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VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS
GROUP (VCAILG)

2007 Annual Monitoring Report

final

submitted to

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

prepared by

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on behalf of the

VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS GROUP (VCAILG)



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Acronyms

BMP	Best Management Practice
CC	Calleguas Creek
CCWTMP	Calleguas Creek Watershed TMDL Monitoring Program
CORF	California Ornamental Research Federation
CWA	Clean Water Act
DPR	Department of Pesticide Regulation
DQO	Data Quality Objective
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
IPM	Integrated Pest Management
IR	Instrument Resolution
LARWQCB	Los Angeles Regional Water Quality Control Board (Regional Board)
MDL	Method Detection Limit
MRP	Monitoring and Reporting Program
NA	Not Applicable
ND	Not Detected
NM	Not Measured
NOA	Notice of Applicability
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
NS	Not Sampled; insufficient flow present
OC	Organochlorine
OP	Organophosphorus
PAM	Polyacrylamide
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCD	Resource Conservation District
RL	Reporting Limit
SCR	Santa Clara River
SOP	Standard Operating Procedure
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UCCE	University of California Cooperative Extension
USDA	United States Department of Agriculture
VCAILG	Ventura County Agricultural Irrigated Lands Group
VR	Ventura River
WQMP	Water Quality Management Plan

Introduction

On November 3, 2005 the Los Angeles Regional Water Quality Control Board (Regional Board) adopted a *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region* (“Conditional Waiver”, Order No. R4-2005-0080). The purpose of the Conditional Waiver is to assess the effects of and control discharges from irrigated agricultural lands in Los Angeles and Ventura Counties, including irrigation return flows, flows from tile drains, and storm water runoff. These discharges can affect water quality by transporting nutrients, pesticides, sediment, salts, and other pollutants from cultivated fields into surface waters, potentially impairing designated beneficial uses. Owners and operators of agricultural lands in Ventura and Los Angeles Counties must comply with provisions contained in the Conditional Waiver or be regulated under other Regional Board programs.

The Conditional Waiver allows individual landowners and growers to comply with its provisions by working collectively as a Discharger Group, or as an individual. A Discharger Group is defined by the Conditional Waiver as “any group of dischargers and/or organizations that form to comply with this Conditional Waiver. Discharger Groups can be, but are not limited to, organizations formed on a geographic basis or formed with other factors in common such as commodities.” The primary purpose of allowing Discharger Groups is to encourage collaboration on monitoring and reporting and to increase the effectiveness of management practices throughout a watershed to attain water quality standards. Those landowners and growers choosing to comply with the Conditional Waiver as a Discharger Group must signify by submitting a Group Notice of Intent and by developing a Discharger Group monitoring program.

To assist agricultural landowners and growers that farm within the boundaries of Ventura County, various agricultural organizations, water districts and individuals joined together to form the Ventura County Agricultural Irrigated Lands Group (VCAILG), which is intended to act as one unified “Discharger Group” for those agricultural landowners and growers that wish to participate. A Notice of Intent (NOI) to comply with the Conditional Waiver was submitted to the Regional Board by the VCAILG on August 3, 2006. The NOI included the VCAILG membership roster, as well as the required Quality Assurance Project Plan (QAPP) and Monitoring and Reporting Program Plan (MRP), which detail the water quality monitoring and reporting procedures being conducted in compliance with the terms of the Conditional Waiver. The Regional Board responded by issuing the Notice of Applicability (NOA) to the VCAILG on December 18, 2006, signifying the Regional Board’s approval of the VCAILG and its Monitoring Program.

This first Annual Monitoring Report provides a detailed summary of activities of the VCAILG during 2007, including administration of the VCAILG, an overview of farming in Ventura County and obstacles faced by VCAILG members, coursework offered to Group members to fulfill the Conditional Waiver’s education requirement, a list of education hours completed to date by each member, and monitoring data collected during the three monitoring events conducted. Also included is a discussion of monitoring results that exceeded water quality benchmarks, therefore triggering the requirement to develop Water Quality Management Plans (WQMPs) designed to reduce water quality

impacts from agricultural discharges. Finally, a discussion of available resources for developing and implementing WQMPs is provided to emphasize the VCAILG's commitment to collaborate with local conservation and outreach groups to improve water quality.

Group Membership and Setting

The VCAILG was formed in 2006 to act as one unified “Discharger Group” in Ventura County for the purpose of compliance with the Conditional Waiver, as discussed in the previous section. VCAILG oversight is provided by a 20-member Steering Committee and a 7-member Executive Committee (also members of the Steering Committee). Steering Committee membership consists of agricultural organization representatives, and agricultural water district representatives, landowners and growers from the three primary watersheds in Ventura County (Calleguas Creek, Santa Clara River and Ventura River). Steering Committee membership also represents the major commodities grown in Ventura County (strawberries, nursery stock, citrus, vegetables, and avocados). The Steering Committee roster is presented in Table 1.

Table 1. VCAILG Steering Committee Membership

Member, Organization ^[1]	Crop(s) Represented	Watershed(s) Represented
Edgar Terry, Terry Farms, Inc. (Committee Chair)	Strawberries, Vegetables	Calleguas Creek, Santa Clara River
Steve Bachman, United Water Conservation District *	N/A	N/A
Jerry Conrow, Jerry L. Conrow & Co., CPA *	Citrus	Ventura River
Jim Coultas, Coultas Ranch Company	Avocado, Citrus	Ventura River
Robert Crudup, Valley Crest Tree Company	Nursery Stock	Santa Clara River
John Dullam, Dullam Nursery	Strawberries	Calleguas Creek
Mike Friel, Laguna Grove Service	Citrus	Calleguas Creek
Jurgen Gramckow, Southland Sod Farms	Sod, Hay, Oats	Calleguas Creek, Santa Clara River, Ventura River
Gus Gunderson, Limoneira Company	Avocado, Citrus	Santa Clara River
Rex Laird, Farm Bureau of Ventura County *	N/A	N/A
Jim Lloyd-Butler, Lloyd-Butler Ranch	Avocado, Citrus	Calleguas Creek, Santa Clara River
John Mathews, <i>Arnold, Bleuel, LaRochelle, et al</i> *	N/A	N/A
Sam McIntyre, Somis Pacific Ag Management Company	Avocado, Citrus	Calleguas Creek, Santa Clara River
Dave Souza, Pleasant Valley County Water District *	N/A	N/A
Dan Naumann, AA Nauman, Inc.	Vegetables	Calleguas Creek
Cris Pérez, Newhall Land & Farming	Citrus, Hay, Nursery Stock, Vegetables, Sod, Pasture	Santa Clara River
Kelle Pistone, Assoc. of Water Agencies of Ventura County *	N/A	N/A
Rob Roy, Ventura County Agricultural Association *	N/A	N/A
Bill Reiman, Catalinos Berry Farms	Strawberries	Calleguas Creek
Craig Underwood, Underwood Ranches	Avocado, Citrus, Vegetables	Calleguas Creek, Santa Clara River

N/A = Not Applicable

[1] An asterisk denotes Executive Committee membership

Because the VCAILG is an unincorporated organization, the Farm Bureau of Ventura County acts as the responsible entity for the collection of funds, contracting with

consultants, and other fiscal and/or business matters that require an organization with some form of tax status; the Farm Bureau is a non-profit 501(c)(5) organization.

A list of VCAILG members and associated parcels is included as Appendix A. The membership list includes the following information:

- Landowner Name
- Mailing Address
- Parcel number(s)
- Irrigated acres per parcel
- Watershed associated with each parcel

Table 2 contains a summary of VCAILG membership statistics, including the number of landowners and parcels enrolled, as well as irrigated acreage enrolled in each watershed. Since the submittal of the NOI on August 2, 2006, 367 new landowners enrolled in the Group. The VCAILG now represents 1,424 Ventura County agricultural landowners and 85,536 irrigated acres. According to the Ventura County Assessor's records, there are an estimated 268 landowners who are not enrolled in the VCAILG, some of whom may have applied as individual dischargers or own land that is no longer in production. Therefore, VCAILG enrollment currently represents nearly 85 percent of agricultural landowners in Ventura County.

Table 2. VCAILG Membership Statistics as of February 15, 2008

Watershed	Landowner Count	Parcel Count	Irrigated Acres
Calleguas Creek	647	1,285	45,957
Oxnard Coastal	52	103	3,787
Santa Clara River	588	1,244	29,842
Ventura River	203	359	5,950
<i>Total</i>	<i>1,490^[1]</i>	<i>2,991</i>	<i>85,536</i>
<i>Percent Increase^[2]</i>	<i>32.7</i>	<i>26.8</i>	<i>16.1</i>

[1] There are 1,424 unique landowners enrolled, a number of whom own property in more than one watershed.

[2] Percent increase over the August 3, 2006 NOI submittal.

IRRIGATED AGRICULTURE IN VENTURA COUNTY

Ventura County covers 1,843 square miles (approximately 1.2 million acres) with 43 miles of coastline (Figure 1). The Pacific Ocean forms its southwestern boundary, with Los Angeles County to the southeast, Kern County to the north and Santa Barbara County to the west. The Los Padres National Forest accounts for the northern half of the county, with residential, agricultural and business uses in the southern portion. Of the estimated 330,000 acres of agricultural land in the county, there are approximately 125,000 acres of irrigated land.¹ The Calleguas Creek Watershed contains the highest number of irrigated acres (roughly 60,000), followed by the Santa Clara River Watershed (approximately 50,000) and Ventura River watershed (approximately 15,000).²

¹ The estimate of 330,000 acres of irrigated agricultural land in the county: U.S. Department of Agriculture-National Agricultural Statistics Service, *2002 Census of Agriculture*. Washington, D.C.: June 2004.

² Estimates of irrigated acreage in each watershed are based on data obtained from the Ventura County Assessor's Office. For irrigated acreage estimates, the same acreage is counted only once for land on which multiple crops are grown throughout the year.

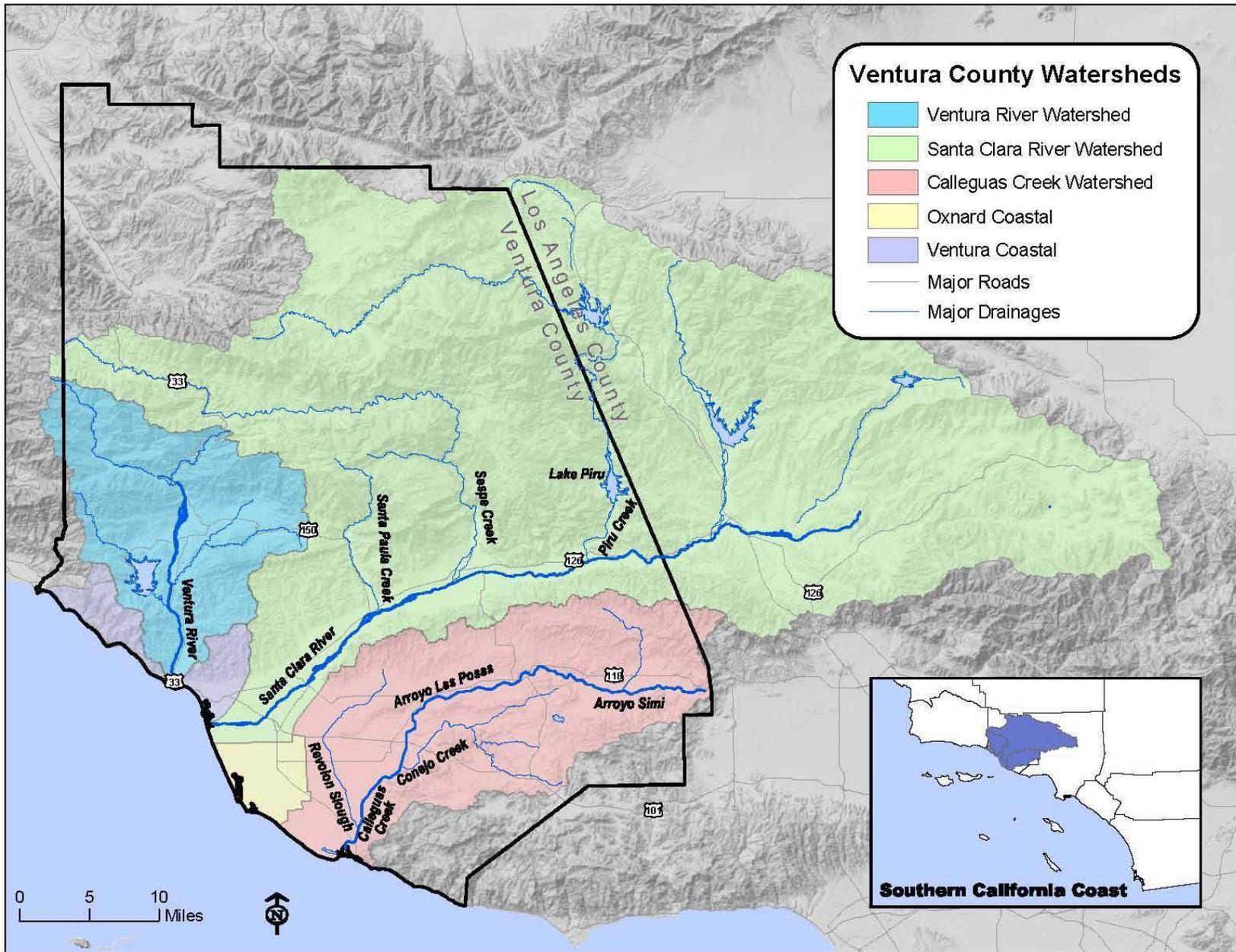


Figure 1. Ventura County Watersheds

Agriculture is a major industry in Ventura County, generating \$1.5 billion in gross sales for 2006. This gross value is up 20.2% from 2005 and is by far the largest increase reported in the state.³ With this increase, Ventura County rose from 11th to 8th in statewide ranking. Ventura County was ranked as one of the top five counties in California for thirteen agricultural commodities in 2006. Table 3 lists the County's ten leading crops in gross value for 2006. Table 4 lists the commodities for which Ventura County ranked in the top five of California's 58 counties for 2006.

Table 3. Ventura County's Leading Agricultural Commodities – 2006

Commodity	Gross Value (\$)
1. Strawberries	366,310,000
2. Nursery Stock	263,890,000
3. Lemons	191,552,000
4. Celery	144,313,000
5. Tomatoes	102,426,000
6. Avocados	87,391,000
7. Raspberries	81,153,000
8. Cut Flowers	52,456,000
9. Peppers	38,138,000
10. Valencia Oranges	19,734,000

Source: Ventura County Agricultural Commissioner. *Ventura County Crop Report 2006*.

Table 4. Ventura County's Statewide Commodity Rank by Gross Value – 2006

Commodity	Ventura County Rank Among 58 CA Counties	% of CA Total
Lemons	1	53.8
Celery	1	44.6
Raspberries	2	43
Strawberries	2	27.3
Avocados	2	25.6
Cabbage	2	19.7
Bell Peppers	2	16.8
Dry Beans	3	6.2
Nursery Stock	4	8.5
Spinach	4	4.6
Oranges	4	2.0
Carrots	4	0.6
Flowers, Foliage	5	6.6

Source: USDA, NASS, CA Field Office. *Summary of County Agricultural Commissioners' Reports, Gross Values by Commodity Groups—California 2005-2006*.

Characteristics of each of the three main watersheds in Ventura County are discussed in more detail below.

³ "Summary of County Agricultural Commissioners' Reports, 2005-2006," USDA, NASS, CA Field Office.

Calleguas Creek Watershed

The Calleguas Creek Watershed (Figure 2) is approximately 30 miles long, 14 miles wide, and drains an area of approximately 343 square miles or 219,520 acres. Cities within the watershed include Camarillo, Thousand Oaks, Moorpark, and Simi Valley. The main surface water system drains from the mountains in the northeast part of the watershed toward the southwest, where it flows through the Oxnard Plain before emptying into the Pacific Ocean through Mugu Lagoon. The main waterbodies in the watershed include Calleguas Creek, Revolon Slough, Beardsley Channel, Conejo Creek, Arroyo Santa Rosa, Arroyo Las Posas and Arroyo Simi. All of these waterbodies appear on the federal 303(d) list of impaired waterbodies, triggering the requirement to develop Total Maximum Daily Loads (TMDLs) for specified pollutants identified as causing impairments. Runoff from irrigated agricultural lands has been identified as one of the sources of these water quality impairments for specified pollutants. To date, TMDLs have been adopted for Nitrogen Compounds, Chloride, Organochlorine Pesticides, PCBs and Siltation, Toxicity, and Metals. In addition, TMDLs for Salts, Bacteria, and Trash are either currently going through the approval process or are under development.

