5.8 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 Town of Yucca Valley from implementation of the proposed General Plan Update. 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 water on the surface of the land and includes lakes, rivers, streams, and creeks. Groundwater is water below the surface of the earth.

The information in this section is based in part on the following technical study:

- *Technical Background Report for the Safety Element, Town of Yucca Valley, California,* Chapter 3: Flood Hazards, Earth Consultants International, Inc., September 2012.

A complete copy of this study is included as Appendix F to this Draft EIR.

5.8.1 Environmental Setting

Regulatory Framework

Water Quality

Clean Water Act

The federal Water Pollution Control Act (also known as the Clean Water Act [CWA]) is the principal statute governing water quality. The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the United States and gives the U.S. Environmental Protection Agency (EPA) the authority to implement pollution control programs, such as setting wastewater standards for industry. The statute's goal is to end all discharges entirely and to restore, maintain, and preserve the integrity of the nation's waters. The CWA regulates both the direct and indirect discharge of pollutants into the nation's waters. The CWA sets water quality standards for all contaminants in surface waters and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit is obtained under its provisions. The CWA mandates permits for wastewater and storm water discharges, requires states to establish site-specific water quality standards for navigable bodies of water, and regulates other activities that affect water quality, such as dredging and the filling of wetlands. The CWA also funded the construction of sewage treatment plants and recognized the need for planning to address nonpoint sources of pollution. Section 402 of the CWA requires a permit for all point source (a discernible, confined, and discrete conveyance, such as a pipe, ditch, or channel) discharges of any pollutant (except dredge or fill material) into Waters of the United States.

National Pollutant Discharge Elimination System

The United States Congress amended the CWA in 1987 to specifically regulate discharges to Waters of the United States from public storm drain systems and stormwater flows from industrial facilities, including construction sites, and require such discharges be regulated through permits under the National Pollutant Discharge Elimination System (NPDES; pursuant to CWA Section 402[p]). Under the NPDES program, all facilities that discharge pollutants (except dredge or fill material) from any point source into Waters of the United States are required to obtain an NPDES permit.

The term pollutant broadly includes any type of industrial, municipal, and agricultural waste discharged into water. Point sources are discharges from publicly owned treatment works (POTWs), discharges from industrial facilities, and discharges associated with urban runoff. While the NPDES program addresses certain specific types of agricultural activities, the majority of agricultural facilities are defined as nonpoint sources and are exempt from NPDES regulation. Pollutant contributors come from direct and indirect sources. Direct sources discharge directly to

receiving waters, whereas indirect sources discharge wastewater to POTWs, which in turn discharge to receiving waters. Under the national program, NPDES permits are issued only to direct point source discharges. The National Pretreatment Program addresses industrial and commercial indirect dischargers. Municipal sources are POTWs that receive primarily domestic sewage from residential and commercial customers. Specific NPDES program areas applicable to municipal sources are the National Pretreatment Program, the Municipal Sewage Sludge Program, Combined Sewer Overflows, and the Municipal Storm Water Program. Nonmunicipal sources include industrial and commercial facilities. Specific NPDES program areas applicable to these industrial/commercial sources are: Process Wastewater Discharges, Non-Process Wastewater Discharges, and the Industrial Storm Water Program. NPDES issues two basic permit types: individual and general. Also, the EPA has recently focused on integrating the NPDES program further into watershed planning and permitting (EPA 2012). The NPDES has a variety of measures designed to minimize and reduce pollutant discharges. All counties with storm drain systems that serve a population of 50,000 or more, as well construction sites one acre or more in size, must file for and obtain an NPDES permit.

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 State Water Resources Control Board (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. Under Porter-Cologne, the SWRCB issues joint federal NPDES Storm Water permits and state Waste Discharge Requirements to operators of municipal separate storm sewer systems (MS4s), industrial facilities, and construction sites to obtain coverage for the stormwater discharges from these operations.

Basin Plan for the Colorado River Basin

The SWRCB, through its nine Regional Water Quality Control Boards (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 Town of Yucca Valley is in the Colorado River Basin, Region 7, in the Lucerne Valley Planning Area. The Water Quality Control Plan for the Colorado River Basin (7) was adopted in 2006. This basin plan gives direction on the beneficial uses of the state waters within Region 7, describes the water quality that must be maintained to support such uses, and provides programs, projects, and other actions necessary to achieve the standards established in the basin plan.

No NPDES permits apply within the Town of Yucca Valley. There are no Waters of the United States in the Town. Waters of the United States include waters used, or potentially usable, in interstate or foreign commerce; interstate waters including interstate wetlands; waters—including intermittent waters—and wetlands, the destruction of which could affect interstate or foreign commerce; tributaries to waters identified above; and wetlands adjacent to waters identified above (Code of Federal Regulations, Title 33, Section 328.3). The Statewide General Construction Permit issued by the SWRCB (Order No. 2009-0009-DWQ issued in 2009) applies statewide to stormwater discharges from construction sites to waters of the U.S. One MS4 Permit has been issued by the Colorado River Basin RWQCB, applicable to the Whitewater River Basin in the Coachella Valley (Order No. R7-2008-0001 issued in 2008); the Town of Yucca Valley is outside of the area covered by that Permit (CRBRWQCB 2008). A statewide general permit for stormwater discharges from small MS4 systems was adopted by the SWRCB in 2003 (Order No. 2003-0005-DWQ). That Small MS4 Permit will be superseded on July 1, 2013, by Order No. 2013-0001-DWQ (SWRCB 2013). Small MS4 Permits only apply to small MS4s that discharge to Waters of the United States, and the Town of Yucca Valley is not listed as a permittee on either of the small MS4 permits referenced above. In addition, the Small MS4 permit covers MS4s serving areas of 10,000 to 100,000 persons, and population density of 1,000 persons per square mile or more. The Town of Yucca Valley had population density of 564 persons per square mile in 2012. The Town would have population density of 1,000 persons per square mile when its population reaches 39,831 people. At ultimate General Plan buildout, the Town would have a forecast population of 64,565, well over the threshold population where coverage under the small MS4 Permit would be required. The Southern California Association of Governments 2035

population forecast for Yucca Valley is 26,200. Assuming that is correct, Yucca Valley would reach the threshold population density for coverage under the small MS4 Permit well after 2035.

The CRBRWQCB may designate the Town's MS4 system a regulated small MS4 before the Town reaches the threshold population for required coverage. Such designation would be based on the potential of the Town's MS4 discharges to exceed water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts.

Water Quality Management Plans Required by the San Bernardino County Stormwater Program

San Bernardino County requires water quality management plans (WQMPs) for specified types of projects in three regions within the county:

- Unincorporated county areas and 16 cities within the Santa Ana River Watershed in southwestern San Bernardino County. The model WQMP for this region was revised in May 2012 pursuant to MS4 Permit R8-2010-0036 issued by the Santa Ana RWQCB in 2010.

- Urbanized areas of the Mojave River Watershed (including Victorville, Hesperia, Town of Apple Valley, and Barstow). The WQMP template for that region was revised in April 2012 pursuant to SWRCB Order No. 2003-0005-DWQ (Small MS4 Permit).

- Small MS4 permittees within the portion of the Colorado River Basin RWQCB region in San Bernardino County. The only permittee on Order No. 2013-0001-DWQ in the aforementioned region is San Bernardino County; thus, WQMPs are only required within the portion of the Colorado River Basin RWQCB region in unincorporated San Bernardino County areas.

None of the three WQMPs issued by the county apply within the Town of Yucca Valley.

California Fish and Game Code and Notification of Lake or Streambed Alteration

Streams, lakes, and riparian habitats in Yucca Valley are Waters of the State jurisdictional to the California Department of Fish and Wildlife (CDFW) pursuant to California Fish and Game Code Sections 1602 et seq. Substantial alterations of the natural flow of a stream or lake or removal of material from—or deposit of debris or waste or other material into—the bed, channel, or bank of a stream or lake, are prohibited under Section 1602 without a Lake or Streambed Alteration Agreement approved by CDFW. Projects that would conduct such activities must submit a Notification of Lake or Streambed Alteration, with required fees, to the CDFW. The notification must identify impacts to the bed, channel, and bank of the affected water body(ies), vegetation, trees, special status animal or plant species, and habitat that could support such species, and mitigation measures to prevent sediment from entering water courses during and after construction and to minimize or compensate for impacts to fish, wildlife, and plants. Engineered water courses are jurisdictional to CDFW, and notification is required for projects affecting engineered water courses.

Safe Drinking Water Act

The federal Safe Drinking Water Act (SDWA) provides regulations on drinking water quality in San Bernardino County. The SDWA gives the EPA the authority to set drinking water standards, such as the National Primary Drinking Water regulations (NPDWRs or primary standards). The NPDWRs protect drinking water quality by limiting the levels of specific contaminants that are known to occur or have the potential to occur in water and can adversely affect public health. All public water systems that provide service to 25 or more individuals are required to satisfy these standards. Water purveyors must monitor for these contaminants on fixed schedules and report to the EPA when a maximum contaminant level (MCL) has been exceeded. MCL is the maximum permissible level of a contaminant in water that is delivered to any user of a public water system. Drinking water supplies are tested for a variety of

contaminants, including organic and inorganic chemicals (e.g., minerals), substances that are known to cause cancer (e.g., carcinogens), radionuclide (e.g., uranium and radon), and microbial contaminants (e.g., coliform and *Escherichia coli*). Changes to the MCL list are typically made every three years as the EPA adds new contaminants or, based on new research or new case studies, revised MCLs for some contaminants are issued. The California Department of Health Services, Division of Drinking Water and Environmental Management, is responsible for implementation of the SDWA in California.

California Code of Regulations, Title 22, Section 60320: Water Quality, Reclaimed Water

Reclaimed water used for recharge of drinking water aquifers shall be at all times of a quality that fully protects public health (California Code of Regulations, Title 22, Section 60320). The California Department of Public Health provides recommendations for proposed groundwater recharge projects based on factors including treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time, and distance from recharge to withdrawal.

California Plumbing Code

The California Plumbing Code, California Code of Regulations Title 24 Part 5, contains requirements for septic tanks.

Town of Yucca Valley Municipal Code Chapter 8.03, Construction Site Maintenance and Trash Containment

Construction operations[1] are prohibited from allowing loose trash, rubbish or debris to accumulate or to be carried offsite by wind or water, and are required to keep trash, rubbish, and debris contained and to provide for waste collection to prevent trash containers from overfilling.

