4.9 HYDROLOGY AND WATER QUALITY

This section summarizes the hydrology, drainage, and water quality analyses performed for the project site. A detailed presentation of the technical data and calculations is provided in Appendix I (*East Area 1 Drainage Study*) of this EIR. This section includes an evaluation of the existing conditions on the project site, a comparison of the pre-project and the post-project conditions, a determination of the potential impacts of the project, and recommended mitigation measures. The purpose of this technical evaluation is to determine the impact of the proposed project on surface water drainage and stormwater quality in the vicinity of the project site within the Santa Clara watershed.

4.9.1 EXISTING CONDITIONS

4.9.1.1 Rainfall

Ventura County is dry during the late spring, summer and early fall and receives most of its rain during the winter months (November through April). The average annual precipitation in Ventura County ranges from 15.1 inches at the coast to 28.8 inches in the mountains near Ojai, but most of this precipitation occurs in the winter months.[1] Further, the prevailing weather patterns during the winter and the orientation of the mountain ranges in the northern half of the County combine to produce extremely high-intensity rainfall. The peak historic rainfall intensity recorded by Ventura County rain gauge occurred on February 12, 1992: approximately 4.04 inches per hour of rainfall fell during a 15-minute period at the Wheeler Gorge gauge approximately three miles northeast of Matilija Dam.[2]

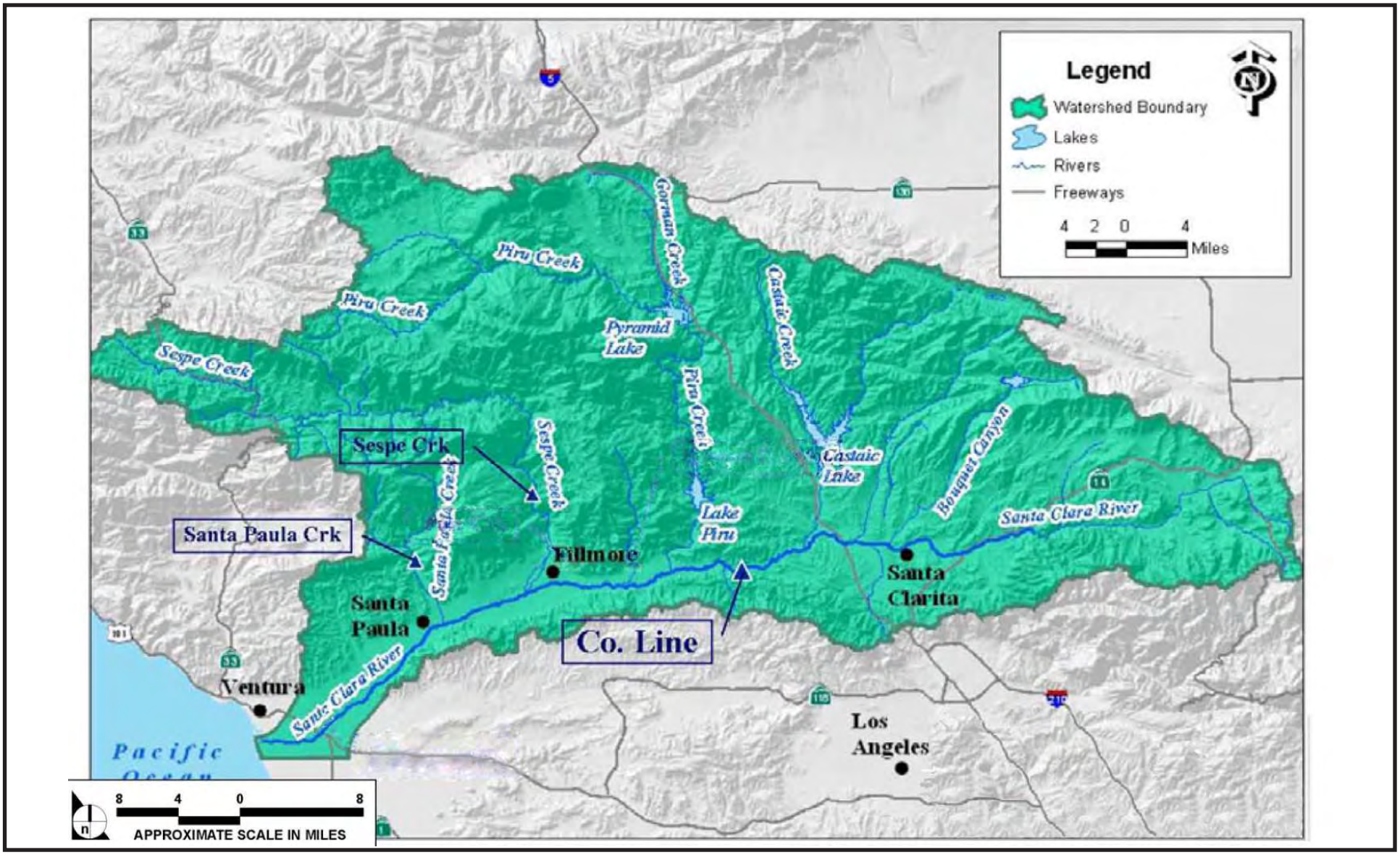
4.9.1.2 Surface Hydrology

<u>Santa Clara River Drainage</u>

The project site is located in the Santa Paula Creek and Haun Creek tributaries of the Santa Clara River watershed. The Santa Clara River is one of the largest river systems in southern California. It flows about 100 miles from its headwater at Pacifico Mountain in the San Gabriel Mountains toward the Oxnard Plain before discharging into the Pacific Ocean near the Ventura Marina. Of the 1,634 square miles (sq. mi.) of the watershed, about 40 percent is located in Los Angeles County and 60 percent in Ventura County. Figure 4.9-1 shows the Santa Clara River watershed.

The majority of the watershed drainage area (approximately 90 percent) consists of the surrounding mountains which range up to 8,800 feet high with the remaining portions (approximately 10 percent) lying within the valley floor and coastal plain with the main stem of the Santa Clara River. The watershed is surrounded to the north, east, and south by largely undeveloped hills and canyons; approximately 47 percent of the watershed is located within the Los Padres and Los Angeles National Forests. In Los Angeles County, the river traverses national forest land, large areas of moderately developed private rural lands, the City of Santa Clarita, and large tracts of rural farmland extending west to the County line. In Ventura County, the river primarily runs through large agricultural tracts, the cities of Fillmore, Santa Paula, Oxnard, and San Buenaventura, before discharging into the Pacific Ocean. Major tributaries include Castaic Creek and San Francisquito Creek in Los Angeles County, and Piru Creek, Sespe Creek, and Santa Paula Creek in Ventura County.

[1] Ventura County Watershed Protection District, *Flood Mitigation Plan for Ventura County, California*, March 1, 2005.
[2] Ibid.



Source: Santa Clara River Hydrolgy Update, Ventura County Water Shed Protection District (2006) & P&D Consultants, Inc. (2007)

Figure 4.9-1
Santa Clara River Watershed

The watershed is comprised of five major subwatersheds and which include the Upper Santa Clara, Piru, Sespe, Santa Paula, and Oxnard Plain. Each of these subwatersheds consists of individual tributaries and reaches, as noted in Tables 4.9-1 and 4.9-2, respectively.

TABLE 4.9-1
TRIBUTARIES FOR EACH SUBWATERSHED

SUBWATERSHED	ASSOCIATED TRIBUTARIES
Upper Santa Clara	Castaic Creek, San Francisquito Creek, Bouquet Canyon Creek, Mint Canyon Creek, South Fork Santa Clara River
Piru	Piru Creek, Hopper Creek
Sespe	Sespe Creek, Pole Creek
Santa Paula	Santa Paula Creek
Oxnard Plain	N/A

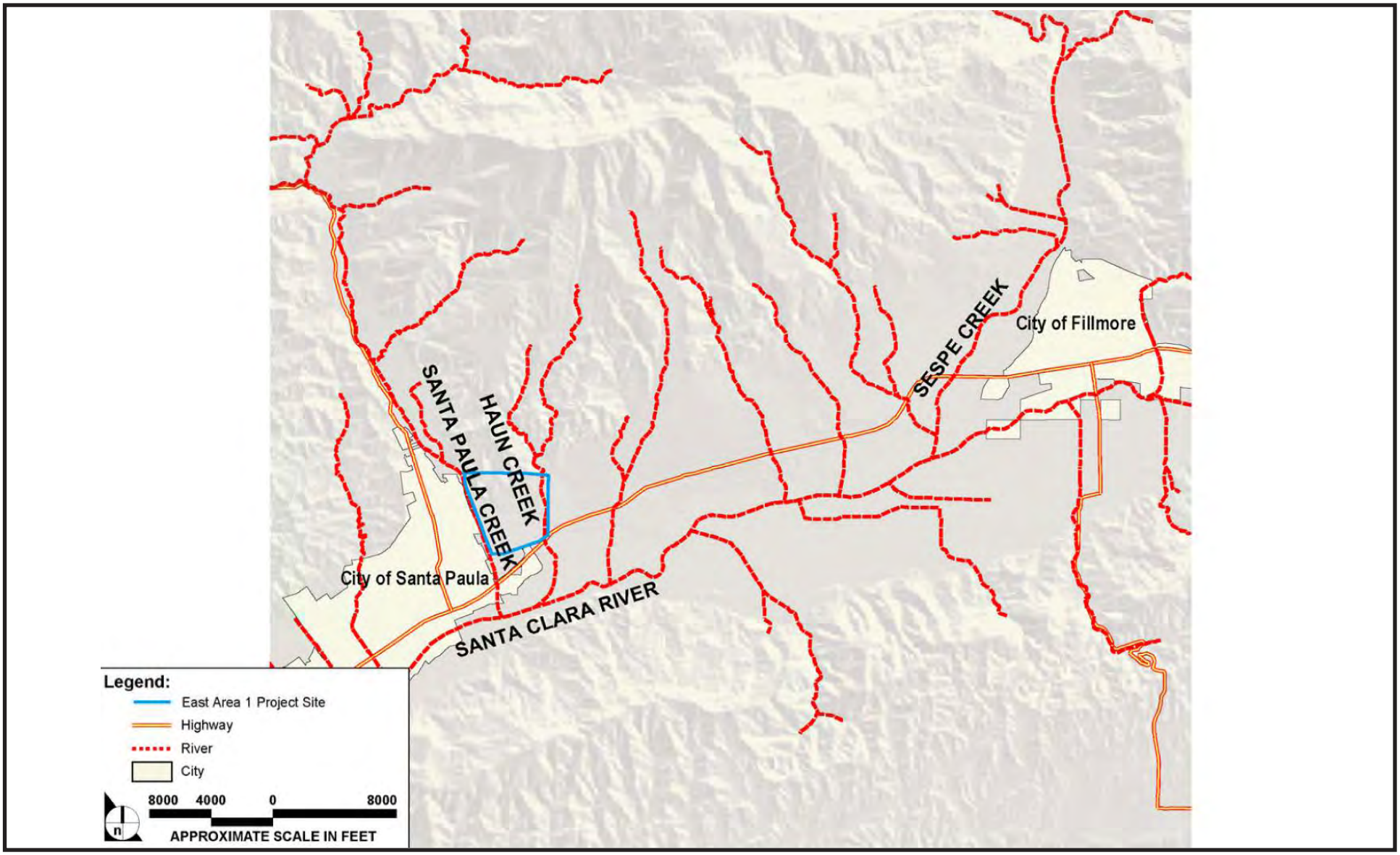
Source: Ventura County Watershed protection District, Comprehensive Water Quality Monitoring Plan for the Santa Clara River Watershed, March 2006.

