5.3 HYDROLOGY, DRAINAGE, AND WATER QUALITY

This section analyzes potential impacts to existing drainage patterns, surface hydrology, and flood control facilities in the project area, as well as water quality conditions. Mitigation measures are recommended to avoid potential impacts or reduce impacts to a less than significant level. Information in this section is based primarily on the Master Plan of Drainage (June 1999) for the Town of Yucca Valley. The Master Plan of Drainage includes technical, hydraulic, and facility-sizing calculations for the regional, secondary, and local drainage systems.

5.3.1 EXISTING SETTING

The Yucca Valley Master Plan of Drainage (1999) was utilized in order to identify the existing conditions in the Specific Plan Area (SPA). The San Bernardino County Transportation/Flood Control Department is responsible for the management of regional drainage facilities, including rivers, major streams, and their tributaries. The Department is empowered with broad management functions, including flood control planning and construction of drainage improvements for regional flood control facilities, watershed, and watercourse protection related to those facilities.

FLOODPLAIN MAPPING

The Town is a participant in the National Flood Insurance Program (NFIP) through the Federal Emergency Management Agency (FEMA). Communities participating in the NFIP must adopt and enforce minimum floodplain management standards, including identification of flood hazards and flooding risks. Participation in the NFIP allows communities to purchase low cost insurance protection against losses from flooding. Title 8, Chapter 8.04, *Flood Control*, within the *Yucca Valley Municipal Code* was recently reenacted by Ordinance 174, Emergency Management Agency, to address the issues of public health, safety, and general welfare and to minimize public and private losses due to flood conditions in the Town.

The published Flood Insurance Rate Maps (FIRMs) for the SPA are included on Community Panel No. 06071C8855F and 06071C8860F, and illustrated in Exhibit 5.3-1, *Flood Map*. The purpose of a FIRM is to show the areas of a community located in the 100-year floodplain (an area that has a one percent or greater chance of flooding in any given year). These areas are known as Special Flood Hazard Areas (SFHAs). As illustrated in Exhibit 5.3-1, portions of the SPA are currently located in a SFHA, as recognized in the NFIP. More specifically, portions of the area are located in Zones A and AE. Zone A is the area within the 100-year floodplain that does not have base flood elevations. Zone AE is also an area within the 100-year floodplain; however, more technical information is available for this zone because base flood elevations were derived from detailed hydraulic analyses. Both zones have mandatory flood insurance purchase requirements and require special authorization from FEMA in order to alter the land or structures or construct new structures within the zones.

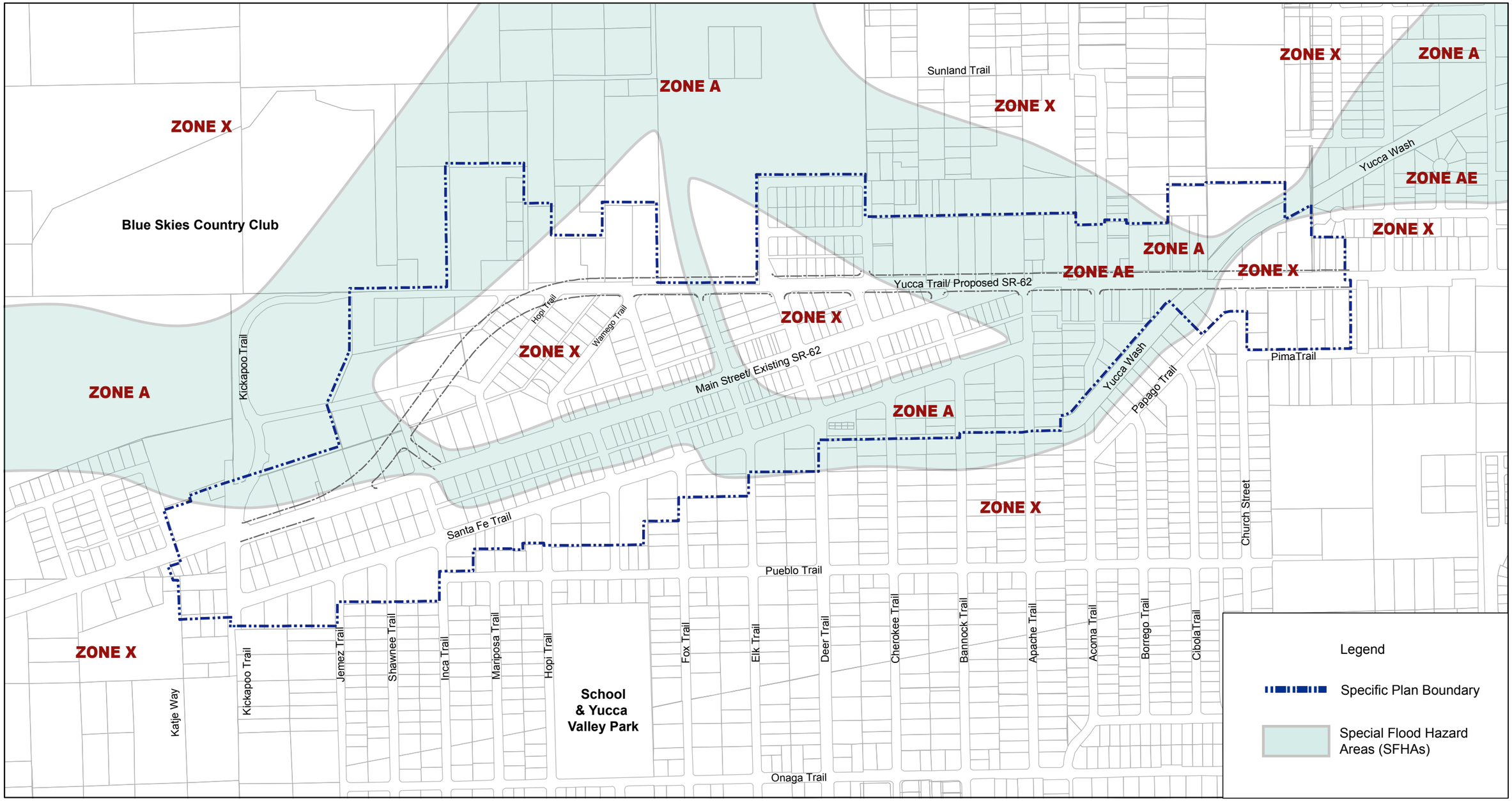
FEMA requires the property owner to complete a form request for a Letter of Map Amendment (LOMA), Conditional Letter of Map Amendment (CLOMA), Letter of Map Revision Based on Fill (LOMR-F), or Conditional Letter of Map Revision Based on Fill (CLOMR-F) for existing or proposed, single, or multiple lots/structures.

More specifically, a LOMA is a letter from FEMA stating that an existing structure or parcel of land that has not been elevated by fill (natural grade) would not be inundated by the base flood. A CLOMA is a letter from FEMA stating that a proposed structure that is not to be elevated by fill (natural grade) would not be inundated by the base flood if built as proposed. A LOMR-F is a letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the base flood. Lastly, a CLOMR-F is a letter from FEMA stating that a parcel of land or proposed structure that will be elevated by fill would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

The review is often done to the property that determines effects to the hydrologic or hydraulic characteristics of a flooding source and any resulting effects in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or the SFHA. The letter does not revise an effective NFIP map but only indicates whether a project, if built as proposed, would be recognized by FEMA. FEMA charges a fee for processing requests, which includes the cost of a review, if necessary. Because a CLOMR does not change the NFIP map, once a project has been completed, an agency must request a revision to the FIRM to reflect the project. “As-built” certification and other data must be submitted to support the revision request.

To remove an existing or proposed structure from the SFHA by the placement of fill, a LOMR-F or Letter of Map Revision (LOMR) is required according to FEMA. Fill is defined as material from any source placed to raise the ground to or above the base flood elevation BFE. Removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered placement of fill if the practice does not alter the existing (natural grade or ground) elevation, which is at or above the BFE. NFIP regulations require that the lowest adjacent grade (the lowest ground touching the structure) be at or above the BFE. To remove the entire lot and structure, both the lowest point on the lot and the lowest adjacent grade of the structure must be at or above the BFE. Additionally, the participating community must also determine that the land and any existing or proposed structures to be removed from the SFHA are “reasonably safe from flooding.”