Mojave Desert Air Quality Management District Rules 403 and 403.2 (Fugitive Dust Control)

Mojave Desert Air Quality Management District (MDAQMD) Rules 403 and 403.2 describe requirements limiting dust that may be emitted from construction, grading, excavation, and clearing of land, and that crosses a property line. Rule 403 requirements include that every reasonable precaution be taken to minimize fugitive dust emissions from wrecking, excavation, grading, and clearing of land. Rule 403 applies to all of the MDAQMD spanning Imperial County, most of San Bernardino County, and parts of Riverside, Los Angeles, and Kern counties. Rule 403.2 sets forth specific requirements for dust control, including construction area watering; minimizing tracking of soil onto paved surfaces; covering loaded haul vehicles while operating on paved public roads; stabilizing graded surfaces that will be left exposed 30 days or more; and reducing nonessential earth-moving activity during high winds. Rule 403.2 applies in the Mojave Desert Planning Area of San Bernardino County, which includes the Mojave River Valley (Victor Valley and Barstow areas), Morongo Basin, and Lucerne Valley.

Flood Hazards

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 FIS and FIRM were completed and published for the Town of Yucca Valley in August 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

[1] Grading or construction operations under building or grading permits issued by the Town.

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 Town of Yucca Valley, under NFIP, has created standards and policies to ensure flood protection. These policies address development and redevelopment, compatibility of uses, required predevelopment drainage studies, compliance with discharge permits, enhancement of existing waterways, cooperation with the U.S. Army Corps of Engineers (Corps) and the San Bernardino County Flood Control District (SBCFCD) for updating, and method consistency with the RWQCB and proposed best management practices (BMP).

Town of Yucca Valley Municipal Code

Chapter 8.04: Flood Control: New construction and modifications to existing structures within special flood hazard areas in the Town of Yucca Valley are prohibited under Municipal Code Chapter 8.04, except if such construction or modification meets standards set forth in Chapter 8.04 and the Town has issued a development permit for such construction or modification. Structures to be built or substantially modified in flood hazard areas must be anchored to prevent flotation, collapse, or lateral movement; must be built of flood-resistant materials; and must be elevated above the existing grade or above the base flood elevation.

Encroachments in special flood hazard areas, including fill, new construction, substantial improvements, and other development, are prohibited under Municipal Code Chapter 8.04 unless it is demonstrated by a registered professional engineer or architect that the cumulative effect of the proposed development, when combined with all other development, will not increase the water surface elevation of the base flood more than one foot at any point within the Town of Yucca Valley.

Chapter 3.40: Development Impact Fees: The Town of Yucca Valley charges a development impact fee for construction and maintenance of general facilities, park facilities, trail facilities, storm drain facilities, and street and traffic facilities, authorized by Municipal Code Chapter 3.40. The fee amounts set by Ordinance No. 217 on October 19, 2010, are as follows:

- Single-family residential development $9,081.00 per unit
- Multifamily residential development 6,352.00 per unit
- Commercial development 7,735.00 per 1,000 square feet
- Office development 7,038.00 per 1,000 square feet
- Industrial development 3,176.00 per 1,000 square feet

The amounts of the development impact fees are amended from time to time by the Town Council.

Existing Conditions

Hydrology

Regional Drainage

The Town of Yucca Valley is at the western edge of the Mojave Desert, an arid region with hot summers, cool winters, and infrequent but potentially violent rainstorms. A watershed is the geographic area draining into a river system,

ocean, or other body of water through a single outlet and includes the receiving waters. Watersheds are usually bordered and separated from other watersheds by mountain ridges or other naturally elevated areas. As rainwater and melting snow run downhill through the watershed, they carry sediment and other materials into receiving bodies of water and groundwater. Yucca Valley is in watersheds that drain into desert basins and do not reach the ocean.

Watersheds within the Town are shown in Figure 5.8-1, *Watersheds and Streams* and are based on the National Hydrography data set provided by USGS. The majority of the Town is in the Water Canyon Watershed, which covers the central and southern portions of the Town. Drainage in this watershed flows eastward toward its lowest point—Yucca Wash at the eastern watershed boundary. The Water Canyon Watershed extends from the Sawtooth Mountains on the west to the Little San Bernardino Mountains and into Joshua Tree National Park to the south. A small portion along the Town's southeastern boundary is within the Black Rock Spring Watershed, which also flows to the Yucca Wash; and the Town of Joshua Tree Watershed, which extends eastward. The southwest corner of the Town is in the Little Morongo Creek Watershed. Drainage in this watershed is southward through the Morongo Basin. The northern portion of the Town is within four watersheds: from south to north, the Town of Joshua Tree Watershed, Joshua Cove-Coyote Lake Watershed, Moonlight Mesa Watershed, and the Flat Top-Pipes Wash Watershed. The Joshua Cove-Coyote Lake Watershed extends eastward to Coyote Lake; the Moonlight Mesa Watershed extends eastward; and the Flat Top-Pipes Wash Watershed extends northeast into Homestead Valley.

Local Surface Waters and Drainage

Precipitation in the Lucerne Valley Planning Area of the Colorado River Basin occurs mostly as rainfall, with some snowfall in the San Bernardino Mountains. Rainfall is sporadic, and amounts vary widely with location. Mean annual precipitation ranges from 16 inches in the San Bernardino Mountains to less than 3 inches in the Bristol Lake (dry) area. The average annual rainfall over the entire planning area is 5 inches. Little of the rainwater percolates into the groundwater table, and most is lost by evaporation and by evapotranspiration. Arrastre and Crystal Creeks are the most significant streams in the planning area (CRBRWQCB 2006).

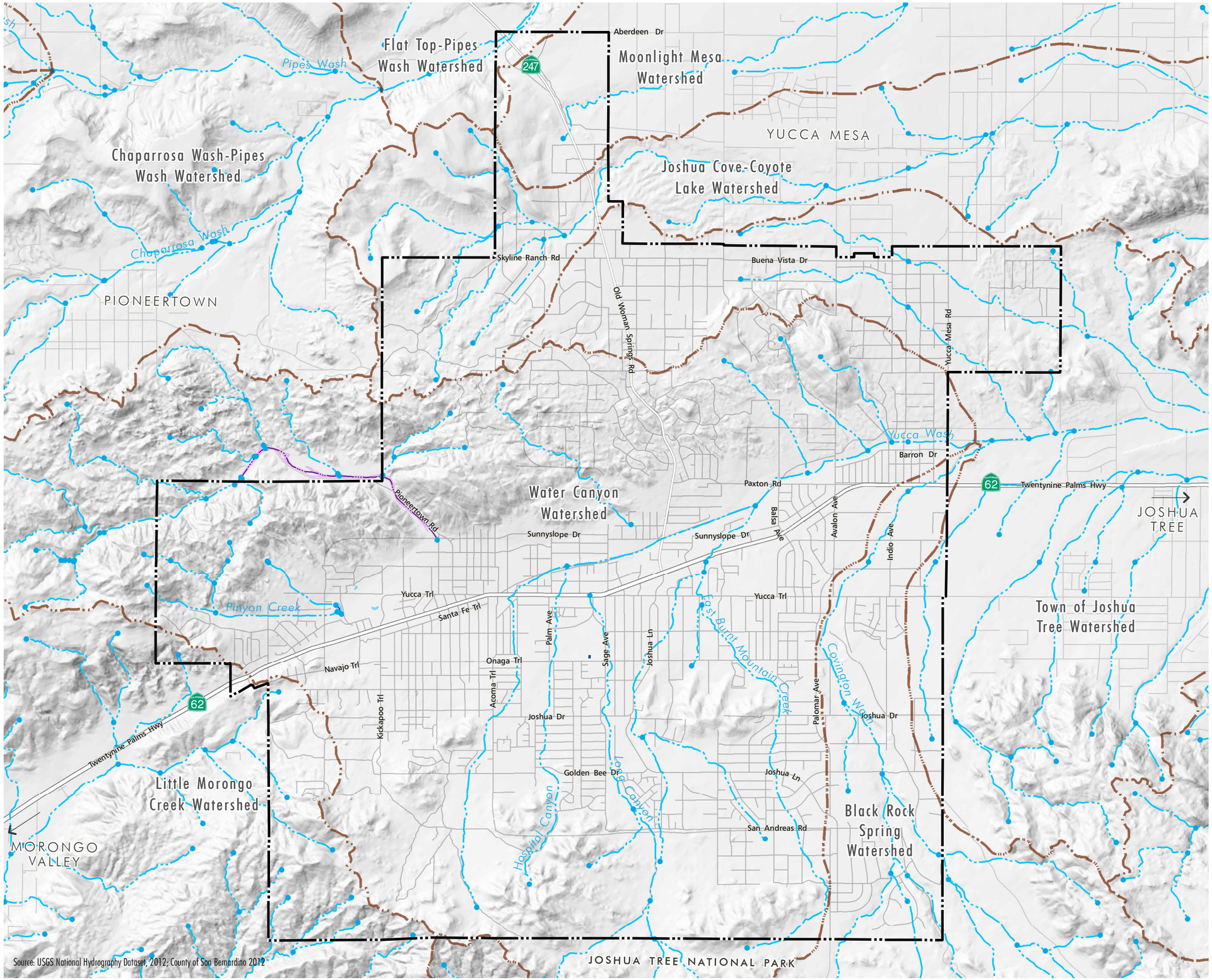
The southern part of the Town consists largely of a gently sloping alluvial plain shaped by a combination of sediments deposited by floodwaters emerging from canyons in the nearby mountains, and by past flooding of the valley's main drainage course, the Yucca Wash. North of Yucca Wash, the rugged, rocky, Sawtooth Mountains divide the southern valley from volcanic hills and sparsely populated alluvial fans in the northernmost part of the Town. The Little San Bernardino Mountains frame the Town on the south, where they exert tremendous influence on the local climate, and ultimately, on the flood hazard in Yucca Valley.

Yucca Valley has no perennial rivers or streams. When a storm arrives, the normally dry rocky canyons of the adjacent hills and mountains disperse runoff into broad desert washes or onto alluvial fans and plains—all of which are laced with a complex and dynamic drainage network that ultimately terminates in desert playas several miles to the east and northeast of the Town. Drainage channels in the local mountains are well incised; however, they lose their strong definition upon reaching the alluvial plain, where sediment-laden water is carried in shallow washes and by sheet flow. Drainage channels that are dry most of the year can quickly become dangerous torrents of water, sand, mud, and rocks, capable of transporting boulders, trees, and cars.