TABLE 4.9-2
REACHES ASSOCIATED WITH EACH SUBWATERSHED

REACH NUMBER	REACH DESCRIPTION	SUBWATERSHED
1	Between Highway 101 Bridge and Santa Clara River Estuary	Oxnard Plain
2	Between Freeman Diversion Dam near Saticoy and Highway 101 Bridge	Santa Paula/Oxnard Plain
3	Between A Street, Fillmore and Freeman Diversion Dam near Saticoy	Sespe/Santa Paula
4	Between Blue Cut gauging Station and A Street, Fillmore	Piru/Sespe
5	Between West Pier Highway 99 and Blue Cut gauging station	Upper Santa Clara/Piru
6	Between Bouquet Canyon Road bridge and West Pier Highway 99	Upper Santa Clara
7	Between Lang gauging station and Bouquet Canyon Road bridge	Upper Santa Clara
8	Above Lang gauging station	Upper Santa Clara
9	Sespe Creek above gauging station, downstream from Little Sespe Creek	Sespe
11	Piru Creek above gauging station below Santa Felicia dam	Piru

Source: Ventura County Watershed Protection District, Comprehensive Water Quality Monitoring Plan for the Santa Clara River Watershed, March 2006.

The project site is located between the Santa Paula Creek and Sespe Creek tributaries and is within the Reach Number 3 between A Street, in Fillmore and Freeman Diversion Dam near Saticoy. More precisely, the area is located east of Santa Paula Creek and approximately four miles west of Sespe Creek as shown on Figure 4.9-2.



Source: Santa Clara River Hydrolgy Update, Ventura County Water Shed Protection District (2006) & P&D Consultants, Inc. (2007)

Figure 4.9-2
Santa Clara River Subwatersheds

Haun Creek and Orcutt Canyon Creek Tributary Drainages

This drainage area comprises over 2,600 acres and is the largest drainage area associated with the project site. The drainage area is linear, situated in a north-south direction with Orcutt Canyon Creek, a natural creek, as the major drainage creek. The Orcutt Canyon Creek drainage is roughly one mile wide and over 4.5 miles long, stretching well into the Topatopa foothills and mountains. The elevation varies from 4,600 feet at the northern end of the drainage area to an elevation of 300 feet at the Haun Creek Bridge on State Route (SR) 126. The entirety of the Orcutt Canyon drainage flows through the project site and exits underneath SR-126 through an existing bridge structure and eventually terminates at the confluence with the Santa Clara River, some 4,000 feet south of the bridge. Of the approximately 501 acres of the project site, roughly the northeast 50 acres are tributary to the Orcutt Canyon Creek drainage area with the remaining 2,450 acres of the drainage area located off-site. Figure 4.9-3 shows the location of this drainage in relation to the project site.

Farm Creek Drainage

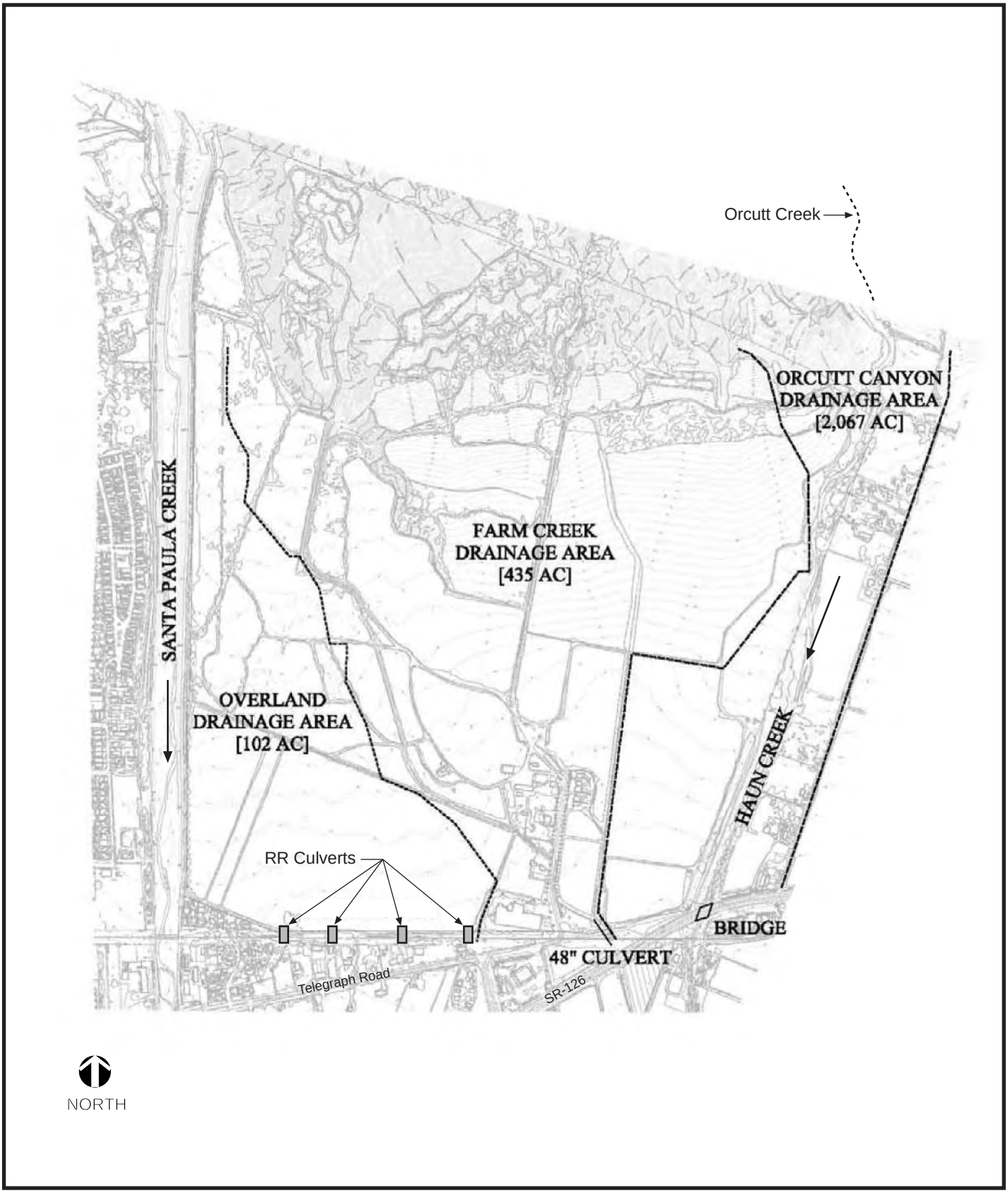
This drainage area comprises 435 acres and is the second largest drainage area associated with the project site. Of the 435 acres, roughly, 340 acres are located on the project site; the remaining 90 acres are off-site drainage. The Farm Creek drainage area is trapezoidal in shape and stretches into the foothills of the Topatopa mountains, with an upper elevation of 980 feet to a low elevation of 300 feet at SR-126. The Farm Creek drainage has several natural and man-made drainage devices that are the primary flow paths. Concrete drainage ditches have been installed throughout the orchard areas to direct the runoff flows and control the damage caused by unabated flows. These concrete ditches are still in use today. The system of natural drainage courses in the foothills and the man-made concrete ditches in the orchard areas combine and form a shallow riprap reinforced channel near the southern edge of the project site. This channel exits the site via a 48-inch culvert under SR-126 approximately 600 feet west of the Haun Creek crossing, flows parallel to Haun Creek for approximately 2,000 feet before flowing into Haun Creek. Eventually the flows from Farm Creek drainage make their way south into the Santa Clara River. Figure 4.9-3 shows the location of this drainage in relation to the project site.

Overland Drainage

This drainage area comprises over 100 acres and is the smallest of the three major drainage areas associated with the project site. The overland drainage is roughly triangular in shape and is wholly contained in the project site. The overland drainage is bounded by Santa Paula Creek to the west and the existing Ventura County Transportation Commission (VCTC) railroad to the south. The VCTC railroad sits atop a berm that varies from at grade to five feet in height. Four existing culverts cross under the VCTC railroad and deposit stormwater unabated onto private property between the VCTC railroad and Telegraph Road. Site reconnaissance of this property shows no drainage devices to control this flow. Presumably, this flow continues south to the Santa Clara River, although no defined drainage paths or devices are evident. Figure 4.9-3 shows the location of this drainage in relation to the project site.

Santa Paula Creek Drainage

This drainage area is largely located west of and off-site of the project site. Field reconnaissance of the project site identified several field inlets immediately adjacent to the Santa Paula Creek boundary. A review of the project site's topography indicates that the on-site drainage area associated with these inlets are minor and are limited to localized nuisance flows which enter into Santa Paula Creek. Figure 4.9-3 shows the location of this drainage in relation to the project site.