Portions of the SPA are within Zone X, which is not a SFHA. Zone X is either in the 500-year floodplain, an area in the 100-year flood with average depth of less than one foot, or with drainage protected by levees from the 100-year flood plain. The local floodplain management regulations required by the NFIP apply only in SFHAs; properties within these areas are not held to the same regulation, nor are they required to purchase flood insurance due to low threat of flood.



SOURCE: Federal Emergency Management Agency (FEMA) Map Service Center. www.msc.fema.gov.2006

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OLD TOWN YUCCA VALLEY SPECIFIC PLAN

Floodplain Map

Exhibit 5.3-1

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EXISTING WATERSHED AND HYDROLOGY

Facilities within the Town include dikes, levees, channels, and debris and detention basins. Within the SPA, the primary existing collector is the Yucca Wash, and a trapezoidal, soft bottom, natural drainage course located in the eastern portion of the SPA. In general, the Town is subject to relatively infrequent but sometimes intense thunderstorms. According to the General Plan EIR, annual rainfall is very low, averaging less than 10 inches. Most of the rainfall occurs during the cooler months of November through March, but occasional high-intensity thunderstorms and tropical storms occur in late summer and early fall. Many existing drainage courses in the Town are unimproved and have insufficient hydraulic capacity. Therefore, intense storms result in significant quantities of water and sediment conveyed from the mountains through developed areas. Flooding of properties and sediment disposition within properties and in the streets is a common occurrence during the storm season. The SPA is primarily reliant upon street gutter capacity for drainage.

The watershed within the SPA consists of residential, industrial, commercial and civic land uses. Soils within the SPA consists of sand and silty sand with localized sandy silts stringer.[1] The drainage pattern for the SPA flows in various directions throughout the area. Refer to Exhibit 5.3-2, *Street Flow*. Generally, the portion of the project area which is west of Fox Trail drains in a northwesterly direction towards the natural drainage course that parallels Kickapoo Trail. East of Fox Trail, water flows in a southwesterly direction towards the Yucca Wash. Storm flow conveyance in the SPA generally exists on local streets and flows in the direction of the natural topography. Major drainage facilities within the area convey flows in two directions. On the eastern portion of the area, the Yucca Creek Wash generally conveys flow in a northeasterly direction, away from the SPA. On the western portion, drainage courses and street conveyance system take flows toward the Blue Skies Country Club. Refer to Exhibit 5.3-3, *Existing Drainage*.

Surface Water Hydrology Existing Conditions

The hydrologic analysis contained in the 1999 Master Plan of Drainage (MPD) was used to identify existing conditions within the SPA. The MPD discusses existing flood facilities and proposed facilities. Existing facilities within the SPA include the Yucca Wash, which begins on-site at Deer Trail, travels northeast through the project area, and continues northeast to Yucca Mesa Road. A soft bottom natural drainage course is present along Kickapoo Trail and Santa Fe Trail, from approximately Hopi Trail to Deer Trail.

Off-site, the Church Channel, located to the southeast of the SPA, serves as a tributary to the Yucca Wash.

[1] Hi-Desert Water District. Wastewater Management Plan, 1999.

Existing On-Site Facilities

YUCCA WASH (1A, 1B, 1C)

The Yucca Wash is a primary drainage facility for the Town and SPA, located in the eastern portion of the SPA. The Yucca Wash is the primary flood control facility and is a graded earth flood control channel for the majority of its length. It is a soft bottom trapezoidal channel with grade stabilizers and side slope revetment. Specifically, the portion of Yucca Creek Wash (Section 1A, 1B, and 1C) that parallels and passes through the site is classified as a Trapezoidal Earthen Channel (TEC). Refer to Table 5.3-1, *Existing Drainage Facilities*. Improvements are proposed for the western portions of the Yucca Wash and the area between Deer Trail and Apache Trail, which is within the SPA.

CHURCH CHANNEL (6)

The Church Channel is an existing TEC drainage facility tributary to the Yucca Wash. The Church Channel is located on the southeastern portion of the project area, extending south beyond the area boundaries. The local facility appears to flow north with direction of the curb flow, between Church Street and Ciboa Trail, into the existing Yucca Wash.

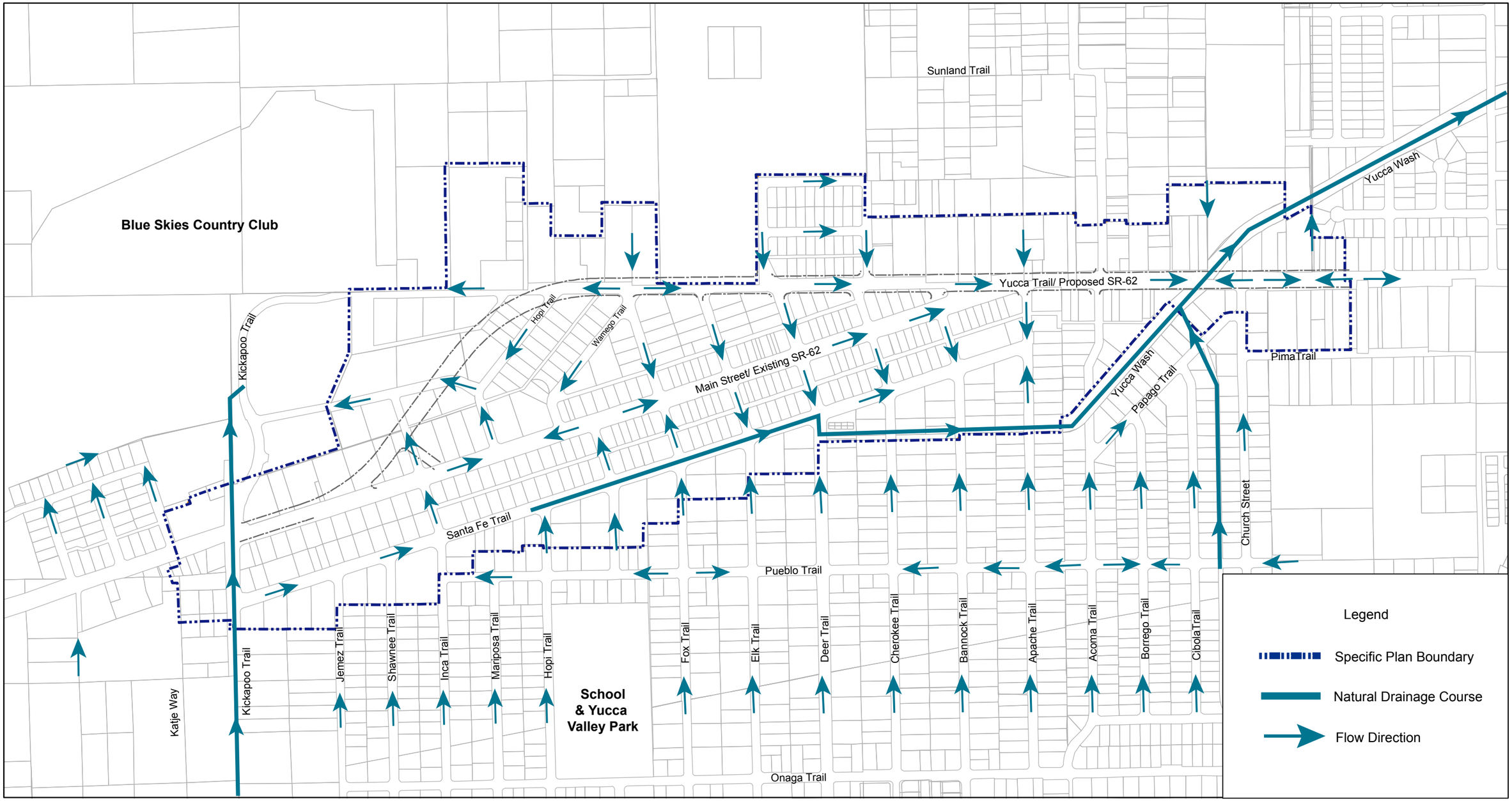
KICKAPOO TRAIL

This natural drainage course is located in the western portion of the SPA, along Kickapoo Trail, to Blue Canyon Country Club. The course flows north along the street and often ponds at the intersection of Kickapoo Trail and SR-62. The flow continues on-street until it reaches the natural drainage course, just north of Twentynine Palms Highway (existing SR-62), and continues as a natural drainage course on the eastern side of Kickapoo Trail off-site.