Approximately 58,235 acres or 26.7% percent of land in the watershed is used for agricultural purposes. Avocados and citrus crops such as lemons and oranges are typically grown in flat or gently sloping foothill areas in the watershed. Agricultural land located on the Oxnard Plain is planted predominately in a wide variety of truck crops, including strawberries, peppers, green beans, celery, and onions, as well as sod farms and nurseries. Many farms located in the watershed grow multiple crops during a single calendar year. This multi-cropping technique is most common in the lower parts of the watershed, adjacent to Revolon Slough and Lower Calleguas Creek.

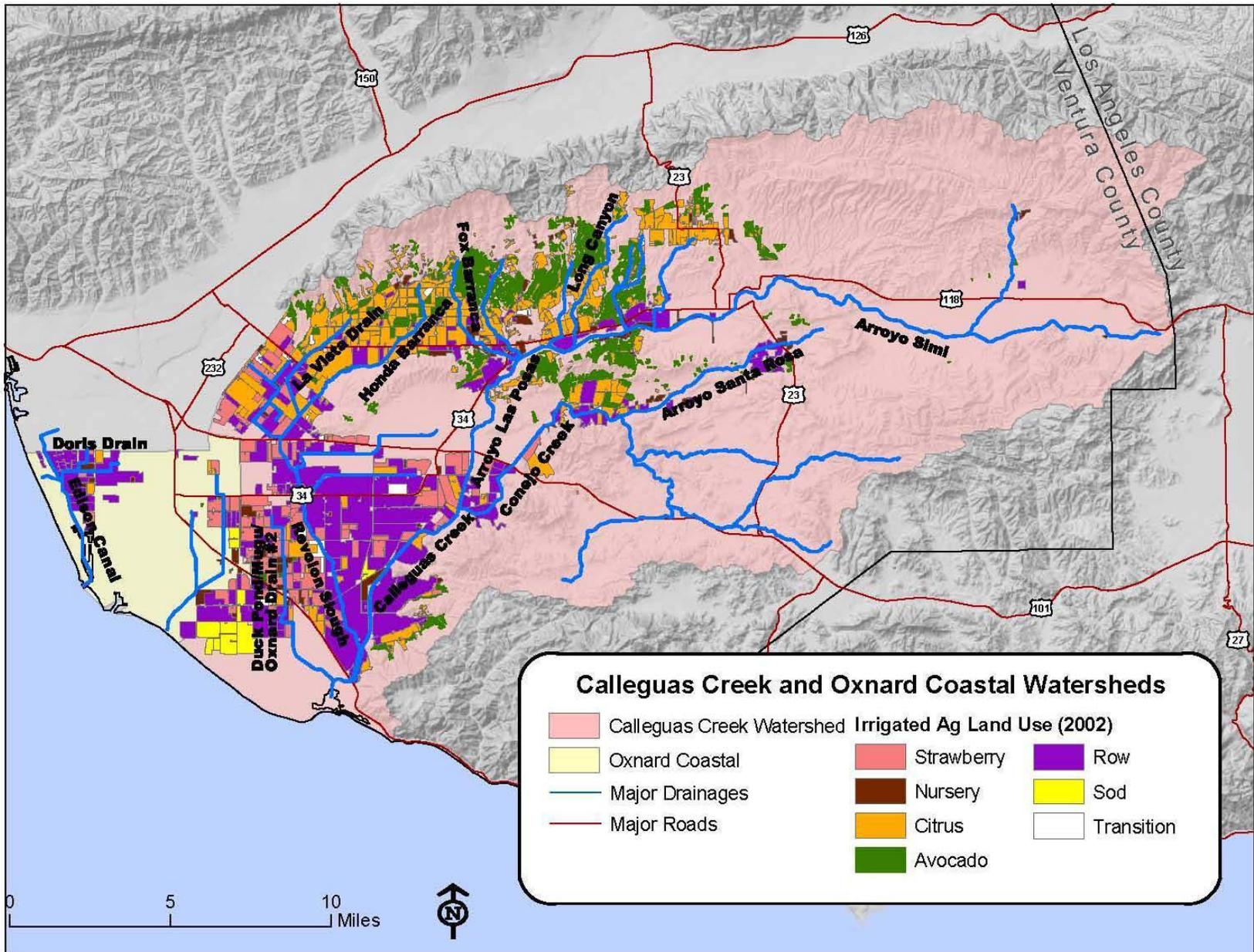


Figure 2. Calleguas Creek Watershed Agricultural Land Use

Santa Clara River Watershed

The Santa Clara River is the largest river system in southern California remaining in a relatively natural state. The river originates in the northern slope of the San Gabriel Mountains in Los Angeles County, traverses Ventura County, and flows into the Pacific Ocean halfway between the cities of San Buenaventura and Oxnard. The Santa Clara River and tributary system has a watershed area of about 1,634 square miles (Figure 3). Cities within the watershed include Ventura, Santa Paula, Fillmore, Piru, Santa Clarita, and Newhall. Major tributaries include Castaic Creek and San Francisquito Creek in Los Angeles County, and the Sespe, Piru, and Santa Paula Creeks in Ventura County. Approximately 40 percent of the watershed is located in Los Angeles County and 60 percent is in Ventura County. The most prevalent land use in the 500-year flood plain of the Santa Clara River is agriculture (62 percent), followed by industry (22 percent). Row crops and orchards are planted across the valley floor primarily in Ventura County and extend up adjacent slopes.

Several Santa Clara River reaches and tributaries appear on the federal 303(d) list of impaired waterbodies due to salts, nitrogen compounds, bacteria, and pesticides. TMDLs have been adopted for Nitrogen Compounds (upper and lower Santa Clara River reaches) and Chloride (Reach 3).

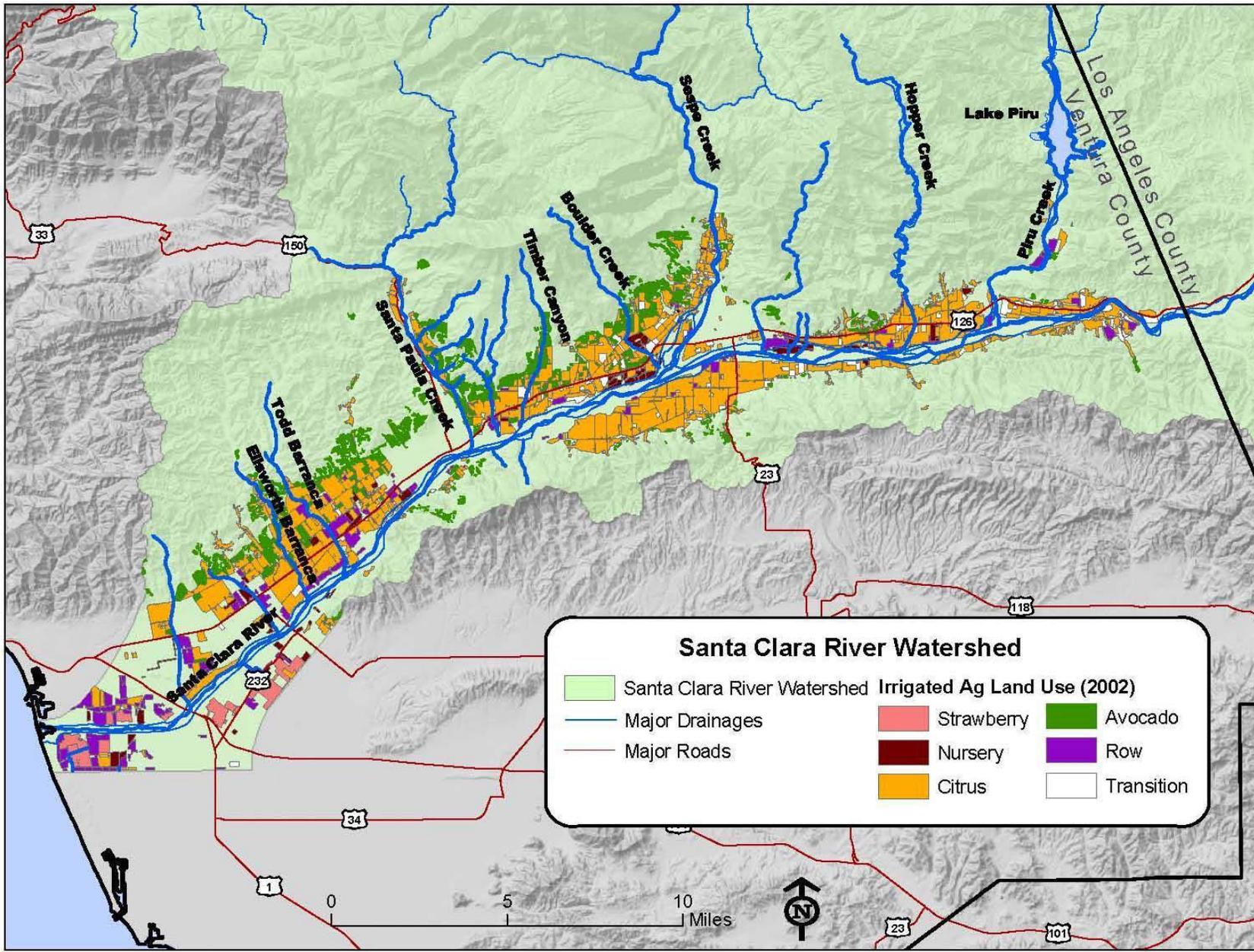


Figure 3. Santa Clara River Watershed Agricultural Land Use

Ventura River Watershed

The Ventura River and its tributaries drain a coastal watershed in western Ventura County. The watershed covers a fan-shaped area of 235 square miles, which is located within the western Transverse Ranges and is 31 miles long from upper Matilija Canyon to the Pacific Ocean (Figure 4). From the upper slopes of the Transverse Ranges, the surface water system in the Ventura River watershed generally flows in a southerly direction to the estuary, located at the mouth of the Ventura River. Main tributaries in the watershed include Matilija Creek, Coyote Creek and San Antonio Creek. The City of Ojai and communities of Meiners Oaks, Oak View and Casitas Springs are located in the watershed, with surrounding suburban and agricultural areas comprising the Ventura River, Santa Ana, and Upper Ojai Valleys. Portions of the City of San Buenaventura border the lower reaches of the Ventura River. Irrigated agriculture constitutes approximately 5 percent of land uses in the watershed, with avocado and citrus as the predominant crops grown.

Several Ventura River reaches and tributaries appear on the federal 303(d) list of impaired waterbodies due to algae/eutrophic conditions, low dissolved oxygen, bacteria, and trash. The Ventura River Estuary Trash TMDL is currently going through the approval process, and development of an Algae TMDL is underway.

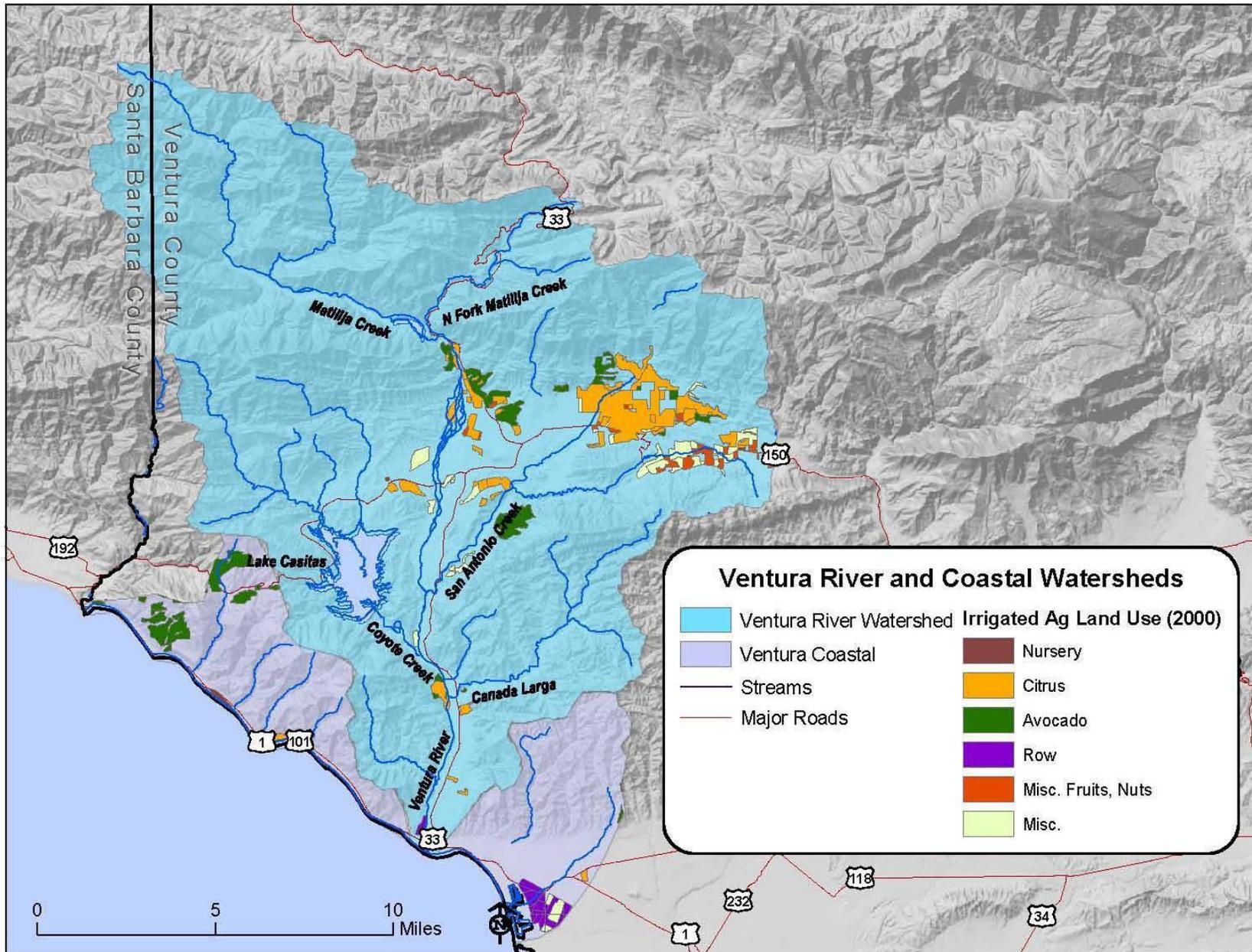


Figure 4. Ventura River Watershed Agricultural Land Use

FARMING CHALLENGES IN VENTURA COUNTY

Farmers in Ventura County suffered widespread losses in recent years due to drought, high winds, and freezing temperatures.

High winds and power line-induced fires destroyed 900 acres of orchards in the fall of 2005 and 2006. Cost estimates of damage are not available due to the complex factors governing crop replacement, including but not limited to replanting, irrigation system repair/replacement, water, fertilizers, pesticides, labor, and the time for trees to reach maturity.

Ventura County was designated a primary natural disaster area because of losses caused by drought that occurred beginning in January 2007. The National Weather Service declared the 2006-2007 rain season to be the driest rain season ever at many locations in southwestern California. Camarillo received just 3.43 inches of rainfall, only 22% of normal. Most stations in Ventura County ended the season with less than 25% of normal rainfall.

The Governor declared a state of emergency in response to a week-long freeze that occurred from January 12 through January 19, 2007 that affected Ventura and other California counties. Based on the Ventura County Agricultural Commissioner's reports, the estimated crop loss for Ventura County totaled \$280.9 million and affected roughly half of the commercial farming operations in the County. Crops that suffered the most damage from this freeze event were nursery stock, avocados, and citrus. Table 5 lists crop losses by commodity; these losses represent 19% of the 2006 crop gross values. The County Agricultural Commissioner estimated the overall freeze-impacted losses at \$750 million, considering industries dependent on agriculture and the multi-year fruit losses that occur in avocados and some citrus. This loss impact estimate does not include replanting of young trees killed in the sustained freeze conditions.

