# 3.12 HYDROLOGY AND WATER QUALITY

## EXECUTIVE SUMMARY

This section describes the drainage features, stormwater quality, flooding hazards, and flood-protection improvements within the County's Planning Area. Regulatory agencies governing stormwater quality and flooding hazards are also discussed. The Land Use Policy Map is inconsistent with **Policy S 2.1.1** in that it would designate some areas within the County's Planning Area that are within the 100-year flood plain as land uses other than Open Space. This would result in the possible inundation of residential, commercial, and industrial areas that would be located within the 100-year floodplain, which in turn can cause damage or possibly cause injury to residents and employees. With mitigation, this impact would be considered less than significant under California Environmental Quality Act (CEQA) Appendix G Thresholds. However, inconsistency with **Policy S 2.1.1** would be considered significant under CEQA Appendix G Thresholds.

## EXISTING CONDITIONS

### Surface Water Drainage Patterns within County's Planning Area

Surface water drainage patterns are dependent on topography, the amount and location of impervious surfaces, and the type of flood control that is located in an area. The size, or magnitude, of a flood is described by a term called a "recurrence interval." By studying a long period of flow record for a stream, hydrologists estimate the size of a flood that would have a likelihood of occurring during various intervals. For example, a five-year flood event would occur, on the average, once every five years (and would have a 20 percent chance of occurring in any one year). Although a 100-year flood event is expected to happen only once in a century, there is a 1 percent chance that a flood of that size could happen during any year. The magnitude of flood events could be altered if changes are made to a drainage basin, such as by diversion of flow or increased flows generated by additional impervious surface area. Additionally, flood control would help manage the surface runoff that occurs in a particular area.

The Federal Emergency Management Agency (FEMA) has mapped most of the flood risk areas within the United States as part of the National Flood Insurance Program (NFIP). The NFIP is a federal program that allows property owners in areas of participating communities to purchase insurance against possible loss due to flooding. The NFIP provides an insurance alternative to disaster assistance to offset the rising costs of repair due to losses in floods.

Most communities with a 1 percent chance of a flood occurring in any given year have a floodway depicted on a Flood Insurance Rate Map (FIRM). **Figure 3.12-1, 100-Year Flood Zone of the OVOV Planning Area**, shows the Special Flood Hazard Areas (SFHA), which are designated A zones or the 100-year flood zones. Figure 3.12-1 depicts the 100-year flood event boundaries for the major watercourses in the County's Planning Area, which are generally located within and directly adjacent to the Santa Clara River, its tributaries, and along portions of Castaic Lake.

The County's Planning Area contains many natural streams and creeks (including San Francisquito Creek, Bouquet Canyon Creek, and Castaic Creek) that function as storm drain channels, conveying surface runoff into the Santa Clara River. From its headwaters in the San Gabriel Mountains to its mouth at the Pacific Ocean, the Santa Clara River drains a watershed of 1,643 square miles, approximately 80 miles in length and about 25 miles in width. Ninety percent of the river's watershed consists of mountainous terrain; the remaining portion is a mix of valley floor, floodplain, and coastal plain. Within the headwater areas of the County's Planning Area, discharge during rainfall events tends to be rapid due to the steep terrain. High intensity rainfalls, in combination with alluvial soils, sparse vegetation, erosion, and steep gradients, can result in significant debris-laden flash floods.

The Santa Clara River and its tributary streams play a major part in moving the large volume of runoff generated from the Santa Clarita Valley and surrounding foothills and mountains within the County's Planning Area. The drainage system, including natural streams as well as constructed storm drain infrastructure within the County's Planning Area, is adequate to handle normal precipitation in the region (15 to 19 inches per year). With the rapid urbanization of the Valley since 1960, stormwater volumes have increased due to increased impervious surface area from parking lots, rooftops, and streets. Flood control facilities have been constructed to mitigate the impacts of development on drainage patterns throughout the County's Planning Area.

## Rainfall

Normal precipitation in the County's Area Plan ranges between 15 to 19 inches per year.[1]

1 Los Angeles County Department of Regional Planning, Preliminary Draft Santa Clarita Valley Area Plan One Valley One Vision, Chapter 5 Safety Element, (2008), pg. 221.

**Legend:**

FEMA DFIRM

- Special Flood Hazard Areas (SFHA) High-risk Zones
- Special Flood Hazard Areas (SFHA) Low to Medium-risk Zones
- Watershed Boundary (Calwater v. 2.2) **(Name)**
- OVOV Planning Area
- City of Santa Clarita Boundary
- SOI
- Incorporated Areas
- Angeles National Forest
- County Boundary
- Waterbody and Perennial Stream
- Aqueduct

GIS Projection - CA State Plane, Zone 5, NAD83, Feet.

Source: City of Santa Clarita - Planning, City Boundary, 2008, California Interagency Watershed Mapping Committee Watersheds, 1999; Thomas Bros., Hydrology, Waterbodies, and Streets, 2008; LA County - Planning, OVOV Boundary National Forests; FEMA: DFIRM Layer, October 2008.

3 1.5 0 3

APPROXIMATE SCALE IN MILES

**SOURCE:** City of Santa Clarita, County of Los Angeles, Valleywide General Plan - March 2009

FIGURE **3.12-1**

100-Year Flood Zone of the OVOV Planning Area

## Drainage Facilities

The Los Angeles County Flood Control Act was adopted by the state legislature in 1915. The Act established the Los Angeles County Flood Control District (LACFCD) and empowered it to provide flood protection, water conservation, recreation, and aesthetic enhancement within its boundaries. The Flood Control District is governed, as a separate entity, by the County of Los Angeles Board of Supervisors. In 1985, the responsibilities and authority vested in the Flood Control District were transferred to the County of Los Angeles Department of Public Works. Watershed Management Division is the planning and policy arm of the Flood Control District, while Public Works Flood Maintenance and Water Resources Division, respectively, oversees its maintenance and operational efforts.[2] Parcels in the incorporated and unincorporated County of Los Angeles pay a fee on their annual tax bill for these services.[3] Currently, the fee provides additional funding to meet the mandates of the Federal Clean Water Act as implemented through the National Pollutant Discharge Elimination System (NPDES) permits (prior to recordation of tract maps on a project-by-project basis) that are issued by the Regional Water Quality Control Board (RWQCB). The NPDES permit is the responsibility of the cities within the County and LACFCD.

LACFCD and the County of Los Angeles are under the same administration but are separate legal entities. The funding for LACFCD is mainly for flood control purposes not for water quality compliance. With the addition of the NPDES permitting, the LACFCD augmented their efforts to address water quality in addition to just flood control. In the County's Planning Area, the LACFCD is responsible for annual maintenance of flood control facilities, mainly in the concrete lined portion of the Santa Clara River and its tributaries. This maintenance includes manual and chemical clearing of vegetation and debris before the rainy season each year, patching and repair of concrete structures, and riprap and other bank stabilization structures, as needed. Maintenance activities also include clearing out of catch basin areas that are upstream of developed lands to catch brush, rocks, and other large debris that would clog the drainage system downstream. The LACFCD is also responsible for maintenance of all in-street storm drain catch basins, pipes, and outfalls.

Under the NPDES permit program, the LACFCD is also responsible to provide annual street catch basin cleaning for the unincorporated County areas and to provide regular street sweeping services. The NPDES permit program also requires the County to serve as the lead agency for all of the cities in Los

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2 Los Angeles County Department of Public Works, Los Angeles County Flood Control District, http://www.ladpw.org/wmd/dspFloodControlDist.cfm.

3 Telephone communication with Lucia Adams, Los Angeles County Watershed Management Division, with Impact Sciences, Inc., May 26, 2009.