Table 5.3-1
Flood Control Facilities/Natural Drainage Course — Existing Conditions

Facility	ID #	Location or Reach	Type of Facility	Width (ft)	Height (ft)	Side Slope	Channel Slope	Capacity	Velocity
Yucca Wash	1A	Deer Trail to Acoma Trail	TEC*	10	3 (1.5)	2:1	0.010	106	6.4
	1B	Acoma Trail to 29 Palms Hwy.	TEC	18	7 (5.5)	1.5:1	0.011	3930	17.9
	1C	29 Palms Hwy to Palm Ave.	TEC	30	8 (8.5)	1.5:1	0.009	4166	16.1
Church Channel	6	Onega Trail to Yucca Wash	TEC	8	4 (2.5)	1.5:1	0.040	503	17.1

Source: *Town of Yucca Valley Master Plan of Drainage, 1998, Figure 3*
* TEC Trapezoidal Earthen Channel



SOURCE: Town of Yucca Valley, Master Plan of Drainage, June, 1999, Final Report.

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OLD TOWN YUCCA VALLEY SPECIFIC PLAN

Street Flow

Exhibit 5.3-2

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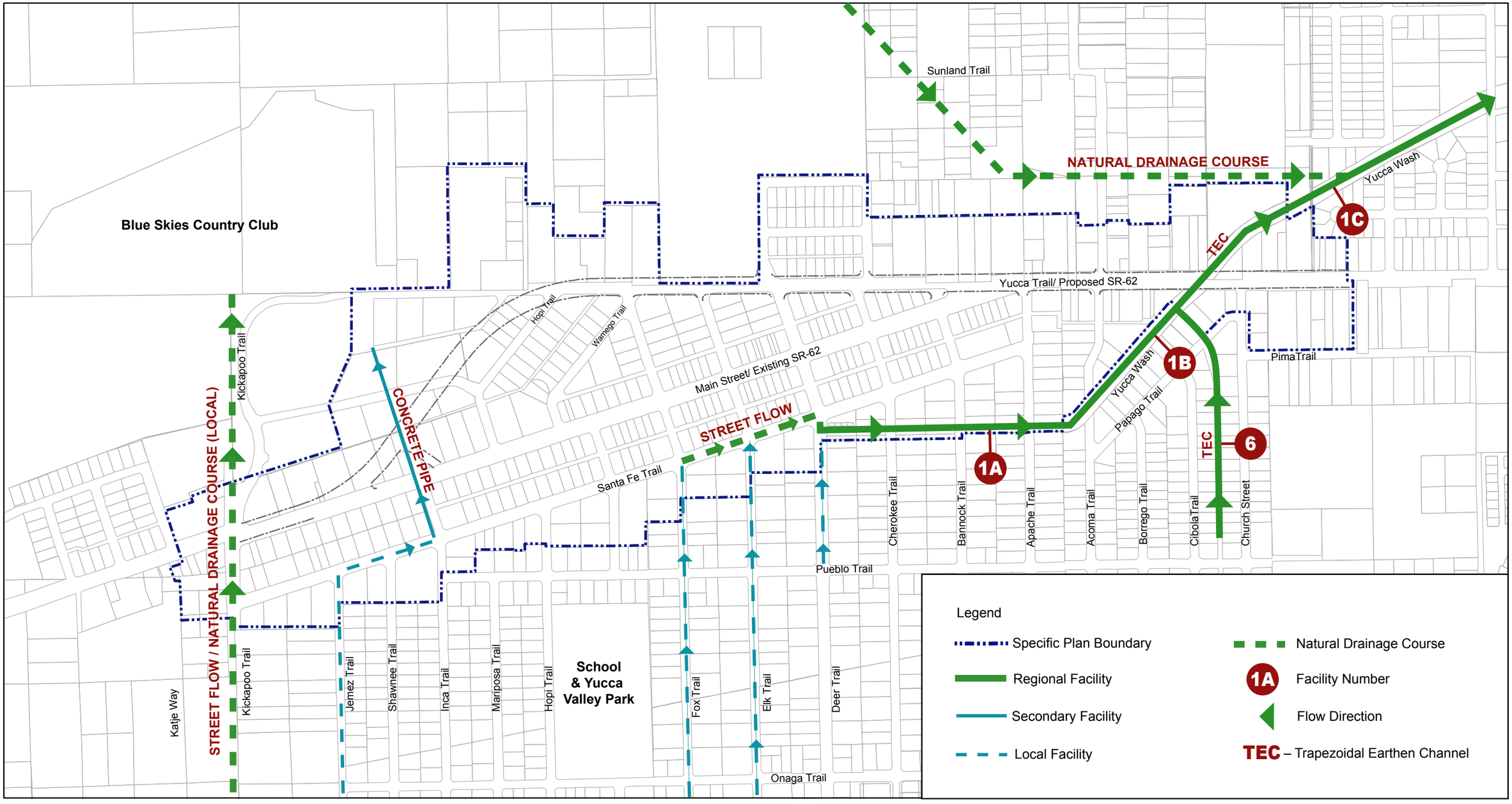

SOURCE: Town of Yucca Valley, Master Plan of Drainage, June, 1999, Final Report.

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OLD TOWN YUCCA VALLEY SPECIFIC PLAN

Existing Drainage

Exhibit 5.3-3

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SANTA FE TRAIL

This natural drainage facility currently directs storm flows along the street. The street currently uses its topographic position and the adjacent development to convey storm flows. The area is often over capacity and minor improvements are planned for this area in the MPD.

INCA TRAIL

Storm flows conveyed through street flows within Santa Fe Trail flow southwest to the intersection of Inca Trail and Santa Fe Trail. From that intersection stormwater is to be conveyed through a reinforced concrete pipe to the Blue Skies Country Club and Water Canyon Basin.

Existing Off-Site Facilities

WATER CANYON FLOOD CONTROL FACILITY

This flood control facility is located to the north of the SPA and travels southeast towards the Yucca Wash. The natural drainage facility boarders the northern area of the SPA, from Apache Trail to the Yucca Wash. Currently, this facility is a natural drainage course, and future improvements have been identified in the MPD.

Proposed Flood Control Facilities (on- and off-site)

Proposed flood control and drainage facilities located within or in close proximity to the SPA are discussed below. These proposed facilities are referenced in the Master Plan of Drainage for the Town of Yucca Valley. The proposed facilities and improvements are phased for implementation based on three set criteria:

- Threat to public safety;
- Potential property damage; and
- Development plans.

According to the MPD, the timing and location of development within the Town is largely reliant upon landowners and developers driven by the local economy. Priorities can be altered due to development agreements in certain areas. Table 5.3-2*, Recommended Priority for Proposed Facility Improvements*, lists the priority of improvements that are within or in close proximity to the SPA. This excludes the purchase of right-of-way for the facility, which would occur prior to construction and improvements.

The MPD considered one hundred and twenty-five year peak discharges, which were computed utilizing the previously approved watershed subarea delineation map, with defined flow paths. Calculations for the proposed facilities were performed for both the non-detained and detained facilities using AES computer software. Selected peak discharges resulting from the computations, which were used from sizing both non-detained and detained drainage facilities within the SPA, are summarized in Table 5.3-3*, Summary of Hydraulic Sizing Calculations-Proposed Facilities*.

