed building would be affected by such flooding, either the building pad for the proposed development would be required to be raised above the flood elevation determined by the risk assessment; or improvements shall be made to the water tank to reduce the probability and/or consequence of tank failure, in the case where the owner and/or manager of an aboveground storage tank is willing to allow such improvements. Therefore, impacts from seiches related to dams or aboveground storage tanks would be less than significant.

Mudflow

Canyons in the northern slopes of the Sierra Pelona Mountains and San Gabriel Mountains and alluvial fans at the foot of the San Gabriel Mountains are susceptible to mudflows, as shown on the US Geological Survey Special Hazard Maps. However, according to the proposed zoning maps for the Antelope Valley Area Plan, the areas that are susceptible to mudflows are on steep slopes and are zoned as watershed. These areas are not planned for future development, and therefore implementation of the Proposed Project would not place substantial numbers of people at risk from mudflows.

5.9.5 Cumulative Impacts

The cumulative study area with regard to hydrology and water quality includes the watersheds that encompass the Project Area (i.e., Antelope Valley Watershed, Santa Clara River Watershed, San Gabriel River Watershed, and Los Angeles River Watershed). Future development within the Project Area, in conjunction with existing and planned development in these watersheds, could result in a cumulatively considerable impact to water quality due to construction activities and increases in post-development runoff.

All construction projects that involve the disturbance of one or more acres of land are subject to the NPDES Construction Permit requirements for implementation of individual SWPPPs, which outline erosion control, sediment control, wind erosion control, tracking control, non-storm water management and waste management, and materials pollution control BMPs. Additionally, new development and significant redevelopment projects within Los Angeles County are required to prepare and implement LID Plans for implementation of source-control, site design, and treatment-control BMPs to ensure compliance with water quality goals and compliance with the MS4 Permit. Thus, pollutants generated within the Project Area and cumulative projects in the watersheds would be mitigated during construction activities and project operation. Compliance with the RWQCB's requirements for waste discharge requirements and/or water quality certifications for certain types of project would also prevent long-term water quality impacts.

Compliance with local, State, and federal regulations to minimize storm water runoff from individual projects in conjunction with the LACFCD's drainage fee program for new development projects within its jurisdiction would reduce impacts from flooding, and significant cumulative impacts would not occur. In addition, housing placed within 100-year floodplains would be subject to federal regulation and approval by the LACDPW, with the lowest floor of the structure elevated above the base flood elevation.

As cumulative projects would be required to comply with the above-listed water-quality, drainage, and flood-safety requirements, significant cumulative impacts would not occur. Therefore, the Proposed Project would not contribute to significant cumulative hydrology and water-quality impacts.

5.9.6 Existing Regulations and Standard Conditions

5.9.6.1 FEDERAL

- United States Code, Title 33, Sections 1251 et seq.: Clean Water Act
- United States Code Title 42, Sections 300f et seq.: Safe Drinking Water Act
- Code of Federal Regulations Title 40 Parts 122 et seq.: National Pollutant Discharge Elimination System (NPDES)

5.9.6.2 STATE

- California Water Code Sections 13000 et seq.: Porter-Cologne Water Quality Act

5.9.6.3 REGIONAL

- Order No. R4-2012-0175 ("MS4 Permit"), Los Angeles Regional Water Quality Control Board

5.9.6.4 COUNTY OF LOS ANGELES

- Low Impact Development (LID) Standards Manual, County Department of Public Works.
- County Code Sections:
  - Grading Code Ordinance and Regulations: Slope Planting and Erosion Control
  - Grading Code Ordinance and Regulations: National Pollutant Discharge Elimination System Compliance
- Los Angeles County Flood Control District Code: Chapter 21
- Los Angeles County Code, Titles 11 and 28: Onsite Wastewater Treatment Systems (OWTS)

5.9.7 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: 5.9-1, 5.9-2, 5.9-3, 5.9-4, 5.9-5, 5.9-6, and 5.9-7.

5.9.8 Mitigation Measures

No mitigation measures are required.

5.9.9 Level of Significance After Mitigation

Compliance with existing regulatory programs would reduce potential impacts to hydrology and water quality to a level that is less than significant.

5.9.10 References

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