Angeles County for production of regional public education materials and advertising to increase awareness of the need to keep stormwater clean. The majority of storm drain catch basins, pipes, and outfalls within the City of Santa Clarita's Planning Area have been transferred to the County for maintenance (May 14, 2002). The transfer of responsibility for these facilities to the County is a standard part of the development review and approval process.

Buried bank stabilization is a relatively new bank stabilization method that leaves the natural river bank in place for use by vegetation and wildlife and preserves the aesthetic appeal of the river. With this method, two levees are built one behind the other, 125 feet behind the natural surface of the bank. The levees are made of gunite, reinforced concrete lining, or soil cement and buried with a slope of 1.5:1 or greater. The County agreed to the use of this innovative measure with the understanding that the City of Santa Clarita would assume responsibility to maintain the banks into the future. No funding mechanism is in place for the City to pay for maintenance activities associated with buried bank stabilization. However, the County began to accept transfers of funds for buried bank stabilization in November 2005. Maintenance activities associated with buried bank stabilization are funded by developer agreements.

## FLOODING

Flooding hazards are directly related to precipitation (rainfall) intensity and duration. Additionally, the regional topography, type and extent of vegetation coverage, amount of impermeable surfaces, local slope characteristics, and available drainage facilities all factor into the region's ability to divert precipitation runoff. Other key elements in a region's ability to safely manage runoff volume are the developments and urbanized areas within the region. Urbanization increases the volume and velocity of runoff water via two main processes:

- areas that would normally absorb rainfall (e.g., soils) have been replaced by impermeable surfaces (e.g., streets, houses); and
- the channelization and accumulation of runoff water adds to the collective whole, resulting in increased volumes and velocity.

Throughout the County's Planning Area, streams have been channelized to allow for development in the floodplain of the Santa Clara River and its tributaries. Soft bottom channels with concrete sides have been the predominant floodway improvement method used. However, the majority of the Santa Clara River has remained unchannelized, and a small portion has been stabilized using buried bank stabilization structures.

## Localized Flood Areas

Two areas within the County's Planning Area are known to have periodic flooding problems. These areas are portions of Sand Canyon and Placerita Canyon. During storm events, transmission of storm flows within the street right-of-way may cause localized flooding making some roads impassable (e.g., Sand Canyon Road and Placerita Canyon Road). However, most streets in the County's Planning Area are designed to accommodate storm flow.

Along with heavy, prolonged rainfall, flooding within the County's Planning Area could also occur due to the leakage or collapse of nearby dams, the rupture of the Los Angeles Aqueduct, or on a smaller scale, within areas that have been cleared of vegetation by fires or mudslides. However, within the County's Planning Area, the primary flood hazard areas occur in and along natural drainage channels within the 100-year floodplain as shown above in **Figure 3.12-1**.

## Dam Failure

Dam failure can result from natural or man-made causes, including earthquakes, erosion, improper siting or design, rapidly rising flood waters or structural flaws. Dam failure may cause loss of life, damage to property, and displacement of persons residing in the inundation path. Damage to electric generating facilities and transmission lines could also impact life support systems in communities outside of the immediate inundation areas.

The County's Planning Area has been inundated by flood waters from a failure of a dam in the past. The St. Francis Dam was built by the Bureau of Water Works and Supply of the City of Los Angeles between 1925 and 1926, as a concrete gravity dam in the San Francisquito Canyon, about 5 miles northeast of the City of Santa Clarita. In 1928 the dam failed, and resulted in billions of gallons of water being sent down the San Francisquito Canyon and eventually dumping into the Santa Clara River within the current boundaries of the City. The flood waters drained 54 miles down the Santa Clara River and dumped into the Pacific Ocean. The dam collapse killed approximately 450 people, damaged a total of 1,200 homes, and damaged 10 bridges on its 54 mile traverse to the Pacific Ocean. The St. Francis Dam disaster is the second largest disaster in California history in which people were killed, compared to the San Francisco Earthquake and Fire in 1906.

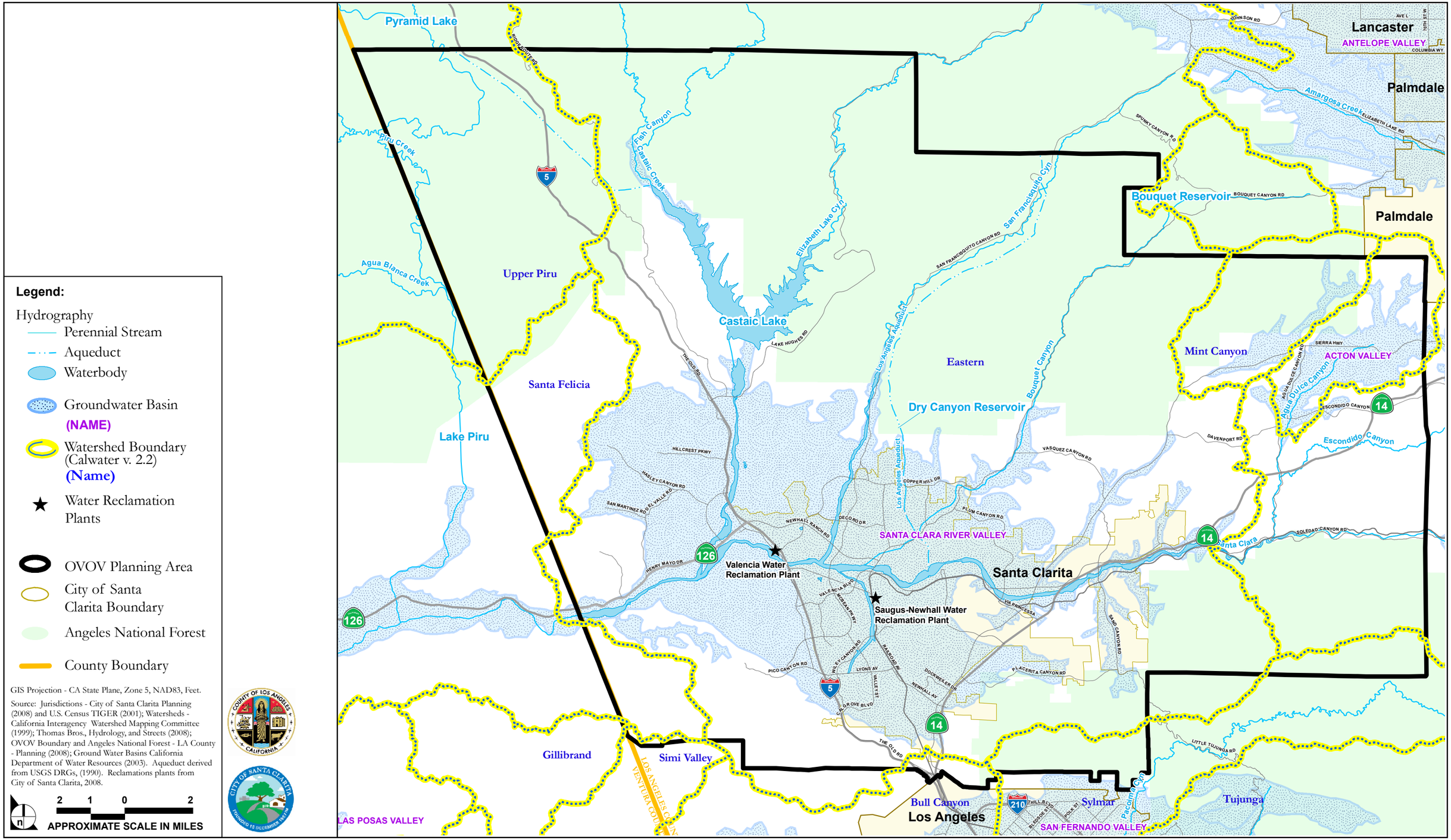
Within the County's Planning Area, the one major reservoir which could have a significant impact on the County's Planning Area in the event of a dam failure is located in Bouquet Canyon. The Bouquet Canyon Reservoir is located in the central portion of the County's Planning Area. The reservoir has two earth-filled dams, one on the west side overlooking Cherry Canyon, and one on the south side above Bouquet