The valley in the southern part of the Town receives runoff from small to very large canyons in the Little San Bernardino Mountains. These canyons disperse floodwaters into numerous washes crossing the valley, including Covington Wash, East and West Burnt Mountain Creeks, Long Canyon, and Hospital Canyon, as well as smaller unnamed drainages—all having the potential to carry flash floods into the most densely populated parts of the Town. Several large drainages emerge from the southern flank of the Sawtooths as well, including Pinon Creek and Water Canyon. Runoff from mountains to the north and south of the valley is collected in the east-flowing Yucca Wash, the main drainage channel. North of the Sawtooths, stream channels also flow eastward, either passing through the gap between the Sawtooth and Bartlett Mountains to Yucca Wash, or continuing eastward north of the Bartlett Mountains.

5.8 - HYDROLOGY AND WATER QUALITY

Figure 5.8-1
WATERSHEDS AND STREAMS



Source: USGS National Hydrography Dataset, 2012; County of San Bernardino 2012

- Hydrographic Junction
- Stream / River
- Artificial Path
- Wash
- Lake / Pond
- Reservoir
- USGS NHD Watershed Boundaries
- Town Limits

YUCCA VALLEY GENERAL PLAN
DRAFT EIR

TYV-01 08.19.13

0 1,500 3,000 6,000 Feet

THE PLANNING CENTER DC&E

This page intentionally left blank.

Drainage Facilities

A significant portion of Yucca Valley encompasses alluvial fans or plains that slope down gradually from the base of the mountains. Most of these areas have at least scattered development; however, higher density development is present on the alluvial fans in the main valley, between the Sawtooth and Little San Bernardino Mountains. Most of the existing development in Yucca Valley has been completed without significant alteration to the natural terrain. As a result, natural drainage courses pass through developed or semideveloped areas. Small channels pass through private yards, and some structures are built within the flow paths of shallow drainages. Most streets, many of which are unpaved, follow the natural contours of the land, crossing arroyos and gullies without the benefit of culverts or bridges. These crossings can quickly become filled with fast-moving floodwaters, trapping vehicles or washing them downstream. Where flows are concentrated or obstructed, the sandy soils that are prevalent can easily erode, forming new gullies and undermining structures.

Development in Yucca Valley has occurred in a piecemeal fashion over the years, much of it before the Town incorporated, and without the benefit of a planned drainage network. Many existing drainage courses are unimproved, and brief but intense storms can quickly overwhelm them, pushing water and sediment over low-lying areas and making unpaved roads impassable. The number of flood control facilities in the Town is limited, and these are mostly in the lowest part of the main valley along Yucca Wash. Some of these improvements have been made under the direction of the SBCFCD, and others have been constructed by developers as a condition of approval for their projects.

Regional Facilities. The SBCFCD operates and maintains regional flood control facilities along Yucca Wash and small portions of several tributaries, including Old Woman Springs Creek, Covington Wash, Burnt Mountain Creek, Long Canyon, High School Canyon, Hospital Canyon, and Church Street. These improvements consist mostly of open, graded earth channels, locally with rock reinforcements. Levees are present along the eastern portion of the Yucca Wash and Burnt Creek channels. Desilting basins are present in Long Canyon and Old Woman Springs Creek (see Figure 5.8-2, *Regional Drainage Facilities*).

Local Facilities. The Town of Yucca Valley has the responsibility of maintaining local flood control improvements. These mostly consist of small unlined earth channels, although some sections are locally lined with concrete or have some form of slope protection. Some streets are constructed with high curbs, so that they function as flood control channels during storms.

Groundwater

Yucca Valley overlies three groundwater basins: from south to north the Warren, Copper Mountain Valley, and Ames Valley basins (see Figure 5.8-3, *Groundwater Basins*). Groundwater is stored principally in the unconsolidated alluvium. Except for areas near some of the dry lakes, groundwater is unconfined. Groundwater flow follows the general gradient of the land surface except in areas of heavy extraction and where subsurface flow may be affected by faults (CRBRWQCB 2006).

- *Warren Groundwater Basin*. The Warren Valley Basin covers an area of approximately 26.9 square miles and includes the water-bearing sediments beneath the Town of Yucca Valley and the surrounding area. The Warren Valley Basin is bounded on the north by the Pinto Mountain fault, on the south by the bedrock outcrop of the Little San Bernardino Mountains, on the east by a bedrock constriction called the "Yucca Barrier," and on the west by a bedrock constriction and a topographic divide between the Warren Valley and Morongo Valley. The Warren Valley Basin has an estimated total storage capacity of approximately 568,000 acre-feet (af), with an estimated usable storage capacity of approximately 160,000 af. Groundwater production from the Warren Groundwater Basin is regulated under a 1977 Superior Court judgment,[2] the

[2] *Hi-Desert County Water District v. Yucca Water Company, Ltd.*, San Bernardino County Superior Court Case No. 172103.

1991 Warren Valley Basin Management Plan, and its 1996 Addendum, issued because of the Court judgment. The Warren Groundwater Basin is recharged by percolation of rainfall and of ephemeral flows in Water Canyon and Covington Canyon; return flows from septic systems and irrigation; and water imported from the State Water Project (SWP), which began in 1995, at three percolation ponds operated by the Hi-Desert Water District (HDWD). Since recharge with SWP water began, groundwater levels in the Warren Basin have risen substantially. Of the 15 of 17 Warren Basin wells for which data are available, groundwater levels rose an average of 151 feet between the 1992–93 and 2011–12 water years (HDWD 2012a).

- *Copper Mountain Valley Groundwater Basin*. This basin covers 47.4 square miles, is approximately one mile north of the town of Joshua Tree, and includes the water-bearing sediments below and adjacent to Coyote Lake (dry). The northern boundary of the basin is coincident with the surface drainage divide between this basin and the Ames Valley Groundwater Basin. The southern boundary of the basin is the Pinto Mountain fault. The contact of alluvium with consolidated rocks forming Copper Mountain and the San Bernardino Mountains mark the east and west boundaries, respectively. Groundwater in storage is estimated to be a minimum of 940,000 af; there is no current estimate of groundwater storage capacity in this basin (DWR 2004). The Copper Mountain Valley Groundwater Basin is managed under a groundwater management plan adopted in 1996 by the Joshua Basin Water District (Kennedy-Jenks 2011b).

- *Ames Valley Groundwater Basin*. This groundwater basin underlies Ames Valley, Homestead Valley, and Pipes Wash in south-central San Bernardino County. The basin is bounded by nonwater-bearing rocks of the San Bernardino Mountains on the west, of Iron Ridge on the north, and of Hidalgo Mountain on the northeast. The Emerson, Copper Mountain, and West Calico faults form parts of the eastern and northern boundaries. The southern boundary and parts of the northern and eastern boundaries lie along surface drainage divides. The valley is drained northeastward by Pipes Wash to Emerson Lake (dry). Total storage capacity was estimated to be 1,200,000 af in 1975, and groundwater in storage was estimated at 540,000 af in 1972 (DWR 2004b). The Ames Valley Groundwater Basin is managed under a regional water management plan issued in 2004 by the Mojave Water Agency. An Ames Valley Recharge Project, under construction and expected to begin operating by the end of 2013, will intentionally recharge the Ames Valley Basin with imported water from the State Water Project.

Water Quality

Surface Water Quality

Beneficial uses are the ways that water can be used for the benefit of people and/or wildlife. Rivers and streams are divided into segments, or "reaches," for the purposes of designating beneficial uses and listing pollutants impacting those water bodies. Under Section 303(d) of the CWA, states are required to identify water bodies that do not meet their water quality standards. Once a water body has been listed as impaired, a total maximum daily load (TMDL) for the constituent of concern (pollutant) must be developed for that water body. A TMDL is an estimate of the daily load of pollutants that a water body may receive from point sources, nonpoint sources, and natural background conditions (including an appropriate margin of safety) without exceeding its water quality standard. Those facilities and activities that are discharging into the water body, collectively, must not exceed the TMDL. No water courses in the Town of Yucca Valley are listed on the 2010 List of Water Quality Limited Segments issued by the EPA pursuant to Section 303(d) of the federal Clean Water Act.