Table 5.3-2
Recommended Priority for Proposed Facility Improvements

Facility Name & No.	Improvement Description	Order of Improvement
Yucca Wash (YO1)	Construct channel/improvements	1
Inca Trail / Wash Storm Drain (K01-03)	Santa Fe Street Improvements	2
La Honda Drain and Debris Control Inlet (K01-01)	Construct channel	3
Kickapoo Drain and Detention/Debris Basin (K01)	Construct storm drain	4
Acoma Channel (Y10)	Construct channel	5
Water Canyon Channel and Detention/Debris Basin (Y12)	Construct channel	6
Yucca Wash (YO1)	Construct channel/improvements	7

Source: *Master Plan of Drainage, 1999*

Table 5.3-3
Summary of Proposed Facility Capacity

Facility Name & No.	Facility location	Type of Facility	Channel Slope/ Base width/ Depth/ Sideslope Design/ Velocity (fps)	Flowrate (cfs)	
				25-yr	100-yr
Yucca Wash (YO1)	SR-62 to Water Cyn. Confl.	RRSS	0.007/30.0/ 9.3/ 2:1/9.8		1,708
	Acoma Trail to SR-62	RRSS	0.16-0.009/ 18.0/ 9.6/ 2:1/ 10.4-13.6		1,327-1680
	Deer Trail to Acoma Trail	RRSS /CLC	0.009-0.013/ 16.0/ 7.2-8.8/ 1:1-2:1/11.2-17.9		821-1,149
Local Facilities	Along Deer Trail	STF	0.035/ 26.0/ Ø/ Ø/ 8.8	102	
	Along Elk Trail (Onaga Tr. to Yucca Wash	STF	0.036/ 26.0/ Ø/ Ø / 10.6	183	
	Along Fox Trail (Onaga Tr. to Yucca Wash	STF	0.030/ 36.0/ Ø/ Ø/ 10.5	245	
Santa Fe Trail (Y01-03)	Fox Trail to Elk Trail	STF	0.010/ 36.0/ Ø/ Ø / 8.7-10.1	359-521	
La Honda drain and Debris Control Inlet (K01-01)	Chemehuevi Way to Kickapoo Drain	SBC	0.005/ 6.0/ 9.0/ 2:1/ 6.9	314	
	Ø	SBC	0.030/6.0/ 5.0/ 2:1/13.3	314	
	Ø	RCP	0.030/4.5/ Ø / Ø /24.3	314	
Inca Trail Wash Storm Drain (K01-03)	Santa Fe Tr. To Blue Skies County Club	RCP	0.039/ 4.5/ Ø/ Ø/ 26.9	314	
Kickapoo Drain and Detention/Debris Basin (K01)	Onaga Trail to La Honda Drain	RCP	0.043/ 8.0/ 6.0/ Vert./ 35.3		1,168
Water Canyon Channel and Detention/Debris Basin (Y12)	Apache Ave. to Yucca Wash	RLC	0.023/ 18.0/ 7.6/ 1.5:1/ 15.1		1,957

Source: *Master Plan of Drainage, 1999.*

cfs = cubic feet per second fps = Flow per second RCP = Reinforced Concrete Pipe SBC = Soft-Bottom Channel
RRSS = Rock Revetted Side Slopes RLC = Rock-lined Channel STF = Street Flow CLC = Concrete-Lined Channel
Ø = Information not available

YUCCA TRAIL (YO1)

Proposed improvements for the Yucca Wash within the SPA would be between Deer Trail and Apache Trail. Plans include a concrete-lined channel with improved culverts at street crossings. A concrete-lined channel is necessary for this reach because of the limited right-of-way. Some of the soft bottom reaches are being enlarged in order to convey the 100-year peak flows with freeboard as well. Improvements to the Yucca Wash and all other facilities are illustrated in Exhibit 5.3-4, *MPD Proposed Drainage Facilities* of this EIR. Improvement properties are included in Table 5.3-2, *Proposed Drainage Facilities.* Improvements for the Yucca Wash have been classified as low priority (Nos. 40-44) and include only improvements to the existing channel. No extensions or new facilities are proposed. Improvements would not require additional right-of-way or easements within the SPA.

The proposed detention basins, located off-site, would reduce the peak flow rate and debris drained into the Yucca Wash. Because of the reduction in debris to Yucca Wash, the need for grade stabilizers is required. Stabilization would be provided in several locations by existing street crossings of the wash flow line and through improved at-grade culvert crossings.

CHURCH CHANNEL (LOCAL DRAIN TRIBUTARY TO Y01)

The existing tributary to the Church Channel is to be reduced as a result of the proposed Acoma Detention/Sediment Basin and Channel (facility No. Y10). The runoff from the local area is to be carried by the existing soft bottom channel. The at-grade street crossings would provide stabilization as well as access to the channel for maintenance.

SANTA FE TRAIL (Y01-03)

This street currently uses the topographic position of the street and the adjacent development to convey storm flows. Minor improvements are planned for this area. High curbs and an inverted crown would be necessary to safely carry the peak 100-year flows. While existing debris problems would be reduced with the Kickapoo Detention/Sediment Basin, some debris removal after storms will be necessary.

DEER TRAIL, ELK TRAIL, FOX TRAIL (LOCAL FACILITIES)

These three local facilities currently consist of street flow. They are tributary to Santa Fe Trail and originate south of the SPA and flow north into the site parallel to Elk Trail, Deer Trail and Acoma Trail. The MPD indicates improvements to these streets are proposed but details are not included.

KICKAPOO DRAIN AND DETENTION/DEBRIS BASIN (K01)

This proposed facility would improve the natural drainage course, located in the western portion of the SPA along Kickapoo Trail, into a soft bottom channel. A detention/debris basin is recommended at the inlet to the drain to reduce the peak

flow rate and remove the debris. The Kickapoo Storm Drain would confluence with the La Hinda Drain and carry the flow under SR-62 and protect the development near the Blue Skies Country Club, which is located directly north of the SPA.

LA HONDA DRAIN AND DEBRIS CONTROL INLET (K01-01)

The La Honda Drain is a proposed underground storm drain recommended in the MPD. It would border the west side of the SPA, just west of Kickapoo Trail. This drain would have a debris control inlet to prevent flow from becoming obstructed. The La Honda Drain would reduce the flooding of SR-62 at the west end of the SPA. It is to provide flood protection for development near the Blue Skies Country Club. This drain would confluence with the Kickapoo Drain and discharge near the Blue Skies Country Club.

INCA TRAIL WASH STORM DRAIN (K01-03)

The Inca Storm Drain would improve flows from the west end of Santa Fe Trail under the existing SR-62. The slope on this drain would be hydraulically steep so that any debris that does not settle out in Santa Fe Trail before entering the storm drain would be transported through the drain. This storm drain would provide additional flood protection for SR-62 and the properties adjacent to Inca Trail, as well as Bencia Trail near the Blue Skies Country Club.

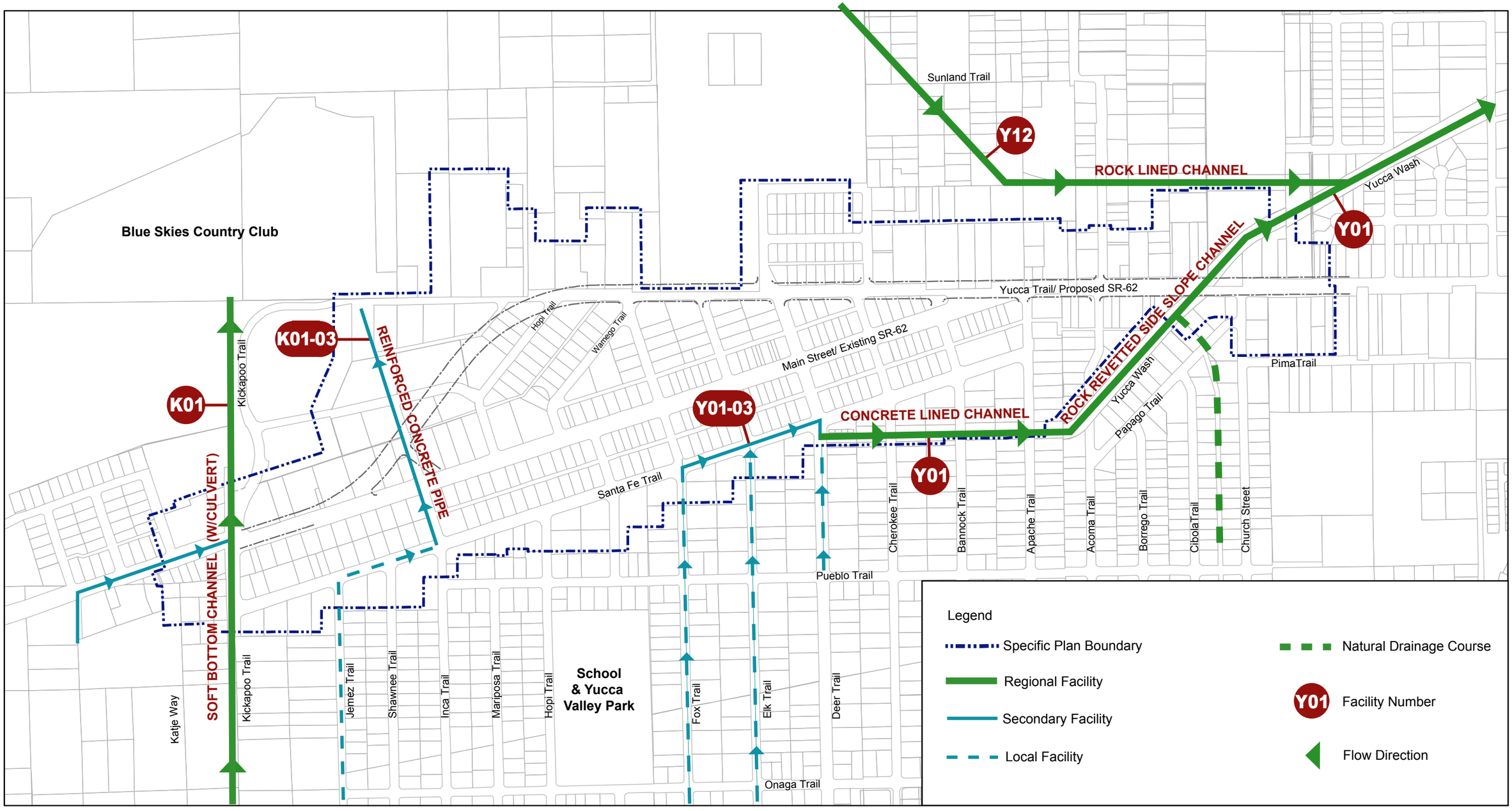
WATER CANYON CHANNEL AND DETENTION/DEBRIS BASIN (Y12)