Table 5. Ventura County Crop Loss Values from January 2007 Freeze

Commodity	Loss Value of Present Year's Crop
Nursery Stock	\$85,400,000
Avocados	\$66,500,000
Berries	\$62,800,000
Lemons	\$46,600,000
Oranges, other Citrus	\$13,800,000
Leafy Vegetables	\$5,500,000

Hoops, Stephanie. "Relief efforts helped thaw a devastating '07 freeze." *Ventura County Star*. January 12, 2008.

In October 2007, growers were hit again with strong wind events, which caused the greatest losses to avocado and lemon crops. Estimates of crop loss values are unavailable at this time; however, some growers reported that 25 to 30% of the current crop was blown to the ground.

Beginning on January 25, 2008, Volatile Organic Chemical (VOC) reduction goals will limit the fumigation allowances of growers in Ventura County. Between May 1 and October 30, the County limit for applied fumigant is 734,000 lbs each year for the next four years. Growers will be required to submit fumigant amount requests to the Department of Pesticide Regulation and will then be notified what their allowance will

be. This regulatory action follows a 2006 court order requiring DPR to enforce a 20% reduction in VOCs from 1991 levels to comply with the California State Implementation Plan ozone standard.⁴ Enforcement of this regulation is applicable to air quality non-attainment areas, one of which is Ventura County. This regulation will have significant impacts on two major commodity groups, strawberries and cut flowers.

⁴ “About New Rules to Control Field Fumigant Emissions.” California Department of Pesticide Regulation, January 2008.

Water Quality Monitoring

MONITORING OBJECTIVES

The objectives of the VCAILG Monitoring Program are as follows:

- Assess the impact on waters of the State from wastes discharged from irrigated lands;
- Determine concentration and loading (where practicable) of pollutants present in surface waterbodies influenced primarily by the irrigated agriculture land use;
- Evaluate compliance with applicable water quality benchmarks to determine whether modifying management practices is necessary to improve surface water quality;
- Attempt to identify pollutant sources, if necessary;
- Provide feedback to growers in areas where benchmarks are exceeded to facilitate implementation and monitoring of management practices employed for controlling pollutant loads, if necessary;
- Report results and other required information as specified in the Monitoring and Reporting Program (CI-8836);
- Monitor trends in ambient water quality over time (long term objective);
- Coordinate monitoring efforts with existing and future monitoring programs so that data generated are complementary and not duplicative (*e.g.*, coordinate monitoring sites and sampling events with the Calleguas Creek Watershed TMDL Monitoring Program).

MONITORING SITE SELECTION

The first step toward fulfilling monitoring program objectives was selecting appropriate monitoring sites. Because the focus of the program is on impacts to surface waterbodies from discharges from irrigated agricultural lands, monitoring sites were selected to best characterize agricultural inputs and are generally located at the lower ends of mainstem tributaries or agricultural drainages in areas associated primarily with agricultural activity. In some cases, sites were also located to facilitate distinguishing agricultural inputs from other sources, such as golf courses or landscaped areas – these are referred to herein as “background” (“BKGD”) sites.

Additional site selection criteria included the following:

- Sub-watershed representation;
- Acreage of agricultural irrigated lands represented;
- Drainage into waterbodies included on the federal Clean Water Act 303(d) list of impaired waterbodies
- Safe access during dry and wet weather

Monitoring site selection in the Calleguas Creek Watershed was coordinated with monitoring sites identified in the Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP). Data collected at these coordinated sites are designed to augment TMDL

implementation monitoring in that watershed by establishing loadings from agricultural inputs.

The format for the monitoring site ID/code is **XXXXA_YYYYY_ZZZZZ**, where:

- “XXX” is a 2- or 3- character code that identifies the mainstem receiving water reach (where applicable) into which the monitored waterbody drains;
- “A” identifies the monitored waterbody as an agricultural discharge (D) or a tributary (T) to the receiving water;
- YYYYY is a 3-, 4- or 5-character abbreviation for the site location;
- ZZZZZ is an optional 3-, 4- or 5-character abbreviation that provides additional site location information (*e.g.*, “BKGD” indicates a background site).

Examples:

05D_SANT_VCWPD signifies that the monitoring site is located in on the Santa Clara Drain, which is an agricultural discharge that flows into Calleguas Creek Watershed Reach 5 (Beardsley Channel). The site is located at the Ventura County Watershed Protection District stream gage.

SO4T_TAPO_BKGD signifies that this a background monitoring site located on Tapo Creek, which is a tributary to the Santa Clara River, Reach 4.

Table 6 contains a detailed list of monitoring sites selected for the VCAILG Monitoring Program. Monitoring site IDs in bold type indicate CCW TMDL monitoring sites that will be monitored through that program once that program is underway.

Maps of monitoring sites located in the Calleguas Creek / Oxnard Coastal, Santa Clara River and Ventura River watersheds are presented in Figure 5, Figure 6, and Figure 7, respectively.

Table 7 provides estimates of irrigated acreage by crop type represented by each monitoring site selected.

Maps of crops grown in the vicinity of each monitoring site in the Calleguas Creek / Oxnard Coastal, Santa Clara River and Ventura River watersheds are presented in Figure 8, Figure 9, and Figure 10, respectively.

Table 6. VCAILG Monitoring Program Monitoring Site Locations

Watershed / Subwatershed	Station ID ^[1]	Reach	Water-body Type ^[2]	Station Location	GPS Coordinates ^[3]	
					Latitude	Longitude
Calleguas Creek / Mugu Lagoon	01T_ODD2_DCH	1	T	Duck Pond/Oxnard Drain #2/Mugu Drain S. of Hueneme Rd.	34.139514	-119.118330
	01T_ODD3_ARN	1	T	Rio de Santa Clara/Oxnard Drain #3 at Arnold Rd.	34.123564	-119.156514
Calleguas Creek / Calleguas Creek	02D_BROOM	2	D	Discharge to Calleguas Creek at Broome Ranch Rd.	34.143353	-119.071306
	02D_CSUCI	2	B	02D_BROOM background site near CSUCI	34.159860	-119.049375
Calleguas Creek / Revolon Slough	04D_ETTG	4	D	Discharge to Revolon Slough at Etting Rd.	34.161797	-119.091419
	04D_LAS	4	D	Discharge to Revolon Slough at S. Las Posas Rd.	34.134208	-119.079767
Calleguas Creek / Beardsley Channel	05D_SANT_VCWPD	5	D	Santa Clara Drain at VCWPD Gage #781	34.242667	-119.113736
	05D_SANT_BKGD	5	B	05D_SANT_VCWPD background site near the golf course	34.263213	-119.111314
	05D_LAVD	5	T	La Vista Drain at La Vista Ave.	34.265950	-119.093589
	05T_HONDO	5	T	Hondo Barranca at Hwy. 118	34.263608	-119.057431
Calleguas Creek / Arroyo Las Posas	06T_FC_BR	6	T	Fox Canyon at Bradley Rd.	34.264653	-119.011128
	06T_LONG	6	T	Long Canyon at Hwy. 118	34.270083	-118.958664
Calleguas Creek / Conejo Creek	9BD_GERRY	9B	D	Drain Crossing Santa Rosa Rd. at Gerry Rd.	34.235847	-118.944675
Oxnard Coastal	OXD_CENTR	--	D	Central Ditch at Harbor Blvd.	34.220555	-119.254983
	S02T_ELLS	2	T	Ellsworth Barranca at Telegraph Rd.	34.306805	-119.141275
	S02T_TODD	2	T	Todd Barranca at Hwy. 126	34.313584	-119.117095
	S03T_TIMB	3	T	Timber Canyon at Hwy. 126	34.370172	-119.020939
	S03T_BOULD	3	T	Boulder Creek at Hwy. 126	34.389578	-118.958738
Santa Clara River	S03D_BARDS	3	D	Discharge along Bardsdale Ave. upstream of confluence with Santa Clara River	34.371535	-118.964470
	S04T_HOPP	4	T	Hopper Creek at Hwy. 126	34.401616	-118.826799
	S04T_TAPO	4	T	Tapo Canyon Creek	34.401717	-118.723706
	S04T_TAPO_BKGD	4	B	S04T_TAPO background site upstream of agricultural operations	34.387316	-118.7204509
Ventura River	VRT_THACH	--	T	Thacher Creek at Ojai Avenue	34.446719	-119.210893
	VRT_SANTO	--	T	San Antonio Creek at Grand Avenue	34.454455	-119.221723

[1] Station IDs indicated in bold type signify Calleguas Creek Watershed TMDL Monitoring Program sites that will be monitored through that program once that program is underway.

[2] T = Tributary to receiving water; D = agricultural Drain; B = Background site.

[3] All GPS coordinates presented in decimal degrees latitude and longitude in North American Datum 1983 (NAD83).

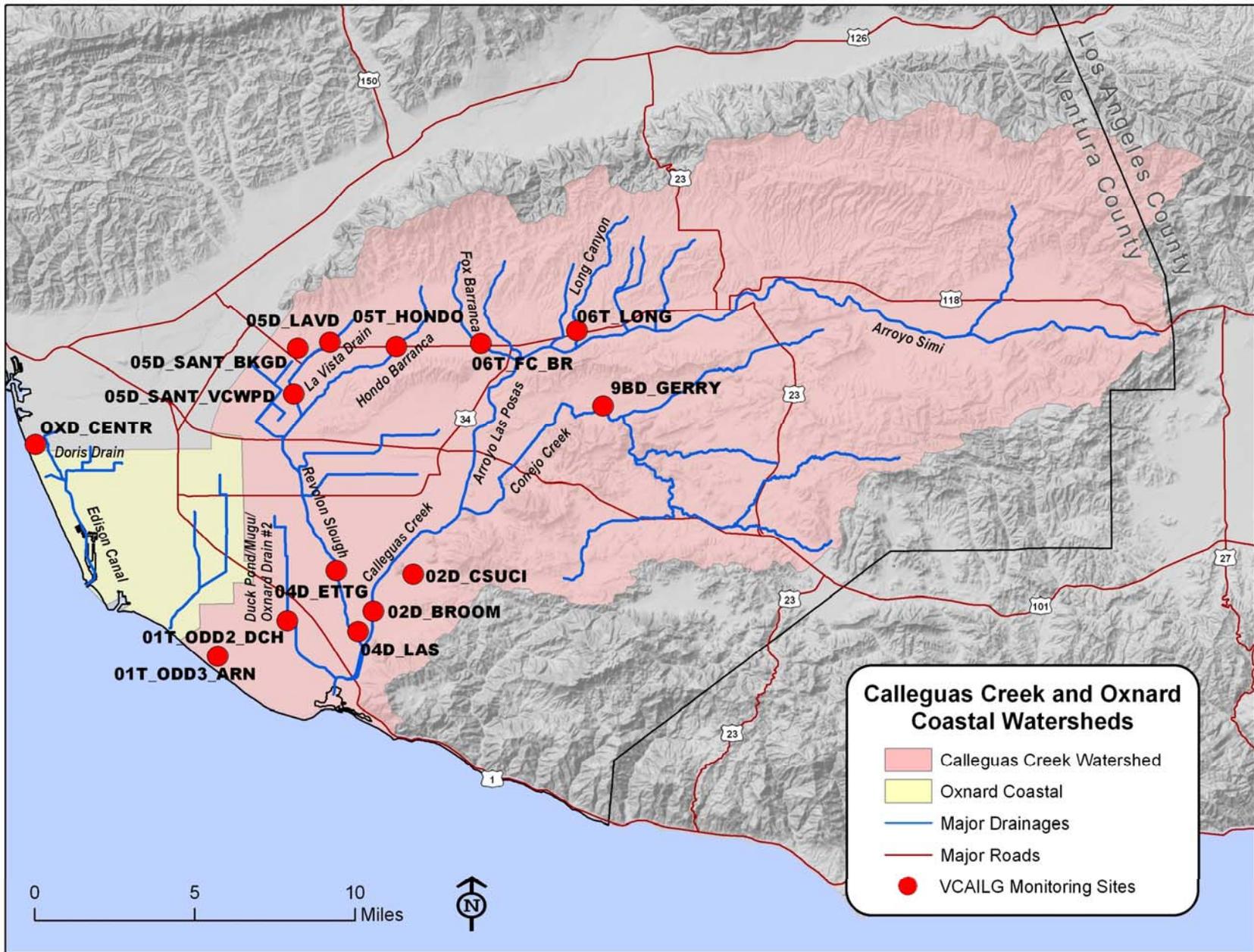


Figure 5. VCAILG Monitoring Sites Located in the Calleguas Creek / Oxnard Coastal Watersheds