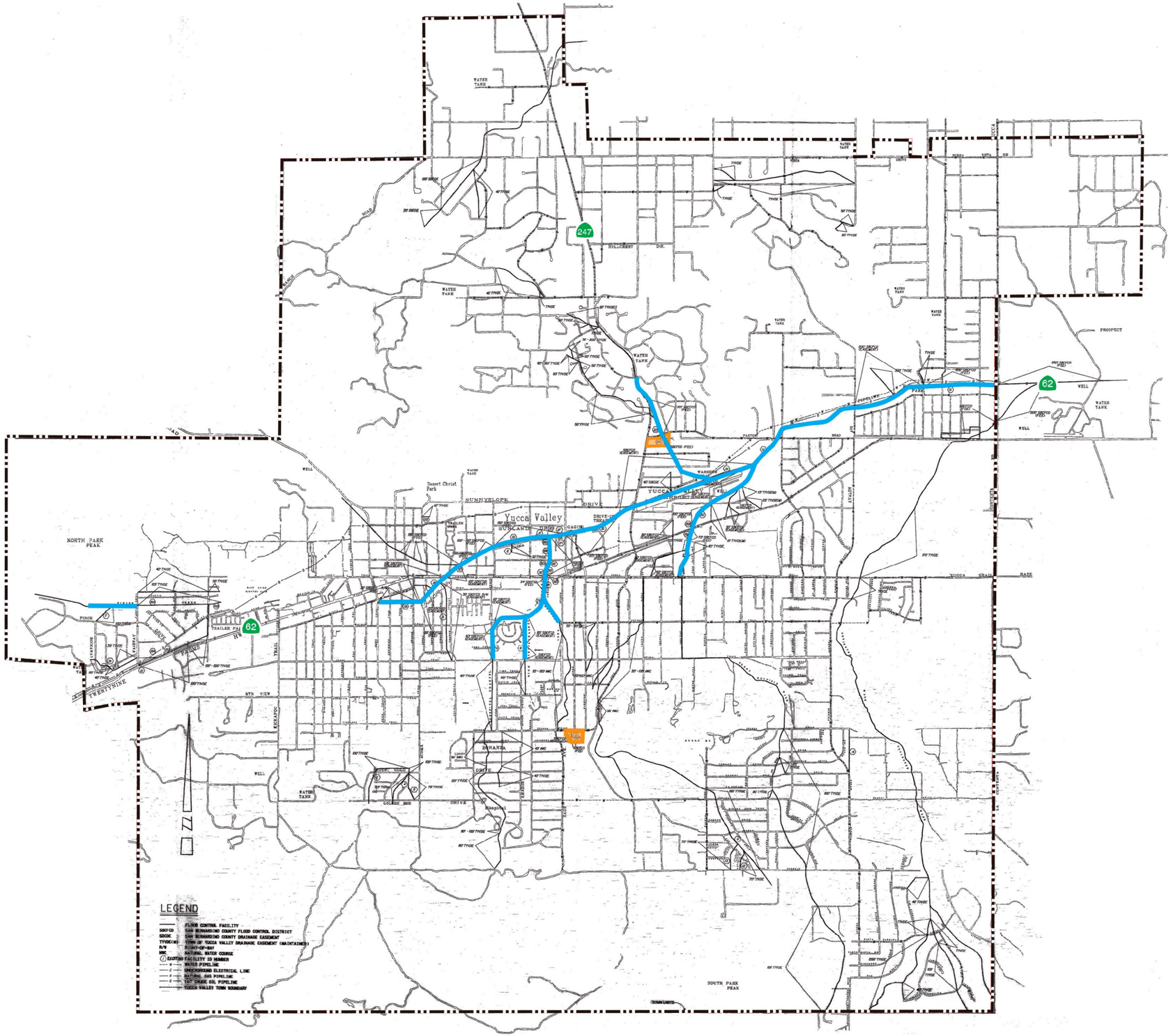
Groundwater Quality

HDWD currently obtains its groundwater from 13 active wells—12 wells from the Warren Valley Basin and 1 well from the Ames Valley Groundwater Basin. All of the district's production wells currently satisfy all applicable MCLs. With the exception of arsenic levels that intermittently exceed the running annual average for MCL compliance in 2 wells, all water from both the Warren Valley Basin and the Ames Valley Basin meets all federal and state drinking water regulations.

5.8 - HYDROLOGY AND WATER QUALITY

Figure 5.8-2

REGIONAL DRAINAGE FACILITIES



Town Limits

Regional Drainage Facilities

Debris Basin

YUCCA VALLEY GENERAL PLAN

DRAFT EIR

TYV-01 08.26.13

0 0.5 1 Miles

THE PLANNING CENTER DC&E

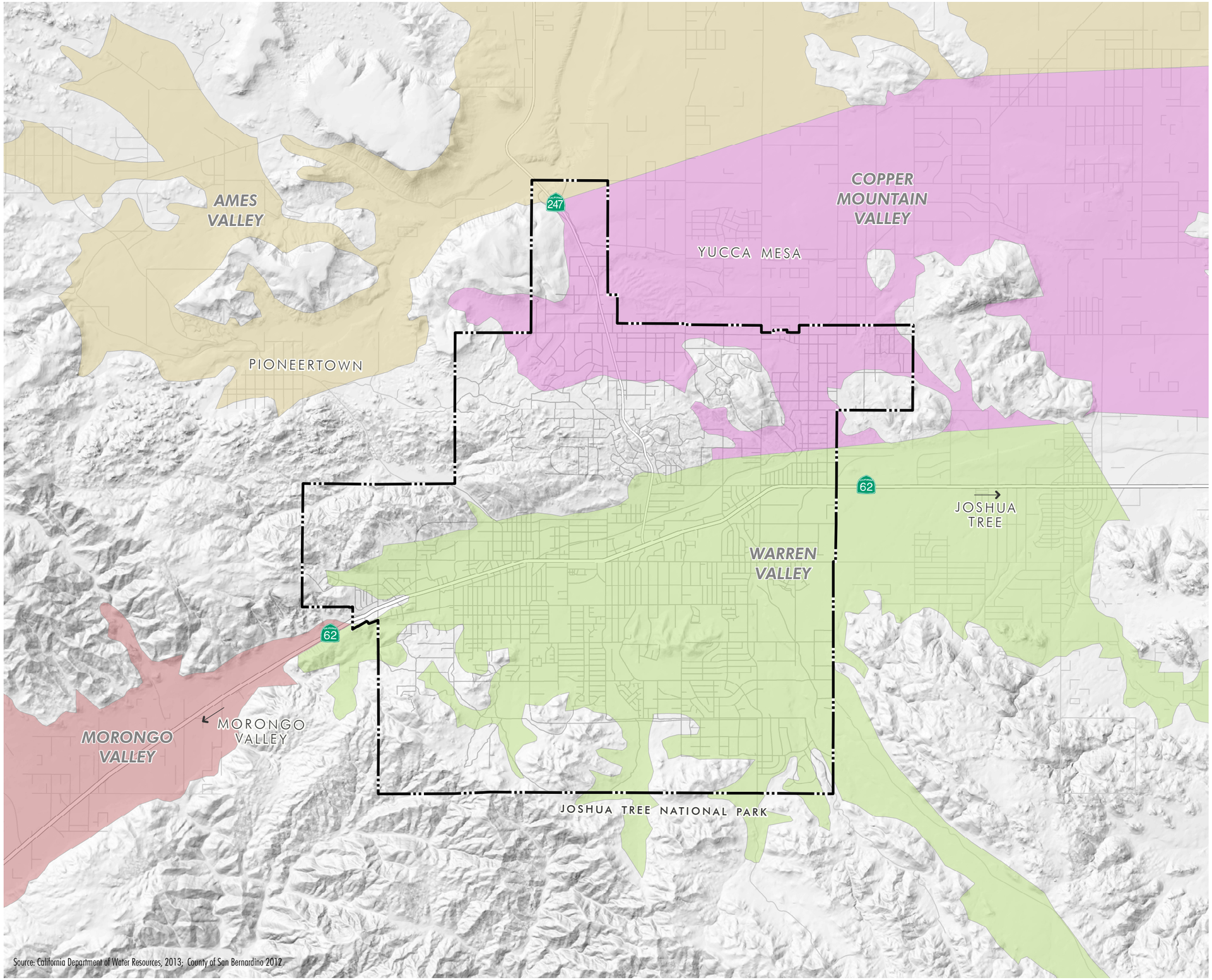
Source: Tettemer & Associates, Inc. 1999, June. Town of Yucca Valley Master Plan of Drainage.

This page intentionally left blank.

5.8 - HYDROLOGY AND WATER QUALITY

Figure 5.8-3

GROUNDWATER BASINS



Source: California Department of Water Resources, 2013; County of San Bernardino 2012.

- AMES VALLEY
- COPPER MOUNTAIN VALLEY
- MORONGO VALLEY
- WARREN VALLEY
- Town Limits

YUCCA VALLEY GENERAL PLAN

DRAFT EIR

TYV-01 04.30.13

0 2,250 4,500 9,000 Feet

THE PLANNING CENTER DC&E

This page intentionally left blank.

Groundwater within the Copper Mountain Valley Basin is of relatively high quality and meets all federal and state standards for drinking water (DWR 2004a). Water produced from the Ames Valley Basin by the HDWD meets all federal and state drinking water regulations. However, in the Warren Valley Basin there are two pollutants that exceed or intermittently exceed the MCL: arsenic and nitrate:

- **Arsenic:** Two of the district's wells that extract water from the lower aquifer portions of the Warren Valley Basin intermittently exceed the MCL for arsenic. One of these wells has been taken off-line pending a solution to reduce the amount of arsenic levels, and the other is currently being treated through a permitted blending process with two low arsenic concentration wells. The current MCL for arsenic is 10 parts per billion (ppb). Arsenic levels within the two wells of concern have been detected as high as 13 ppb and as low as 2 ppb. Both wells produce less than 250 gallons per minute (gpm) and are not considered critical production wells.

- **Nitrate:** The detected amount of nitrate in the district's groundwater, 12.8 parts per million (ppm), was well within the EPA MCL of 45 ppm. However, the CRBRWQCB has concluded that concentrations of nitrate in the Warren Valley Groundwater Basin may be inconsistent with the water quality objectives established by the Water Board. Partially treated wastewater, or septage, in septic tanks was identified as the primary source of nitrate to the groundwater system in 2003 by the US Geological Survey. Increasing groundwater use caused the groundwater level to drop over 300 feet between the 1940s and 1995, when recharge of the basin with imported SWP water began. During that time, groundwater levels dropped faster than nitrates from septic systems moved downward. However, groundwater levels in HDWD Warren Valley Basin wells have risen an average of 151 feet between the 1992–93 and 2011–12 water years. High levels of nitrates from septic systems were found in some wells after recharge with SWP water began. An estimated 880 af of septic discharge currently reaches the groundwater annually (HDWD 2012b).

Because the Warren Valley Basin has elevated nitrates due to septic discharge, in 2011 the CRBRWQCB prohibited discharge from septic systems in areas of the Town of Yucca Valley shown on Figure 5.8-4, *Wastewater Treatment Project Phasing Map*. The prohibition will be phased, with areas of the Town prohibited from discharging beginning in 2016, 2019, and 2022. A small fraction of the Phase I area may be deferred to Phase II to keep Phase I cost closer to the original estimate (Ban 2013). A wastewater treatment and water reclamation system that would collect, treat, and reclaim wastewater in a majority of Yucca Valley is currently being developed. The system, which is projected to begin construction in 2016, includes a sewer collection system, a wastewater treatment plant, and water reclamation recharge ponds.

Other pollutants of concern include hexavalent chromium. Total hexavalent chromium concentration of 3.6 ppb (with a range of between 1.2 and 7.7 ppb) were reported in drinking water by the HDWD in 2009. These concentrations are significantly below the maximum contaminant level of 50 ppb for total chromium. In December 2010, however, the California Office of Environmental Health Hazard Assessment proposed a Public Health Goal for hexavalent chromium of 0.02 µg/L, with a maximum contaminant level for hexavalent chromium (independent of total chromium) expected to be established in the near future. This means that the hexavalent chromium levels in groundwater in Yucca Valley (and many other jurisdictions in the region) exceed this value.

No known hazardous materials releases affecting groundwater were identified in Chapter 5, *Hazardous Materials Management*. One Superfund site is located in Yucca Valley: La Contessa Middle School at 7050 La Contessa Road. A one-time release of mercury was removed from the site in 2007. Ten leaking underground storage tank (LUST) cases in Yucca Valley were identified in the technical background report. All cases affect soil only, and none of the cases affect groundwater; all 10 cases have been closed by the CRBRWQCB.