Source: Huitt-Zollars (2007) & P&D Consultants, Inc. (2007)

Figure 4.9-3
Existing Drainage Area

4.9.1.3 On-site Hydrology & Surface Flows

Figure 4.9-4 shows the existing on-site hydrology. Table 4.9-3 shows the existing 100-year (Q_{100}) storm event surface flows for the on-site drainage outlet points, by existing watershed area.

TABLE 4.9-3
EXISTING HYDROLOGIC FLOWS

OUTLET POINT	EXISTING WATERSHED AREA	EXISTING Q_{100} (CFS)
Santa Paula Creek	K5	16.9
Santa Paula Creek	K6	70.4
Total		**∑=87.3**
VCTC railroad	K8	38.1
VCTC railroad	J1-3, J5-7, K0-4	1,120.0
Total		∑=1,158.1
Haun Creek	O1-O37	7,861.0
Haun Creek	J4	33.0
Haun Creek	J8	44.4
Total		∑=7,938.4

Source: East area 1 Drainage Technical Report, Huitt-Zollars, Inc., April 2007 (see Appendix I of this EIR).

As shown in Table 4.9-3, during a Q_{100} event the existing watershed area for the Haun/Orcutt Creek drainage experiences moderate to major surface flows. These range from 33 cfs within Watershed J4 to 7,861 cfs within Watershed O1-O37. The combined flows for this drainage are substantial and consist of 7,938.4 cfs. Surface flows originating from the Farm Creek Drainage and Overland Drainages during a Q_{100} event also experience both moderate and major flows. Within Watershed K8 flows are 38.1 cfs, while those associated with Watersheds J1-3, J5-7 and K0-4 (combined) are 1,120 cfs. However, the combined flows for this drainage are substantial and consist of 1,158.1 cfs. The Q_{100} storm event for Santa Paula Creek experiences moderate to major flows ranging from 16.9 cfs for Watershed K5 to 70.4 cfs for Watershed K6. Combined, flows of 87.3 cfs are experienced within this drainage and are considered substantial.

4.9.1.4 Floodplain & Flood Hazards

<u>Floodplain</u>

As shown in Figure 4.9-5, portions of the project site located adjacent to Haun Creek and Santa Paula Creek are located within a Federal Emergency Management Agency (FEMA)-designated 100-year Floodplain.[3]

[3] Note: A "floodplain" is the area adjacent to a watercourse or other body of water that is subject to recurring floods. Floodplains may change over time due to natural processes, changes in the characteristics of a watershed, or human activity such as construction of bridges or channels. In areas where flow contains a high sediment load, such as along the Santa Clara River in Ventura County, the course of a river or stream may shift dramatically during a single flood event.

Figure 4.9-4
Existing Hydrology Map

Source: Impact Sciences, Inc. (2007) & P&D Consultants, Inc. (2007)

Figure 4.9-5
East Area 1 Flood Hazard Map

However, the City of Santa Paula obtained a Letter of Map Revision (LOMR) in 2001 after improvements were made to the Santa Paula Creek drainage stating the 100-year flood zone associated with the Santa Paula Creek adjacent to the project site is confined within recently constructed channel banks. Therefore, the area of the 100-year flood zone on the west side of the project site has been eliminated.

In addition, the project site is located outside of a FEMA-designated floodway.

Flooding

Ventura County is highly vulnerable to damage from floods[4] due to the geographic location and topographic conditions. Since 1992, there have been five Presidential disaster declarations for flooding in Ventura County.[5] In addition, approximately every five years, a flood or flood-related event causes damage that is not significant enough for a federal disaster declaration but, nonetheless, costs County residents, businesses, and taxpayers millions of dollars. The risks posed by these hazards increase as the County's population continues to grow. In addition, in regions such as Ventura County that do not have extended periods of below freezing temperatures or significant snowfall, floods usually occur during the season of highest precipitation or during heavy rainfalls after prolonged dry periods.

Flash floods are particularly dangerous. The National Weather Service defines a flash flood as one in which the peak flow travels the length of a watershed within a 6-hour period. These floods arise when storms produce a high volume of rainfall in a short period of time over a watershed where runoff collects quickly. They are likely to occur in areas with steep slopes and sparse vegetation. They often strike with little warning and are accompanied by high-velocity flow.

Santa Clara River

The largest and most damaging recorded natural floods in the Santa Clara watershed occurred in 1969. During these floods, the 50- (Q_{50}) and Q_{100} peak discharge levels were reached in many channels. In this flood, 13 people lost their lives, property damage was significant, and over 3,000 residents of Santa Paula were evacuated.[6] All over the County, transportation facilities, including roads, bridges, and railroad track were damaged. Suspended sediment concentrations reached a maximum of about 160,000 milligrams per liter (mg/l) in the Santa Clara River at Saticoy, and the maximum daily sediment discharge was 20,000,000 tons during the storm peak.[7]

Santa Paula Creek

The City of Santa Paula has experienced several heavy water flows along Santa Paula Creek, dating back as early as 1938.[8] As a result of the flooding in the late 1930s and early 1940s, the United States Congress authorized a flood protection project on Santa Paula Creek in 1948. Floods in 1969 and 1978 along Santa Paula Creek presented major threats to the City, as rock and debris completely filled the channel.[9]

[4] Note: A flood occurs when the existing channel of a stream, river, canyon, or other watercourse cannot contain excess runoff from rainfall or snowmelt, resulting in overflow onto adjacent lands. In coastal areas, flooding may occur when high winds or tides result in a surge of seawater into areas that normally lie above the high-tide line.
[5] Ventura County Watershed Protection District, *Flood Mitigation Plan for Ventura County, California*, March 1, 2005.
[6] Ibid.
[7] Ibid.
[8] City of Santa Paula, General Plan, V. Technical Appendices, p. S-A 14, April 1998.
[9] Ibid, p. S-A 15.

Haun Creek

The elevation of the Topatopa foothills and mountains creates extreme velocities within Haun Creek during periods of heavy rainfall. Existing flows within the Creek for a 10-year storm event (Q_{10}) - and Q_{100} event are 7,260 cfs and 8,981 cfs respectively. These storm flows have historically resulted in flooding at the Haun Creek/SR-126 bridge.[10] Significant flooding recently occurred in 2001 and 2004, when this area experienced heavy rainfall and associated runoffs which resulted in large quantities of sediment, rock, and fire debris that clogged the Creek at this location.[11,12] Two factors have been identified as the primary causes of flooding within this area and include: (1) flow capacity of the California Department of Transportation (Caltrans) maintained bridge[13] and the VCTC maintained railroad trestle[14]; and (2) flood debris buildup during storm events. It should be noted that depending upon the amount of debris buildup, the bridge may flood during a Q_{10} storm event.

4.9.1.5 Hydrogeology

Santa Paula Groundwater Basin

A portion of the project site is in the Santa Paula Groundwater Basin (SPGWB). The SPGWB surface elevation ranges from 140 to 280 feet mean sea level (MSL), although the maximum drainage basin elevation reaches 2,750 feet MSL on Sulphur Mountain. The SPGWB covers an area of approximately 13,000 acres, and extends ten miles from northeast to southwest and two miles from northwest to southeast. Water-bearing geologic formations include Recent Alluvium, Older Alluvium and San Pedro Formation. Recent Alluvium consisting of sands and gravels occurs in the southern part of the SPGWB along the Santa Clara River and has a typical thickness of 60 to 80 feet. Older Alluvium lies beneath Recent Alluvium and is exposed at the surface in the north part of the SPGWB. The Older Alluvium has a typical thickness of approximately 200 feet. The upper part of the Older Alluvium is predominantly clay, whereas the lower part consists of gravel. The San Pedro Formation is of Pleistocene age consisting of gravels, sands and clays. The San Pedro Formation has a typical thickness of 4,000 feet in the area of the SPGWB and has undergone substantial faulting, folding and uplifting. Geologic units of low permeability and likely poor water quality bounding the aquifers include the Santa Barbara and Pico Formations (Water Resources Board, 1953 and Mann, 1959).

The groundwater system is considered to be mostly confined to semi-confined, although areas of unconfined conditions exist in the Recent Alluvium. The average specific yield of the uppermost saturated zone has been estimated at ten percent. The total groundwater storage capacity of the SPGWB has been estimated at 800,000 acre-feet based on an area of 10,000 acres, aquifer depth of 800 feet and specific yield of ten percent. Typical well yields in the SPGWB range from 300 to 1,500 gallons per minute (gpm) and average about 700 gpm (Water Resources Board, 1953).

Regional groundwater flow in the SPGWB is generally from northeast to southwest. However, the direction of groundwater flow varies locally around major pumping wells. Groundwater can move out of the SPGWB and into Mound Basin located to the west as underflow in the Recent Alluvium.

[10] Note: The Haun Creek Bridge was constructed in the late 1950s and is maintained by the California Department of Transportation (Caltrans).
[11] California Regional Water quality Control Board, Los Angeles Region, *Conditional Certification for Proposed and "After-the-Fact" Activities: Haun Creek Sediment and debris removal at State Route 126*, November 3, 2001.
[12] State of California, Department of Transportation (Caltrans), Memorandum from Cindy McKim, Chief Financial Officer to California Transportation Commission Chair and Commissioners, Informational Report – Emergency G-11 Allocation, March 2-3, 2005, p. 3.
[13] Note: The design capacity of the Caltrans maintained bridge at Haun Creek/SR-126 is estimated to be approximately 3,000 cfs.
[14] Note: The design capacity of the VCTC maintained railroad trestle is estimated to be approximately 2,000 cfs.

Groundwater flows can also be expressed as surface flow into the Santa Clara River due to restricted outflow caused by fault displacements of the underlying geologic formations (Mann, 1959). The SPGWB is in hydraulic connection with and receives underflow from the up-gradient Fillmore Groundwater Basin (FGWB). A groundwater contour map for spring 2002 shows groundwater elevations of 250 feet MSL on the up-gradient end of the SPGWB and 145 feet MSL on the down-gradient end of the SPGWB for wells screened below 100 feet. The associated hydraulic gradient is approximately 0.002 (UWCB, 2003).