Canyon. The Bouquet Reservoir has a maximum capacity of 36,505 acre-feet of water and 7.6 miles of shoreline. Because of its two dams, two potential inundation areas have been identified in the event of a dam failure. On the Cherry Canyon side, the water would flow west for approximately 2 miles through the Canyon into San Francisquito Canyon, and then south for approximately 11 miles into the Santa Clara River. The Bouquet Creek dam would drain south through Bouquet Canyon for 17 miles, into the Santa Clara River. Failure of the Bouquet Canyon dams during a catastrophic event, such as a severe earthquake, is considered unlikely, due to their type of construction. However, local County safety plans have considered the possibility of dam failure and have outlined a procedure for response and recovery from this type of hazard, including identification of inundation areas and evacuation routes.

The Castaic Dam is located on Lake Hughes Road, 1 mile northeast of Interstate 5, just north of the community of Castaic. This dam is an earth filled dam located at the confluence of Castaic and Elizabeth Lake Creeks. The dam facing is approximately 1 mile across with a maximum capacity of 350,000 acre-feet of water, covering a surface area of 2,600 acres with 34 miles of shoreline. Should a breach in the dam occur, the water will flow south in Castaic Creek for approximately 5 miles to the Santa Clara River. The Castaic Reservoir is within the boundaries of the County's Planning Area; a dam failure would result in a flow of flood water that would flow through portions of the County's Planning Area boundaries.

## Groundwater Basins

Groundwater is concentrated into natural hydro-geological units called basins. An aquifer is a subsurface area where water collects, concentrates, and can be extracted within a basin. Multiple aquifers may be located within each basin. The two major groundwater basins underlying the County's Planning Area are the Santa Clara River Valley Groundwater Basin, East Subbasin, and the Acton Valley Groundwater Basin. The East Subbasin encompasses the upper Santa Clara River Valley and is comprised of two aquifer systems, the Alluvium (also referred to as the Alluvial Aquifer), and the Saugus Formation. The Alluvial Aquifer generally underlies the Santa Clara River and its tributaries, and the Saugus Formation underlies nearly the entire Upper Santa Clara River area. Groundwater from the East Subbasin generally flows from east to west, following the movement of the Santa Clara River. The East Subbasin is the sole source of local groundwater for urban water supply in the City of Santa Clarita. The groundwater basins within the proposed project area are shown in **Figure 3.12-2, Groundwater Basins Within and Adjacent to the OVOV Planning Area**.




**SOURCE:** City of Santa Clarita, County of Los Angeles, Valleywide General Plan - August 2009

FIGURE **3.12-2**

## Groundwater Basins Within and Adjacent to the OVOV Planning Area

Because up to 80 percent of the average annual precipitation occurs between November and March, most groundwater infiltration is in the form of winter-storm flow. However, the East Subbasin is also replenished by deep percolation of agricultural land, urban irrigation, percolation from septic tanks and leach field systems, and treated effluent from water reclamation plants.

The Acton Valley Groundwater Basin encompasses about 17 square miles and is bounded by the Sierra Pelona on the north and the San Gabriel Mountains on the south, east, and west. Groundwater in the basin is unconfined and found in alluvium and stream terrace deposits. The regional direction of groundwater flow is in a southwesterly direction toward Soledad Canyon. Replenishment of this basin is through percolation of direct rainfall and infiltration of surface water runoff, agriculture and irrigation, and septic tanks. There is no pumping for urban water supply and distribution from this basin, although individual users in the far eastern portion of the OVOV planning area may have private wells in the Acton Valley Groundwater Basin.

Natural or soft bottom drainage channels and wide natural floodways and flood plains maximize the groundwater recharge and help to replenish the aquifers. As an unchannelized river, the Santa Clara River and its tributaries provide opportunities for groundwater recharge. The best available evidence shows that no adverse impacts on Basin recharge have occurred due to the existing or projected used of local groundwater supplies, consistent with the CLWA/purveyor groundwater operating plan for the basin (see *2005 Basin Yield Report*). In addition, according to the memorandum prepared by CH2MHill (*Effect of Urbanization on Aquifer Recharge in the Santa Clarita Valley*, February 22, 2004), urbanization in the Santa Clarita Valley has been accompanied by long-term stability in pumping and groundwater levels, and the addition of imported State Water Project water to the Valley, which together have not reduced recharge to groundwater, nor depleted the amount of groundwater in storage within the local groundwater basin.

## Major Water Bodies and Tributaries

The area within the County's Planning Area contains abundant types of freshwater bodies, including lakes, rivers, streams, and tributaries. The following is a description of the lakes, rivers, streams, and tributaries that are nearest to the County's Planning Area, **Figure 3.12-3, Surface Water Within and Adjacent to the OVOV Planning Area.**

### *Santa Clara River*

The County's Planning Area is located within the Santa Clara River Valley basin, a watershed that encompasses approximately 1,634 square miles. The Santa Clara River is the largest river system in

Southern California that remains in a relatively natural state. From its headwaters in the San Gabriel Mountains to its terminus at the Pacific Ocean, the Santa Clara River flows approximately 84 miles. Historically, the river generally flowed year-round from the area near Interstate 5 westerly into Ventura County (a noted exception is the "dry gap" area located between the Los Angeles County/Ventura County line and Piru Creek). The upper reach of the river, has been typically dry except in periods following storm events; this portion of the river extends from the Bouquet Canyon Road overpass to Lang Station, located on Lang Station Road south of Soledad Canyon Road and east of Lost Canyon Road within the County's Planning Area. Flows within the river are largely a result of stormwater runoff in the rainy months and wastewater treatment discharges in the drier months. Effluent from the Saugus Water Reclamation Plan (WRP) and Valencia WRP accounts for up to 40 percent of total stream flow within the Santa Clara River during the winter, and up to 90 percent during summer months.