Flood Hazards

Floods on alluvial fans have characteristics that are significantly different from those caused by river flooding. Although typically shallow in depth, flows can strike with little warning, travel at very high speeds, and carry tremendous amounts of sediment and debris. FEMA defines an active alluvial fan flood hazard based on three related criteria: 1) unpredictable flow paths; 2) abrupt deposition and erosion; and 3) an environment where the combination of sediment availability, slope, and topography creates an ultrahazardous condition. The active portions of the fan generally have shallow, braided stream channels and sparse vegetation. FEMA also defines an inactive alluvial fan surface as one that has relatively stable flow paths and a low level of sedimentation/erosion such that it does not cause instability in the established flow paths. Inactive surfaces usually have some soil development as well as incised, typically single-strand channels that behave more like rivers during floods. At their downstream margins, fans merge with the flatter topography of the valley floor.

Alluvial fans, including those in Yucca Valley, are highly diverse because of variations in geology, vegetation, topography of the source area, climate, tectonism (fault movements), and land uses. A particular fan may show characteristics of both active and inactive processes, especially if it has been modified by man-made structures. Therefore, it is generally not reasonable to assume that the flood risk on a fan surface is uniform. Furthermore, these characteristics make realistic assessments of flood risk and development of reliable mitigation measures particularly challenging.

Designated Flood Zones

There are 100-year flood zones in the Town along Pinyon Creek, Water Creek, Yucca Wash, Hospital Canyon, Long Canyon, West and East Burnt Mountain Creeks, Covington Wash, as well as a few other drainages (see Figure 5.8-5, *Flood Hazard Zones*).

Seismically Induced Dam Inundation

There are no dams that could pose a flood hazard to Yucca Valley through dam failure.

Inundation from Aboveground Water Storage Reservoirs

Seismically induced inundation can also occur if strong ground shaking damages aboveground water tanks. If a tank is not adequately braced and baffled, sloshing water can lift a water tank off its foundation, splitting the shell, damaging the roof, and bulging the bottom of the tank (causing what is referred to as "elephant's foot"). Movement can also shear off the pipes leading to the tank, releasing water through the broken connections. New standards for design of steel water tanks were adopted in 1994 due to lessons learned from recent earthquakes. The new tank design includes flexible joints at the inlet/outlet connections to accommodate movement in any direction.

HDWD maintains 15 aboveground water tanks, with a total capacity of 12.9 million gallons. All the tanks are within the Town limits except Reservoir 33, which is to the northeast in the Yucca Mesa area. The two newest tanks were constructed in 2000 and 2003; however, many of the older tanks were constructed 20 years ago or more, before the adoption of newer earthquake design standards. Older tanks may not meet the new construction requirements for safety, lacking the flexible joints and other seismic upgrades that can help limit the damage that a failed water tank could cause to areas downstream. Some of the tanks have been retrofitted with seismic valves (see Table 5.8-1 below).

Table 5.8-1
Aboveground Water Storage Tanks in Yucca Valley

Tank No.	Capacity (millions of gallons)	Year Built	Seismic Valves
Tank 14	2.0	1983	Yes
Tank 18	1.0	1986	Yes
Section 19	0.15	1966	No
Section 23	0.15	2003	No
Section 30	0.50	1969	No
Palomar	0.98	1978	No
FWH	0.98	1978	No
Alta Loma	1.00	1977	No
Golden Bee	0.42	1988	No
Hospital	0.21	ND	No
Homestead	0.50	2000	No
Lower Fox	2.22	1992	No
Upper Fox	1.50	1992	Yes
Lower Ridge	0.01	1992	Yes
Upper Ridge	0.50	ND	Yes

ND = no data

Seiche

A seiche is a surface wave created when an inland water body is shaken, usually by an earthquake. Seiches as a result of ground shaking are unlikely to occur in Yucca Valley due to the lack of large bodies of water.

Tsunami

A tsunami is a sea wave caused by a sudden displacement of the ocean floor, most often due to earthquakes. There is no tsunami hazard in Yucca Valley due to its inland location and its elevation.

Mudflows and Debris Flows

A mudflow or debris flow is a rapidly moving slurry of water, mud, rock, vegetation and debris generated by prolonged heavy rainfall. It is especially dangerous because it can move at speeds as fast as 40 feet per second (27 miles per hour), is capable of crushing buildings, and can strike with very little warning. Canyons in the Sawtooth and Bartlett Mountains and Little San Bernardino Mountains are susceptible to mudflows, and canyons on Burnt Mountain are susceptible to small mudflows.

5.8.2 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 pre-existing 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 storm water 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.

5.8.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

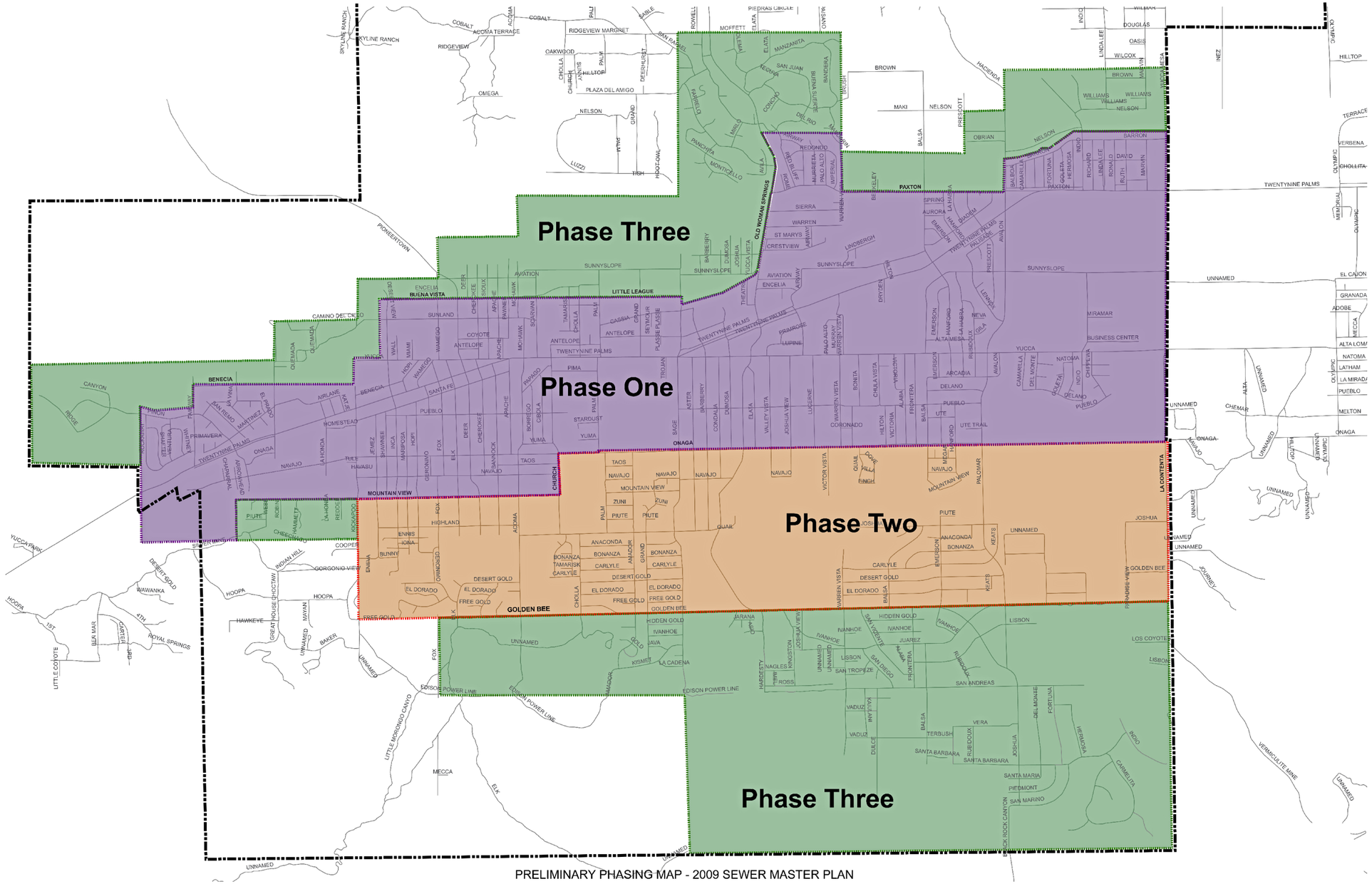
IMPACT 5.8-1: ***DEVELOPMENT PURSUANT TO THE PROPOSED GENERAL PLAN UPDATE WOULD INCREASE SURFACE WATER FLOWS INTO DRAINAGE SYSTEMS WITHIN THE AFFECTED WATERSHEDS AS RESULT OF AN INCREASE IN IMPERVIOUS SURFACES IN THE TOWN. HOWEVER, THE TOWN WOULD NOT DEVELOP IN A MANNER THAT WOULD INCREASE FLOODING ON- OR OFFSITE. [THRESHOLDS HYD-4 AND HYD-5]***

Impact Analysis: At buildout of the General Plan Update, 98.5 percent of the Town's 25,492 acres (25,106 acres) would be designated for some type of developed land use, and the remaining 386 acres would be designated for open space conservation. Currently, 65.4 percent of the Town (16,661 acres) consists of vacant land. Therefore, General Plan Update implementation would involve development of 16,275 acres of currently vacant land. Buildout of the proposed General Plan Update would increase the amount of impervious surfaces in the Town, thus increasing surface water flows into drainage systems within the watersheds in the Town. Excess flows in these drainages as a result of development has the potential to result in flooding.

To minimize flooding in the Town, 47 flood control improvements were proposed in the 1999 Master Plan of Drainage, including 27 drainage channels or channel segments, 6 detention basins, 2 storm drains, and a levee (Tettemer 1999). Existing flood control facilities in the Town are described above in Section 5.8-1. Implementation of the Master Plan of Drainage would minimize flood hazards in the Town. Furthermore, the General Plan Update includes several policies and implementation actions to reduce flooding, including Policies S 3-1 through S 3-11 and Implementation Actions S 10 through S 17. Specifically, Implementation Action S 10 requires developers to provide onsite retention of stormwater at a minimum of 10 percent above the incremental increase from preproject conditions. This is enforced through the development review process and routine site inspection. With adherence to the Town's standard conditions and development of the Master Plan of Drainage, impacts from an increase in impervious surfaces within the Town would be minimized.