Groundwater recharge to the SPGWB occurs through stream flow percolation, rainfall percolation and underflow from the FGWB. Most of the stream flow percolation occurs through the Santa Clara River and Santa Paula Creek with minor contributions from other tributaries. Based on a study period from 1936 to 1957, the average annual groundwater recharge to the SPGWB was estimated to be 26,450 acre-feet per year (AFY, Mann, 1959). Groundwater pumping in the SPGWB from 1980 to 2002 averaged 25,871 AFY (UWCD, 2003). A comprehensive water balance of the SPGWB has not been completed in recent years. However, analysis of recent groundwater pumping amounts, groundwater levels and precipitation in the SPGWB from 1983 to 1995 suggests that the no overdraft has occurred with average annual pumping rates of 26,000 AFY under average hydrologic conditions. Therefore, it was concluded that the yield of the SPGWB is at least 26,000 AFY (UWCD, 2003).

Fillmore Groundwater Basin

A portion of the project site is in the Fillmore Groundwater Basin (FGB). The surface elevations in the area underlain by the FGB range from 280 to 470 feet AMSL along the Santa Clara River channel, and the maximum drainage basin elevation reaches 4,960 feet AMSL on Santa Paula Peak. The Sespe Uplands north of the Santa Clara River and west of Sespe Creek range in elevation from 400 to 800 feet AMSL. The FGB covers an area of approximately 18,500 acres, and extends 10 miles from northeast to southwest and four miles from northwest to southeast. Water-bearing geologic formations include Recent Alluvium, Older Alluvium and San Pedro Formation. Recent alluvium consisting of sands and gravels occurs along the Santa Clara River and Sespe Creek and has a typical thickness of 60 to 80 feet. Older Alluvium lies beneath Recent Alluvium and is exposed at the surface at various locations in the FGB. The Older Alluvium has a typical thickness of approximately 40 feet where it underlies Recent Alluvium and up to 100 feet where it is exposed at the surface. The Older Alluvium consists of sand, gravel and clay. The San Pedro Formation is of Pleistocene age consisting of gravels, sands and clays. The San Pedro Formation has a maximum thickness of 8,000 feet in the FGB and has undergone significant faulting, folding and uplifting. Geologic units of low permeability and likely poor water quality bounding the aquifers include the Pico, Santa Barbara and Sespe Formations (Water Resources Board, 1953, and Mann, 1959).

The FGB groundwater system is considered to be mostly confined to semi-confined, although areas of unconfined conditions exist in the Recent Alluvium. The average specific yield of the uppermost saturated zone has been estimated at 12 percent. The total groundwater storage capacity of the FGB has been estimated at one million acre-feet. Typical well yields in the basin range up to 2,100 gallons per minute (gpm) and average about 700 gpm. Average specific capacities of wells are on the order of 50 gpm/feet (Water Resources Board, 1953).

Regional groundwater flow in the FGB is generally from east-northeast to west-southwest. However, the direction of groundwater flow varies locally around major pumping wells. Groundwater can move out of the FGB and into the Santa Paula Groundwater Basin as underflow in the alluvium and San Pedro Formation, and as groundwater rising up into the Santa Clara River due to a constricted subsurface cross-sectional flow area at the basin boundary. The FGB is in hydraulic connection with and receives underflow from the upgradient Piru Groundwater Basin (Mann, 1959). A groundwater contour map for

Spring 2002 shows groundwater elevations of 460 feet AMSL on the upgradient end (Piru) of the FGB and 260 feet AMSL on the downgradient end (Santa Paula) of the FGB. The associated hydraulic gradient is approximately 0.004 feet (UWCB, 2003).

Groundwater recharge to the FGB occurs through stream flow percolation, rainfall percolation and underflow from the Piru Groundwater Basin. Most of the stream flow percolation occurs through the Santa Clara River and Sespe Creek with minor contributions from other tributaries. Based on a study period from 1936 to 1957, the average annual groundwater recharge to the FGB from these sources was estimated to be 51,890 acre-feet per year (AFY) (Mann, 1959). Historic groundwater pumping in the FGB averaged 44,685 AFY from 1980 to 2002. Groundwater recharge during wet climatic periods has resulted in groundwater levels recovering to historic highs (UWCD, 2003).

Groundwater Levels in the Project Vicinity

Modified maps from California Geological Survey (CGS, 2002) show estimated historically shallowest groundwater depths (i.e., historical high groundwater levels) in the Santa Paula vicinity. These data suggest historically shallowest groundwater depths of greater than forty feet below the ground surface (bgs) for the project site. California Department of Water Resources (2007) well data notes three wells on the project site. These wells have historic high ground water levels of 65.7 and 75.2 feet bgs. However, investigative geologic sampling conducted as part of the Preliminary Geotechnical Investigation Report (PGIR) indicate that groundwater was encountered as high as 21 feet bgs near the central part of the project site. Also, groundwater was discovered between 28 and 39 feet in the vicinity of Hahn Creek. If subsurface conditions include shallow fine-grained layers, then perched groundwater may be encountered at even shallower depths.

4.9.1.6 Surface and Groundwater Pollution Sources

Non-Point Source Pollution

Surface water quality in the Santa Clara River and drainages that are tributary exhibit degraded surface quality due to uncontrolled pollutants from non-point sources (NPS).[15] NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters and even underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas.
- Oil, grease, and toxic chemicals from urban runoff and energy production.
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambank.
- Salt from irrigation practices and acid drainage from abandoned mines.
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems.

Atmospheric deposition and hydro-modification are also sources of non-point source pollution.[16] Surface waters on and in the immediate area of the project site experience similar NPS effects from urbanized and agricultural land uses located both upstream and on-site. On the project site, pesticides used for agriculture and increased sedimentation caused by farm equipment and vehicle use can contribute to degrading water quality within Reach 3 of the Santa Clara River.

[15] California Regional Water Quality Control Board – Los Angeles Region (4), Water Quality Control Plan, Los Angeles Region. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, June 13, 1994, page 1-18.
[16] Source: http://www.epa.gov/owow/nps/qa.html, accessed August 2, 2007.

Point-Source Pollution (PSP)

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into "waters of the United States." Point sources are discrete conveyances such as pipes or man-made ditches. Individual residences that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal and other facilities must obtain permits if their discharges go directly to surface waters. In California, the NPDES permit program is administered by the local Regional Water Quality Control Board (RWQCB).[17]

4.9.1.7 Surface and Groundwater Water Quality

Santa Clara River Surface Water Quality

Surface water quality in the Santa Clara River is related to the amount of stream flow at the time of sample collection. The flow weighted average concentrations for Reach 3 at the Freeman Diversion during 2002 for Total Dissolved Solids (TDS), chloride and nitrate were 974, 60, and 5.6 milligrams per liter (mg/L), respectively. These concentrations were similar to the long term flow weighted average, and were less than RWQCB groundwater basin objectives of 1,200 to 2000, 100 to 110, and 45 mg/l for TDS, chloride, and nitrate, respectively (United Water Conservation District (UWCD), 2003).

Santa Paula Groundwater Basin Quality

Within the SPGWB, concentrations of TDS average 1,190 mg/L with a range from 870 to 3,010mg/L. TDS concentrations in 13 municipal water supply wells monitored by UWCD in the SPGWB averaged about 1,200 mg/L with a range from 470 to 1,800 mg/L. Nitrate concentrations in two of 16 municipal water supply wells sampled between 1994 and 2000 exceed the maximum contaminate limits (MCL) (DWR, 2004).

The TDS concentrations in groundwater for wells sampled in 2002 ranged from about 800 to 2,250 mg/L. Most of the wells had TDS concentrations in the 900 to 1,400 mg/L range. Chloride concentrations in these wells for 2002 ranged from about 35 to 140 mg/L, with most values in the 35 to 75 mg/L range. With the exception of two wells near Santa Paula Creek having nitrate (as NO_3) concentrations of 51 to 55 mg/L, the nitrate concentrations ranged from non-detect to 26 mg/L (6 mg/L for nitrate as Nitrogen)). Longer term groundwater quality data show concentrations of TDS, chloride and nitrate similar to 2002 conditions and do not appear to show any substantial increasing or decreasing concentration trends (UWCD, 2003).

Fillmore Groundwater Basin Quality

Concentrations of TDS vary by location within the FGB. In the Sespe Upland area (Well Number T4N/R20W-33C3), historic TDS concentrations range from 700 to 1,000 mg/l. A well located east of Sespe Creek and north of Santa Clara River (Well Number T4N/R19W-30D1) has TDS concentrations from 1,400 to 1,700 mg/l. A well south of the City of Fillmore and the Santa Clara River in the unincorporated community of Bardsdale (Well Number T3N/R19W-6D3) has TDS concentrations ranging from 950 to 1,100 mg/l. Historic chloride concentrations for these same three wells range from 30 to 50 mg/l, 60 to 80 mg/l and 30 to 50 mg/l, respectively. Nitrate concentrations for these three wells also experience fluctuations and range from near zero to as high as 18 mg/l (UCWD, 2003).

[17] Source: http://cfpub2.epa.gov/npdes/, accessed August 2, 2007.

The TDS data from nine municipal supply wells located throughout the City of Fillmore indicate an average of 967 mg/l and range from 660 to 1,590 mg/l. Overall, TDS concentrations in the FGB are reported to range from 800 to 2,400 mg/l with an average of 1,100 mg/l (DWR, 2004). The chloride levels for these wells average 55 mg/l and range from 45 mg/l to 67 mg/l. The nitrate levels for these wells average 4.3 mg/l and range from 2.3 mg/l to 6.9 mg/l (Boyle Engineering Corporation, 2004).

4.9.2 THRESHOLDS OF SIGNIFICANCE

Based upon the thresholds contained in Appendix G of the CEQA Guidelines, the proposed project would have a significant impact on the environment if it would:

- Violate any water quality standards or waste discharge requirements;
- 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);
- 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 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 which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- 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 within a 100-year flood hazard area structures which 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;
- Inundation by seiche, tsunami, or mudflow

4.9.3 METHODOLOGY RELATED TO HYDROLOGY AND WATER QUALITY

The assessment of impacts to hydrology and water quality was based on information and/or requirements contained in applicable state and federal regulations, the City's General Plan Update EIR (1998), information from the City's Department of Public Works, Ventura County Watershed Protection District (VCWPD), County of Ventura General Plan and Initial Study Assessment Guidelines, RWQCB – Los Angeles' Basin Plan and on-site review of existing conditions. These resources in addition to the thresholds of significance formed the basis for the impact assessment.