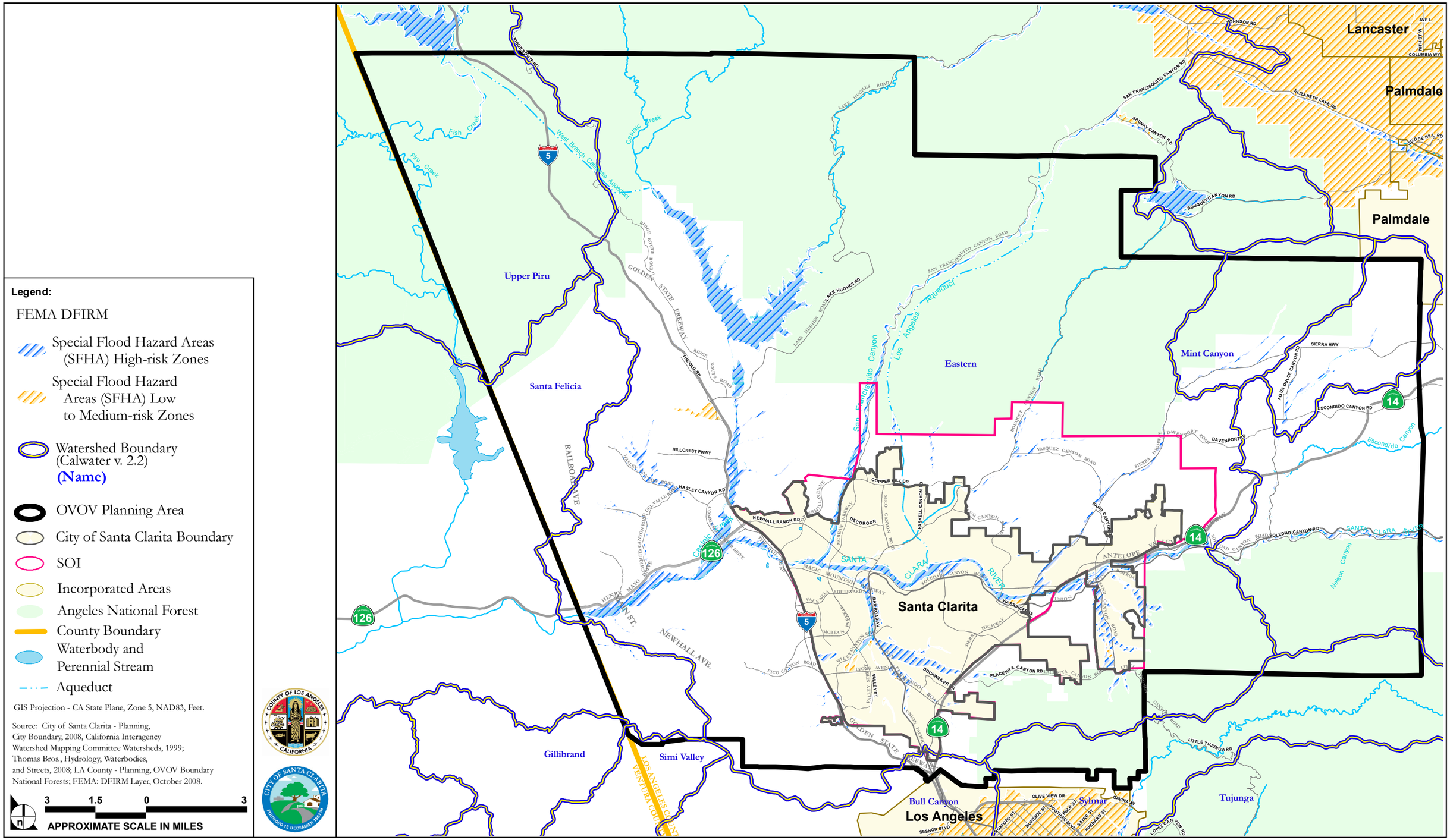
Principal tributaries to the upper Santa Clara River include creeks located in Mint, Bouquet, San Francisquito, Castaic, Oak Spring, and Sand Canyons. The principal tributaries of the South Fork of the river, which drains in a northerly direction toward its confluence with the main course of the river, include Placerita Creek, Newhall Creek, and Pico Creek. At higher elevations these creeks are typically perennial, flowing all year unless rainfall is below normal. Flow in the stream canyons near the valley floor is normally limited to the rainy season.

### *Castaic Lake*

Castaic Lake is a 324,000 acre-foot storage facility created by an earth-filled dam across Castaic Creek. The reservoir serves as the West Branch Terminus of the California Aqueduct. In addition to its State Water Project (SWP) functions, the lake is operated to conserve local floodwaters for use in water recharge of underlying groundwater basins. Castaic Lagoon is located directly south and downstream of Castaic Dam, and was created by the California Department of Water Resources (DWR) to provide recreational opportunities. The lagoon has a surface area of 197 acres and a capacity of 5,701 acre-feet. Elderberry Forebay is also a part of the Castaic Reservoir system, and is an enclosed section of Castaic Lake.

### *California Aqueduct*

State Water Project (SWP) water is one of the primary sources of water for County residents within the County's Planning Area. SWP water is conveyed from the Sacramento Delta through 444 miles of the Edmund G. Brown California Aqueduct, south to the Southern California region (see **Section 3.13, Water Service,** for a more detailed description of the SWP). As described above, Castaic Lake is the most southerly reservoir on the West Branch of the SWP California Aqueduct.




**SOURCE:** City of Santa Clarita, County of Los Angeles, Valleywide General Plan - March 2009

FIGURE **3.12-3**

Surface Water Within and Adjacent to the OVOV Planning Area

## FLOOD CONTROL IMPROVEMENTS

Publicly maintained flood control facilities include approximately 12,000 linear feet of levee on the north bank and approximately 17,000 linear feet of levee on the south bank of the Santa Clara River.[4] These facilities are maintained by the Los Angeles County Department of Public Works.

Privately maintained levees amount to approximately 3,400 linear feet of the south bank of the river between Sierra Highway and State Route (SR) 14, and 5,000 linear feet east of Castaic Creek on the north bank of the river. Additionally, the Newhall Ranch Specific Plan intends to incorporate floodway improvements such as buried bank stabilization, and additional drainage systems into the development plan. Other flood control improvements include the use of detention basins, rip rap, and soft bottom methods that are biologically sensitive and aesthetically pleasing.

### Low Impact Development

In the past, traditional planning and design techniques have often focused on particular characteristics of a building site and the immediate areas, rather than on the relationship of each new development project to the surrounding regional environment. Even more holistic planning concepts such as new urbanism and smart growth have often overlooked the implications of a specific development project on environmental conditions in the greater watershed. Planners now understand that development decisions cannot be limited to site specific conditions, but must be made in consideration of broader environmental conditions such as regional water quality.

The construction of impervious surfaces such as roads, parking lots, and rooftops leads to the degradation of water quality by increasing runoff volume, stream sedimentation and water acidity, altering regular stream flow and watershed hydrology, and reducing groundwater recharge. According to the EPA, a 1-acre parking lot produces a runoff volume almost 16 times as great as would an undeveloped meadow of the same size.

The concept of Low Impact Development (LID) was created to ensure that new development is designed in consideration of overall environmental conditions, including regional water quality. LID is a land-use planning approach that incorporates "green infrastructure" concepts such as zero runoff, rainfall harvesting, groundwater recharge, biofiltration, native landscapes, green streets, and other measures to promote water quality protection in new development. The goal of LID is to protect a community's natural, pre-development water flow in order to minimize ecological impacts from urbanization.

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4 Santa Clara River Project Steering Committee, Biological Resources, Vol. 1, 1996

The LID concept was created in the early 1990s in Maryland, with support from the U.S. Environmental Protection Agency, to improve water quality in Chesapeake Bay. LID was designed to provide cost-effective alternatives to conventional stormwater management, which is typically designed to transport heavily polluted stormwater and urban runoff through pipes and concrete channels as quickly as possible into larger regional water bodies. LID principles were developed to control runoff at the source. According to information from the LID Center, basic planning principles include the following:

- Stormwater management. In LID, stormwater is managed as in a natural system, by creating permeable surfaces to infiltrate stormwater and urban runoff into the underlying soil and reduce the amount of runoff from impervious surfaces. Design measures to manage stormwater at the source include trenches, drainfields, dry wells, and bio-retention areas. Rain gardens are shallow depressions filled with soil, sand and plants that retain, filter, and treat stormwater. Filter strips and bioswales provide pretreatment before waters enter an infiltrated area. Constructed wetlands are designed to remove pollutants from runoff and provide habitat and recreation value. Vegetated swales move runoff to infiltration systems, slow the erosive velocity, and filter pollutants.