Figure 5.8-4

WASTEWATER TREATMENT PROJECT PHASING MAP



Source: MWH 2009

YUCCA VALLEY GENERAL PLAN
DRAFT EIR

TYV-01 08.26.13

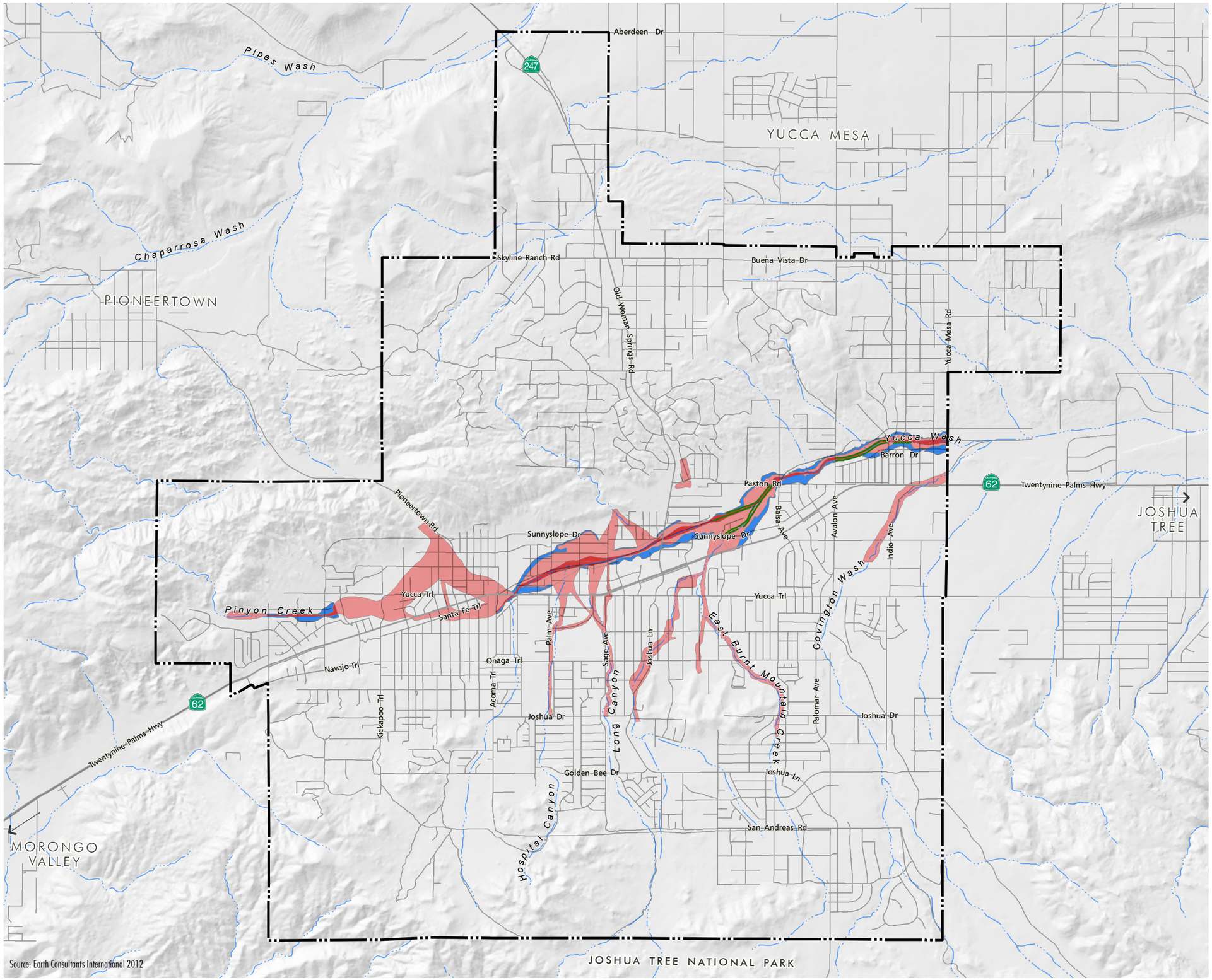
0 0.25 0.5 MILES

THE PLANNING CENTER DC&E

This page intentionally left blank.

5.8 - HYDROLOGY AND WATER QULAITY

Figure 5.8-5
FLOOD HAZARD ZONES



Source: Earth Consultants International 2012

Floodway Zone
100 Year Flood Area
500 Year Flood Area
Levee
Town Limits

Note: This map is intended for general land use planning only. Information on this map is not sufficient to serve as a substitute for detailed studies of individual sites

YUCCA VALLEY GENERAL PLAN
DRAFT EIR

TYV-01 04.30.13

0 1,500 3,000 6,000 Feet

THE PLANNING CENTER DC&E

This page intentionally left blank.

IMPACT 5.8-2: ***DEVELOPMENT PURSUANT TO THE PROPOSED GENERAL PLAN UPDATE WOULD INCREASE THE AMOUNT OF IMPERVIOUS SURFACES IN THE TOWN OF YUCCA VALLEY. HOWEVER, GENERAL PLAN UPDATE BUILDOUT WOULD NOT SUBSTANTIALLY REDUCE GROUNDWATER RECHARGE. [THRESHOLD HYD-2]***

Impact Analysis: General Plan Update implementation would involve development of 16,275 acres of currently vacant land. Buildout of the proposed General Plan Update would increase the amount of impervious surfaces in the Town, thus decreasing the amount of rain that could percolate into the groundwater basins.

Recharge Basins

Intentional recharge of the Warren Valley Groundwater Basin is conducted at three recharge basins owned and operated by the HDWD. Approval of the proposed General Plan Update would not change or require any change in land use on the three percolation basins. A groundwater recharge system in Ames Valley using imported SWP water is under construction and is planned to begin operation by the end of 2013. Approval of the General Plan Update would not interfere with that groundwater recharge system.

Proposed Increase in Impervious Area

There are currently 8,831 acres of developed land uses in the Town. Note, however, that some of the residential development in the Town is at a density of several acres per residence; most of the land at that low density is still available for groundwater recharge from rain. It should also be noted that the Town receives nominal annual rainfall (less than five inches per year). The proposed General Plan Update designates 25,106 acres of the Town for some type of developed land use, an increase of 16,275 acres above existing conditions. However, 8,929 acres, or 35 percent of the Town's area, would have residential land uses with maximum densities of one unit per five or more acres: Hillside Residential (one unit/20 acres), RL-10 (one unit/10 acres), and RL-5 (one unit/five acres). Thus, substantial portions of land within land use designations that would comprise slightly more than one-third of the Town would remain available for groundwater recharge at General Plan Update buildout.

Aside from imported SWP supplies, most other groundwater recharge is from septic and irrigation return flows (Kennedy-Jenks 2011). Natural recharge within the Warren Valley Groundwater Basin occurs through percolation of rainfall and of ephemeral flows in Water Canyon and Covington Canyon. Natural recharge within the Warren Valley Groundwater Basin is estimated as 49 afy (HDWD 2012a), compared to 2,569 af recharge with SWP water and 820 af septic and irrigation return flows in 2010 (Kennedy-Jenks 2011). Therefore, increasing the amount of impervious areas in the Town would not substantially reduce groundwater recharge.

Planned Wastewater Treatment System and Ensuing Groundwater Recharge

The first phase of the Town's planned wastewater treatment system is under construction. When all three phases of the wastewater collection and treatment system are completed (planned for 2022), most of the northern and central parts of the Warren Valley Groundwater Basin will dispose of wastewater through sewers rather than through septic tanks (see Figures 5.8-3 and 5.8-4). Septic returns to the Warren Valley Groundwater Basin will be greatly reduced by 2022 compared to current conditions. Treated wastewater would be recharged into the Warren Valley Groundwater Basin. Treated wastewater production by the treatment facility is forecast to be 1,863 afy in 2020 and to increase to 2,876 afy in 2035, compared to 820 afy of estimated septic and irrigation returns in 2010 (Kennedy-Jenks 2011). Thus, reducing use of septic systems in Yucca Valley in favor of the planned wastewater treatment and water reclamation system is not expected to reduce groundwater recharge into the Warren Valley Groundwater Basin and would improve water quality in this groundwater basin.

IMPACT 5.8-3: ***PORTIONS OF THE TOWN PROPOSED FOR DEVELOPMENT ARE WITHIN A 100-YEAR FLOOD HAZARD AREA. DEVELOPMENTS AND REDEVELOPMENTS PURSUANT TO THE PROPOSED GENERAL PLAN UPDATE WOULD NOT INCREASE FLOOD HAZARDS IN THE TOWN OF YUCCA VALLEY. [THRESHOLDS HYD-7 AND HYD-8]***

Impact Analysis: Portions of the Town proposed for development are within 100-year flood hazard areas mapped on Figure 5.8-5, *Flood Hazard Zones*. One-hundred-year flood zones are located along Pinyon Creek, Water Creek, Yucca Wash, Hospital Canyon, Long Canyon, West and East Burnt Mountain Creeks, Covington Wash, and a few other drainages. Portions of Yucca Wash are a designated floodway that must be kept free of encroachment.

Future development within the 100-year flood plan must be reviewed by FEMA to determine whether or not the project meets the criteria of the National Flood Insurance Program and if revisions will be needed to the FEMA maps for the community as a result of the project's construction. Per FEMA, any proposed habitable spaces in a special flood hazard area would be required to be placed above the 100-year flood elevations. Final elevations would be verified by FEMA. Furthermore, all developments and redevelopments approved in accordance with the proposed General Plan Update would comply with provisions governing new construction, modifications of existing structures, and encroachments into special flood hazard areas set forth in Municipal Code, Chapter 8.04. Therefore, impacts related to flood zones are considered less than significant and would not subject people or structures to substantial hazards from 100-year floods.

IMPACT 5.8-4: ***DURING THE CONSTRUCTION OF PROJECTS IN ACCORDANCE WITH THE GENERAL PLAN UPDATE, THERE IS THE POTENTIAL FOR SHORT-TERM UNQUANTIFIABLE INCREASES IN POLLUTANT CONCENTRATIONS. AFTER PROJECT DEVELOPMENT, THE QUALITY OF STORM RUNOFF (SEDIMENT, NUTRIENTS, METALS, PESTICIDES, PATHOGENS, AND HYDROCARBONS) MAY BE ALTERED. [THRESHOLDS HYD-1 AND HYD-6]***

Impact Analysis: Buildout of the Town of Yucca Valley would generate pollutants during the construction and operation of projects in accordance with the General Plan Update.