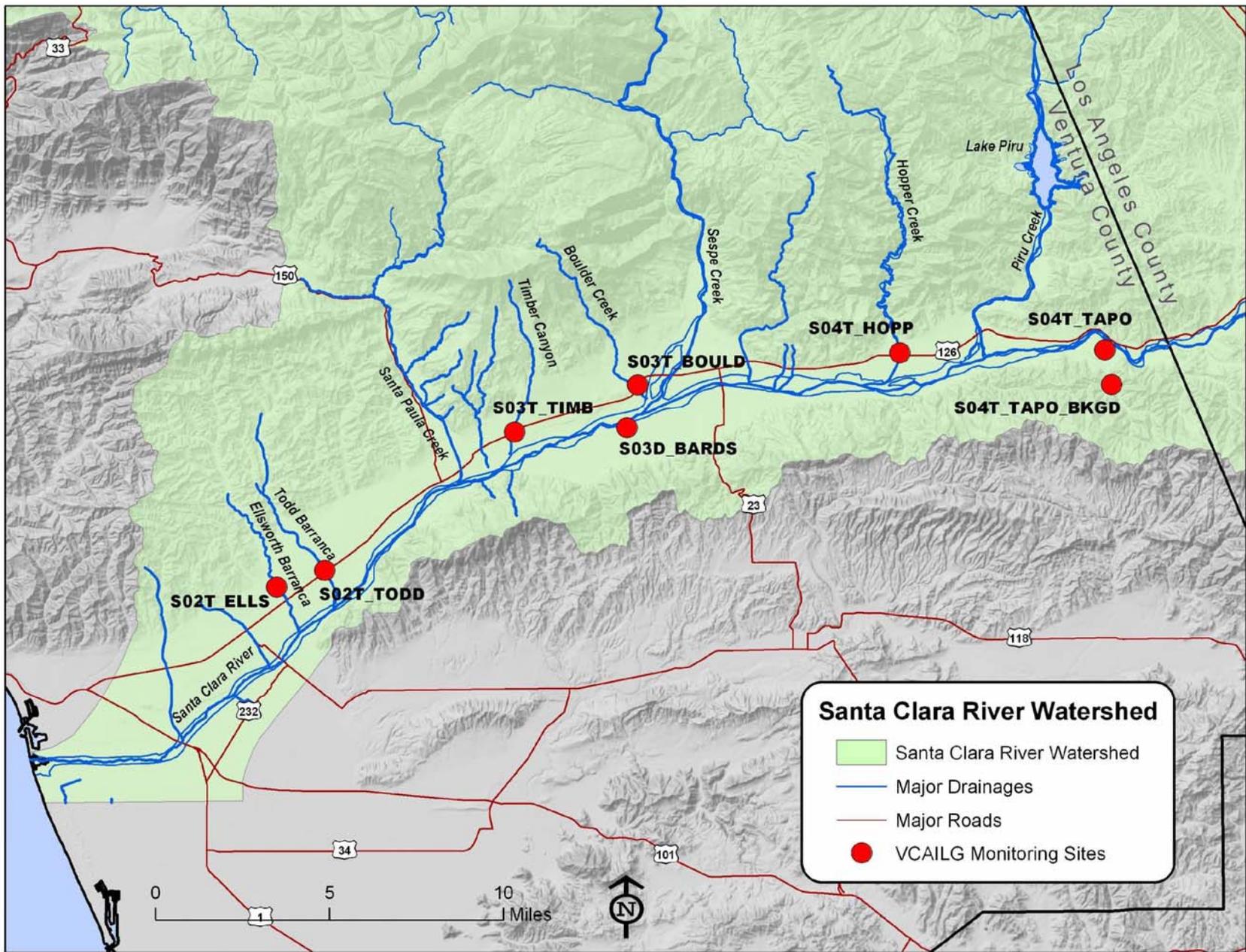


Figure 6. VCAILG Monitoring Sites Located in the Santa Clara River Watershed

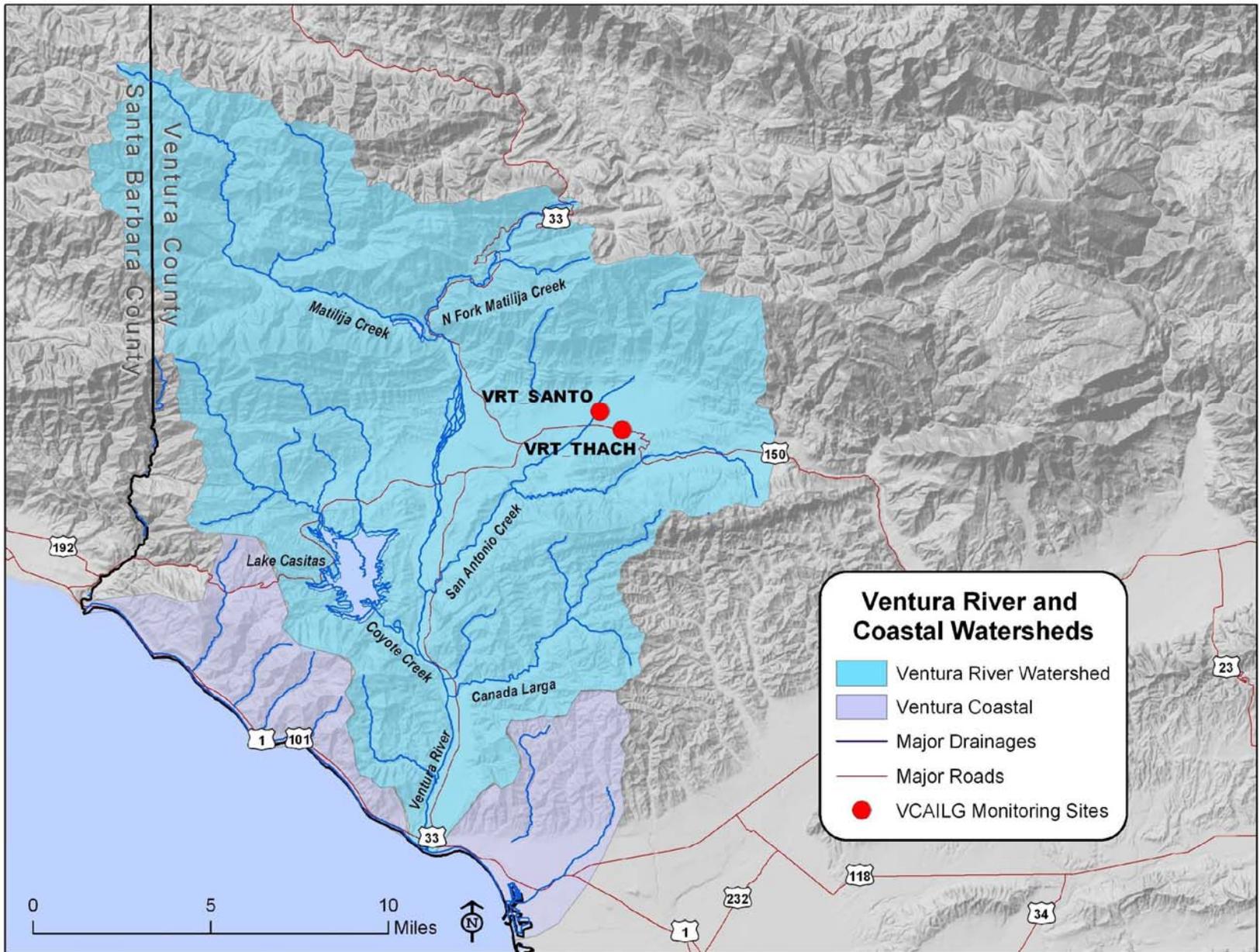


Figure 7. VCAILG Monitoring Sites Located in the Ventura River Watershed

Table 7. Estimated Irrigated Acreage Represented at Each VCAILG Monitoring Site

Station ID ^[1]	Estimated Irrigated Agricultural Acreage							Estimated Total Acres Drained
	Strawberries	Nursery Stock	Citrus	Avocado	Row Crops	Berries	Sod	
01T_ODD2_DCH	825	70	250	110	1895			3150
01T_ODD3_ARN					470		500	970
02D_BROOM		15	40	60	1065	20		1200
04D_ETTG					1650			1650
04D_LAS	200	55			945		300	1500
05D_SANT_VCWPD			460	210	100	550		1320
05D_LAVD			345	200	40	65		655
05T_HONDO			1400	800	200			2400
06T_FC_BR		70	900	160	70			1200
06T_LONG		100	1000	1000	200			2300
9BD_GERRY			175	100		25		300
OXD_CENTR	500		80		395			975
S02T_ELLS			600	450		100		1150
S02T_TODD			945	235	120			1300
S03T_TIMB			300	300				600
S03T_BOULD		140	290	620				1050
S03D_BARDS			340	20	40			400
S04T_HOPP		100	210		70			380
S04T_TAPO			80		240			320
VRT_THACH			800	100				900
VRT_SANTO			700	200				900

[1] Background Sites 02D_CSUCI (primarily runoff from the university), 05D_SANT_BKGD (runoff from a golf course and residential area), and S04T_TAPO_BKGD (runoff from non-irrigated agriculture) are not included in this table.

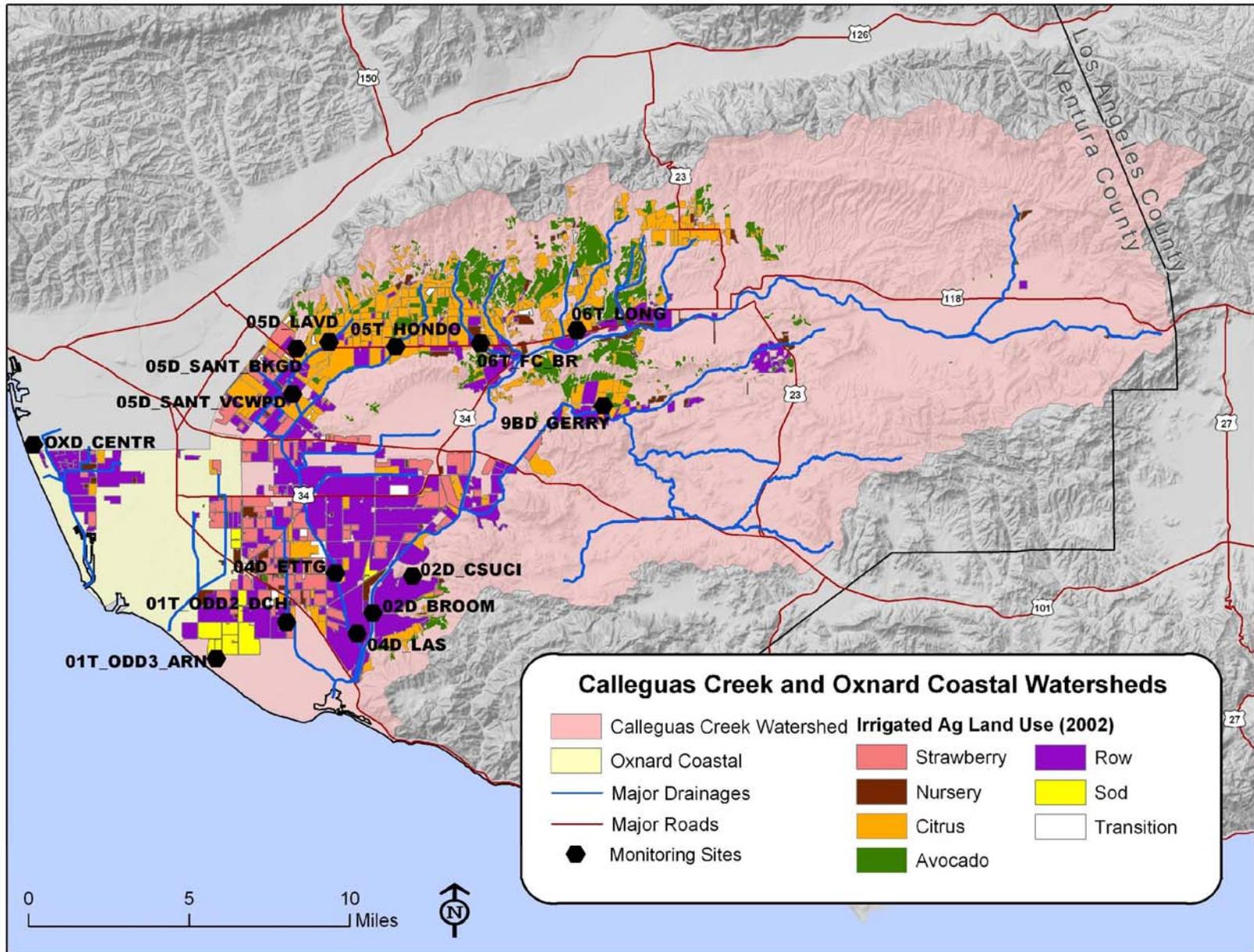


Figure 8. Calleguas Creek Watershed Monitoring Sites and Agricultural Land Use

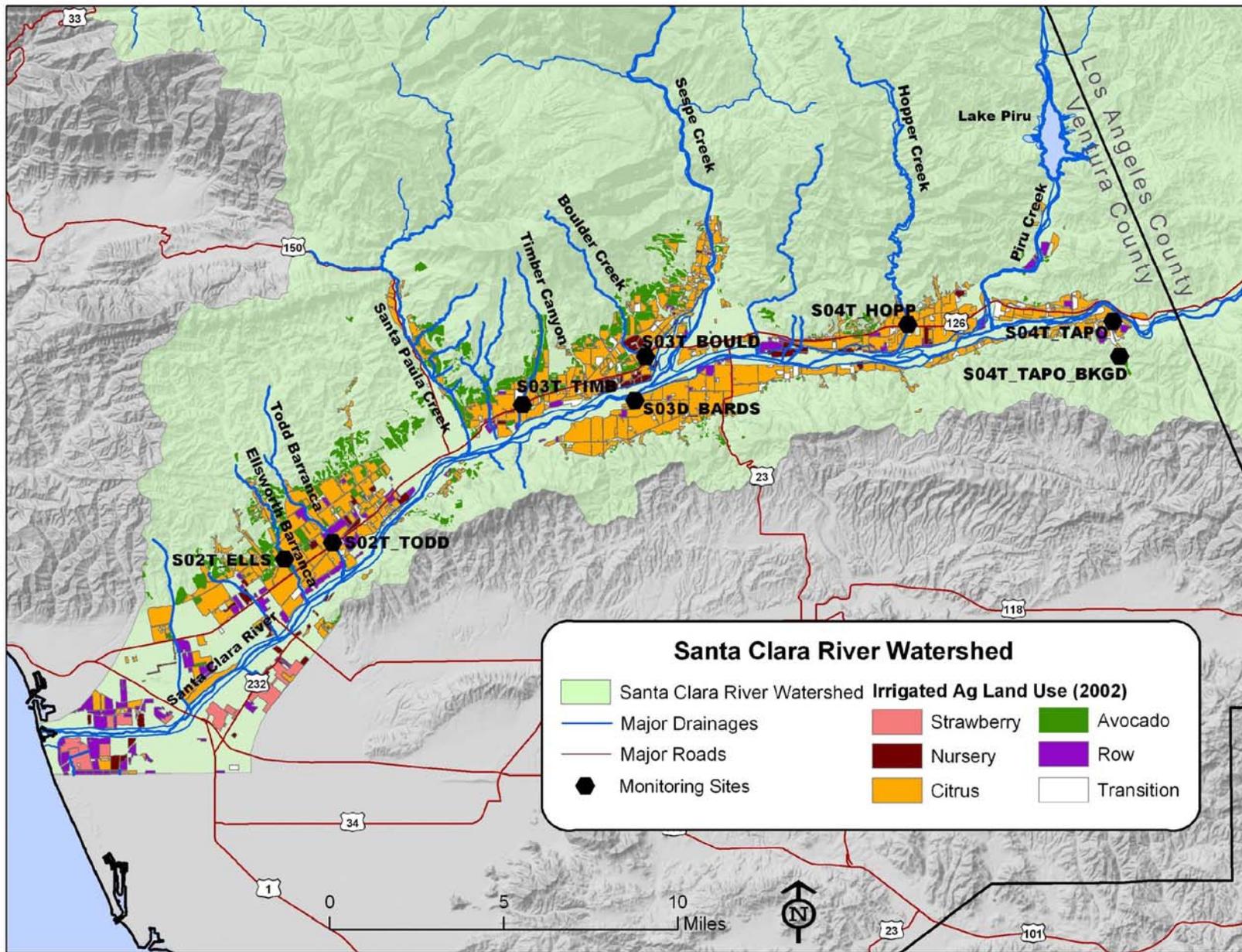


Figure 9. Santa Clara River Watershed Monitoring Sites and Agricultural Land Use

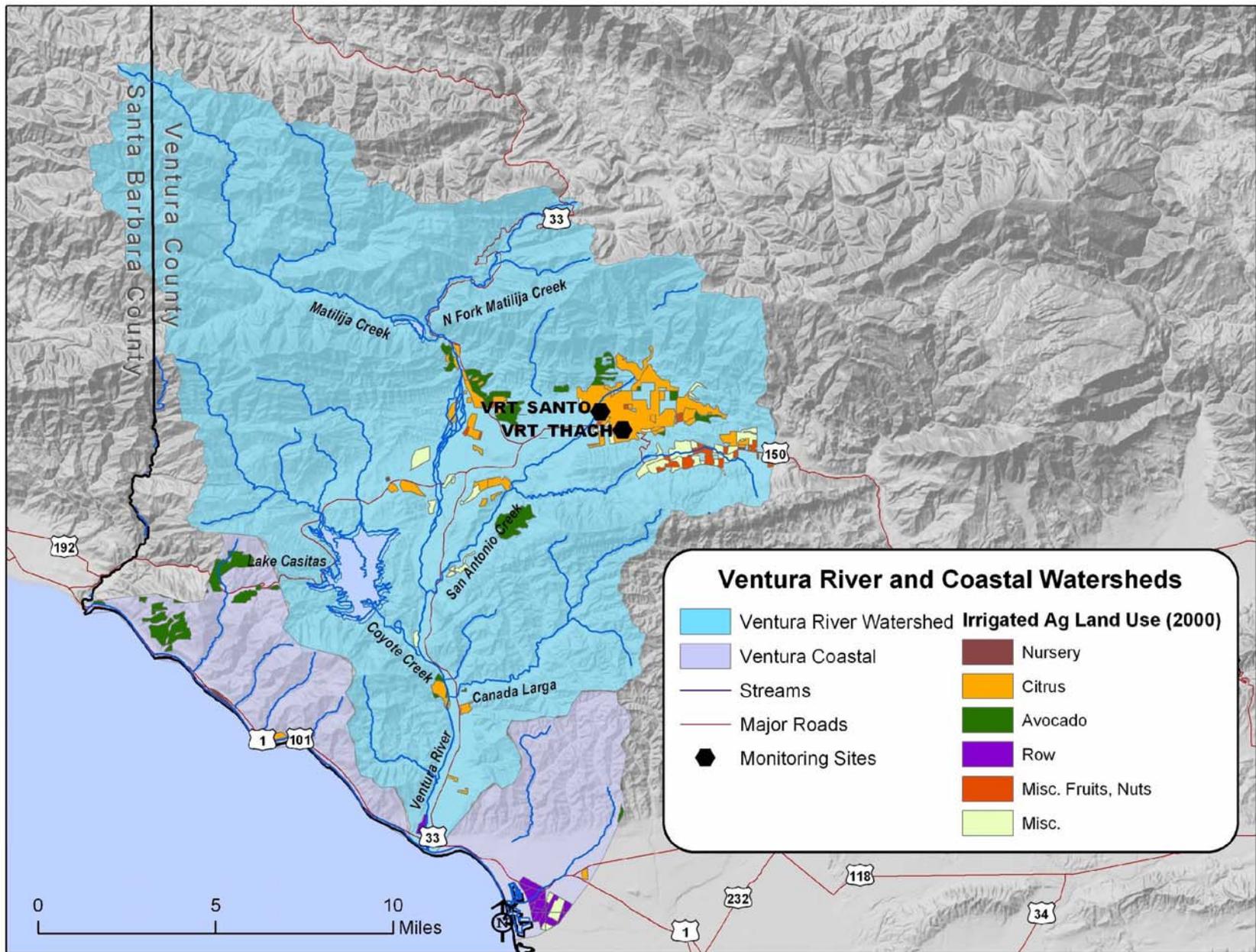


Figure 10. Ventura River Watershed Monitoring Sites and Agricultural Land Use

PARAMETERS MONITORED AND MONITORING FREQUENCY

The Conditional Waiver specifies the constituents to be monitored during each monitoring event as well as the monitoring frequency. These requirements are summarized in Table 8 for Phase I of the Monitoring Program, which covers the first two monitoring years (2007-2008). Monitoring years are defined as calendar years (January through December).