4.9.3.1 Drainage & Detention Basin Calculation Methodology

The drainage study prepared for the project site (see Appendix I of this EIR) is based upon technical methodologies identified in the Ventura County Watershed Protection District (VCWPD) Hydrology Manual (December 2006). The drainage study also included an analysis of policies contained within the Ventura County Land Development Manual (February 1995). The Rational Method was utilized to calculate stormwater runoff for a 100-year (Q_{100}) frequency storm as follows:

- Conservative soil group type D was used for all areas in drainage study.
- Existing conditions coefficients were obtained from Appendix A, Exhibit 6A of the VCWPD Hydrology Manual.
- Proposed conditions coefficients were obtained from Appendix A, Exhibit 6A of the VCWPD Hydrology Manual.
- As outlined in the VCWPD Hydrology Manual, Time of Concentration (Tc) values were calculated with the Tc Calculator program and for delineation of watersheds, flow paths and flow type (overland, natural, channel, street, pipe, etc.).
- Travel times were computed by flow path length along the drainage divided by the computed flow velocity of water flow in the drainage (maximum overland flow path of underdeveloped areas to 1,000 ft).
- Hydraulic calculations were computed by the VCRat program with 10-year (Q_{10}), 50–year (Q_{50}), and 100-year (Q_{100}) rainfall intensities, peak flows, and velocities as defined in the VCWPD Hydrology Manual.
- Confluence calculations were performed at several junction points within the drainage areas.

Drainage and detention basin size calculation utilized the VCWPD's VCHYDRO model and VCRat (combined) to accurately compare the regional watershed impacts. The conceptual layout of the basins was prepared in order to develop these rating curves to provide the storage-indication relationship for reservoir routing. The two on-site detention basins were ultimately sized to accept the peak discharge of Haun Creek (Q_{100}) over and above what the safe discharge rate (flow rate that can be handled without overflow) of the Haun Creek/SR-126 bridge (Q_{bridge}) plus the proposed internal network of storm drains within the project site.

4.9.3.2 Best Management Practices (BMP) Calculation Methodology

<u>BMP Design</u>

All BMPs for the proposed project were designed following available Ventura Countywide Stormwater Quality Management Program Manual design standards for BMPs. The treatment runoff volume was calculated based on the treatment volume calculation guidelines provided in the Ventura Countywide Water Quality manual. The manual provides graphs for the estimation of the storm water volume that must be captured and treated to provide treatment of 80 percent of the annual runoff and equations for calculation of the Stormwater Quality Design Flow (SQDF) for flow based BMPs. The California Stormwater Quality Association Best Management Practices Design Manual for New Development and Redevelopment (CASQA Manual) provides design guidelines that are useful and commonly accepted for design of volume based and flow based BMPs. The CASQA Manual will be relied upon for design guidance when the design phases of this project are reached.

Volumetric BMPs

The acreage of land that is tributary to each of the volumetric BMPs, such as extended detention basins, was calculated based on the site plan for the project. Runoff volume was based on proposed land uses in the watershed area. The volume of storm water that must be captured to provide 80 percent annual capture was assumed to be the "design storm" as analyzed. The volumetric BMP-sizing calculation for basin-type BMPs utilized a 40-hour drawdown time or treatment period for the BMP runoff volume. The proposed extended detention basins were preliminarily sized per Appendix-B of the Ventura Countywide Stormwater Quality Management program requirements.

Flow Based BMPs

The flowrate-based BMPs, such as vegetated swales and water quality creeks, were preliminarily sized to treat 10 percent of the 50-year (Q_{50}) tributary peak flowrate per SQDF calculation detailed in Appendix-A of the Ventura Countywide Stormwater Quality Management program manual.

Dry Extended Detention Basin BMPs

The proposed detention basins were designed as dry extended-detention basins. A dry extended-detention basin is a basin that remains empty most of the time until a rainfall runoff event occurs. During the runoff event, water entering the basin is detained. This water is released through an engineered outlet structure over the course of approximately 48 hours. During this time, particulates and other pollutants are removed from the water in the basin by settling, infiltration, and absorption by soils. In most cases dry extended detention basins are designed with gentle side slopes and shallow water depths (when full) to provide a safe condition for the public.

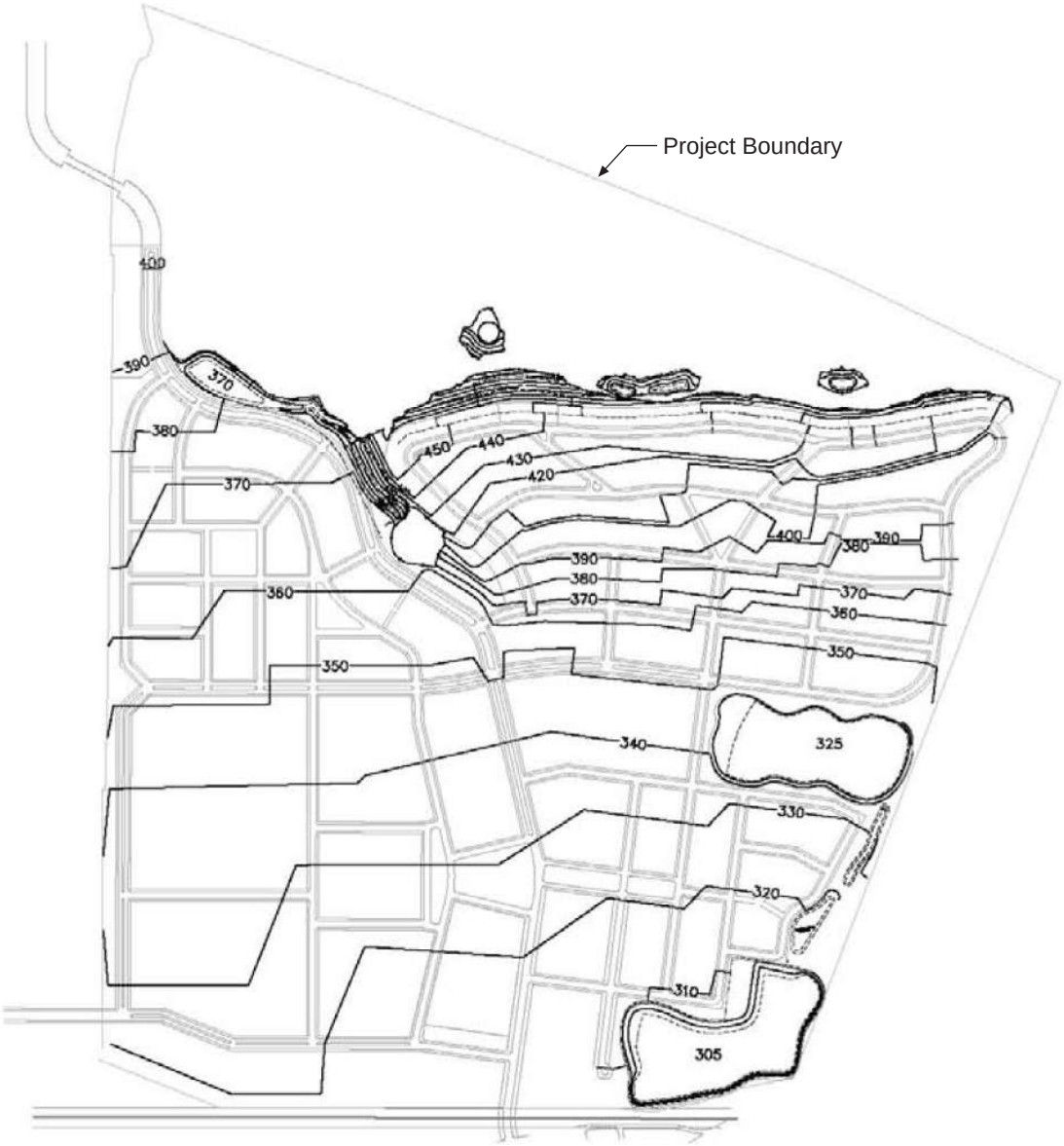
4.9.4 POTENTIAL IMPACTS

4.9.4.1 Proposed Grading and Hydrology and Storm Drain Plans

Figure 4.9-6 shows the proposed grading plan for the project site. As noted in this figure, the project site would be graded to create building pads. However, only the lower and middle portions of the site would be graded. The northern areas of the project site comprising the open space areas (i.e., natural areas and Agricultural Preserve) would remain in their existing conditions. The building pads located within the middle and lower portions of the project site would be graded to one percent slopes with two to one (2:1) slopes between building pads. Roadway grades in the middle portion of the project site would vary between two and eight percent with some limited roadway reaches approaching ten percent grade. In addition, the grading plan has been designed to ensure that during rain events precipitation falling on-site is directed towards the storm drain system.

Figure 4.9-7 shows the proposed hydrology plan for the project site. As noted in this figure, off-site surface flows would be directed to a series of debris and detention basins located within the northern and eastern portions of the project site. On-site surface flows would be directed to the on-site storm drain system and then off-site into either Santa Paula or Haun Creeks.

Figure 4.9-8 shows the proposed storm drain plan for the project site. The City of Santa Paula does not have its own design standards for drainage design. The City defers to the County of Ventura drainage design manuals for design guidance on storm drain design and construction. The Ventura County Flood Control Design Manual indicates that minor storm drain system and appurtenant structures that will not be under future jurisdiction of the Ventura County Watershed Protection District (VCWPD) should be designed for the 10-year (Q_{10}) storm event. Channels and basins of regional significance that will be under VCWPD jurisdiction should be designed for the 100-year (Q_{100}) storm event. Typically, in jurisdictions where the storm drain is not designed to accommodate flows from a 100-year storm event, a design requirement combined with FEMA guidelines results in the ability to surcharge the streets and utilize the roadway section as storm conveyance. In such a case, the development pad of existing and proposed structures must have a minimum of one foot of freeboard beyond 100-year storm elevation. However, it should be noted that this approach is not proposed for the project site.