Construction

Pollutants from construction activities that can enter stormwater include sediment, metals, nutrients, soil additives, pesticides, construction chemicals, and other construction waste (CASQA 2003). The Town of Yucca Valley gets very little rainfall; the average annual rainfall over the entire Lucerne Valley Planning Area is five inches (CRBRWQCB 2006). Many of the water courses in the Town are dry washes. The Corps has identified that there are currently no Waters of the U.S. within the Town because the most prominent water course in the Town, the Yucca Valley Creek, is classified as an intermittent desert stream.[3] If a jurisdictional determination has been made that the project does not discharge to federal waters, then no enrollment under the General Construction Permit is necessary and no water quality impacts are considered to occur. Furthermore, grading or construction operations under Town grading or construction permits are prohibited from allowing loose trash, rubbish, or debris to accumulate or to be carried offsite by wind or water; are required to keep trash, rubbish, and debris contained; and are required to provide for waste collection to prevent trash containers from overfilling, by Town Municipal Code Chapter 8.03, *Construction Site Maintenance and Trash Containment*. Construction, grading, excavation, and land clearing operations are required to use measures to minimize wind erosion under MDAQMD Rules 403 and 403.2. Grading and construction activities pursuant to the General Plan Update would comply with existing laws and regulations aimed at minimizing or eliminating pollution of stormwater with trash and debris and pollution of air and water by dust.

[3] Waters of the United States include waters used, or potentially usable, in interstate or foreign commerce; interstate waters including interstate wetlands; waters—including intermittent waters—and wetlands, the destruction of which could affect interstate or foreign commerce; tributaries to waters identified above; and wetlands adjacent to waters identified above (Code of Federal Regulations, Title 33, Section 328.3). The Corps determination is reviewed every five years.

Project Design and Project Operation

Pollutants from the postconstruction phases of projects include sediment, metals, nutrients, pesticides, and hydrocarbons. SWRCB Order No. 2013-0001 DWQ, effective July 1, 2013, for small MS4s does not apply because the Town does not currently exceed a population density of 1,000 persons per square mile. However, the Town would have a population density of 1,000 persons per square mile when its population reaches 39,831 persons. The Southern California Association of Governments 2035 population forecast for Yucca Valley is 26,200. Assuming that is correct, Yucca Valley would reach the threshold population density for coverage under the small MS4 Permit well after 2035. At General Plan buildout, the Town would have a forecast population of 64,565, well over the threshold population, and the requirements under this Statewide General Permit for small MS4s would apply. The CRBRWQCB may designate the Town's MS4 system a regulated small MS4 before the Town reaches the threshold population. Such designation would be based on the potential for the Town's MS4 discharges to exceed water quality standards, including impairment of designated uses, or for other significant water quality impacts, including habitat and biological impacts.

At buildout, the Town would be required to implement the Statewide General Permit for Small MS4s. This would include a requirement for land use projects subject to the permit to prepare a site-specific WQMP that identifies BMPs for pollutants of concern. Site design for stormwater quality protection under the Statewide General Permit for small MS4s uses a three-level strategy:

1) Reduce or eliminate post-project runoff;

2) Control sources of pollutants; and, if still needed after (1) and (2),

3) Treat contaminated stormwater before discharging it into the storm drain system or into receiving waters.

There are three categories of BMPs, with each category corresponding to one of the three strategies.

- Low-impact development (LID) BMPs (site design) are intended to reduce or eliminate postproject runoff

- Source control BMPs control sources of pollutants and are divided into two types:
    - Structural source control BMPs, which are included in project design
    - Nonstructural source control BMPs, which are used during project operation

- LID/treatment control BMPs treat contaminated stormwater before the water is discharged offsite (CASQA 2003).

LID BMPs, structural source control BMPs, and treatment control BMPs would all be required in the design of projects developed once the Town reaches the threshold population density for coverage under the small MS4 Permit.

Impacts to Waters of the State

Streams and riparian habitats in the Town of Yucca Valley are Waters of the State regulated by the CDFW under California Fish and Game Code Sections 1602 et seq. Alterations to the natural flow, removal of material from, or deposit of material into a stream or lake are prohibited except under a lake or streambed alteration agreement. Selected requirements for notifications of lake or streambed alterations are described in Section 5.8.1. All development and redevelopment projects approved according to the General Plan Update would comply with Sections 1602 et seq. of the Fish and Game Code. Impacts to water bodies and riparian habitats must be identified and mitigated.

Groundwater Pollution from Sanitary Wastewater Treatment

Buildout of the proposed General Plan would add approximately 17,771 residential units, 43,283 residents, 17.4 million square feet of nonresidential land uses, and 27,387 employees in the Town of Yucca Valley, thus substantially increasing wastewater generation in the Town.

Waste discharge requirements are issued for certain individual projects by the CRBRWQCB. Properties in the Town for which waste discharge requirements have been issued include stores, a restaurant, a mobile home park, and a laundromat. Some affected properties discharge to onsite wastewater treatment plants while others discharge to septic tanks/seepage pits (CRBRWQCB 2013).

The CRBRWQCB in 2011 prohibited discharge from septic systems in the Town of Yucca Valley. The prohibition will be phased, with areas of the Town prohibited from discharging beginning in 2016, 2019, and 2022 (see Figure 5.8-4, *Wastewater Treatment Project Phasing Map*). A wastewater treatment and water reclamation system that would collect, treat, and reclaim wastewater in a majority of Yucca Valley is currently being developed. The system, which is projected to begin operation in 2016, includes a sewer collection system, a wastewater treatment plant, and water reclamation recharge ponds. Wastewater treatment, groundwater recharge with treated wastewater, and withdrawal of groundwater after recharge, would all comply with requirements in Title 22, California Code of Regulations; and recommendations of the California Department of Public Health pursuant to such regulations. Recharge of the Warren Valley Groundwater Basin with treated wastewater would have a favorable impact on groundwater quality compared to existing pollution from septic system returns.

Septic systems that would be installed in parts of the Town where they would still be permitted—that is, outside of the phased prohibited areas shown on Figure 5.8-4—would be mandated to comply with requirements for septic tanks in the California Plumbing Code, California Code of Regulations, Title 24, Part 5. Adherence to the septic tank prohibition in the areas identified in Figure 5.8-4 and compliance with the California Plumbing Code in the more rural areas would reduce impacts to groundwater quality.

IMPACT 5.8-5: BUILDOUT IN ACCORDANCE WITH THE YUCCA VALLEY GENERAL PLAN UPDATE WOULD NOT EXPOSE PEOPLE OR STRUCTURES TO RISKS ASSOCIATED WITH FAILURE OF A LEVEE. [THRESHOLD HYD-9]

Impact Analysis: Levees are present along the eastern portion of the Water Canyon Channel and along Burnt Mountain Wash. There are also planned and existing detention/debris basins in the Town that contain stormwater on a temporary basis. Implementation of the proposed General Plan could expose additional population to flood hazards. The 1999 Town of Yucca Valley Master Plan of Drainage (MPD) recommends the following improvements for Water Canyon:

- A detention/debris basin in Water Canyon along the north side of Pioneertown Road next to the west Town boundary. The basin would be sized to store the 100-year debris yield.
- Construction of Water Canyon Channel as a revetted soft-bottom channel 3,000 feet downstream from the proposed basin, then continuing downstream as a rock-lined channel.

These improvements have not yet been built. An area near the mouth of Water Canyon is designated as a FEMA 100-year flood zone (Zone A; see Figure 5.8-5, *Flood Hazards*).

Seven basins were included in the MPD: one existing basin (Old Woman Springs), an expansion to a second existing basin (Long Canyon), and five planned basins. All basins except Old Woman Springs Basin were sized to hold the debris volume from a 100-year storm. Selected characteristics of the five planned and one expanded basins are provided below.

- Water Canyon Basin: 438 af storage capacity, 126,000 cubic yards (cy) debris capacity, 35 acres.
- Kickapoo Basin: 32 af storage capacity, 26,500 cy debris capacity, 8 acres.
- Acoma Basin: 90 af storage capacity, 57,000 cy debris capacity, 10 acres.
- Long Canyon Basin (expanded): 130 af storage capacity, 108,000 cy debris capacity, 15 acres.
- East Burnt Mountain Basin: 194 af storage capacity, 39,000 cy debris capacity, 20 acres.
- West Burnt Mountain Basin: 96 af storage capacity, 50,000 cy debris capacity, 20 acres.

Based on a survey of locations of proposed facilities using Google Satellite View in May 2013, the Old Woman Springs Channel has been built both upstream and downstream of Old Woman Springs Basin. Remaining proposed facilities in the 1999 MPD have not yet been built. The six above-listed basins, given their size and storage capacity, would be under the jurisdiction of the California Division of Safety of Dams (DOSD). The DOSD would review the design and oversee the construction of the basins and would inspect the basins annually once completed.

Developments within Yucca Valley are required to pay a development impact fee for construction and maintenance of general facilities, park facilities, trail facilities, storm drain facilities, and street and traffic facilities, pursuant to Municipal Code Chapter 3.40. Future developments would pay the required development impact fee; revenue from such fee would be available to construct and maintain storm drainage facilities. After payment of development impact fees by future developments, and review and inspection of basins by DSOD during design, construction, and operations, no substantial flooding hazard would occur due to failure of levees or of detention/debris basins.

IMPACT 5.8-6: IMPLEMENTATION OF THE GENERAL PLAN UPDATE WOULD NOT CAUSE SUBSTANTIAL HAZARDS FROM FAILURE OF AN ABOVEGROUND WATER TANK. [THRESHOLD HYD-10]

Impact Analysis:

There are currently 15 aboveground water storage tanks in the Town of Yucca Valley that are owned and operated by HDWD. The HDWD provides water to over 24,000 people in the communities of Yucca Valley and Yucca Mesa. Most of the tanks are on hilltops in sparsely populated areas, but there is a remote possibility that if any of the tanks were to catastrophically fail, it would result in localized flooding in some areas of the Town.

The tanks range from 150,000 gallons to 2.2 million gallons, with a total capacity of 12.9 million gallons. All of the tanks are constructed of welded steel, except for the Hospital Reservoir, which is constructed of bolted steel. The tanks were installed between 1965 and 2010 with an average date of 1985. The newest tank, Lower Ridge Reservoir, was constructed in 2010 and is in compliance with the latest seismic standards and AWWA standards for welded steel tanks. However, some of the older tanks may lack the flexible joints and other seismic upgrades that can help limit the potential for damage to areas downstream of a failed water tank. The HDWD has a program of evaluating and retrofitting existing tanks as necessary, and all water tanks within Yucca Valley are regularly inspected.