The Water Canyon Channel would carry flows from Water Canyon, located along the northern border of the SPA, to where it drains into the Yucca Wash just outside the eastern boundary of the SPA. Water Canyon is one of the largest tributaries to Yucca Wash. A detention/debris basin at the mouth of Water Canyon, just outside of the Town limits, is recommended by the MPD. This basin would substantially reduce the peak flows from Water Canyon. The channel would be revetted soft bottom for a distance of approximately 3,000 feet downstream of the basin. From this point downstream, which includes the portions that lie along the northern border of the SPA, the channel would be rocklined.

Proposed drainage facilities are prioritized and will be completed as funds become available. Ordinance 173, *Development Impact Fees*, is applicable to drainage and hydrology facilities and would be required prior to issuance of a development permit.

STORMWATER QUALITY

Stormwater quality is a significant concern in southern California. This section discusses typical pollutants found in stormwater runoff and discusses the types of contaminants that may be found in existing stormwater runoff in the Specific Plan Area.



SOURCE: Town of Yucca Valley, Master Plan of Drainage, June, 1999, Final Report.

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OLD TOWN YUCCA VALLEY SPECIFIC PLAN

MPD Proposed Drainage Facilities

Exhibit 5.3-4

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Point Source Pollutants

Historically, point-source pollutants have consisted of industrial operations with discrete discharges to receiving waters. Over the past several decades, many industrial operations have been identified as potential sources of pollutant discharges. For this reason, many types of industrial operations require coverage under the State of California's General Industrial Permit. This permit regulates the operation of industrial facilities and monitors and reports mechanisms to ensure compliance with water quality objectives.

Industrial operations not under the General Industrial Permit's jurisdiction may still have the potential to affect the water quality of receiving waters. These industrial operations would be considered non-point-source pollutants.

Because of State regulations, industrial operations that require compliance with California's General Industrial Permit are considered to have less than significant impacts on the receiving waters' water quality.

Non-Point-Source Pollutants in Stormwater

A net effect of urbanization can be to increase pollutant export. However, an important consideration in evaluating storm water quality from the SPA is to assess whether it impairs the beneficial use to the receiving waters. Non-point-source pollutants have been characterized by the following major parameters to assist in determining and using the pertinent data. Receiving waters can assimilate a limited quantity of various constituent elements; however, there are thresholds beyond which the measured amount becomes a pollutant and results in an undesirable impact. The following background information on these standard water quality parameters provides an understanding of typical urbanization impacts.

SEDIMENT

Sediment is made up of tiny soil particles that are washed or blown into surface waters. It is the major pollutant by volume in surface water. Suspended soil particles can cause the water to look cloudy or turbid. The fine sediment particles also act as a vehicle to transport other pollutants, including nutrients, trace metals and hydrocarbons. Construction sites are typically the largest source of sediment for urban areas under development.

NUTRIENTS

Nutrients (especially phosphorous and nitrogen) are a major concern for surface water quality because they can cause algal blooms and excessive vegetative growth. Of the two, phosphorus is usually the limiting nutrient that controls the growth of algae in lakes.

The orthophosphorous form of phosphorus is readily available for plant growth. The ammonium form of nitrogen can also have severe effects on surface water quality. The ammonium is converted to nitrate and nitrite forms nitrogen in a process called nitrification; this process consumes large amounts of oxygen, which can impair the

dissolved oxygen levels in water. The nitrate form of nitrogen is very soluble and is found naturally at low levels in water. When nitrogen fertilizer is applied to lawns or other areas in excess of plant needs, nitrates can leach below the root zone, eventually reaching groundwater. Orthophosphate from auto emissions also contributes phosphorus in areas with heavy automobile traffic. As a general rule of thumb, nutrient export is greatest from development sites with the most impervious areas. Other problems resulting from excess nutrients are (1) surface algal scums, (2) water discolorations, (3) odors, (4) toxic releases, and (5) overgrowth of plants. Common measures for nutrients are total nitrogen, organic nitrogen, total Kjeldahl nitrogen (TKN), nitrate, ammonia, total phosphate, and total organic carbon (TOC).

TRACE METALS

Trace metals are primarily a concern because of their toxic effects on aquatic life and their potential to contaminate drinking water supplies. The most common trace metals found in urban runoff are lead, zinc and copper. Fallout from automobile emissions is also a major source of lead in urban areas. A large fraction of the trace metals in urban runoff are attached to sediment and this effectively reduces the amount that is immediately available for biological uptake and subsequent bioaccumulation. Metals associated with the sediment settle out rapidly and accumulate in the soils. Also, urban runoff events typically occur over a shorter duration, which reduces the aquatic environment's amount of exposure to toxics. The toxicity of trace metals in runoff varies with the hardness of the receiving water. As total hardness of the water increases, the threshold concentration levels for adverse effects increases.

OXYGEN-DEMANDING SUBSTANCES

Aquatic life is dependent on the dissolved oxygen (DO) in the water, and when organic matter is consumed by microorganisms, DO is consumed in the process. A rainfall event can deposit large quantities of oxygen-demanding substances in lakes and streams. The biochemical oxygen demand (BOD) of typical urban runoff is on the same order of magnitude as the effluent from an effective secondary wastewater treatment plant. A problem from low DO results when the rate of oxygen-demanding material exceeds the rate of replenishment. Oxygen demand is estimated by direct measure of DO and indirect measures such as BOD, chemical oxygen demand (COD), oils and greases and TOC.

BACTERIA

Bacteria levels in undiluted urban runoff exceed public health standards for water contact recreation almost without exception. Studies have found that total coliform counts exceeded EPA water quality criteria at almost every site and almost every time it rained. The coliform bacteria that are detected may not be a health risk in themselves, but are often associated with human pathogens.

OIL AND GREASE

Oil and grease contain a wide variety of hydrocarbons, some of which could be toxic to aquatic life in low concentrations. These materials initially float on water and

create the familiar rainbow-colored film. Hydrocarbons have a strong affinity for sediment and quickly become absorbed to it. The major source of hydrocarbons in urban runoff is crankcase oil and other lubricating agents that leak from automobiles. Hydrocarbon levels are highest in the runoff from parking lots, roads and service stations. Residential land uses generate less hydrocarbons export, although illegal disposal of waste oil into stormwaters can be a local problem.