- Urban runoff reduction. Urban runoff during dry weather is largely the result of too much water for landscaped irrigation, and washing of driveways and sidewalks. This runoff mixes with fertilizer, pesticides, pollutants on roadways, and other contaminants to create some of the most polluted water entering creeks and rivers. LID measures include irrigation control and the use of native and compatible plant species that require less water.

- Site design and circulation. Minimizing the amount of asphalt and other impervious road and parking surfaces in site design and circulation decreases the amount of runoff and pollutants, while reducing both infrastructure and maintenance costs. Modifications to conventional design to reduce impervious surfaces area includes reduced street widths, reduced parking, use of porous materials in driveways and parking areas, and the use of traffic calming measures that include stormwater capture components. Mixed use development which allows pedestrian circulation and incorporates green belts, conserves open space, and protects natural features will also protect water quality.

Policies have been proposed below that would require LID techniques in the design of both private development and capital projects, for the purpose of managing stormwater at the source, enhancing surface water quality, reducing runoff volumes, and economizing on infrastructure costs for drainage and treatment facilities.

## Drainage Future Needs

In some portions of the County's Planning Area, major drainage improvements will be constructed by developers for new master-planned communities. Portions of Sierra Highway north of the Santa Clara River are subject to flooding from Mint Canyon, and the lack of adequate flood control facilities in this area represents the last major constraint to development along this arterial corridor in Canyon Country. Within the County's Planning Area, localized, short-term flooding resulting from excessive rainfall, soil

erosion resulting from wildland fires, or inadequate local drainage infrastructure will be addressed by providing or requiring local improvements as needed.[5]

## WATER QUALITY

The Federal Clean Water Act was adopted to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The act directs each state to establish water quality standards for all "water of the United States." The Environmental Protection Agency has delegated responsibility for implementation of portions of the Clean Water Act, including water quality control planning to the California State Water Resources Control Board (SWRCB) and nine RWQCB. The SWRCB establishes statewide policies and regulations for implementing water quality control programs. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. Each Basin Plan also provides strategies and implementation plans for the control of pollutants, remediation of pollution, monitoring, and assessment of the region's waters.

The NPDES Program was established in the Clean Water Act to regulate discharges of pollutants into surface waters of the United States. Both point source discharges (such as a municipal or industrial discharge at a specific location or pipe) and nonpoint source discharges (such as diffuse runoff of surface water from streets and parking lots) are regulated by the NPDES Program. In addition, construction activities which may result in water-borne erosion from grading or stockpiling are regulated through various techniques called "best management practices." Water quality management plans and stormwater pollution prevention plans are required for development projects to meet the requirements of the NPDES Program to maintain water quality.

Surface water quality within the County's Planning Area is affected by a variety of discharges from both point and nonpoint sources. Wastewater treatment plant effluent is the largest and most common point-source discharge. Urban runoff, erosion, agricultural runoff, and other natural causes are common nonpoint sources. Pollutants from both point and nonpoint sources include dissolved and suspended solids, oil, grease, nutrients, metals, bacteria, and pesticides.

The County's Planning Area is within the hydrological areas covered by the 1994 Water Quality Control Plan for the Santa Clara River Basin (California Department of Water Resources Hydrological Unit No. 403.51). Portions of the Santa Clara River watershed have been identified as an "impaired water body" by

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5 Los Angeles County Department of Regional Planning, *Preliminary Draft Santa Clarita Valley Area Plan*, 2008, Chapter 5, "Safety Element," 223.

the SWRCB because waters in these areas exceed adopted standards for various pollutants. Pollutants of concern include chloride, coliform, ammonia, nitrates, nitrites, and various organics. In 2005, the Upper Santa Clara River Chloride Total Maximum Daily Load (TMDL) became effective, outlining a 13-year plan to reduce chloride levels in the river. Chloride sources include SWP Saugus WRPs and domestic sources (including water softeners and salt-water pools). Although installation of new automatic water softeners was prohibited in 2003 it is estimated that thousands of self-regenerating water softeners are still in use within the Santa Clarita Valley Joint Sewerage System. The Santa Clarita Valley Sanitation District has initiated a public awareness and education program, financial incentives for removal of water softeners, and a voluntary sales ban of salt and water softeners in local businesses. In 2007, the Santa Clarita Valley Sanitation District entered into an agreement with a water softener provider to remove nearly 600 rented water softeners from Valley residences in order to protect water quality. If salt levels discharged into the river do not decrease due to those voluntary compliance efforts, the Sanitation District may have to install additional costly treatment equipment, resulting in higher rates charges to sewage customers.

The Los Angeles County Public Works Environmental Programs Division is working closely with the SWRQCB to meet requirements for the TDML, through programs to provide pro-active public education and outreach, incentives for residents and business owners, and implementation of new technologies.

To ensure drinking water quality of SWP water, the Castaic Lake Water Agency (CLWA) has two surface water treatment plants that eliminate microbial contaminant, salts, minerals, and algae. According to the 2005 Urban Water Management Plan (UWMP), groundwater from the East Subbasin does not have microbial water problems. Parasites, bacteria, and viruses are filtered out as water percolates through soil, sand, and rock on its way to the aquifer. However, disinfectants are added to local groundwater when it is pumped by wells to protect public health. All groundwater used for potable water meets or exceeds drinking water standards.

Perchlorate has been detected in two alluvial municipal-supply wells in the East Subbasin; however, wellhead treatment has been permitted and installed at one of the two impacted wells, Valencia Water Company's (VWC) Well Q2. The treatment removes perchlorate pumped from the well to a non-detect level. As discussed in the 2005 UWMP, Chapter 5 and Appendix D, there has been extensive investigation of the extent of perchlorate contamination, which, in combination with groundwater modeling has led to the current plan for integrated control of contamination migration and restoration of impacted pumping (well) capacity.

The short-term response plan for the protection of other alluvial wells, down gradient from the former Whittaker-Bermite site, is to promptly install wellhead treatment to ensure adequate water supplies. This plan complements the longer-term source control actions being undertaken by the Whittaker-Bermite property owner under supervision of the Department of Toxic Substances Control (DTSC) to address perchlorate contamination in the northern alluvium (to the north of the former Whittaker-Bermite site), and the subsequent restoration of the one other perchlorate-contaminated alluvial well (Stadium well). The long-term plan also includes the CLWA groundwater containment, treatment and restoration project to prevent further downstream migration of perchlorate, the treatment of water extracted as part of the containment process, and the recovery of lost local groundwater production from the Saugus Formation.

There are four Saugus wells contaminated by perchlorate. The four contaminated wells consist of one owned by Newhall County Water District, two owned by Santa Clarita Water District, and VWC well 157, which has been sealed and abandoned and replaced by VWC's Well 206 in a non-impacted part of the Basin. These four wells represent a total of 7,900 gallons per minute (gpm) of pumping capacity (or full-time source capacity of about 12,700 acre-feet per year (afy) inactivated due to perchlorate contamination.

## REGULATORY FRAMEWORK

### Federal

#### *National Flood Insurance Program*

The National Flood Insurance Program (NFIP) is a relatively recent federal program. The federal government has been actively involved in flood control since 1927, following major floods on the Mississippi River. Beginning with the Flood Control Act of 1936, Congress assigned the U.S. Army Corps of Engineers (USACE) the responsibility for flood control engineering works and later for floodplain information services. Flood control is provided through construction of dams and reservoirs.

Despite these programs and rapidly rising federal expenditures for flood control, flood losses continued to rise. In 1968, Congress passed the National Flood Insurance Act, which created the NFIP. The Flood Disaster Protection Act of 1973, which also amended the 1968 act, requires the purchase of flood insurance by property owners who are located in special flood hazard areas and are being assisted by federal programs, or by federally supervised, regulated, or insured agencies or institutions.