The Conditional Waiver requires that two wet events be conducted each Phase I year between October 15 through May 15. The decision to mobilize sampling crews for a wet event is based on receiving at least 0.5 inches of rainfall that produces runoff from agricultural lands. The timing of sample collection for wet events is targeted toward the first 24 hours of discharge to the extent practicable. Two dry events are also required during each Phase I year between May 16 and October 14 during irrigation and immediately following pesticide application.

Table 8. Constituents and Monitoring Frequency for the VCAILG Monitoring Program

Constituent	Phase I Frequency ^[1]	
General Water Quality Constituents (WQ)		
Flow pH Temperature Dissolved Oxygen Turbidity Conductivity Total Dissolved Solids (TDS) Total Suspended Solids (TSS) Chloride Sulfate	Quarterly (2 dry events; 2 wet events)	
Nutrients		
Total Ammonia-N Nitrate-N Phosphate		
Pesticides		
Organochlorine Pesticides ^[3] Organophosphorus Pesticides ^[4] Pyrethroids ^[5]		
Aquatic Toxicity (Chronic)		Semiannually (1 dry event; 1 wet event) ^[2]

[1] The Phase I monitoring period covers the first two monitoring years of the Conditional Waiver (2007-2008).

[2] For chronic toxicity testing, the "dry" season is defined as May 16 through October 14; the "wet" season is defined as October 15 through May 15. This same seasonal monitoring schedule will be followed for all constituents monitored.

[3] Organochlorine Pesticides include aldrin, alpha-BHC, beta-BHC, gamma-BHC (Lindane), delta-BHC, chlordane-alpha, chlordane-gamma, 2,4'-DDD, 2,4'-DDE, 2,4'-DDT, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, endrin aldehyde, endrin ketone, toxaphene.

[4] Organophosphorus Pesticides include bolstar, chlorpyrifos, demeton, diazinon, dichlorovos, dimethoate, disulfoton, ethoprop, fenchlorophos, fensulfthion, fenthion, malathion, merphos, methyl parathion, mevinphos, phorate, tetrachlorvinphos, tokuthion, trichloronate.

[5] Pyrethroids include allethrin, bifenthrin, cyfluthrin, I-cyhalothrin, cypermethrin, danitol (fenpropathrin), deltamethrin, esfenvalerate, fenvalerate, fluvalinate, permethrin, prallethrin, resmethrin.

As mentioned previously, 2007 was one of the driest years on record for Southern California, and Ventura County was no exception. In spite of a storm in late January that dropped upwards of 2 inches of rain in the Ventura River Watershed, there was no surface water present at monitoring sites in that watershed, and insufficient flow was present to collect samples at over half the monitoring sites in the Calleguas Creek and Santa Clara River Watersheds. Significant storms later in the year created conditions such that a mid-December storm finally produced flow at 6 sites that are typically dry. The decision was therefore made to sample the storm event on December 19, 2007.

Two dry events were also conducted in 2007, one on June 4-5, and the other on September 10-11. The first monitoring event was scheduled for June because according to the Department of Pesticide Regulation (DPR) Pesticide Use Summaries Database, June is one of three months with the highest pesticide usage. The 3 peak months of reported pesticide usage are April through June; any runoff that occurred during the June monitoring event is representative of overland flows with the potential to transport pesticides that were recently applied. The September event was scheduled under the assumption that dry antecedent conditions would require more frequent irrigation events, thereby increasing the likelihood of irrigation runoff. Table 9 provides a summary of monitoring sites and constituents that were sampled during each of the three monitoring events in 2007. Field probe measurements were also performed at all sites where samples were collected.

Table 9. VCAILG Sites Monitored and Constituents Sampled in 2007

Watershed / Subwatershed	Station ID	Reach	Dry Events		Wet Event
			June 4-5	Sept. 10-11 ^[1]	Dec. 19 ^[2]
Calleguas Creek / Mugu Lagoon	01T_ODD2_DCH	1	TOX ,WQ,N,P	TOX ,WQ,N,P	WQ,N,P
	01T_ODD3_ARN	1	TOX ,WQ,N,P	TOX ,WQ,N,P	WQ,N,P
Calleguas Creek / Calleguas Creek	02D_BROOM	2	NS	WQ,N,P	WQ,N,P
	02D_CSUCI	2	NS	NS	NS
Calleguas Creek / Revolon Slough	04D_ETTG	4	WQ,N,P	WQ,N,P	WQ,N,P
	04D_LAS	4	WQ,N,P	WQ,N,P	WQ,N,P
Calleguas Creek / Beardsley Channel	05D_SANT_VCWPD	5	WQ,N,P	WQ,N,P	WQ,N,P
	05D_SANT_BKGD	5	NS	NS	NS
	05D_LAVD	5	TOX ,WQ,N,P	WQ,N,P	NS
	05T_HONDO	5	NS	NS	WQ,N,P
Calleguas Creek / Arroyo Las Posas	06T_FC_BR	6	NS	NS	WQ,N,P
	06T_LONG	6	NS	NS	NS
Calleguas Creek / Conejo Creek	9BD_GERRY	9B	NS	NS	NS
Oxnard Coastal	OXD_CENTR	--	WQ,N,P	WQ,N,P	WQ,N,P
	S02T_ELLS	2	NS	NS	WQ,N,P
Santa Clara River	S02T_TODD	2	TOX ,WQ,N,P	WQ,N,P	WQ,N,P
	S03T_TIMB	3	NS	NS	WQ,N,P
	S03T_BOULD	3	TOX ,WQ,N,P	WQ,N,P	WQ,N,P
	S03D_BARDS	3	NS	NS	WQ,N,P
	S04T_HOPP	4	NS	NS	WQ,N,P
	S04T_TAPO	4	TOX ,WQ,N,P	TOX ,WQ,N,P	WQ,N,P
	S04T_TAPO_BKGD	4	NS	WQ,N,P	NS
	VRT_THACH	--	NS	NS	NS
Ventura River	VRT_SANTO	--	NS	NS	NS

TOX = Chronic Toxicity WQ = General Water Quality Constituents N = Nutrients P = Pesticides

NS = Not Sampled; insufficient flow present.

[1] Toxicity tests were rerun on samples collected at 3 high-conductivity sites during the September event because of a test failure for those sites during the June event.

[2] Samples were not collected for toxicity testing during the December event; the analyzing laboratory was closed for the holidays.

SAMPLING METHODS

The VCAILG QAPP contains requirements for sampling procedures that are designed to ensure that high-quality data are generated through the VCAILG Monitoring Program. Field crews are trained to adhere strictly to standard operating procedures for all aspects of monitoring, including use of sample containers that are appropriate to each constituent or constituent group analyzed, avoiding potential sources of contamination, and accurately completing field log sheets and chain-of-custody forms, to name a few examples.

With the exception of samples for toxicity, samples collected during both dry events were collected by direct immersion of sample containers at mid-stream and mid-depth, then immediately placed on ice in an ice chest. A secondary container was used to fill 5-

gallon jerricans for toxicity tests. Flow measurements were made according to the standard operating procedure included in Appendix C-1 of the QAPP. Water velocity and depth were measured at specified increments across the width of the channel, and then the sum of the incremental flow measurements was calculated to obtain total flow.

Samples collected during the wet event in December were collected either by the direct immersion technique or by using a secondary container attached to a grab pole; filled sample containers were immediately put on ice in an ice chest. During this event, 4 replicate measurements of water velocity were performed by measuring the time it took for a floating object (e.g., stick, orange) to travel a defined distance downstream. Channel width was measured at some monitoring sites and estimated at sites with higher flow. Channel depth was estimated at several locations across the width of the channel if it was safe to do so, then averaged. Total flow was estimated by multiplying the estimated velocity, depth and width of flow. *Flow estimates made during the December 19 event, therefore, should be regarded as gross estimates and used with discretion.*

During all three monitoring events, a Hydrolab MS5 Data Sonde was used to measure a number of parameters in situ, including temperature, pH, dissolved oxygen, conductivity, and turbidity. Data and information collected at each monitoring site were recorded on a field log sheet. PDFs of completed field log sheets for each event are included with this Annual Report as Appendix B, which is included on the Annual Report Data CD. Information recorded on the field log sheet at each monitoring site includes the following:

- Field crew initials;
- Date and time samples were collected;
- Water quality results for constituents measured using field probes (pH, temperature, conductivity, etc.);
- Measurements supporting flow calculations (channel width, depth, water velocity);
- Observations regarding the weather, water color and odor, contact and non-contact recreation, instream activity, the presence of foreign matter, wildlife, etc.;
- Estimates of algae coverage and bank vegetation, and the dominant channel substrate (*i.e.*, concrete, cobble, sand, etc.)

Information entered on field log sheets is ultimately entered into the VCAILG Monitoring Program database for reporting. Field data are included with this Annual Report in Appendix C, which can be found on the Annual Report Data CD. Photo-documentation of each monitoring site for all three events is also included on the Annual Report Data CD as Appendix D.

Samples were transported back to FGL Environmental Laboratory in Santa Paula, where chain-of-custody documentation was completed and toxicity samples were prepared for overnight delivery to Pacific EcoRisk (toxicity testing laboratory). A courier picked up CRG's samples from FGL and delivered them to CRG.

PDFs of completed Chain-of-Custody (COC) forms are included this Annual Report as Appendix E, also included on the Annual Report Data CD.

ANALYTICAL METHODS

Table 10 provides a summary of analytical methods used by contract laboratories for analyzing samples collected for the VCAILG Monitoring Program in 2007.

Table 10. Analytical Methods

Constituent	Analytical Method
Aquatic Toxicity ^[1]	
Chronic (7 day) <i>Ceriodaphnia dubia</i> ^[2]	EPA-821-R-02-013, EPA-600-4-91-002
Chronic (7 day) <i>Pimephales promelas</i> ^[3]	
Chronic (96-hour) <i>Selenastrum capricornutum</i> ^[4]	
General Water Quality Constituents (WQ)	
Flow, pH, Temperature, Dissolved Oxygen, Conductivity, Turbidity	Field Measurement
Total Dissolved Solids (TDS)	SM 2540C
Total Suspended Solids (TSS)	SM 2540D
Chloride	300.0
Sulfate	300.0
Total Ammonia-N	SM 4500NH ₃ H
Nitrate-N	300.0
Phosphate	SM 4500PE
Organic Constituents ^[5]	
Organochlorine Pesticides	EPA 625m/8270Cm
Organophosphorus Pesticides	EPA 625m/8270Cm
Pyrethroid Pesticides	EPA 625m/8270Cm / NCI GC/MS ^[6]

IR = Instrument Resolution

- [1] Chronic toxicity tests were performed on three species for the first monitoring event, after which the most sensitive species was selected for use in subsequent monitoring events.
- [2] If sample conductivity exceeded 3000 uS/cm, *Hyalella azteca* was used for toxicity testing.
- [3] If sample conductivity exceeded 3000 uS/cm, *Atherinops affinis* (Event 1) or *Menidia beryllina* (Event 2) was used for toxicity testing. The *Atherinops affinis* culture "crashed" during Event 1 testing. Because there is only one supplier in the United States for this organism, Regional Board staff approved use of *Menidia beryllina* instead for subsequent vertebrate toxicity tests on high-conductivity samples. *Menidia* is a more readily available and more commonly used vertebrate species.
- [4] If sample conductivity exceeded 3000 uS/cm, *Thalassiosira pseudonana* was used for toxicity testing.
- [5] See Table 8 for the list of constituents in each pesticide group.
- [6] CRG Marine Laboratories, the contract laboratory for pesticide analysis, used EPA Method 625m/8270m for analyzing samples for pyrethroids for Event 1 and Event 2. Because interferences were affecting results for several pyrethroids, the laboratory began using NCI GC/MS (negative chemical ionization GC/MS) with Event 3 samples, which achieves better sensitivity (lower detection limits) than the method previously used (electron impact GC/MS).

WATER QUALITY BENCHMARKS

The Conditional Waiver requires that if monitoring data exceed applicable benchmarks, Water Quality Management Plans (WQMPs) designed to reduce pollutant loading to surface waters must be developed to address those exceedances. This section presents the water quality benchmarks used to evaluate monitoring data collected at VCAILG monitoring sites in 2007. Benchmarks used for this purpose include numeric and narrative water quality objectives contained in Appendix 1 and Appendix 2 in the Conditional Waiver, which includes narrative and numeric Basin Plan objectives and water quality standards from the California Toxics Rule (CTR). For the purposes of this report, TMDL load allocations were not used as benchmarks to determine whether WQMPs are necessary to reduce water quality impacts from irrigated agriculture. Rather, because effective TMDLs already contain the requirement to develop WQMPs regardless of whether monitoring data exceed benchmarks identified in the Conditional Waiver, VCAILG monitoring data were compared against TMDL load allocations solely for the purpose of evaluating compliance with applicable load allocations.

Limitations associated with comparing VCAILG monitoring data with TMDL load allocations include the following:

- Load allocations for organochlorine (OC) pesticides in the Calleguas Creek Watershed are established in sediment. The VCAILG monitoring program does not include a sediment monitoring element, so a comparison of VCAILG monitoring data to these TMDL load allocations cannot be made.
- Load allocations for the organophosphorus (OP) pesticides in the Calleguas Creek Watershed apply at the base of each subwatershed. However, there are no VCAILG monitoring sites co-located with these TMDL compliance monitoring locations, so the data collected at VCAILG monitoring sites cannot be used without associated data from the TMDL compliance points for comparison to the TMDL load allocations. Although monitoring data are not compared with these TMDL load allocations, it should be noted that VCAILG data will be evaluated to determine whether agricultural discharges are contributing to any load allocation exceedances detected when the Calleguas Creek Watershed TMDL Monitoring Program begins collect compliance samples at the base of each subwatershed.

Several of the narrative water quality objectives contained in the Basin Plan specify that discharges of wastes to receiving waters cannot alter “natural” or “ambient” conditions above or below a stated level. Many of the VCAILG monitoring sites are located on agricultural drains that discharge to receiving waters. Because “natural” and “ambient” conditions have not been established in receiving waters or are non-existent on agricultural drains and ephemeral streams, monitoring data from sites located on agricultural drains are evaluated based on the assumption that if benchmarks are not exceeded in the agricultural drain, it is unlikely that the discharge from that drain will cause benchmark exceedances in the receiving water.

Conditional Waiver benchmarks applicable to VCAILG monitoring sites and TMDL load allocations in effect are presented in Tables 11 through 19.