LEGEND

CONTOUR

DAYLIGHT

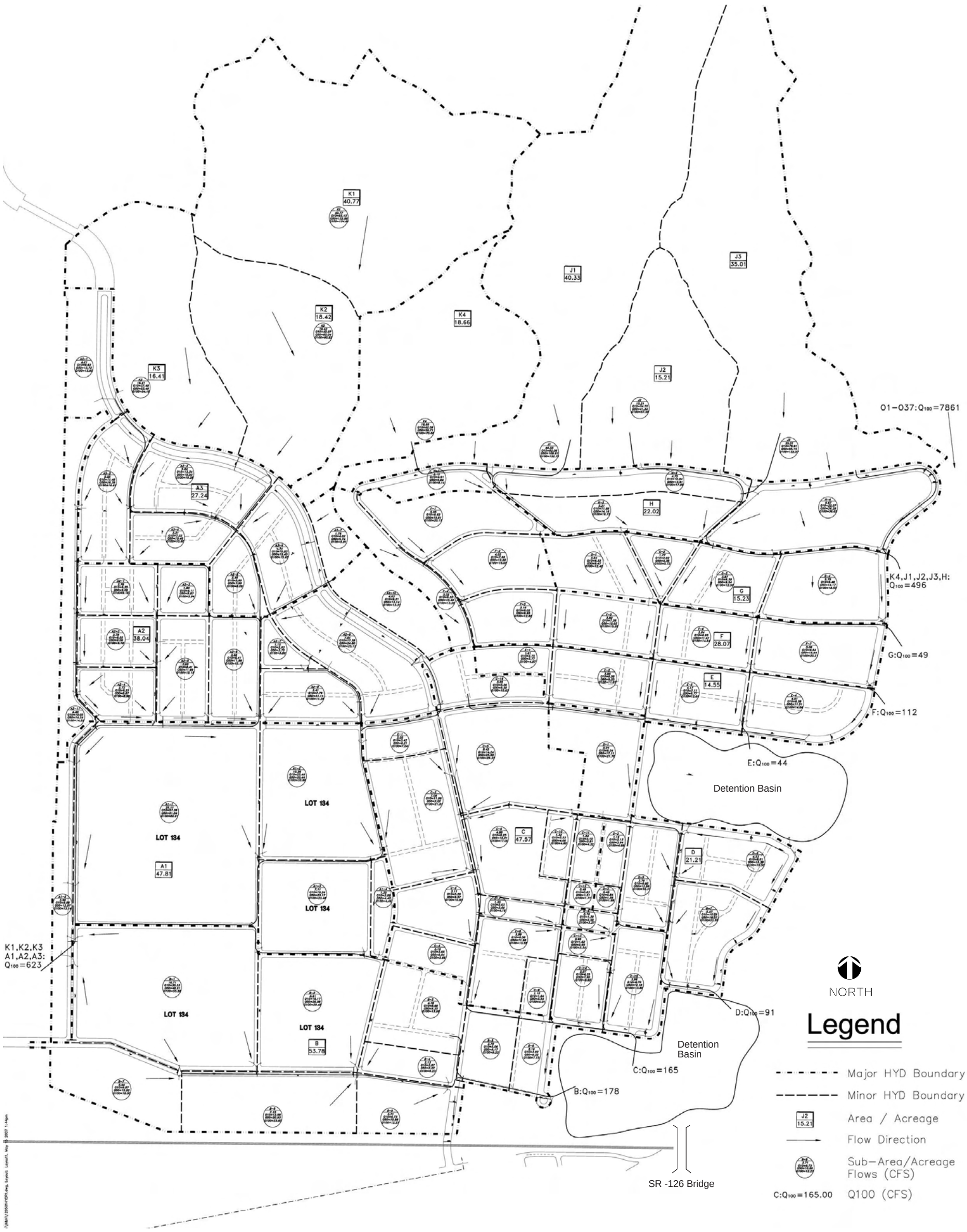
TOP/TOE OF SLOPE

NORTH

Footnote: "Daylight" Refers to a specified elevation, distance, or where grading meets the existing surface.

Source: Huitt-Zollars (2007) & P&D Consultants, Inc. (2007)

Figure 4.9-6
East Area 1 Grading Master Plan



Footnote: See Appendix D of the Drainage Study Technical Report of this DEIR for larger scale drawing.

Source: Huitt-Zollars (2007) & P&D Consultants, Inc. (2007)

Figure 4.9-7
Proposed Hydrology Map

Source: Huitt-Zollars (2007) & P&D Consultants, Inc. (2007)

Figure 4.9-8
Proposed Storm Drain System

Based on the VCRat modeling, the project site storm drain system and all pipes have been sized to accommodate both 10-year (Q_{10}) and 25-year (Q_{25}) (in sump conditions) flows. The pipe size diameters would vary on-site in order to accommodate the respective flow quantities. In general, pipe diameter would range from 18-inches to 54-inches.

4.9.4.2 Construction

Construction activities would entail the use of machinery and materials handling and storage (e.g., gravel, asphalt) during all phases of the proposed project. These activities would entail the use of graders and other earthmoving equipment during initial site preparation. The use of this machinery and other vehicles would generate dust and would require the use of water trucks to meet Ventura Air Pollution Control District fugitive dust requirements. Increased erosion and siltation may also occur due to construction activities and the modification and/or, filling and re-routing of existing agricultural and drainage ditches. The use of water trucks to reduce dust may increase the potential for urban pollutants and silt to enter both Santa Paula and Haun Creeks which drain to the Santa Clara River to the south of the project site. Accidental on-site spills of hazardous materials (e.g., fuels, solvents, paint) may also enter ground and/or surface waters, if not properly addressed.

The proposed project would be subject to a General Permit[18] because it would disturb more than one acre of soil and as such, the Applicant and/or its contractor would be required to prepare and implement a Stormwater Pollution and Prevention Plan (SWPPP) which meets the requirements of the General Permit. All construction activities would be required to implement storm water prevention measures identified in the SWPPP during all phases of construction. Adherence to the SWPPP and the implementation of standard best management practices (BMPs) during construction would reduce the potential for increased siltation, erosion and hazardous materials spills. Therefore, construction impacts associated with water quality would be less than significant.

4.9.4.3 Operation

<u>Surface Hydrology</u>

Santa Clara River Drainage

The proposed project does not include modifications to the Santa Clara River. However, tributaries to the Santa Clara River, including Haun and Santa Paula Creeks would be affected by implementation of the proposed project. Impacts to these drainages are discussed below.

Haun Creek and Orcutt Canyon Creek Tributary Drainages

The proposed project includes the implementation of mechanisms to reduce surface flow velocity and retain high flows associated with off-site areas within Orcutt and Haun Creeks. The purpose of these improvements is to address flooding, scour and erosion associated with these drainages and their potential to affect both on-site and downstream areas. As noted previously, flooding within the vicinity of SR-126/Haun Creek bridge occurs frequently and is problematic. Two large detention basins and a series of weir diversions[19] along the western bank of Haun Creek (upstream of SR-126) are proposed.

[18] State Water Resources Control Board Order No. 99-08-DWQ, NPDES General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activity (General Permit).

[19] Note: The first weir would be a low berm built parallel and on the stream bank to divert some of the creek's flow. The diverted water would flow within a trapezoidal channel, over another weir, and into a detention basin. Both weirs would be

The weirs would slow and temporarily detain flows within Haun Creek, thus reducing their potential to cause flooding and erosion downstream. As the flows are released within Haun Creek they would be diverted into two large detention basins capable of capturing and holding 115.1 acre-feet of water. The purpose of the detention basins would be to divert and store water from Haun Creek and the project site, and allow the water to drain slowly ("lagging"), thus reducing peak flows at the SR-126 bridge. Figure 4.9-9 shows the location of the proposed detention basins. Figure 4.9-10 shows the design of the proposed weir structure.

As shown in Table 4.9-4, during a Q_{100} storm event the detention basins would substantially reduce surface flows along Haun Creek from an estimated pre-project flow of 7,938.4 cfs to 3,000 cfs (the design capacity of the Caltrans maintained bridge at SR-126). This is anticipated to eliminate the historical flooding problem experienced at this location.

TABLE 4.9-4
COMPARISON OF PROJECT HYDROLOGY

	OUTLET POINT	EXISTING WATERSHED AREA	EXISTING Q_{100} (CFS)	PROPOSED WATERSHED AREA	PROPOSED Q_{100} (CFS)
	Santa Paula Creek	K5	16.9	K1-3, A1-3	623
	Santa Paula Creek	K6	70.4		
	Totals		**∑=87.3**		∑=623
	VCTC railroad	K8	38.0		
	VCTC railroad	J1-3, J5-7, K0-4	1120.0		
	Totals		∑=1,158.1		∑=0
Pre-detention Basin Routing	Haun Creek	O1-37	7861.0	O1-37	7861
	Haun Creek	J4	33.0	K4, J1-3, H	496
	Haun Creek	J8	44.4	G	49
	Haun Creek			Q	112
	Det. Basin 1/Haun Creek			E	44
	Det. Basin 2/Haun Creek			B	178
	Det. Basin 2/Haun Creek			C	165
	Det. Basin 2/Haun Creek			D	91
	Totals		∑=7,938.4		∑=8,996a

broad-crested and made of reinforced PCC, armorflex, or other permanent hard surfaces. Once in this basin, it would be drained through a storm drain pipe that would restrict the outflow discharge rate.

TABLE 4.9-4
COMPARISON OF PROJECT HYDROLOGY

	OUTLET POINT	EXISTING WATERSHED AREA	EXISTING Q_{100} (CFS)	PROPOSED WATERSHED AREA	PROPOSED Q_{100} (CFS)
Post-detention Basin Routing	**Detention Basin Sizing**				
	Tributary Area			**Required Detention Volume (ac-ft)**	**Proposed Q100 (cfs)**
	Haun Creek Detention			113.1	
	Storm Drain Line B			0.8	
	Storm Drain Line C Detention			0.7	
	Storm Drain Line E Detention			0.2	
	Total Project Detention			∑=115.1b	
	Detention Basins Reduction in of Flow in Haun Creek				
	Summary				∑=3,000c

Source: Huitt-Zollars, Inc, East Area 1 Drainage Technical Report, April 2007.