### *National Flood Insurance Program Reform Act of 1994*

In 1994, the National Flood Insurance Program Reform Act went through its first major revision since its inception. Included in this revision were provisions that if a lender were to escrow an account and if the structure were in the floodplain, then the lender must escrow for flood insurance. The revised legislation also included increased flood insurance limits and the elimination of the 1962 buy-out program. However, the legislation did initiate the Hazard Mitigation Fund as part of the flood insurance policy. This made it possible to cover the cost of elevating a continuously flood damaged home through the insurance policy. Also included in this legislation was the increase from a 5-day to a 30-day waiting period for a new policy to become effective. It also prohibits the waiver of flood insurance purchase requirements as a condition of receiving federal disaster assistance. If the flood insurance policy were not maintained, in the event of another disaster, no disaster assistance would be made available for that structure.

### *Executive Order 11988, Flood Plain Management*

Executive Order 11988 requires the USACE to provide leadership and to take action to:

- Avoid development in an existing 100-year floodplain, unless such development is the only practicable alternative;
- Reduce the hazards and risk associated with floods;
- Minimize the impact of floods on human health, safety, and welfare; and,
- Restore and preserve the natural and beneficial values of current floodplains.

To comply with Executive Order 11988, the policy of USACE is to formulate projects, and to the extent possible, avoid or minimize adverse effects associated with use of a floodplain, and avoid inducing development in an existing floodplain unless there is no practicable alternative.

### *Federal Water Project Recreation Act of 1965 (Amended)*

The Federal Water Project Recreation Act reestablished recreation as a full project purpose, directing that full consideration be given to the outdoor recreation opportunities, if any, of any federal navigation, flood control, reclamation, hydroelectric, or multipurpose water resource project. The act also placed additional requirements on recreation as a project purpose, defining the basis for sharing financial responsibilities in joint development, enhancement, and management of recreation and fish and wildlife resources of federal water projects.

## State

### *Cobey-Alquist Flood Plain Management Act 8401*

The Flood Plain Management Act states that a large portion of land resources in the State of California is subject to recurrent flooding. The public interest necessitates sound development of land use, as land is a limited, valuable, and irreplaceable resource, and the floodplains of the state are a land resource to be developed in a manner that, in conjunction with economically justified structural measures for flood control, will result in prevention of loss of life and of economic loss caused by excessive flooding. The primary responsibility for planning, adoption, and enforcement of land use regulations to accomplish floodplain management rests with local levels of government. It is the State of California's policy to encourage local levels of government to plan land use regulations to accomplish floodplain management and to provide state assistance and guidance.

### *Water Code Section 8100*

The Water Code states that the boards of supervisors, in their respective counties, may appropriate and expend money from the general fund of a county for any of the following purposes in connection with streams or rivers in the county:

- The construction of works, improvements, levees, or check dams to prevent overflow and flooding;
- The protection and reforestation of watersheds;
- The conservation of the floodwaters;
- The making of all surveys, maps, and plans necessary to carry out any work, construction, or improvement authorized by this article; and,
- The carrying out of any work, construction, or improvement authorized by this article outside the county if the rivers or stream affect flow in or through more than one county.

## Local

### *County*

Since October 1990, the County has been a voluntary participant in NFIP of FEMA. As a participant, the County is responsible for the regulation of development in special hazard flood areas of the County and the planning for other floodplain management activities that will promote and encourage programs for the preservation and restoration of the natural state of the floodplain. As a compliance requirement of the

NFIP, the County enforces regulations of these developments to ensure that buildings are erected at a safe elevation to prevent potential damages to property.

The County provides information regarding flood zone designations from FEMA's Flood Insurance Rate Maps to property owners for use in resolving flood insurance issues with their respective insurance companies and lending institutions.

The Flood Maintenance Division of the Department of Public Works (DPW) is responsible for operating and maintaining flood control and water conservation facilities. These facilities include 15 major dams, 284 debris basins, 450 miles of storm drain channel, 2,500 miles of drains, 33 pump plants, 30 spreading grounds covering 1,989 acres, and 22 miles of barrier projects that prevent the intrusion of seawater into the fresh water supply. The Flood Maintenance Division is also responsible for implementing Best Management Practices (BMPs) to meet the permit requirements of the NPDES. These BMPs include the inspection of all storm drains for illegal connections and discharges. The following guidelines apply to projects that are located within a Flood Zone as indicated on the Flood Zone Map for the County of Los Angeles:

- No permanent structures shall be constructed, altered, modified, or enlarged within the boundaries of a flood zone, except those accessory structures that will not impede the flow of water and flood control structures approved by the County Flood Control District.
- Any development proposed within a flood zone area shall be reviewed by the County Engineer or Flood Control District who will define the area within which no permanent structures or improvements shall be permitted.
- The scale, design, and intensity of any approved project in a flood zone must minimize exposure of current and future community residents to flood related property damage and loss.
- Any proposed project in a flood zone must be consistent with density and use standards set forth in the Los Angeles County General Plan or applicable local-level plan, and must be compatible with the character of surrounding development.
- Any proposed project in a flood zone must be situated and designed so as to avoid isolation from essential services and facilities in the event of flooding.
- The costs associated with on and off-site hazard mitigation, including design, construction, and continued maintenance of necessary flood protection facilities will be assumed by the developer and/or future owners, occupants, or residents of the proposed development.

The County also conducts educational outreach programs to unincorporated communities on how to mitigate flooding impacts on their properties. The County seeks to reduce the flood insurance cost for residents who are required to purchase flood insurance by taking actions which lower the community

rating system number. The County restricts development within floodplains. Any development within the floodplain cannot increase the flood hazard to adjacent properties by increasing the capital flood water surface elevation, deflecting flows, or increasing velocity of the flow such that it causes bank erosion. Developments in the floodplain must make provisions to avoid these impacts and eliminate inundation hazards by providing adequate drainage facilities through protective walls, suitable fill, raising the floor level of the buildings, or a combination of these methods. The County also requires compliance with FEMA regulations, including a maximum 1 foot rise in water surface elevation of flood flows.

## THRESHOLDS OF SIGNIFICANCE

In order to assist in determining whether a project will have a significant effect on the environment, the *California Environmental Quality Act (CEQA) Guidelines*, Appendix G, identify criteria for conditions that may be deemed to constitute a substantial or potentially adverse change in physical conditions.

Significant hydrology and water quality resource impacts will result if:

- The proposed project would 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;
- If the proposed project would place housing within a 100-year flood hazard as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map or place structures within a 100-year flood hazard area, where the structures would impede or redirect flood flows.
- If the proposed project would 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.

## IMPACT ANALYSIS

The following text discusses the potential impacts on hydrology and water quality resources with the County's Planning Area per the proposed Area Plan policies and the *State CEQA Guidelines* thresholds of significance criteria.

**Impact 3.12-1** **The proposed project would 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.**

**Policies S 2.2.1** and **S 2.2.2** require that the County prepare and maintain maps of floodways and floodplains based on information from FEMA and appropriate sources in order to qualify for FEMA's NFIP (**Policy S 2.2.1)** and that the County identify areas prone to localized, short-term flooding due to drainage deficiencies (**Policy S 2.2.2**). The County would be (1) required to plan for and construct adequate drainage and flood control infrastructure to ensure flood protection **(Policies S 2.3.1 and S 2.3.2)** and (2) provide for the maintenance of drainage structures and flood control facilities to avoid system malfunctions and overflows (**Policy S 2.5.2**). **Policies S 2.3.1 and S 2.3.2** require the County to implement drainage master plans designed to handle storm flows from the 100-year storm and to include funding for drainage and flood control improvements in the annual County budget. These policies would reduce surface water runoff by addressing and locating drainage problems that cause flooding within the County's Planning Area and putting responsibility on landowners, to make repairs for any type of issue that prevents proper drainage of excessive flooding and flood waters.