Table 11. Conditional Waiver Benchmarks Derived From Narrative Objectives and Toxicity

Constituent	Watershed ^[1]	Narrative Objective ^[2]	Applicable Benchmark
pH	CC, OXD, SCR, VR	The pH of inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed by more than 0.5 pH units from natural conditions as a result of waste discharges.	6.5 ≤ pH ≤ 8.5 Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Temperature	CC, OXD, SCR, VR	For waters designated WARM, water temperature shall not be altered by more than 5°F above the natural temperature. At no time shall WARM-designated waters be raised above 80°F as a result of waste discharges.	WARM: ≤ 80°F Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
	SCR, VR	For waters designated COLD, water temperature shall not be altered by more than 5°F above the natural temperature.	COLD: No numeric benchmark. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Dissolved Oxygen	OXD	No single dissolved oxygen determination shall be less than 5 mg/L, except when natural conditions cause lesser concentrations.	≥ 5 mg/L
	CC, SCR, VR	The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges.	WARM: ≥ 5 mg/L
	SCR, VR	The dissolved oxygen content of all surface waters designated as COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.	COLD, SPWN: ≥ 7 mg/L
Turbidity	CC, OXD, SCR, VR	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: <ul style="list-style-type: none"> ▪ Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%; ▪ Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%. 	No numeric benchmarks. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Biostimulatory Substances	CC, OXD, SCR, VR	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	No numeric benchmarks. Waterbody-specific benchmarks for nutrients are listed in Tables 12 and 13.
Total Suspended Solids (TSS)	CC, OXD, SCR, VR	Wastes shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.	No numeric benchmarks.
Pesticides	CC, OXD, SCR, VR	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.	No numeric benchmarks. Applicable benchmarks for specific pesticides are listed in Tables 14, 15, and 16
Toxicity	CC, OXD, SCR, VR	All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal or aquatic life. There shall be no chronic toxicity in ambient waters outside mixing zones.	≤ 1.0 TUC ^[3] Benchmarks for specific potentially toxic constituents are listed in Tables 12 through 16.

[1] CC = Calleguas Creek Watershed OXD = Oxnard Coastal Watershed SCR = Santa Clara River Watershed VR = Ventura River Watershed

[2] Source: Water Quality Control Plan, Los Angeles Region (Basin Plan), 1994.

[3] Source: "Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands," Order No. R4-2005-0077, Los Angeles Regional Water Quality Control Board, adopted November 3, 2005.

Table 12. Conditional Waiver Benchmarks for Salts and Nutrients (Basin Plan Table 3-8 Numeric Water Quality Objectives)

Watershed / Reach	Reach Description	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Nitrogen ^[1] (mg/L)	Ammonia ^[2] (mg/L)	Phosphate (mg/L)
CC below Potrero Rd.	-----	-----	-----	-----	10 ^[3]	pH, temperature dependent	-----
CC above Potrero Rd. ^[5]	-----	150	250	850	10	pH, temperature dependent	-----
OXD	-----	-----	-----	-----	10 ^[3]	pH, temperature dependent	-----
SCR Reach 1	Tidally-influenced mouth of Santa Clara River upstream to 101 Bridge	-----	-----	-----	10 ^[3]	pH, temperature dependent	-----
SCR Reach 2	Upstream of Hwy 101 Bridge to Freeman Diversion	150	600	1200	10 ^[3]	pH, temperature dependent	-----
SCR Reach 3	Upstream of Freeman Diversion to A Street Bridge in Fillmore	100 ^[4]	650	1300	5	pH, temperature dependent	-----
SCR Reach 4	Upstream of A Street Bridge in Fillmore to Blue Cut Gaging Station	100	600	1300	5	pH, temperature dependent	-----
VR Reach 4	Between Camino Cielo Rd. and Casitas Vista Rd.	60	300	800	5	pH, temperature dependent	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

[1] The Nitrogen benchmarks listed are as Nitrate-N plus Nitrite-N.

[2] Ammonia benchmarks are based on 1) freshwater ammonia objectives as calculated according to LARWQCB Resolutions 2002-011 and 2005-014, and 2) saltwater ammonia objectives as calculated according to LARWQCB Resolution 2004-022. Ammonia objectives are calculated based on the pH and temperature of the receiving water measured at the time of sample collection for ammonia analysis. Ammonia objectives used as benchmarks are chronic, 30-day averages.

[3] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

[4] The 100 mg/L benchmark for chloride is the revised water quality objective adopted by the Regional Board in Resolution 2003-015.

[5] In the 1997 Chloride policy, the Basin Plan objectives for salts were defined to apply to Calleguas Creek above Potrero, Conejo Creek, Arroyo Las Posas, Arroyo Simi, and upstream tributaries. The Basin Plan objectives were not identified as applicable to Revolon Slough in the 1997 Basin Plan Amendment. However, the CCW Salts TMDL applied the Basin Plan Amendment as targets upstream of Laguna Road on Revolon Slough to be above the tidal influence. As a result, the benchmarks in this table are applied upstream of Laguna Road on Revolon Slough.

Table 13. Total Maximum Daily Load (TMDL) Load Allocations for Salts

Watershed	Subwatershed / Reach Description	Chloride (mg/L)		Sulfate (mg/L)		TDS (mg/L)	
		Interim LA (mg/L)	Final LA (lb/day)	Interim LA (mg/L)	Final LA (lb/day)	Interim LA (mg/L)	Final LA (lb/day)
CC ⁽¹⁾	Simi	230	641	1962	1068	3995	3631
	Las Posas	230	2109	1962	3515	3995	11952
	Conejo	230	743	1962	1239	3995	4212
	Camarillo	230	59	1962	99	3995	336
	Pleasant Valley	230	305	1962	509	3995	1730
	Revolon	230	7238	1962	12063	3995	41015
OXD	-----	-----	-----	-----	-----	-----	-----
SCR	Reach 1 - Tidally influenced mouth of Santa Clara River upstream to 101 Bridge	-----	-----	-----	-----	-----	-----
	Reach 2 - Upstream of Hwy 101 Bridge to Freeman Diversion	-----	-----	-----	-----	-----	-----
	Reach 3 - Upstream of Freeman Diversion to A Street Bridge in Fillmore	----- ^[2]	-----	-----	-----	-----	-----
	Reach 4 - Upstream of A Street Bridge in Fillmore to Blue Cut Gaging Station	-----	-----	-----	-----	-----	-----
VR	Reach 4 - Between Camino Cielo Rd. and Casitas Vista Rd.	-----	-----	-----	-----	-----	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

[1] Calleguas Creek Watershed Salts TMDL: "Total Maximum Daily Load for Boron, Chloride, Sulfate and TDS (Salts) in the Calleguas Creek Watershed" (LARWQCB Resolution 2007-016, approved by the LARWQCB on October 4, 2007, approved by the SWRCB on May 20, 2008, and awaiting USEPA approval at the time of this AMR revision). Although this TMDL is currently not in effect, USEPA approval is expected to occur in the near future. Final load allocations must be fully achieved by 15 years after the effective date of the TMDL. These interim dry weather TMDL load allocations for irrigated agricultural dischargers apply in the receiving water at the base of each sub-watershed. However, there are no VCAILG monitoring sites located at the base of each sub-watershed. As a result, the VCAILG data cannot be compared directly to the TMDL load allocations without associated TMDL compliance monitoring point data. If data collected at the base of each sub-watershed under the CCW TMDL Monitoring Program exceed TMDL load allocations for salts, VCAILG monitoring data collected at VCAILG monitoring sites within each sub-watershed will be evaluated to determine whether agricultural discharges may be contributing to the exceedance.

[2] Santa Clara River Chloride TMDL: "Total Maximum Daily Load for Chloride in the Santa Clara River, Reach 3" (USEPA, June 18, 2003). The USEPA Chloride TMDL is in effect for SCR Reach 3, but it does not specify a load allocation for agriculture.

Table 14. Total Maximum Daily Load (TMDL) Load Allocations for Nutrients

Watershed / Reach	Reach Description	Nitrogen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)
CC All Waterbodies	-----	9 ^[1]	-----	-----
OXD	-----	-----	-----	-----
SCR Reach 1	Tidally-influenced mouth of Santa Clara River upstream to 101 Bridge	-----	-----	-----
SCR Reach 2	Upstream of Hwy 101 Bridge to Freeman Diversion	-----	-----	-----
SCR Reach 3	Upstream of Freeman Diversion to A Street Bridge in Fillmore	10 ^[2]	-----	-----
SCR Reach 4	Upstream of A Street Bridge in Fillmore to Blue Cut Gaging Station	-----	-----	-----
VR Reach 4	Between Camino Cielo Rd. and Casitas Vista Rd.	-----	-----	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

[1] Nitrogen Compounds and Related Effects TMDL: "Amendment to the *Water Quality Control Plan for the Los Angeles Region* to Include a TMDL for Nitrogen Compounds and Related Effects in Calleguas Creek (LARWQCB Resolution 2002-017). The TMDL became effective July 16, 2003. The load allocation must be fully achieved by July 16, 2010. The load allocation listed is as Nitrate-N + Nitrite-N.

[2] Nitrogen Compounds TMDL: "Amendment to the *Water Quality Control Plan for the Los Angeles Region* to Include a TMDL for Nitrogen Compounds in the Santa Clara River" (LARWQCB Resolution 2003-011). The TMDL became effective March 23, 2004, but only covers Reach3 of the Santa Clara River in Ventura County. The Basin Plan Amendment does not specify the date to achieve full compliance for nonpoint sources. The load allocation listed is as Ammonia-N + Nitrate-N + Nitrite-N.

Table 15. Conditional Waiver Benchmarks for Organochlorine Pesticides

Constituent	CC Watershed		OXD, SCR Watersheds		VR Watershed	
	Benchmark (ug/L)	Benchmark Source [1]	Benchmark (ug/L)	Benchmark Source [1]	Benchmark (ug/L)	Benchmark Source [1]
Aldrin	0.00014	CTR HHO	0.00014	CTR HHO	0.00013	CTR HHWO
Alpha-BHC	0.013	CTR HHO	0.013	CTR HHO	0.0039	CTR HHWO
Beta-BHC	0.046	CTR HHO	0.046	CTR HHO	0.014	CTR HHWO
Gamma-BHC (Lindane)	0.063	CTR HHO	0.063	CTR HHO	0.019	CTR HHWO
Delta-BHC	-----	-----	-----	-----	-----	-----
Chlordane-alpha	-----	-----	-----	-----	-----	-----
Chlordane-gamma	-----	-----	-----	-----	-----	-----
Chlordane, sum	0.00059	CTR HHO	0.00059	CTR HHO	0.00057	CTR HHWO
2,4'-DDD	-----	-----	-----	-----	-----	-----
2,4'-DDE	-----	-----	-----	-----	-----	-----
2,4'-DDT	-----	-----	-----	-----	-----	-----
4,4'-DDD	0.00084	CTR HHO	0.00084	CTR HHO	0.00083	CTR HHWO
4,4'-DDE	0.00059	CTR HHO	0.00059	CTR HHO	0.00059	CTR HHWO
4,4'-DDT	0.00059	CTR HHO	0.00059	CTR HHO	0.00059	CTR HHWO
Dieldrin	0.00014	CTR HHO	0.00014	CTR HHO	0.00014	CTR HHWO
Endosulfan I	0.056	CTR AFWC	0.056	CTR AFWC	0.056	CTR AFWC
Endosulfan II	0.056	CTR AFWC	0.056	CTR AFWC	0.056	CTR AFWC
Endosulfan Sulfate	240	CTR HHO	240	CTR HHO	110	CTR HHWO
Endrin	0.036	CTR AFWC	0.036	CTR AFWC	0.036	CTR AFWC
Endrin Aldehyde	0.81	CTR HHO	0.81	CTR HHO	0.76	CTR HHWO
Endrin Ketone	-----	-----	-----	-----	-----	-----
Toxaphene	0.0002	CTR AFWC	0.0002	CTR AFWC	0.0002	CTR AFWC

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

[1] CTR = California Toxics Rule (USEPA, May 18, 2000).

HHO = Human Health for Consumption of Organisms Only (30-day average)

HHWO = Human Health for Consumption of Water and Organisms (MUN-designation) (30-day average)

AFWC = Aquatic Life, Freshwater Chronic (4-day average)

Table 16. Total Maximum Daily Load (TMDL) Load Allocations for Organochlorine Pesticides

Constituent	CC Watershed	OXD, SCR Watersheds	VR Watershed
	Load Allocation (ug/L) [1]	Load Allocation (ug/L) [2]	Load Allocation (ug/L) [2]
Chlordane-alpha	-----	-----	-----
Chlordane-gamma	-----	-----	-----
Chlordane, sum	-----	-----	-----
4,4'-DDD	-----	-----	-----
4,4'-DDE	-----	-----	-----
4,4'-DDT	-----	-----	-----
Dieldrin	-----	-----	-----
PCBs	-----	-----	-----
Toxaphene	-----	-----	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

[1] The Organochlorine (OC) Pesticides TMDL for the Calleguas Creek Watershed contains load allocations based on concentrations in sediment. However, the Conditional Waiver does not require sediment quality monitoring.

Sediment quality data collected through the CCW TMDL Monitoring Program will be evaluated against sediment TMDL load allocations once that monitoring program is underway.

[2] There is currently no TMDL in effect in this watershed for Organochlorine (OC) Pesticides.

Table 17. Conditional Waiver Benchmarks for Organophosphorus Pesticides

Constituent	CC, OXD, SCR, VR Watersheds
	Benchmark (ug/L) ^[1]
Bolstar	-----
Chlorpyrifos	0.025
Demeton	-----
Diazinon	0.10
Dichlorovos	-----
Dimethoate	-----
Disulfoton	-----
Ethoprop	-----
Fenchlorophos	-----
Fensulfothion	-----
Fenthion	-----
Malathion	-----
Merphos	-----
Methyl Parathion	-----
Mevinphos	-----
Phorate	-----
Tetrachlorvinphos	-----
Tokuthion	-----
Trichloronate	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River
 [1] Benchmarks are from Appendix 1 of the Conditional Waiver

Table 18. Total Maximum Daily Load (TMDL) Load Allocations for Organophosphorus Pesticides

Constituent	CC Watershed			OXD, SCR, VR Watersheds
	Interim LA ^[2] (ug/L)	Final LA (ug/L)	Load Allocation Source ^[1]	Load Allocation
Chlorpyrifos	2.57 / 0.810	0.013	TMDL	-----
Diazinon	0.278 / 0.138	0.10	TMDL	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River
 [1] "Total Maximum Daily Load for Toxicity, Chlorpyrifos, and Diazinon in the Calleguas Creek, its Tributaries and Mugu Lagoon" (LARWQCB Resolution 2005-009). The TMDL became effective on March 24, 2006. These TMDL load allocations apply to the receiving water at the base of each sub-watershed. However, there are no VCAILG monitoring sites located at the base of each sub-watershed. As a result, the VCAILG data cannot be compared directly to the TMDL load allocations without associated TMDL compliance monitoring point data.. If data collected at the base of each sub-watershed under the CCW TMDL Monitoring Program exceed TMDL load allocations for chlorpyrifos and diazinon, VCAILG monitoring data collected at VCAILG monitoring sites within each sub-watershed will be evaluated to determine whether agricultural discharges may be contributing to the exceedance.
 [2] Interim load allocations listed are the acute (1-hour) / chronic (4-day) values that are currently in effect. Final load allocations must be achieved by March 24, 2016.

Table 19. Conditional Waiver Benchmarks and Total Maximum Daily Load (TMDL) Load Allocations for Pyrethroid Pesticides

Constituent	CC, OXD, SCR, VR Watersheds
	Benchmark / Load Allocation (ug/L) [1]
Allethrin	-----
Bifenthrin	-----
Cyfluthrin	-----
I-Cyhalothrin	-----
Cypermethrin	-----
Deltamethrin	-----
Esfenvalerate	-----
Fenpropathrin (Danitol)	-----
Fenvalerate	-----
Fluvalinate	-----
Permethrin	-----
Prallethrin	-----
Resmethrin	-----

Watersheds: CC = Calleguas Creek OXD = Oxnard Coastal SCR = Santa Clara River VR = Ventura River
 [1] There are currently no Conditional Waiver benchmarks or TMDL load allocations in effect for these watersheds.