Farm Creek Drainage

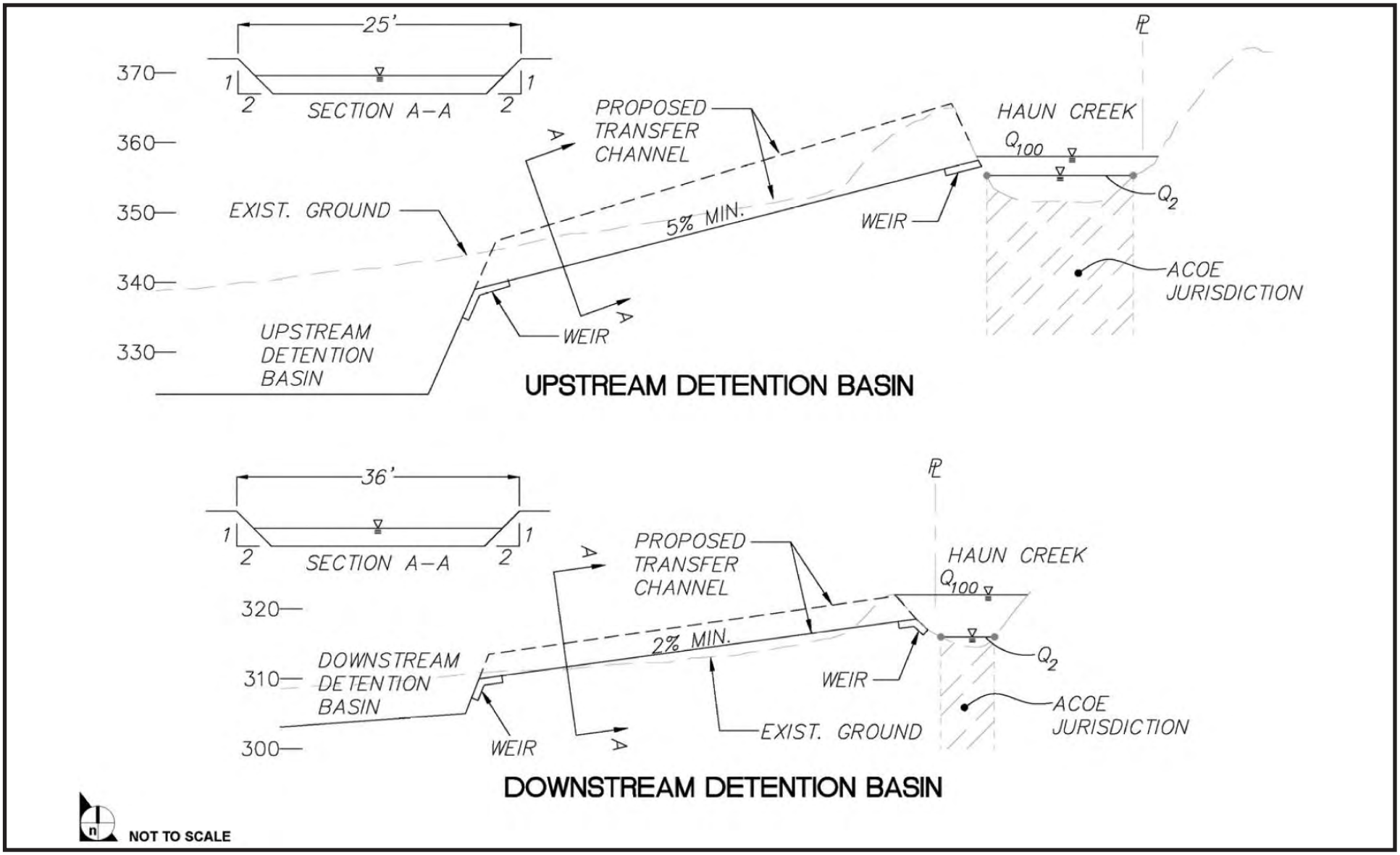
This drainage area would be graded and modified for building pads. Surface flows originating within the northern portion of this area would be captured within debris basins before being conveyed off-site to Haun Creek via the on-site storm drain/detention basin system. In addition, surface flows which would normally be conveyed off-site via an existing 48-inch diameter outlet located along the VCTC right-of-way will be redirected to the east and will exit the project site via the proposed southern detention basin located adjacent to Haun Creek. Figure 4.9-9 shows the location of the proposed debris and detention basins. As shown in Table 4.9-4, during a Q_{100} storm event, surface flows within this drainage area would be reduced from its pre-project level of 1,120 cfs to 0 cfs with implementation of the proposed project.

Overland Drainage

This drainage area would be graded and modified for building pads. Surface flows originating within the northern portion of this area would be captured within a debris basin before being conveyed off-site to Santa Paula Creek via the on-site storm drain system. In addition, surface flows which would normally be conveyed off-site via outlets located along the VCTC right-of-way will be redirected to the west and will exit the project site at one central location located adjacent to Santa Paula Creek. Figure 4.9-9 shows the location of the proposed debris basin. As shown in Table 4.9-4, during a Q_{100} storm event, surface flows within this drainage area would be reduced from its pre-project level of 38 cfs to 0 cfs with implementation of the proposed project.

Source: Huitt-Zollars (2007) & P&D Consultants, Inc. (2007)

Figure 4.9-9
Proposed Detention Basins



Source: Huitt-Zollars (2007) & P&D Consultants, Inc. (2007)

Figure 4.9-10
Proposed Weir Structures

Santa Paula Creek Drainage

This drainage area would be graded and modified for building pads. Surface flows originating within the northern portion of this area would be captured within a debris basin before being conveyed off-site to Santa Paula Creek via the on-site storm drain system. In addition, surface flows which would normally be conveyed off-site via outlets located along the VCTC right-of-way will be redirected to the west and will exit the project site at one central location located adjacent to Santa Paula Creek. Figure 4.9-9 shows the location of the proposed debris basin. As shown in Table 4.9-4, during a Q_{100} storm event, surface flows within this drainage area would be increased from its pre-project level of 87.3 cfs to 623 cfs with implementation of the proposed project. However, these flows would not exceed the flow or quantity capacity of Santa Paula Creek.

As noted above and in Table 4.9-4, although the proposed project would include the alteration of existing drainage areas and patterns, the implementation of the proposed debris/detention basin system would eliminate the potential for flooding within both on- and off-site areas. The design features noted above are intended to reduce on-site flow velocities and direct these flows (which currently travel unimpeded) towards appropriately sized conveyance and detention facilities before ultimately being discharged to Santa Paula and Haun Creeks. In addition, the construction of the detention basins and weirs along the west side of Haun Creek would reduce flow rates and quantities to the design capacity (i.e., 3,000 cfs) of the existing Caltrans maintained bridge at SR-126/Haun Creek. Therefore, implementation of the proposed project would result in a beneficial impact related to the amount and rate of surface flows to both on- and off-site areas. Additionally, the proposed project would result in less than significant impacts related the project's potential to exceed the capacity of an existing or planned storm water drainage system since all drainage conveyance facilities would be appropriately sized, per City of Santa Paula and VCWPD requirements.

Floodplain & Flood Hazards

Floodplain

As noted previously, construction of the on-site debris and detention basin system would greatly improve drainage conditions along Haun Creek and would reduce the potential for flooding within upstream areas and at the SR-126/Haun Creek bridge. However, existing FEMA maps show this area of Haun Creek as located within a 100-year Floodplain and is designated as Zone A[20]. Although FEMA does not restrict construction (including residential units) within Zone A areas, the City of Santa Paula seeks to avoid development in areas subject to flooding. A review of the project site plan indicates that no residential or commercial land uses are proposed within the existing Zone A areas. Therefore, implementation of the proposed project would result in less than significant impacts associated with placing housing within a 100 year flood area.

[20]Note: FEMA defines Zone A as follows: Zone A is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the Flood Insurance Study by approximate methods of analysis. Because detailed hydraulic analyses are not performed for such areas, no Base Flood Elevations or depths are shown within this zone. Mandatory flood insurance purchase requirements apply. Source: http://www.fema.gov/plan/prevent/fhm/fq_gen13.shtm, accessed August 7, 2007.

Flooding

See section 4.9.4.3 (Operation) above for a detailed discussion of potential flooding impacts.

In addition, the proposed project would not result in the placement of structures within a 100-year flood hazard area which would impede or redirect flood flows. As noted above, with the implementation of debris/detention basin system, impacts associated with flooding would be reduced to less than significant levels. Therefore, implementation of the proposed project would result in less than significant impacts related to the placement of structures within a 100-year flood hazard area and would not impede or redirect flood flows.

The proposed project does not include the construction of a levee or dam. Although the debris/detention basins and associated weirs would serve to reduce flow velocities and temporarily retain storm flows, they have not been designed to serve as "dams" as defined by the State of California Division of Dam Safety (DOSD).[21] Therefore, implementation of the proposed project would not 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 and as such, impacts would be less than significant.

Seiche, Tsunamis, and Mudflows

The project site is approximately 14 miles inland from the Pacific Ocean and is at or above 300 feet AMSL. Accordingly, the potential for inundation due to tsunamis to affect the project site is considered negligible. In addition, there are no lakes, ponds or dams adjacent to the project site. Therefore, the potential for inundation due to seiches is also considered negligible. Consequently, impacts associated with tsunami or seiches would be less than significant.

The potential for mudflows within Santa Paula Creek, Haun Creek and the on-site drainages does exist due to the steep topography and sandy and fine particle soils on-site and within the adjacent areas. The segment of Santa Paula Creek located adjacent to the project site has been improved to address high velocity flows and associated debris. However, Haun Creek and the on-site drainages are currently unimproved and therefore, in the absence of detention and debris basins, during heavy precipitation, debris and mudflows could occur on-site. Therefore, impacts associated with mudflows would result in a significant impact.

Hydrogeology

Santa Paula and Fillmore Groundwater Basins

Section 4.2 (Agricultural Resources) of this EIR contains a detailed discussion of potential impacts related to depletion of groundwater supplies.