Strong ground shaking can cause structural damage to aboveground water storage tanks if the tanks are not adequately braced and baffled. Ground movement and water inertia combine to exert stresses on the tank shell, tank foundation, anchorage of the tank to the foundation, and piping connections. A seiche, that is, the sloshing of water within the tank, also occurs with strong ground movement and can potentially lift the tank off its foundation, damage the roof, or create a bulge at the tank bottom. Movement can also shear off the inlet and outlet piping to the tank, releasing water.

In addition to the potential inundation of downslope properties, water released from these tanks can significantly reduce the water available for residential or commercial/industrial use or for fighting earthquake-induced fires. However, water from other sources, such as imported water from the State Water Project and local groundwater wells, should be able to meet the water demand of the communities served by HDWD until repairs to the tanks can be made.

During the 1994 Northridge earthquake, 40 steel water storage tanks sustained damaged, from minor damage to walkways to complete collapse of the tanks. However, the most serious damage occurred to bolted steel tanks that were constructed prior to 1972. Only one of the HDWD tanks fits these criteria—the Hospital Reservoir was constructed in 1965 of bolted steel. However, it is relatively small in size (210,000 gallons) and is on top of a hill on the southeast boundary in a sparsely populated area of the Town. If a release occurred from this tank, the nearest downslope residence is over 600 feet to the northeast, with an intervening road that would convey a portion of the released water. Buildout of the proposed General Plan Update would not cause substantial flood hazards due to failure of an aboveground water tank.

IMPACT 5.8-7: IMPLEMENTATION OF THE GENERAL PLAN UPDATE WOULD NOT CAUSE SUBSTANTIAL HAZARDS FROM MUDFLOW. [THRESHOLD HYD-10]

Impact Analysis: Canyons in the Sawtooth and Bartlett Mountains and Little San Bernardino Mountains are susceptible to mudflows, and canyons on Burnt Mountain are susceptible to small mudflows (see Figure 5.1-1, *Mountain Ranges*). Projects considered for approval in those areas pursuant to the proposed General Plan would be required to have geotechnical studies conducted for their sites. Such studies would be required to evaluate the potential for slope failure onsite, including mudflow, and to include recommendations for minimizing any identified hazards. Each project would be required to comply with recommendations in its geotechnical report. Consequently, adherence to the Town's standard conditions would minimize impacts from mudflows.

5.8.4 Relevant General Plan Policies and Implementation Actions

Safety Element

Safety Element Policies

S 3-1 Continue to improve local drainage facilities to be consistent with or complementary to the Master Plan of Drainage.

S 3-2 Seek funding for local drainage improvements to provide flood control protection, preserve natural landform, and create passive and active recreational open space amenities.

S 3-3 Continue to manage local natural and improved drainage facilities to be consistent with or complementary to the Master Plan of Drainage.

S 3-4 Collaborate with the San Bernardino County Flood Control District and other state and federal agencies to minimize flood damage.

S 3-5 Participate in regional planning efforts to monitor and regulate the use and removal of sewage disposal systems threatening the Town's groundwater basin.

S 3-6 In those locations where managed flood plains are recommended by the Master Plan of Drainage, limited to no improvements shall be allowed to control or divert the flow of flood water.

S 3-7 Require development within the 100-year flood zone to implement mitigation measures to minimize risks associated with flood hazards.

S 3-8 Collect, maintain, and make available information regarding flooding hazards to remain aware of potential hazards and serve as an educational resource for the community.

S 3-9 Actively cooperate with FEMA regarding amendments to local Flood Insurance Rate Maps, recognizing the importance of redesignation of the 100 and 500-year flood plains within the Town boundaries as facility improvements are completed.

S 3-10 Coordinate with the San Bernardino County Flood Control District to enter into multi-use agreements within flood control facilities, allowing for safe, attractive recreational facilities while maintaining the function of the drainage facilities.

S 3-11 Require new development to incorporate adequate flood mitigation, including appropriate siting of structures located within flood plains and grading that prevents adverse drainage impacts to adjacent properties through on-site retention of runoff.

Safety Element Implementation Actions

S 10 Work with the San Bernardino County Flood Control District to update and implement the Master Plan of Drainage for the near and long term protection of the community and its residents. Encourage the County to develop and include strategies to address local drainage issues unique to Yucca Valley's desert environment such as drainage over private properties in semi-developed areas and unpaved roads that cross natural drainage areas that cannot be remedied by standard measures included in the existing Master Plan and typically apply to more urbanized areas.

S 11 Continue to disseminate information on flooding, flood control on private property, floodplains, and flood preparedness to the public at Town Hall and on the Town's website.

S 12 Periodically review county, state, and federal flood control best practices and incorporate appropriate standards into the Municipal Code.

S 13 Apply for grants that provide funding for local drainage controls. Cal/EPA and the California State Water Resources Control Board both offer grants to municipalities throughout California.

S 14 Secure a Conditional Letter of Map Revision (CLOMAR) and final map amendment recognizing the re-designation of the 100-year flood plain within the Town boundaries.

S 15 Enforce on-site retention of stormwater and run-off, plus a minimum of 10% above the incremental increase, through the development review process and routine site inspections.

S 16 Communicate with FEMA regarding Flood Insurance Rate Maps.

S 17 Map areas that frequently flood to track priority places for infrastructure improvements. Use this data to apply for grant funding.

Open Space and Conservation Element

Open Space and Conservation Element Policies

OSC 5-1 Support Hi-Desert Water District efforts to promote water conservation and efficiency in existing and new development.

OSC 5-2	Protect open spaces, natural habitat, floodplains, and wetland areas that serve as groundwater recharge areas; and participate in regional transportation/flood control planning to increase groundwater recharge concurrent with flood plain management practices.
OSC 5-3	Protect groundwater recharge and groundwater quality when considering new development projects.
OSC 5-4	Participate in regional water planning efforts to protect groundwater resources and to assist the HDWD in implementation of its wastewater collection and treatment system.
OSC 5-5	Require the inclusion of erosion control measures as components of a grading plan to assure elimination of impacts to downstream property owners.
OSC 6-1	Coordinate with the Hi-Desert Water District to share information on potential groundwater contaminating sources.
OSC 6-2	Coordinate with the Hi-Desert Water District to implement the wastewater collection and treatment system.
OSC 6-3	Require low water use, drought resistant landscape planting to reduce water demand.
OSC 6-4	Require new development to incorporate Best Management Practices (BMPs) for water use and efficiency and demonstrate specific water conservation measures.
OSC 6-5	Preserve and enhance all watercourses and washes necessary for regional flood control, ground water recharge areas, and drainage for open space and appropriate recreational purposes.
OSC 6-6	Require that development and maintenance of project specific on site stormwater retention/detention basins implement and enhance ground water recharge, complement regional flood control facilities, and addresses applicable community design policies.

Open Space and Conservation Element Implementation Actions

OSC 23	Continue to support the Hi-Desert Water District's groundwater recharge program, while protecting recharge sites from potential impacts of proposed development.
OSC 24	Track data collected by HDWD's groundwater quality data monitoring program.
OSC 25	Continue to work with HDWD in the pursuit of outside financial resources to reduce the costs to property owners for wastewater system implementation.
OSC 26	Update water efficient-landscape guidelines, which address the use of drought-tolerant plant materials and irrigation standards in the Development Code in accordance with State law.
OSC 27	Provide development standards and guidelines for the construction of on-site storm water retention facilities that are consistent with community design standards and local and regional drainage plans.

5.8.5 Existing Regulations

Federal

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

State

- California Water Code Sections 13000 et seq.: Porter-Cologne Water Quality Act
- California Code of Regulations Title 24 Part 5: California Plumbing Code

Town of Yucca Valley

- Town of Yucca Valley Municipal Code Chapter 8.04, Flood Control

5.8.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: 5.8-1, 5.8-2, 5.8-3, 5.8-4, 5.8-5, 5.8-6, and 5.8-7.

5.8.7 Mitigation Measures

No significant adverse impacts were identified and no mitigation measures are necessary.

5.8.8 Level of Significance After Mitigation

With implementation of the Master Plan of Drainage and the General Plan Update policies and implementation actions, impacts to hydrology in the Town would be minimized. Furthermore, at buildout, the Town would reach the population density for coverage under the small MS4 permit, which would further reduce impacts to water quality from an increase in development within the Town. No significant impacts were identified with regard to hydrology and water quality.

5.8.9 References

Colorado River Basin Regional Water Quality Control Board (CRBRWQCB). 2013, April 15. Colorado River Basin Board Orders: Year 2013. http://www.waterboards.ca.gov/coloradoriver/board_decisions/adopted_orders/boardorders2013.shtml.

———. 2006, June. Water Quality Control Plan, Colorado River Basin–Region 7.

Department of Water Resources (DWR). 2004a, February 27. Copper Mountain Valley Groundwater Basin. http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/7-11.pdf.

———. 2004b, February 27. Ames Valley Groundwater Basin. http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/7-16.pdf.

Earth Consultants International, Inc. (ECI). 2012, September. Chapter 3: Flood Hazards. In Technical Background Report for the Safety Element, Town of Yucca Valley, California.

High Desert Water District (HDWD). 2012a, December 20. Annual Report of the Warren Valley Basin Watermaster, October 1 2011 through September 30 2012. http://www.hdwd.com/LinkClick.aspx?fileticket=0TJu0H9lTyM%3d&tabid=170&mid=811.

———. 2012b, June. Wastewater Treatment & Water Reclamation Project: Questions & Answers. http://www.hdwd.com/Portals/0/HDWD/Documents/WastewaterProject/QA_FINAL.pdf.

———. 1996, November. Addendum to the Warren Valley Basin Management Plan. http://www.hdwd.com/LinkClick.aspx?fileticket=lTKs9WCEMxM%3d&tabid=173&mid=804.

Kennedy-Jenks Consultants. 2011, June. Final 2010 Urban Water Management Plan for Hi-Desert Water District. http://www.hdwd.com/LinkClick.aspx?fileticket=dUTe%2bDg6kBQ%3d&tabid=180.

State Water Resources Control Board. 2013, February 5. Fact Sheet for NPDES General Permit And Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (Order). Order No. 2013-0001-DWQ. http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/phsii2012_5th/fs_final_sidenote.pdf.

Tettemer & Associates, Inc. 1999, June. Town of Yucca Valley Master Plan of Drainage.

United States Environmental Protection Agency (USEPA). 2012, September 26. Water Permitting 101. http://www.epa.gov/npdes/pubs/101pape.pdf.