WATER QUALITY MONITORING RESULTS

This section contains a summary of water quality monitoring data collected at VCAILG sites where flow was present during the 3 monitoring events conducted in 2007. Information presented for each VCAILG monitoring site includes the receiving water of the drainage monitored, a site location map, a site photo, and a narrative summary of which events were monitored, benchmark and/or TMDL load allocation exceedances (if any), and unusual occurrences (if any) from each event. The predominant crop type(s) potentially contributing to the flow at each monitoring site is also noted in this section; this information is also listed in Table 7. Data tables for each site present all detected values from each monitoring event. Water quality data that were reported as less than the laboratory's detection limit are not included in this section, but instead are included with all of the water quality monitoring data for 2007 as Appendix F on the Annual Report Data CD. PDFs of all hard copy laboratory reports are also included on the Data CD. Results summarized in this section are compared with Conditional Waiver benchmarks and applicable TMDL load allocations listed in Tables 11 through 18 where applicable, and all exceedances are indicated in ***bold italic type*** in data tables.

Data reported by the laboratory in units of ng/L were converted to µg/L for comparison with benchmarks expressed in units of µg/L. Results reported by the laboratory as "Total Orthophosphate as P" were converted to "Total Orthophosphate" by multiplying the result by the molecular weight of phosphate (95 g/mol) and dividing the product by the molecular weight of phosphorus (31 g/mol). The converted result is reported as "Total Orthophosphate" in the electronic data file accompanying this report and as "Phosphate" on data tables presented in this section.

Results of toxicity tests, including the 3-species screens and Toxicity Identification Evaluation (TIE) tests conducted to date are discussed separately in a subsequent section.

Table 20. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD2_DCH

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	4.4	3.7	NM
pH	Units	6.5 ≤ pH ≤ 8.5	7.7	7.8	7.4
Temperature	°C	---	17.4	25.4	16.3
Dissolved oxygen	mg/L	≥ 5	9.2	13.0	10.5
Turbidity	NTU	---	ND	4.1	143
Conductivity	umhos/cm	---	3954	3968	3003
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	---	3600	3380	2560
Total Suspended Solids (TSS)	mg/L	---	4	10	108
Chloride	mg/L	---	175	208	126
Sulfate	mg/L	---	1890	1690	1210
Total Ammonia-N	mg/L	1.7 / 0.9 / 3.6 ^[1]	0.1	0.1	0.2
Nitrate-N	mg/L	10 ^[2]	63.25	12.28	30.23
Phosphate	mg/L	---	0.18	0.31	1.35
<i>Organochlorine Pesticides</i>					
2,4'-DDT	µg/L	---	ND	ND	0.005
4,4'-DDD	µg/L	0.00084	ND	ND	0.027
4,4'-DDE	µg/L	0.00059	0.007	0.0069	0.0933
4,4'-DDT	µg/L	0.00059	ND	ND	0.0138
<i>Pyrethroid Pesticides</i>					
Bifenthrin	µg/L	---	ND	ND	0.0167
Fenpropathrin (Danitol)	µg/L	---	ND	ND	0.1498
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025	ND	ND	2.146
Malathion	µg/L	---	ND	0.0521	0.023

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

NM = Not Measured; too dangerous to measure flow. ND = Not Detected

[1] The 3 benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the Basin Plan Amendment to Update Saltwater Ammonia Objectives (LARWQCB Resolution No. 2004-022). The benchmarks are based on the chronic saltwater equation and are dependent upon the pH and temperature of the water at the time of sample collection.

[2] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 21. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD2_DCH

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 ^[1]	63.25	12.28	30.23

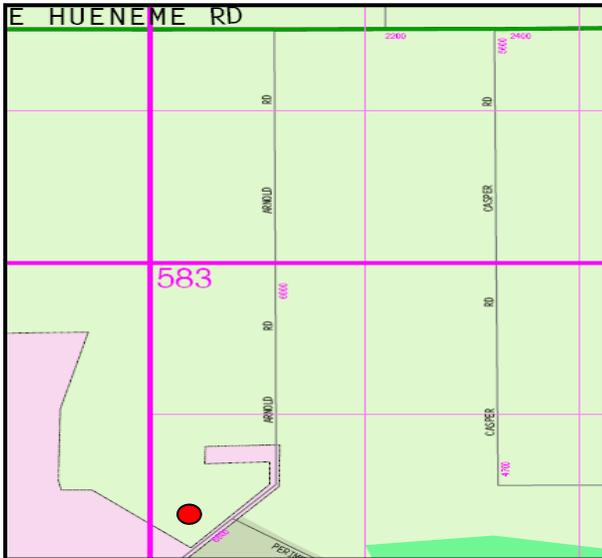
Note: Concentrations in ***bold italics*** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

01T_ODD3_ARN

Rio de Santa Clara / Oxnard Drain No. 3. The monitoring site is located on an agricultural drain just upstream from the Arnold Road Bridge. Flow from this drain eventually discharges into the western arm of Mugu Lagoon (Calleguas Creek Reach 1). Because the site is tidally influenced, an attempt is made to conduct monitoring at this site approximately one-half hour after low tide.

Site Map



View downstream at sampling point



Sufficient flow was present to collect samples during all 3 monitoring events. Table 21 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 22 provides a comparison of detected constituent concentrations with applicable TMDL load allocations. Flow is not measured at this site because it is unsafe to do so.

DDT compounds were the most commonly detected pesticides at this site, and there were exceedances of DDT benchmarks during each event in 2007. Nitrate results from Events 1 and 3 exceeded the benchmarks. Two pyrethroid pesticides were detected, but none of the organophosphorus pesticides were. Row crops and sod are the primary crop types in the vicinity of this site.

Table 22. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD3_ARN

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	NM	NM	NM
pH	Units	6.5 ≤ pH ≤ 8.5	7.5	8.3	7.8
Temperature	°C	---	18.1	25.9	16.6
Dissolved oxygen	mg/L	≥ 5	5.2	26.6	8.8
Turbidity	NTU	---	31.7	72.8	77.5
Conductivity	umhos/cm	---	5864	11811	1952
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	---	5030	8040	1370
Total Suspended Solids (TSS)	mg/L	---	25	70	43
Chloride	mg/L	---	1210	3080	204
Sulfate	mg/L	---	2160	1650	480
Total Ammonia-N	mg/L	2.6 / 0.3 / 1.5 ^[1]	0.9	0.3	1.5
Nitrate-N	mg/L	10 ^[2]	16.44	5.06	31.45
Phosphate	mg/L	---	0.67	0.28	2.73
<i>Organochlorine Pesticides</i>					
2,4'-DDD	µg/L	---	ND	ND	0.0053
4,4'-DDD	µg/L	0.00084	0.0181	0.0244	0.0185
4,4'-DDE	µg/L	0.00059	0.0437	0.0454	0.0744
4,4'-DDT	µg/L	0.00059	ND	ND	0.0056
<i>Pyrethroid Pesticides</i>					
Bifenthrin	µg/L	---	ND	ND	0.0122
Prallethrin	µg/L	---	0.03	ND	ND

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

NM = Not Measured; too dangerous to measure flow. ND = Not Detected

[1] The 3 benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based on the Basin Plan Amendment to Update Saltwater Ammonia Objectives (LARWQCB Resolution No. 2004-022). The benchmarks are based on the chronic saltwater equation and are dependent upon the pH and temperature of the water at the time of sample collection.

[2] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 23. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD3_ARN

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 ^[1]	16.44	5.06	31.45

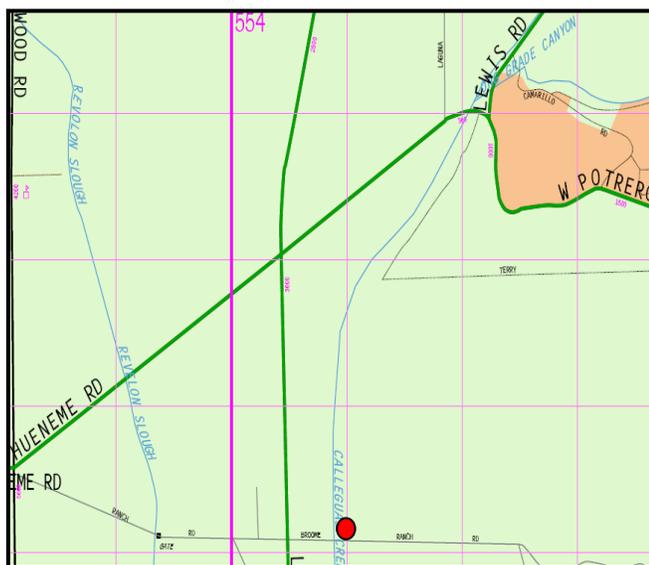
Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

02D_BROOM

The monitoring site is located on an agricultural drain that discharges into Calleguas Creek Reach 2 at Broome Ranch Road.

Site Map



View of discharge (looking upstream on Calleguas Creek)



Water at 02D_BROOM originates in an agricultural drain to the east of Calleguas Creek and is pumped at an approximate rate of 200 gpm into Calleguas Creek. Water was not flowing through the discharge pipe when the monitoring crew visited the site during Event 1, but sufficient water was flowing during Event 2 and Event 3 to collect samples. Table 23 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 24 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of DDT compounds exceeded benchmarks during Event 2 and Event 3. Nitrate results from Event 3 (wet weather event) exceeded the benchmarks. No other benchmarks were exceeded at this site in 2007. Organophosphate pesticides were also detected in Event 2 and Event 3 samples. Row crops are the predominant crop type in the vicinity of the monitoring site.

Table 24. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 02D_BROOM

Constituent	Units	Benchmark	Results			
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007	
<i>Field Measurements</i>						
Flow	CFS	---		0.5	0.5	
pH	Units	$6.5 \leq \text{pH} \leq 8.5$		7.1	7.6	
Temperature	°C	≤ 26.7 [1]		19.9	15.7	
Dissolved oxygen	mg/L	≥ 5		7.2	10.8	
Turbidity	NTU	---		135	25.4	
Conductivity	umhos/cm	---		3593	3934	
<i>General Water Quality Constituents</i>						
Total Dissolved Solids (TDS)	mg/L	---	Not Sampled; No Flow	3180	3210	
Total Suspended Solids (TSS)	mg/L	---		174	17	
Chloride	mg/L	---		376	330	
Sulfate	mg/L	---		1290	1390	
Total Ammonia-N	mg/L	--- / 4.0 / 3.6 [2]		0.1	0.3	
Nitrate-N	mg/L	10 [3]		7.92	644	
Phosphate	mg/L	---		2.3	1.23	
<i>Organochlorine Pesticides</i>						
2,4'-DDD	µg/L	---			0.0134	ND
4,4'-DDD	µg/L	0.00084			0.04	ND
4,4'-DDE	µg/L	0.00059		0.0702	0.029	
<i>Organophosphorus Pesticides</i>						
Diazinon	µg/L	0.10		0.0446	0.013	
Dimethoate	µg/L	---		ND	0.293	
Disulfoton	µg/L	---		ND	0.076	

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

[3] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 25. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 02D_BROOM

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 [1]	NS	7.92	644

Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

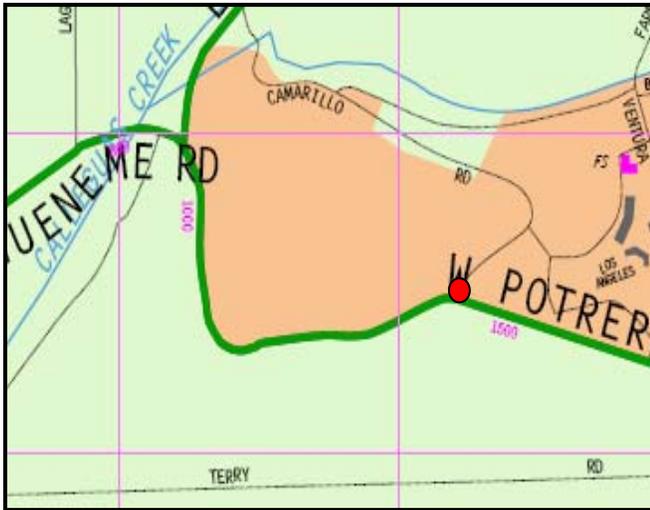
NS = Not sampled; no flow.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

02D_CSUCI

This site was selected as a background site for 02D_BROOM and was selected to account for nutrients, salts, or pesticides that may be contained in runoff from CSUCI grounds that ultimately makes its way to 02D_BROOM. This site is visited only if flow is present at 02D_BROOM.

Site Map



View toward SE of culvert draining runoff from CSUCI campus.

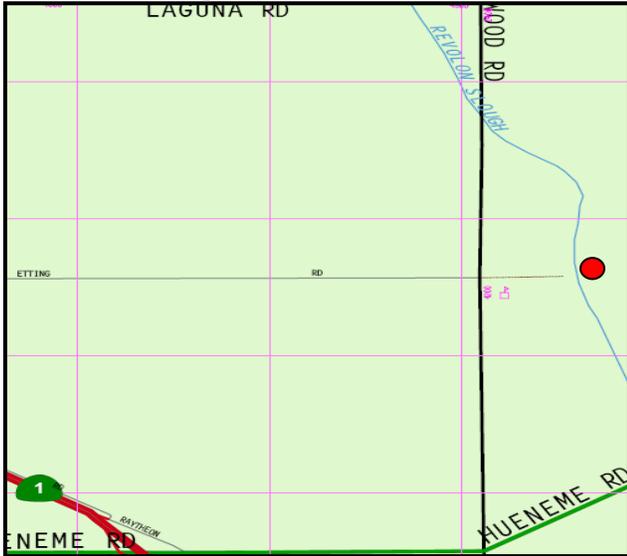


This site has not yet been sampled. It was dry both times samples were collected at the 02D_BROOM monitoring site, signifying that runoff from CSUCI is not influencing constituent concentrations at 02D_BROOM during dry weather.

04D_ETTG

This monitoring site is located on an agricultural drain just upstream from its confluence with Revolon Slough, just east of the intersection of Wood Road and Etting Road. Flow from this drain eventually discharges into Calleguas Creek Reach 4 (Revolon Slough).

Site Map



View toward SW looking downstream an ag drain before the confluence with Revolon



Flow was present during all 3 sampling events. Table 25 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 26 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of DDT compounds exceeded benchmarks during all 3 events, and chlorpyrifos exceeded the benchmark during Event 3. Nitrate results from all 3 events exceeded the benchmarks. There were no other benchmark exceedances in 2007 at this site. All 3 classes of pesticides were detected at this site. Row crops are the predominant crop type in the vicinity of the monitoring site.

Table 26. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_ETTG

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	3.6	3.8	12.7 EST
pH	Units	$6.5 \leq \text{pH} \leq 8.5$	8.0	7.8	7.4
Temperature	°C	$\leq 26.7^\circ\text{C}$ [1]	24.0	19.5	15.4
Dissolved oxygen	mg/L	≥ 5	10.3	10.1	10.6
Turbidity	NTU	---	18.7	6.7	294.1
Conductivity	umhos/cm	---	4063	3773	3408
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	---	3550	3290	2890
Total Suspended Solids (TSS)	mg/L	---	24	8	380
Chloride	mg/L	---	220	218	200
Sulfate	mg/L	---	1720	1530	1310
Total Ammonia-N	mg/L	1.2 / 2.2 / 4.4 [2]	0.2	ND	0.8
Nitrate-N	mg/L	10 [3]	77.25	9.58	67.08
Phosphate	mg/L	---	0.24	2.75	1.62
<i>Organochlorine Pesticides</i>					
2,4'-DDD	µg/L	---	ND	ND	0.0231
2,4'-DDE	µg/L	---	ND	ND	0.0101
2,4'-DDT	µg/L	---	ND	ND	0.0324
4,4'-DDD	µg/L	0.00084	0.0124	0.0108	0.0463
4,4'-DDE	µg/L	0.00059	0.0447	0.0248	0.4055
4,4'-DDT	µg/L	0.00059	ND	0.0059	0.0639
<i>Pyrethroid Pesticides</i>					
Bifenthrin	µg/L	---	ND	ND	0.0102
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025	ND	ND	1.38
Diazinon	µg/L	0.10	ND	ND	0.013
Disulfoton	µg/L	---	ND	ND	0.021
Malathion	µg/L	---	0.0342	0.0456	0.275

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST = Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (no ELS) and are dependent upon the pH and temperature of the water at the time of sample collection.