Implementation of the proposed project would require the construction impervious surfaces (e.g., roads, sidewalks, homes, parking lots, etc.). Of the 501 acres comprising the project site, a total of 299.8 acres would be non-pervious surfaces. The remaining 201.2 acres would consist of pervious surfaces (e.g., natural areas, an agricultural reserve, parks and greenways). Although the proposed project would roughly reduce the amount of pervious surfaces contained on-site by more than half, when considered in the context of the overall available land comprising the Santa Paula and Fillmore Groundwater Basin

[21] Source:Department of Water Resources, Division of Safety of Dams. No date. *Statutes and Regulations Pertaining to Supervision of Dams and Reservoirs*. P.2.

recharge areas, the impact to the Basins would be inconsequential[22]. Therefore, implementation of the proposed project would not substantially interfere with groundwater recharge and impacts would be less than significant.

Storm Water Runoff & Water Quality

Water quality for both surface and groundwater resources could be affected by implementation of the proposed project. As noted above, storm water runoff contains urban pollutants that degrade surface and groundwater quality in the Santa Clara River and associated tributaries. Storm water runoff in Ventura County is regulated by the RWQCB – Los Angeles. On July 27, 2002, the RWQCB adopted Board Order No. 00-108 and issued the final municipal stormwater permit for Ventura County (Ventura County Municipal Storm Water Permit NPDES Permit No. CAS004002). Board Order No. 00-108 serves as the County-wide NPDES permit for storm water discharges and urban runoff in Ventura County. The City of Santa Paula is a participating municipality under the County-wide permit. Under the terms of the permit, the VCWPD and other co-permittees (i.e., City of Santa Paula) are required to implement NPDES Permit No. CAS004002 (including the Monitoring and Reporting Program, Ventura Countywide Stormwater Quality Urban Impact Mitigation Plan (SQUIMP), and Ventura Countywide Stormwater Quality Management Plan (SMP)).

SQUIMP

The proposed detention basins would serve dual roles of flood protection and water quality enhancement. The detention basins would be sized to treat 10 percent of the Q_{50} emanating from the storm drain system as outlined in the County's SQUIMP guidelines. The detention basins would be constructed with tiered sides, allowing for differing plant species to develop on the various tiers. As storm water flows increase, successive tiers will be inundated with storm water, slowing down the flow through the basin and allowing contact time with the plant species. The outlet structure of the detention basin will permit flows to enter Santa Paula Creek or Haun Creek. By reducing the outlet structure size and "choking" the outlet flows, contact time within the detention basin can be maximized, allowing for sediment and pollutant drop-out.

The detention basins will also accept runoff through a series of storm drain systems located in the public streets or public easements within the project site. These storm drain facilities will collect and convey the flows to a discharge point at the upstream end of the detention basin. Runoff will flow through the detention basins and eventually spill into Haun Creek at several discharge points

Water quality measures for the project site will consist of BMPs that are listed in the Ventura County SQUIMP. The SQUIMP was devised to address storm water pollution for any new development and redevelopment. Storm water treatment for the project site will occur on-site and before discharge to the adjacent drainages and the Santa Clara River. BMPs will be utilized in the project; the proposed BMPs include bio-swales, detention basins, and a storm drain system.

As per design guidelines shown in the SQUIMP, bio-swales will be designed for the Project using flow-based criteria (e.g., 10% of the 50-year design flowrate). Bio-swales, which generally have low velocities, are used to mitigate concentration of nutrients through contact with vegetation. For the project site, installation of bio-swales along the east and west boundaries of the project would provide cleansing

[22] Note: Santa Paula Groundwater Basin is comprised of 13,000 acres (20.3 square miles). The Fillmore Groundwater Basin is comprised of 20,800 acres (32.5 square miles) By comparison, the proposed project would result in the construction of impervious surfaces over an area of 0.43 square miles.

of storm runoff before discharge into Santa Paula Creek and Haun Creek. Additionally, bio-swales could be incorporated into roadway medians, providing treatment of runoff from the paved roadways.

Detention basins proposed on-site will be utilized to delay discharge of storm water. Basins settle out and filter pollutants from runoff. The majority of storm runoff from the project site will flow through the project site to these detention basins.

The storm water management elements and improvements which are used to form the on-site flood control system can be either classified as conveyance-oriented or storage-oriented. The proposed system is composed of improved, stabilized, and restored creeks and streams, underground storm drains conduits (RCPs, RCBs, and culverts), water quality swales, debris basins, detention basins, water quality basins, and multi-use combined storage facilities. Where possible, the storm water management system has been designed to include multiple-use facilities to result in the most economical storm water management system while obtaining optimum performance with regard to flood control and water quality parameters.

Table 4.9-5 compares flow-based and volume-based flow as required by the SQUIMP for water quality treatment.

TABLE 4.9-5
WATER QUALITY[1]

SUB-AREA ID	AREA (AC)	Q_{10}	Q_{50}	Q_{100}	FLOW BASED WATER QUALITY TREATMENT 10% OF Q_{50} (CFS)	VOLUME BASED WATER QUALITY REQ'D (FT^3)[1]
A1	47.81	109.22	155.83	157.86	15.58	130,163
A2	38.04	86.93	123.94	125.59	12.39	103,564
A3	27.24	62.24	88.79	89.94	8.88	74,161
B	53.78	97.62	157.41	177.92	15.74	146,416
C	47.57	80.42	146.32	165.72	14.63	129,509
D	21.21	38.91	72.01	91.30	7.20	57,744
E	14.55	24.81	34.09	44.00	3.41	39,612
F	28.07	53.44	88.45	112.13	8.85	76,421
G	15.23	25.11	37.54	49.19	3.75	41,464
H	22.02	50.25	59.85	83.39	5.99	59,949
				TOTAL FLOW	**96.2**	
					Volume (ft^3) =	**859, 003**
					Volume (ac-ft) =	**19.7**

Source: Huitt-Zollars, 2007.
[1] Based on rainfall totals of 0.75 inches per hour intensity over drainage areas, per SQUIMP. Includes both East Area 1 and Haun Creek requirements
[2] The total East Area 1 north and south drainage basin volumes equal 101 acre-feet of water.

As co-permittees of the NPDES Permit No. CAS004002, the City and County have developed programs to address the following:

- Implementation of controls to reduce pollution from commercial, industrial and residential areas.
- Implementation of structural/non-structural controls on land development and construction sites.
- Implementation of controls to reduce pollution from maintenance activities.

- Elimination of illegal connections, including discouragement of improper disposal.
- Encouragement of spill prevention and containment, and implementation of appropriate spill response.
- Inspection monitoring and control programs for industrial facilities.
- Implementation of public awareness and training programs.[23]

Adherence to Board Order No. 00-108, the implementation of standard BMPs and the preparation of a Business Plan, as discussed in Section 4.10 (Hazards and Hazardous Materials) during operation of the proposed project would reduce the incidence and quantities of urban pollutants potentially affecting surface and groundwater. Therefore, impacts related to the proposed project resulting in the violation of a water quality standard would be less than significant.

4.9.5 MITIGATION MEASURES

4.9.5.1 Construction

H-1 Grading may occur during the rainy season from October 15th to April 15th, subject to approval by the City Engineer and installation of erosion control facilities. Erosion control measures must be in place and functional between October 15th and April 15th. In order to comply with the October 15 date, revised erosion control plans must be submitted to the City Engineer no later than September 15th of each year from the start of grading or clearing operations to the time of grading bond release.

H-2 Temporary irrigation, hydroseeding, and erosion control/sedimentation control measures must be implemented on all temporary grading. Temporary grading is defined to be any grading partially completed and any disturbance of existing natural conditions due to construction activity. These measures will apply to temporary grading activity that remains or is anticipated to remain unfinished or undisturbed in its altered condition for a period of time greater than 30 days or until the beginning of the rainy season whichever comes first.

H-3 During site preparation and construction, the Applicant and/or its contractor must minimize disturbance of natural groundcover on the project site until such activity is required for grading and construction purposes. During grading operations, the Applicant and/or its contractor must employ a full-time superintendent for NPDES compliance. If determined necessary by the City Engineer, the NPDES superintendent must be present on the project site not only during normal working hours, (e.g., Monday through Friday), but also on all other days when the probability of rain is 40 percent or higher, as well as before the start of and during all grading or clearing operations until the release of grading bonds.

The NPDES superintendent must perform site inspections before a forecast storm, during an extended storm, and after storms. The NPDES superintendent must have full authority to hire personnel, bind the Applicant and/or its contractor in contracts, rent equipment, and purchase materials to the extent needed to effectuate BMPs. The NPDES superintendent must have certifications and training as per the Storm Water Practitioner requirements of the 2007 General Construction Permit, and must provide proof to the City Engineer of satisfactory completion of courses and certifications to meet permit requirements and any requirements imposed by the City. Proof of such attendance and completion must be provided to the City Engineer before

[23]Source: RWQCB LosAngeles,http://www.swrcb.ca.gov/rwqcb4/html/programs/stormwater/VentCoPermit.pdf, accessed August 10, 2007.

employment of the NPDES superintendent. The project must follow requirements specified in the City of Santa Paula Municipal Code related to Stormwater Quality Management.

H-4 Before the City issues an initial grading permit, the Applicant and/or its contractor must have prepared a Stormwater Quality Urban Impact Mitigation Plan (SQUIMP), including Non-Structural, Source Control, and Structural BMPs. A Certified Erosion and Sediment Control Professional or qualified Civil Engineer must prepare the SQUIMP. The SQUIMP must be reviewed and approved as per the requirements of Ventura County and/or the City Engineer. The development of the SQUIMP must conform to the Ventura County NPDES permit, the SQUIMP standards, and the Technical Guidance Manual for Storm Water Quality Control Measures.

H-5 The SQUIMP must include structural and/or treatment BMPs. The structural BMPs must focus on meeting potential TMDL and pollutant standards for residential developments. The treatment BMPs must conform to the *Technical Guidance Manual for Storm Water Control Measures.* The SQUIMP guidelines contained in the *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements* for Ventura County.

4.9.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With the implementation measures identified above, the proposed project will result in less than significant impacts. In addition, the construction of the detention/debris basin system would result in a beneficial impact related to flooding at SR-126/Haun Creek bridge.