Buildout within presently vacant areas of the County's Planning Area would result in an increase in residential and non-residential structures and associated facilities, increasing the amount of impervious surface area. The addition of impermeable surfaces would increase the volume and rate of stormwater runoff and limit the amount of ground infiltration during storm events. Roads and buildings generate greater amounts of runoff than typical open space and landscaped areas. Fixed drainage channels in urban areas may be unable to contain the runoff generated by relatively small, but intense rainfall events.

**Policies S 2.1.4, S 2.1.5, and S 2.5.1** encourage the County to cooperate with other agencies regarding flood control, watershed management, water quality and habitat protection and promote joint use of flood control facilities with other beneficial uses where feasible. **Policy S 2.1.2** would promote the use of LID standards throughout the County's Planning Area. The basic planning principals involved in LID construction include stormwater management, urban runoff reduction, and site design and circulation. In order to reduce urban runoff, achieve water quality and habitat objectives in addition to flood control, **Policy S 2.1.3** promotes the use of vegetated drainage courses and soft-bottom channels for flood control facilities to the extent feasible.

New development projects within the County's Planning Area can take such measures as utilizing building materials that allow infiltration, which in turn would reduce surface water runoff, recharge aquifers, and reduce impacts on water quality (**Policy S 2.1.2, Policy CO 4.3.1, Policy CO 4.3.4**). **Policies**

**CO 4.3.1** and **4.3.3** would also encourage future projects to reduce impervious surfaces by reducing street widths, reducing parking, using porous materials in driveways and parking area, and using traffic calming measures that include stormwater capture components. Flexibility in design standards would provide the benefits of stormwater retention, groundwater infiltration, and reduction of heat islands (**Policy CO 4.3.3**). Additionally, design measures that could be implemented on a project-by-project basis include, but are not limited to detention and retention basins or ponds, and ephemeral swales (**Policy S 2.1.5, Policy CO 4.3.5**). On previously developed sites proposed for major alteration, provide stormwater management improvements to restore natural infiltration, as required by the reviewing authority (**Policy CO 4.3.2**).

With the increase in stormwater runoff that would occur with buildout of the County's Planning Area, the potential exists for an increase in pollutants conveyed to the groundwater basins and surface waters in creeks and rivers (such as the Santa Clara River and its tributaries). **Policy CO 4.3.7** requires the County to reduce the amount of pollutants entering the Santa Clara River and its tributaries by capturing and treating stormwater runoff at the source, to the extent possible. Implementation of **Policy CO 4.3.1** through **Policy CO 4.3.7** would provide specific guidance on how to reduce the possibility of pollution within water runoff that can penetrate into ground water beneath the County's Planning Area and that will possibly flow into the Santa Clara River and its tributaries. Landscaping and use of plant material as suggested in these policies would reduce the amount of pollution within surface water runoff that would increase due to buildout of the Area Plan (**Policy CO 4.3.6**). **Policy CO 4.4.3** discourages the use of chemical fertilizers, herbicides, and pesticides in landscaping to reduce water pollution**.**

## *Proposed Area Plan Policies*

**Policy S 2.1.2:** Promote Low Impact Development standards on development sites, including but not limited to minimizing impervious surface area and promoting infiltration, in order to reduce the flow and velocity of stormwater runoff throughout the watershed.

**Policy S 2.1.3:** Promote the use of vegetated drainage courses and soft-bottom channels for flood control facilities to the extent feasible, in order to achieve water quality and habitat objectives in addition to flood control.

**Policy S 2.1.4:** Cooperate with other agencies, as appropriate, regarding the related issues of flood control, watershed management, water quality, and habitat protection.

**Policy S 2.1.5:** Promote the joint use of flood control facilities with other beneficial uses where feasible, such as by incorporating detention basins into parks and extending trails through floodplains.

**Policy S 2.2.1:** Prepare and maintain maps of floodways and floodplains based on information from the Federal Emergency Management Agency (FEMA) and other appropriate sources in order to qualify for FEMA's National Flood Insurance Program.

**Policy S 2.2.2:** Identify areas subject to localized short-term flooding due to drainage deficiencies.

**Policy S 2.3.1:** Implement drainage master plans designed to handle storm flows from the 100-year storm.

**Policy S 2.3.2:** Include funding for drainage and flood control improvements in the annual County Budget.

**Policy S 2.5.1:** Address drainage problems that cause flooding on prominent transportation corridors by working with multi-jurisdictional agencies and stakeholders to construct needed drainage improvements.

**Policy S 2.5.2:** Provide for the maintenance of drainage structures and flood control facilities to avoid system malfunctions and overflows.

**Policy CO 4.3.1:** On undeveloped sites proposed for development, promote onsite stormwater infiltration through design techniques such as pervious paving, draining runoff into bioswales or properly designed landscaped areas, preservation of natural soils and vegetation, and limiting impervious surfaces.

**Policy CO 4.3.2:** On previously developed sites proposed for major alteration, provide stormwater management improvements to restore natural infiltration, as required by the reviewing authority.

**Policy CO 4.3.3:** Provide flexibility for design standards for street width, sidewalk width, parking, and other impervious surfaces when it can be shown that such reductions will not have negative impacts and will provide the benefits of stormwater retention, groundwater infiltration, reduction of heat islands,

enhancement of habitat and biodiversity, saving of significant trees or planting of new trees, or other environmental benefit.

**Policy CO 4.3.4:** Encourage and promote the use of new materials and technology for improved stormwater management, such as pervious paving, green roofs, rain gardens, and vegetated swales.

**Policy CO 4.3.5:** Where detention and retention basins or ponds are required, seek methods to integrate these areas into the landscaping design of the site as amenity areas, such as a network of small ephemeral swales treated with attractive planting.

**Policy CO 4.3.6:** Discourage the use of mounded turf and lawn areas which drain onto adjacent sidewalks and parking lots, replacing these areas with landscape designs that retain runoff and allow infiltration.

**Policy CO 4.3.7:** Reduce the amount of pollutants entering the Santa Clara River and its tributaries by capturing and treating stormwater runoff at the source, to the extent possible.

**Policy CO 4.4.3:** Discourage the use of chemical fertilizers, herbicides and pesticides in landscaping to reduce water pollution by substances hazardous to human health and natural ecosystems.

## *Effectiveness of Proposed Area Plan Policies*

The policies outlined above provide and promote the use of design and engineering techniques that would promote infiltration, reduce the volume and rate of stormwater runoff, and reduce the pollutants in stormwater runoff. However, the proposed policies would not solely reduce the impacts associated with exceeding the capacity of existing stormwater drainage systems or reduce the amount of polluted runoff that would occur from development. Implementation of mitigation measures **MM 3.12-1** and **3.12-2** would reduce potential impacts on surface water runoff to less than significant.

**Impact 3.12-2** **If the proposed project would place housing within a 100-year flood hazard as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map or place structures within a 100-year flood hazard area, where the structures would impede or redirect flood flows.**

The County's Planning Area contains areas that are designated as 100-year floodplain along the Santa Clara River and its tributaries, and along the Castaic Lake Reservoir system (**Policy S 2.2.1)**. Development within a flood plain would pose potential impacts associated with the inundation of residential and commercial units, if a 100-year type of flood would occur in these areas. In addition to an increase in industrial, commercial, and public facilities, the number of dwelling units in the County's Planning Area is expected to increase at buildout of the Area Plan. This large increase in demand for dwelling units may cause housing to encroach onto the 100-year flood plain and potentially place housing and structures in areas subject to flooding, from natural conditions, or dam inundation.