Priority pollutants are generally related to hazardous wastes or toxic chemicals and can sometimes be detected in storm water. Priority pollutant scans have been conducted in previous studies of urban runoff, which evaluated the presence of over 120 toxic chemicals and compounds. The scans rarely revealed toxins that exceeded the current safety criteria. The urban runoff scans were primarily conducted in suburban areas not expected to have many sources of toxic pollutants (with the possible exception of illegally disposed or applied household hazardous wastes). Priority pollutants in stormwater are (1) phthalate (plasticizer compound), (2) phenols and creosols (wood preservatives), (3) pesticides and herbicides, (4) oils and greases and (5) metals.

Physical Characteristics of Stormwater

Standard parameters assess the quality of stormwater and provide a method of measuring impairment. The quantity of a material in the environment and its characteristics determine the degree of availability as a pollutant in surface runoff. In an urban environment, the quantity of certain pollutants in the environment is a function of the intensity of the land use. For instance, a high density of automobile traffic makes a number of potential pollutants (such as lead and hydrocarbons) more available. The availability of a material, such as a fertilizer, is a function of the quantity and the manner in which it is applied. Applying fertilizer in quantities that exceed plant needs leaves the excess nutrients available for loss to surface or groundwater.

The physical properties and chemical constituents of water traditionally have served as the primary means of monitoring and evaluating water quality. The water quality parameters for stormwater are numerous and are classified in several ways. In many cases, the concentration of an urban pollutant, rather that the annual load of that pollutant, is needed to assess a water quality problem. Common physical, chemical and biological characteristics that evaluate the quality of the surface runoff are outlined below.

DISSOLVED OXYGEN (DO)

Dissolved oxygen in the water has a pronounced effect on the aquatic organisms and the chemical reactions that occur. It is one of the most important biological water quality characteristics in the aquatic environment. The DO concentration of a water body is determined by the solubility of oxygen, which is inversely related to water temperature, pressure, and biological activity. DO is a transient property that can fluctuate rapidly in time and space, and so represents the status of the water system at a particular point and time of sampling. The decomposition of organic debris in water is a slow process and the responding changes in oxygen status are also slow.

OXYGEN DEMAND

The oxygen demand is an indication of the pollutant load and includes measurements of biochemical oxygen demand or chemical oxygen demand.

- The biochemical oxygen demand (BOD) is an index of the oxygen-demanding properties of the biodegradable material in the water. Samples are taken from the field and incubated in the laboratory at 20°C, after which the residual dissolved oxygen is measured. The BOD value commonly referenced is the standard 5-day values. These values are useful in assessing stream pollution loads and for comparison purposes.

- The chemical oxygen demand (COD) is a measure of the pollutant loading in terms of complete chemical oxidation using strong oxidizing agents. It can be determined quickly because it does not rely on slow bacteriological actions, as does BOD. COD does not necessarily provide a good index of oxygen-demanding properties in natural waters.

TOTAL DISSOLVED SOLIDS (TDS)

TDS concentration is determined by evaporation of a filtered sample to obtain residue whose weight is divided by the sample volume. The TDS of natural waters varies widely. TDS is an important indicator of water quality for several reasons:

- Dissolved solids affect the ionic bonding strength related to other pollutants such as metals in the water;

- TDS is a major determinant of aquatic habitat;

- TDS affects the saturation concentration of dissolved oxygen and influences the ability of a water body to assimilate wastes; and

- Eutrophication rates depend on TDS.

pH

The pH of water is the negative log, base 10, of the hydrogen ion (H+) activity. A pH of 7 is neutral; a pH greater than 7 indicates alkaline water; a pH less than 7 represents acidic water. In natural water, carbon dioxide (CO_2) reactions are some of the most important in establishing pH. The pH at any one time is an indication of the balance of chemical equilibrium in water and affects the availability of certain chemicals or nutrients in water for uptake by plants. The pH of water directly affects fish and other aquatic life; generally, toxic limits are pH values of less than 4.8 and greater than 9.2.

ALKALINITY

Alkalinity is the opposite of acidity, representing the capability of water to neutralize acid. Alkalinity is also linked to pH and is caused by the presence of carbonate, bicarbonate, and hydroxide, which are formed when carbon dioxide is dissolved. A

high alkalinity is associated with a high pH and excessive solids. Most streams have alkalinities of less than 200 milligrams per liter (mg/l) and alkalinity ranges of 100 – 200 mg/l seem to support well-diversified aquatic life.

SPECIFIC CONDUCTANCE

The specific conductivity of water (its ability to conduct an electric current) is related to its total dissolved ionic solids. Long-term monitoring of a Project's waters can develop a relationship between specific conductivity and TDS. Its measurement is quick and inexpensive and can be used to approximate TDS. Specific conductivities in excess of 2,000 micro-ohms per centimeter (µohms/cm) indicate a TDS level that is too high for most freshwater fish.

TURBIDITY

Turbidity is an indicator of the property of water that causes light to become scattered or absorbed. Suspended clays and other organic particles cause turbidity. The clarity of water is an important indicator of water quality that relates to the ability of photosynthetic light to penetrate. Turbidity can be used as an indicator of certain water quality constituents, such as predicting the sediment concentrations.

NITROGEN (N)

Sources of nitrogen in stormwater are from the additions of organic matter to water bodies or chemical additions. Ammonia and nitrate are important nutrients for the growth of algae and other plants. Excessive nitrogen can lead to eutrophication, because nitrification consumes dissolved oxygen in the water. Nitrogen occurs in many forms. Organic nitrogen breaks down into ammonia, which eventually becomes oxidized to nitrate-nitrogen, a form available for plants. High concentrations of nitrate-nitrogen (N/N) in water can stimulate growth of algae and other aquatic plants, but if phosphorus (P) is present, only about 0.30 mg/l of nitrate-nitrogen is needed for algal blooms. Some fish life can be affected when nitrate-nitrogen exceeds 4.2 mg/l. There are a number of ways to measure the various forms of aquatic nitrogen. Typical measurements of nitrogen are Kjeldahl nitrogen (organic nitrogen plus ammonia); ammonia; nitrite plus nitrate; nitrite; and nitrogen in plants. The principal water quality criteria for nitrogen focus on nitrate and ammonia.

PHOSPHORUS (P)

Phosphorus is an important component of organic matter. In many water bodies, phosphorus is the limiting nutrient that prevents additional biological activity from occurring. The origin of this constituent in urban stormwater discharge is generally from fertilizers and other industrial products. Orthophosphate is soluble and is considered to be the only biologically available form of phosphorus. Because phosphorus strongly associates with solid particles and is a significant part of organic material, sediments influence concentration in water and are an important component of the phosphorus cycle in streams. The primary methods of measurement are detecting orthophosphate and total phosphorus.

EXISTING STORMWATER QUALITY

The SPA lacks any measured data on stormwater runoff quality. In the absence of site-specific data, expected storm water quality can be qualitatively discussed by relating typical pollutants to specific land uses. The expected existing pollutants in the existing storm water runoff from the developed areas of the SPA and its tributary area are oil and grease from automobile use, vacant areas could add suspended solids in the stormwater runoff. Other pollutants associated with residential and commercial development include trash, nutrients, bacteria, oil and grease and household hazardous wastes.

Residential Activities and Development

Residential and urban development is often a significant source of stormwater pollution. Development and redevelopment activities have two primary effects on water quality; they are sources of erosion and sedimentation during the construction phase and they have long-term effects on runoff once the development is complete. Residential and urban development can affect water quality in three ways:

- Impervious surfaces associated with development increase the rate and volume of stormwater runoff, which increase downstream erosion potential;
- Urban activities generate dry-weather ("nuisance") flows, which may contain pollutants and/or may change the ephemeral nature of streams and the degradation of certain habitats; and
- Impervious surfaces increase the concentration of pollutants during wet weather flows.

The potential for negative water quality effects is generally correlated to the density of development and the amount of impervious area associated with development. Detached residential development has the potential to generate sediments such as nutrients and organic substances (including fertilizers), pesticides (from landscape application), trash and debris (including household hazardous waste), oxygen demand, oil and grease (from driveways and roads), and bacteria and viruses.

Municipal Activities and Development

Infrastructure and facilities (roads, streets, highways, parking facilities, storm drains and flood management facilities) present a threat to water quality. Other facilities such as parks, airfields, water treatment plants, wastewater reclamation plants, landfills and transfer centers, and corporate yards also present water quality issues. Municipalities may also own and administer areas and activities tributary to impaired water bodies and/or water quality sensitive areas that might be harmful to water quality.