**Policy S 2.4.1** requires that new development comply with floodplain management requirements adopted to implement FEMA programs. **Policy S 2.4.2** requires the land use and zoning maps, restrict the type and intensity of land use in flood prone areas, or require flood-proof construction, as deemed appropriate. Under the current **Land Use Map,** areas of land within the 100-year flood plain (**Figure 3.12-1)** are designated as land other than Open Space; along the northern fork of the Santa Clara River south of Castaic Lake where the land use is designated as Public-Semi Public Facility; and, along San Francisquito Canyon in the northern portion of the County's Planning area that is designated as Rural Land.

**Policy S 2.1.1** requires the designation of appropriate areas within floodplains as open space for multi-purposes, including flood control, habitat preservation, and recreational open space. The current **Land Use Map** places urbanized land uses within the 100-year flood plain, which in turn, would cause potential inundation to areas developed as residential and commercial areas. **Policy S 2.2.1** would require the County to prepare and maintain floodway areas based on FEMA records. The County currently has maps depicting 100-year flood zones as shown above in **Figure 3.12-1**. **Policy S 2.3.1** and **Policy 2.4.1** would require that new development implement drainage master plans designed to handle storm flows from 100-year storm events and require that new development comply with floodplain management requirements adopted to implement programs of FEMA, respectively; however, this would occur on a project-by-project basis. These policies would also help implement flood-proof construction and development for areas within the County's Planning Area that are within the 100-year flood plain.

## *Proposed Area Plan Policies*

**Policy S 2.1.1:** On the Land Use Map, designate appropriate areas within the floodplain as open space for multi-use purposes, including flood control, habitat preservation, and recreational open space. Development in the floodplain will require mitigation as deemed necessary by the reviewing authority.

**Policy S 2.2.1:** Prepare and maintain maps of floodways and floodplains based on information from the Federal Emergency Management Agency (FEMA) and other appropriate sources in order to qualify for FEMA's National Flood Insurance Program.

**Policy S 2.3.1:** Implement drainage master plans designed to handle storm flows from the 100-year storm.

**Policy S 2.4.1:** Require that new development comply with FEMA floodplain management requirements.

**Policy S 2.4.2:** On the Land Use Map, restrict the type and intensity of land use in flood-prone areas, or require flood-proof construction, as deemed appropriate.

## *Effectiveness of Proposed Area Plan Policies*

The above policies would be implemented in order to provide protection to residential and commercial units that are proposed for areas within the County's Planning Area that are within 100-year flood plains. These policies would provide guidance on the measures that should be taken for any residential or commercial units planned for development within the 100-year floodplain. However, these policies do not implement specific requirements to protect residential and housing units that are planned for development within a 100-year flood plain. The **Land Use Map** is not consistent with **Policy S 2.1.1**, in that the **Land Use Map** identifies land uses other than Open Space in areas of the 100-year flood plain within the County's Planning Area. Therefore, mitigation measures **MM 3.12-3** through **3.12-5** are recommended to reduce potentially significant impacts from the 100-year flood hazard to a less than significant level.

**Impact 3.12-3** **If the proposed project would 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 of dam.**

As discussed above, there is one main reservoir within the County's Planning Area that could cause flooding through the Planning Area if a breach in the dams supporting the water were to occur. The Bouquet Canyon Reservoir has two earth-filled dams, one on the west side overlooking Cherry Canyon and one on the south side above Bouquet Canyon (**Policy S 1.1.4)**. If the earth-filled dam on the Cherry Canyon side were to fail, the water behind the dam would flow west for approximately 2 miles through the Canyon into San Francisquito Canyon, and then south for approximately 11 miles into the Santa Clara River. The Bouquet Creek dam, if breached, would drain south through Bouquet Canyon for 17 miles, into the Santa Clara River, within the County's Planning Area. The possibility of the failure of these dams during a catastrophic event is considered unlikely due to their type of construction; however, a slight possibility still exists that these dams could fail (**Policy S 1.2.5)**. Therefore, impacts on land uses within the dam inundation zones within the County's Planning Area could be potentially significant.

The Castaic Dam holds back water from Castaic Lake, and is located on Lake Hughes Road, 1 mile northeast of Interstate 5. The inundation area, if this dam were to be breached, would flood areas of the County's Planning Area. Should a breach in the dam occur, water would flow south in Castaic Creek for approximately 5 miles to the Santa Clara River (**Policy S 1.1.4** and **Policy S 1.2.5)**. Castaic Creek within the County's Planning Area boundaries and the portion of the Santa Clara River, where the water would flow into, is located within the County's Planning Area. The potential for flooding to occur as a result of the breach of Castaic Dam, within the County's Planning Area would be possible.

As discussed under existing conditions for this section, the County has prepared maps of areas within its Planning Area that are subject to inundation from dam failure from the Castaic and Bouquet Dams (**Policy S 1.1.4** and **Policy S 1.2.5**). Dam inundation area maps will allow County decision makers to determine if development plans would be appropriate within potential dam inundation areas, protecting the public and property within the County's Planning Area, and providing protection if a geologic catastrophe were to damage the above-mentioned dams.

### *Proposed Area Plan Policies*

**Policy S 1.1.4:** Maintain maps showing potential inundation areas from dam failure.

**Policy S 1.2.5:** Consider the potential for inundation from failure of the Castaic or Bouquet Canyon Reservoir dams when reviewing development proposals within potential inundation areas.

### *Effectiveness of Proposed Area Plan Policies*

Implementation of the proposed Area Plan's policies related to dam inundation hazards would reduce potentially significant adverse impacts from dam inundation hazards to less than significant. No mitigation measures would be required.

## MITIGATION FRAMEWORK

The following mitigation measures would be implemented to reduce potential impacts on hydrology and water quality to less than significant.

**MM 3.12-1** The County shall prohibit alteration of floodways and channelization unless alternative methods of flood control are found to be technically, economically, and practicably infeasible.

**MM 3.12-2** The County shall not require all land uses to withstand flooding. These may include land uses such as agricultural, golf courses, and trails. For these land uses, water flows shall not be obstructed, and upstream and downstream properties, shall not be adversely affected by increased velocities, erosion backwater effects, concentration of flows, and adverse impacts to water quality from point and nonpoint sources of pollution.

**MM 3.12-3** The County shall require that all structures (residential, commercial, and industrial) be flood-proofed from the 100-year storm flows. All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the Flood Insurance Rate Maps for the City of Santa Clarita, Map revised September 29, 1989), must be elevated so that the lowest floor is at or above the Base Flood Elevation in accordance with the effective Flood Insurance Rate Map.

**MM 3.12.-4** The County shall require that for agricultural, recreation, or other low-density uses, flows are not obstructed and that upstream and downstream properties are not adversely affected by increased velocities, erosion backwater effects, or concentration of flows.

**MM 3.12-5** Any development that is located within a Regulatory Floodway as delineated on the Flood Insurance Rate Map for the County's Planning Area must not increase base flood elevations. (Development means any man-made change improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials). A hydrologic and hydraulic analysis shall be performed prior to the start of development, and must demonstrate that the development would not cause any rise in base flood levels and additionally would no allow any rise within regulatory floodways.

## SIGNIFICANCE OF IMPACT WITH MITIGATION FRAMEWORK

Implementation of the above policies and mitigation measures would reduce potential impacts on hydrology and water quality to a less than significant level. Unless revisions are made to the Land Use Map to ensure consistency with Area Plan policies, impacts on developing in the 100-year flood plain would remain a significant impact.