Commercial, Civic and Industrial Activities and Development

Certain commercial activities have the potential to generate pollutants that can negatively affect stormwater quality. Auto repair shops in particular have the

potential to generate heavy metals, oils, toxic chemicals and other oxygen-demanding substances. In addition, restaurants have the potential to generate pollutants such as grease, trash and other oxygen-demanding substances.

Industrial activities can significantly affect water quality, depending on the type of pollutants and activity. In general, industrial activity is associated with effects on ambient water temperature, alkalinity levels of total suspended solids and oxygen demand. Certain industrial uses may entail the generation of heavy metals, nutrients, toxic chemicals and other pollutants. Industrial uses that take place indoors do not have stormwater pollutant exposure and present little threat to stormwater quality.

5.3.2 REGULATORY SETTING

This section describes the Federal, State, and local laws, ordinances, regulations and standards pertinent to hydrology, drainage and water quality.

FEDERAL AND STATE REGULATIONS

The Clean Water Act (CWA) amendments of 1987 established a framework for regulating stormwater discharges from municipal, industrial and construction activities under the National Pollutant Discharge Elimination System (NPDES) program. The primary objectives of the municipal stormwater program requirements are to:

- Effectively prohibit non-stormwater discharges; and
- Reduce the discharge of pollutants from the stormwater conveyance system to the maximum extent practicable.

For this evaluation, impacts on stormwater quality would be considered significant if the project did not attempt to address stormwater pollution to the maximum extent practical. Currently, there are no definitive water quality standards for individual pollutants. Therefore, impacts on stormwater quality would be considered less than significant if they meet requirements set by the California Regional Water Quality Control Board, Colorado River Basin Region (Region 7) and is compliant with all applicable policies and principals outlined in the Water Quality Control Plan.

Stormwater Pollution Prevention Plan (SWPPP) is a fundamental requirement of stormwater permits which are necessary as of March 10, 2003 on all construction projects that disturb one acre or more of land or whose projects disturb less than one acre, but are part of a larger common plan of development. A SWPPP:

- identifies all potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges from the construction site;
- describes practices to be used to reduce pollutants in storm water discharges from the construction site; and

- helps assure compliance with the terms and conditions of the permit (when the plan is designed for the individual site, and is fully implemented).

LOCAL REGULATIONS

Town of Yucca Valley General Plan

Program 2.B establishes regulations and guidelines for the development and maintenance of project specific on-site retention/detention basins, which enhance groundwater, recharge, and complement regional flood control facilities. Any future detention basin would need to comply with the applicable guidelines developed as part of the program identified in the Town's Water Resources Element.

Standard Conditions and Uniform Codes

Ordinance 173, *Development Impact Fee,* which has been passed by the Town Council and will be added to Title 3, Section 3.40 of the *Yucca Valley Municipal Code* states that:

> *General Facility, Park Facility, Trail Facility, Storm Drain Facility, and Street and Traffic Facility development impact fees shall be paid by applicants for development projects as set forth in this chapter and in the amounts adopted by the Town Council by resolution from time to time. No building permit, or occupancy permit, shall be issued for any new development project unless the fees specified in this chapter as adopted by Resolution of the Town Council are paid. Fees collected pursuant to this chapter shall be deposited into a separate fund and used only for the purpose of acquiring, designing, constructing, improvement, providing and maintaining, to the extent permitted by law, the General Facilities provided for in the Study and the Plans as adopted and amended from time to time by the Town Council.*

Ordinance 174, *Emergency Management Agency*, was passed by the Town of Yucca Valley to reenact Chapter 8.04 of Title 8 of the Municipal Code. The purpose of the Ordinance is to address the issues of public health, safety and general welfare and to minimize public and private losses due to flood conditions in the Town. Provisions are designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;

- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;

- Ensure that potential buyers are notified that property is in an area of special flood hazard; and

- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

5.3.3 IMPACT THRESHOLDS AND SIGNIFICANCE CRITERIA

Appendix 15.1, *Initial Study and Notice of Preparation*, contains the *Initial Study*, based on Appendix G of the *CEQA Guidelines* used during the preparation of the Project *Initial Study*. The *Initial Study* includes questions relating to hydrology, drainage and water quality. The issues presented in the *Initial Study Checklist Form* have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it would:

- Violate any water quality standards or waste discharge requirements.

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

- 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 that would result in substantial erosion or siltation on- or off-site.

- 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 that would result in flooding on- or off-site.

- Create or contribute to runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provision of substantial additional sources of polluted runoff.

- Otherwise substantially degrade water quality.

- 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.

- Place a structure within a 100-year flood hazard area that would impede or redirect flood flows.

- 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.

- Result in inundation by seiche, tsunami, or mudflow; refer to Section 10.0 *Effects Found Not To Be Significant*.

5.3.4 IMPACTS AND MITIGATION MEASURES

FLOOD HAZARDS

- **IMPLEMENTATION OF THE PROPOSED PROJECT MAY PLACE STRUCTURES WITHIN A 100-YEAR FLOOD HAZARD AREA (ZONE A OR ZONE AE), IMPEDING OR REDIRECTING FLOOD FLOWS.**

Impact Analysis: As stated above, portions of the SPA are located in Zone A and Zone AE, which are defined by FEMA as areas within the 100-year flood zones, where depths are between one to three feet. These areas are known as Special Flood Hazard Areas (SFHAs). Special requirements apply to commercial and residential development/redevelopment in these zones. Placement of fill or other forms of zone removal would be required in order to build or remove structures from the SFHA. Regulatory compliance with FEMA would be required in order to build within these areas. The completion of a LOMA, CLOMA, LOMR-F or CLOMR-F would be required by FEMA verifying that the lowest adjacent grade of the existing or proposed structure is at or above the Base Flood Elevations (BFE) or, for removal of an entire lot and structure, that both the lowest point on the lot and the lowest adjacent grade of the structure is at or above the BFE. Details and specific requirements vary within each land use and are available through FEMA.

Compliance with FEMA regulations, which includes the completion of a CLOMR, CLOMR-F, LOMA or LOMR-F, would be required. FEMA requirements and impact fees paid towards storm drain facility improvements, as referenced in the Master Plan of Drainage, would reduce potential flooding hazards to a less than significant level.

Mitigation Measures: No Mitigation Measures are recommended.

Level of Significance: Less Than Significant Impact.

DRAINAGE AND RUNOFF

- **BUILDOUT OF THE SPA WOULD INCREASE THE TOTAL IMPERVIOUS AREA WITHIN THE PROJECT AREA, WHICH COULD RESULT IN INCREASED DRAINAGE AND RUNOFF IMPACTS.**

Impact Analysis: Drainage exists primarily within the local streets and is defined by the natural topography of the area. On the northern portion, flows occur in a northeastern direction and on the western portion of the SPA drainage flows in a northwestern direction.

Within the SPA, impervious areas are anticipated to increase, due to development on vacant lots and infill development on underdeveloped parcels. The Town of Yucca Valley has a standard of a no net increase in runoff from new development. Town standards require new development to submit a hydrology report, which indicated how the proposed development would provide for on-site retention, capture and dispose, or conveyance of generated runoff to a County of San Bernardino Flood Facility. These plans are reviewed and approved by the Town's Public Works Department at the entitlement phase, verified prior to issuance of the grading permit, and post-construction.

The Master Plan of Drainage refers to proposed drainage facilities within the SPA, which have been determined necessary for capturing and treating flows in the Town of Yucca Valley. Their description and level of priority is discussed above in the existing conditions portion of this section.

Funding for these improvements would be attained through assessment fees pursuant to *Ordinance 173*, which would mitigate the affects of new development to downstream areas. Fees would pay for facility improvements and therefore impacts to the SPA would be reduced to a less than significant level.

Mitigation Measures: No Mitigation Measures are recommended.

Level of Significance: Less Than Significant Impact.

WATER QUALITY – SHORT-TERM IMPACTS

- **GRADING AND EXCAVATION ASSOCIATED WITH CONSTRUCTION ACTIVITIES IN THE SPA MAY IMPACT WATER QUALITY DUE TO POTENTIAL SHEET EROSION OF EXPOSED SOILS AND SUBSEQUENT DEPOSITION OF PARTICLES AND POLLUTANTS IN DRAINAGE AREAS.**

Impact Analysis: Construction controls are discussed separately from other water quality management measures because they are temporary and specific to the type of construction. Construction activities of the individual development sites that will take place through buildout of the SPA has the potential to produce typical pollutants such as nutrients, suspended solids, heavy metals, pesticides and herbicides, toxic chemicals related to construction and cleaning, waste materials (including wash water), paints, wood, paper, concrete, food containers, sanitary wastes, fuel and lubricants. The significance of this impact would vary depending upon the level of construction activity, weather conditions, soil conditions, and the increased sedimentation of drainage systems within the local area of the individual development sites. However, with mitigation measures would vary accordingly to mitigate impacts on a project-by-project basis.

During construction on the development sites, mitigation in the form of erosion control measures would be necessary to prevent the erosion of exposed soils during periods of heavy rainfall. During the interim period, before the ground cover takes hold, straw, wood chips and plastic (visqueen) can be used as stabilizing agents. With implementation of erosion control measures, the total debris produced from the

individual development sites would be lower when compared to the area of soils exposed within the existing conditions.

Mandated by Congress under the CWA, the NPDES Storm Water Program addresses nonagricultural sources of stormwater discharges that adversely affect the quality of waters of the United States. Construction activities that disturb one or more acres of land (or less than one acre, but are part of a larger common plan of development or sale) are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (General Permit). The General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP outlines the source control and/or treatment control Best Management Practices (BMPs) that would avoid or reduce runoff pollutants at the construction site to the maximum extent practicable. A copy of the SWPPP must be available and implemented at the construction site at all times. As part of its compliance with the NPDES requirements, a Notice of Intent (NOI) would need to be prepared and submitted to the State Water Resource Control Board (SWRCB) providing notification that a SWPPP has been developed and the operator intends to comply with the State of California General Permit. Implementation of recommended mitigation (i.e., compliance with the NPDES requirements) would reduce construction-related impacts on water quality to a less than significant level.

Mitigation Measures:

HYD-1 Prior to Grading Permit issuance and as part of the compliance with the NPDES requirements, a Notice of Intent shall be prepared for each future development project and submitted to the California State Water Resources Control Board, providing notification and intent to comply with the State of California General Permit.

HYD-2 A Storm Water Pollution Prevention Plan (SWPPP) shall be completed for the construction activities for each future development project. A copy of the SWPPP shall be available and implemented at the construction sites at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction site to the maximum extent practicable.

Level of Significance: Less Than Significant Impact After Mitigation Incorporated.

WATER QUALITY – LONG-TERM IMPACTS

- **IMPLEMENTATION OF THE PROPOSED SPECIFIC PLAN COULD RESULT IN LONG-TERM IMPACTS ON THE QUALITY OF STORMWATER AND URBAN RUNOFF, SUBSEQUENTLY IMPACTING WATER QUALITY.**

Impact Analysis: The general water quality of the SPA is not anticipated to be negatively impacted by project implementation due to the Town's no net increase stormwater standards, incorporation of BMPs into the design and operation of projects, and site specific mitigation measures.

Residential Development and Activities

Specific Plan implementation would result in the development of approximately 1,115 total residential units. As previously stated, residential uses typically generate pollutants such as sediments, pesticides, trash and debris, oil and grease, and bacteria and viruses. However, compliance with Town stormwater standards for on-site stormwater retention, regional plans, local standards and mitigation measures would reduce water quality impacts to a less than significant level.

Commercial and Industrial Development and Activities

The potential for pollution due to the proposed 2.9 million square feet of development would not increase relative to existing General Plan conditions. New development activities would be subject to in the Regional Water Quality Control Board and the Town of Yucca Valley's stromwater standards, which require on-site retention. Regulations require post-construction runoff to be less or equal to pre-construction conditions through on-site retention.

Additionally, most commercial and industrial point sources are subject to an Industrial Storm Water General Permit, which serves as a regulatory mechanism for the monitoring, inspection, and enforcement of pertinent water quality regulations.

Since 1990, the SWRCB has required that certain industrial businesses obtain a stormwater permit in order to discharge runoff into a Town's storm drain system or a local water body. The SWRCB adopted the current version of this storm water permit (SWRCB Water Quality Order No. 97-03-DWQ, or Industrial Permit) in 1997. The Industrial Permit mandates that regulated industrial businesses develop and implement programs to prevent the contamination of urban runoff draining off their site. The Industrial Permit is intended to cover all new or existing storm water discharges and authorized nonstormwater discharges, as required by Federal regulations. The Industrial Permit is administered by the SWRCB, and is generally enforced by the Regional Boards.

Industrial permittees are required to collect and analyze samples of stormwater discharges for pH, TSS, TOC, specific conductance, toxic chemicals and other pollutants that are likely to be present in stormwater discharges in significant quantities. In addition, certain industries are required to test for specific analytes, such as metals, nitrate and nitrite, phosphorus, COD and TSS.

Permit compliance includes development and implementation of a SWPPP, and necessary BMPs. Consistent inspection and enforcement of Industrial Storm Water General Permit requirements effectively reduce the potential harmful water quality effects of existing and proposed commercial and industrial activities. In addition to plans, standards and other requirements, a requiring a Water Quality Management Plan has been included to further remove any potential water quality impact within the SPA.

Mitigation Measures:

HYD-3 A Water Quality Management Plan shall be prepared for each future development project and shall include Nonstructural/Source Control and Structural/Treatment Best Management Practices to conform to the Town's Storm Water standards and National Pollution Discharge Elimination System requirements.

Level of Significance: Less Than Significant Impact After Mitigation Incorporated.

5.3.5 CUMULATIVE IMPACTS

- **THE PROPOSED SPECIFIC PLAN, ALONG WITH OTHER FUTURE DEVELOPMENT MAY INCREASE HYDROLOGY AND DRAINAGE IMPACTS IN THE AREA. IMPACTS WOULD BE EVALUATED ON A PROJECT-BY-PROJECT BASIS.**

Impact Analysis: The basis of the cumulative analysis is presented in Section 4.0, *Basis of Cumulative Analysis*. For purposes of drainage and water quality analysis, cumulative impacts are considered for projects within the same watershed as the SPA. The projects listed in Section 4.0 are within the same watershed as the SPA.

Increased impermeable surfaces resulting from future development in the SPA may increase runoff flows to existing drainage facilities, which manage drainage throughout the watershed. This may negatively impact the watershed's ability to manage hydrology and drainage in the area. Cumulative projects southeast of the SPA would discharge runoff into the Yucca Wash, which passes through a portion of the SPA and continues eastward off-site. Runoff from these projects would combine and interact with runoff from the SPA. Runoff from cumulative projects west of the SPA would utilize offsite drainage facilities that would not pass through the SPA or receive runoff from the SPA.

Future development would be required comply with Town of Yucca Valley's stromwater standards, which require on-site retention. Regulations require post-construction runoff to be less or equal to pre-construction conditions through on-site retention during peak flows.

Additionally, new development would be required to pay storm drain facility development impact fees pursuant to Chapter 3.40.040: Public Infrastructure Facilities (*Ordinance 173*) of the Town of Yucca Valley's Municipal Code. The Ordinance requires payment of fees as determined by the Town Council prior to receipt of building permit or occupancy permit. Development impact fees are used only for the purpose of acquiring, designing, constructing, improving, providing and maintaining, to the extent permitted by law, the general facilities, which would mitigate impacts of new development. Impact fees provide funding for drainage facility maintenance, improvements, and/or new facilities. The management of these facilities are outlined in the Town of Yucca Valley's Master Plan of Drainage, which is designed to address the need for flood control planning and floodplain management. The plan established policies and concepts based on published Town goals and objectives, which have anticipated future grow in Yucca Valley. The report is used

as a guideline for future planning, design and construction of regional, secondary, and local drainage facilities within the Town of Yucca Valley and includes detailed hydrologic, hydraulic, and facility sizing calculations for the drainage systems. Compliance with Town standards and payment of fees on a project-by-project level would reduce impacts created by cumulative development to a less than significant level.

Mitigation Measures: No Mitigation Measures are recommended.

Level of Significance: Less Than Significant Impact.

5.3.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION

No significant impacts related to hydrology and water quality have been identified following implementation of mitigation measures and/or compliance with applicable standards and policies.