[3] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 27. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_ETTG

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 ^[1]	77.25	9.58	67.08

Note: Concentrations in ***bold italics*** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

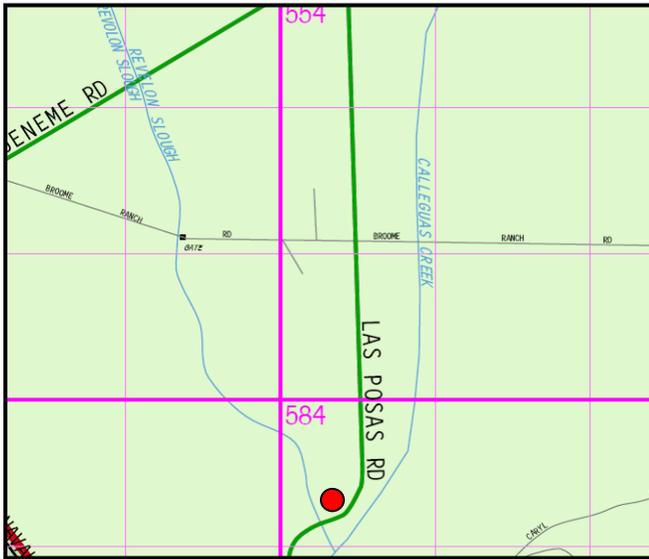
[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

04D_LAS

This monitoring site is located on an agricultural drain just upstream of its confluence with Revolon Slough just upstream of South Las Posas Road. A tile drain discharge is intermittently pumped into this ag drain upstream of the monitoring site. Flow from this drain eventually flows into Calleguas Creek Reach 4 (Revolon Slough).

04D_LAS: View toward S looking downstream on ag drain before the culvert draining into Revolon Slough. Samples are collected downstream of rocky area.

Site Map



Flow was present during all 3 sampling events. Table 27 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 28 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of DDT compounds exceeded benchmarks during all 3 events, and chlorpyrifos exceeded the benchmark during Event 3. Nitrate results from all 3 events exceeded the benchmarks. There were no other benchmark exceedances at this site in 2007. All 3 classes of pesticides were detected at this site. Row crops and sod are the primary crop types in the vicinity of this site.

During Event 2, samples were inadvertently collected upstream of a tile drain discharge pipe, rather than downstream as specified in sampling instructions. Also during Event 2, field crews encountered Ventura County employees who were applying the herbicide Aquamaster on channel banks in close proximity to the sampling location. The active ingredient in Aquamaster is glyphosate.

Table 28. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_LAS

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	1.4	2.3	NM
pH	Units	6.5 ≤ pH ≤ 8.5	8.4	7.8	7.7
Temperature	°C	≤ 26.7°C [1]	23.8	25.7	15.6
Dissolved oxygen	mg/L	≥ 5	13.9	6.3	10.7
Turbidity	NTU	---	70	134	78
Conductivity	umhos/cm	---	3694	2798	2412
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	---	2970	2170	1800
Total Suspended Solids (TSS)	mg/L	---	64	128	62
Chloride	mg/L	---	350	262	210
Sulfate	mg/L	---	1300	854	730
Total Ammonia-N	mg/L	0.8 / 1.5 / 3.4 [2]	0.1	0.1	0.6
Nitrate-N	mg/L	10	25.12	11.61	32.46
Phosphate	mg/L	---	0.25	3.52	5.55
<i>Organochlorine Pesticides</i>					
2,4'-DDD	µg/L	---	ND	0.0135	ND
4,4'-DDD	µg/L	0.00084	0.0107	0.0267	0.0103
4,4'-DDE	µg/L	0.00059	0.0585	0.0585	0.0645
4,4'-DDT	µg/L	0.00059	ND	0.0187	ND
<i>Pyrethroid Pesticides</i>					
Bifenthrin	µg/L	---	ND	ND	0.0116
Fenpropathrin (Danitol)	µg/L	---	ND	ND	0.0054
Prallethrin	µg/L	---	0.039	ND	ND
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025	ND	ND	0.033
Diazinon	µg/L	0.10	0.0134	ND	ND

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

NM = Not Measured; too dangerous to measure flow. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (no ELS) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 29. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_LAS

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 [1]	25.12	11.61	32.46

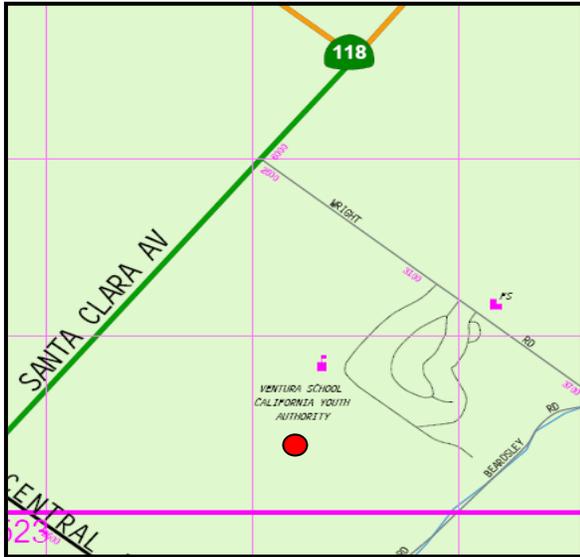
Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

05D_SANT_VCWPD

This monitoring site is located on the Santa Clara Drain east of Santa Clara Avenue at the Ventura County Watershed Protection District's Stream Gage #781. Flow from this drain eventually discharges into Calleguas Creek Reach 5 (Beardsley Channel).

Site Map



View upstream (toward NW) facing the VCWPD stream gage.



Flow was present during all 3 sampling events. Table 29 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 30 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Water temperature measured at this site during Event 2 exceeded the temperature benchmark for waterbodies designated as WARM. Water depth at the deepest point in the channel was only ~2.4 inches, a factor which likely influenced water temperature. In addition, nitrate-N results from all 3 events exceeded the benchmarks, and salts (TDS, chloride, sulfate) and DDT concentrations exceeded benchmarks during all 3 events. Row crops, berries, citrus and avocado are the predominant crop types that may influence water quality at this site. Flows are also influenced by a golf course and residential area upstream. Accordingly, background site 05D_SANT_BKGD was selected to characterize non-agricultural inputs.

During Event 1, Ventura County crews were in the channel with heavy equipment, scraping sediment and vegetation from the channel bottom. VCAILG sampling crews returned later in the day and collected samples upstream of Santa Clara Avenue, but elevated turbidity and total suspended solids levels indicate that disturbed suspended sediment was still being carried from upstream. Correspondingly, more pesticides were detected during this event relative to Events 2 and 3, particularly legacy (organochlorine) pesticides. Concentrations of the DDTs and cypermethrin in samples from Event 1 were much higher than those in Event 2, commensurate with higher levels of suspended solids.

Table 30. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_SANT_VCWPD

Constituent	Units	Benchmark	Results		
			Event 1 ^[3] 6/5/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	1.7	1.0	4.6 EST
pH	Units	$6.5 \leq \text{pH} \leq 8.5$	8.1	8.5	8.0
Temperature	°C	$\leq 26.7^\circ\text{C}$ ^[1]	18.7	29.5	15.8
Dissolved oxygen	mg/L	≥ 5	10.2	14.8	15.9
Turbidity	NTU	---	596	7.5	40.5
Conductivity	umhos/cm	---	2766	2622	3951
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	850	2130	2000	3290
Total Suspended Solids (TSS)	mg/L	---	306	13	30
Chloride	mg/L	150	218	200	250
Sulfate	mg/L	250	940	894	1550
Total Ammonia-N	mg/L	1.6 / 0.4 / 2.3 ^[2]	0.2	ND	0.3
Nitrate-N	mg/L	10 ^[4]	16.99	14.55	38.78
Phosphate	mg/L	---	0.23	0.01	0.76
<i>Organochlorine Pesticides</i>					
2,4'-DDD	µg/L	---	0.0208	ND	ND
2,4'-DDE	µg/L	---	0.0067	ND	ND
4,4'-DDD	µg/L	0.00084	0.2034	ND	ND
4,4'-DDE	µg/L	0.00059	0.7361	0.0101	0.0228
4,4'-DDT	µg/L	0.00059	0.4522	ND	ND
<i>Pyrethroid Pesticides</i>					
Cypermethrin	µg/L	---	2.262	ND	ND
Fenpropathrin (Danitol)	µg/L	---	ND	ND	0.0584
Prallethrin	µg/L	---	0.071	ND	ND
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025	ND	0.0193	0.292

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (no ELS) and are dependent upon the pH and temperature of the water at the time of sample collection.

[3] Elevated levels of TSS, turbidity, organochlorine and pyrethroid pesticides in Event 1 are atypical and were caused by channel cleaning activities performed by Ventura County crews at the time of sampling. County crews were using heavy equipment to scrape sediment and vegetation off the channel bottom.

[4] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 31. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_SANT_VCWPD

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 ^[1]	16.99	14.55	38.78

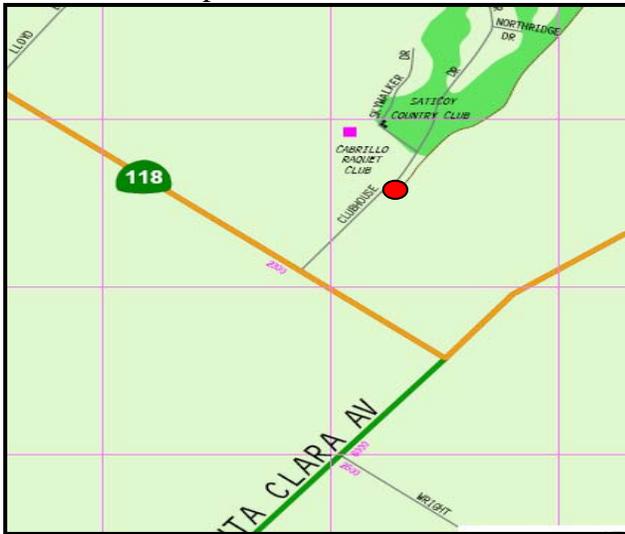
Note: Concentrations in ***bold italics*** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

05D_SANT_BKGD

This monitoring site is a background site for 05D_SANT_VCWPD and was selected to account for nutrients, salts, or pesticides that may be contained in runoff from the Saticoy Country Club and Golf Course and surrounding residential area that ultimately drains through 05D_SANT_VCWPD. This site is visited only if flow is present at 05D_SANT_VCWPD.

Site Map



View toward NE of sampling location on channel upstream of Clubhouse Dr.



This site has not yet been sampled. Though 05D_SANT_VCWPD was sampled during all 3 monitoring events, this background site was dry.

05D_LAVD

This monitoring site is located on the La Vista Drain just east of La Vista Avenue, north of Hwy 118. Flow from this drain eventually discharges into Calleguas Creek Reach 5 (Beardsley Channel). The Ventura County Watershed Protection District maintains a stormwater monitoring station just downstream of the VCAILG monitoring site.

View upstream (NE) from sampling location. Samples are collected at the culvert entrance.

Site Map



Sufficient flow was present during the two dry weather events, but insufficient flow was present during Event 3 to collect samples. Table 31 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 32 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of DDT compounds and salts (TDS and sulfate) exceeded benchmarks during Events 1 and 2, and chlorpyrifos exceeded the benchmark during Event 1. Nitrate results from both dry events exceeded the benchmarks. There were no other benchmark exceedances in 2007 at this site.

During Event 1, farm workers were spraying an unknown chemical in an orchard adjacent to the La Vista Drain. By the time VCAILG field crews noticed the sprayer, samples for all constituents except toxicity had been collected. The sampling crew left the site for safety reasons and returned 2.5 hours later to collect the sample for toxicity. Additional samples for organophosphate and pyrethroid pesticides were collected at that time. Results for both sets of pesticides are included in this Annual Report; only Chlorpyrifos was detected in both samples.

Table 32. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_LAVD

Constituent	Units	Benchmark	Results			
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007	
<i>Field Measurements</i>						
Flow	CFS	---	0.4	0.3	Not Sampled; insufficient flow	
pH	Units	$6.5 \leq \text{pH} \leq 8.5$	8.5	7.4		
Temperature	°C	$\leq 26.7^\circ\text{C}^{[1]}$	17.7	16.6		
Dissolved oxygen	mg/L	≥ 5	11.5	10.2		
Turbidity	NTU	---	128	81.3		
Conductivity	umhos/cm	---	2057	2133		
<i>General Water Quality Constituents</i>						
Total Dissolved Solids (TDS)	mg/L	850	1650	1830		
Total Suspended Solids (TSS)	mg/L	---	115	416		
Chloride	mg/L	150	121	138		
Sulfate	mg/L	250	760	802		
Nitrate-N	mg/L	10 ^[2]	16.99	14.44		
Phosphate	mg/L	---	1.01	1.56		
<i>Organochlorine Pesticides</i>						
trans-Nonachlor	µg/L	---	ND	0.0055		
Total Chlordane	µg/L	0.00059	ND	0.0055		
2,4'-DDD	µg/L	---	ND	0.0359		
2,4'-DDE	µg/L	---	ND	0.0112		
2,4'-DDT	µg/L	---	ND	0.0254		
4,4'-DDD	µg/L	0.00084	ND	0.111		
4,4'-DDE	µg/L	0.00059	0.0171	0.6817		
<i>Organophosphorus Pesticides</i>						
Chlorpyrifos (9:00 AM sample)	µg/L	0.025	0.1094	ND		
Chlorpyrifos (11:00 AM sample)	µg/L	0.025	0.0775	ND		

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 33. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_LAVD

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 ^[1]	16.99	14.44	NS

Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

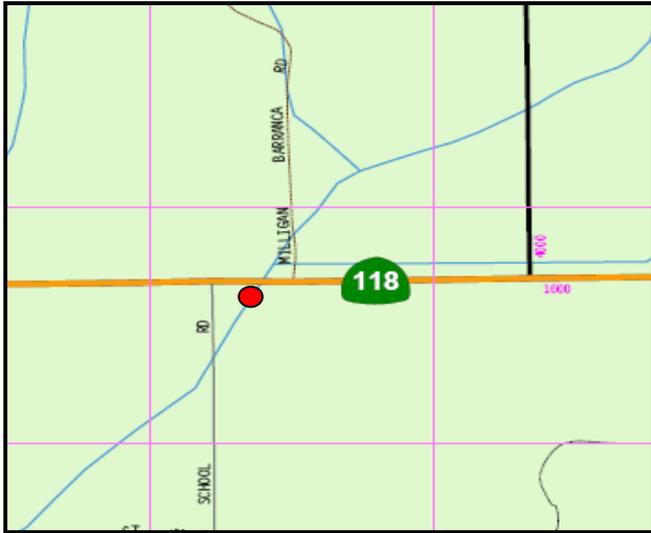
NS – Not Sampled; insufficient flow.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

05T_HONDO

This monitoring site is located on Hondo Barranca just downstream of the Hwy 118 Bridge. Hondo Barranca is a tributary to Calleguas Creek Reach 5 (Beardsley Channel).

Site Map



View upstream (N) from sampling location toward Hwy 118 Bridge.



Water was not present at this monitoring site during Events 1 and 2, indicating a lack of irrigation runoff from agricultural lands in the area during dry weather. Stormwater runoff was collected at this site during Event 3. Table 33 contains a summary of constituents detected in Event 3 samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 34 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of DDT compounds, chlorpyrifos and diazinon exceeded benchmarks during Event 3. Hondo Barranca is one of the sites that drains the largest area of irrigated acres, planted primarily in citrus, avocado and row crops.

Table 34. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 05T_HONDO

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---			0.3 EST
pH	Units	6.5 ≤ pH ≤ 8.5			7.7
Temperature	°C	≤ 26.7°C [1]			12.4
Dissolved oxygen	mg/L	≥ 5			11.9
Turbidity	NTU	---			225.2
Conductivity	umhos/cm	---			227.5
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	850			190
Total Suspended Solids (TSS)	mg/L	---			90
Chloride	mg/L	150			12
Sulfate	mg/L	250			48
Total Ammonia-N	mg/L	--- / --- / 4.2 [2]			0.2
Nitrate-N	mg/L	10 [3]			2.36
Phosphate	mg/L	---			5.12
<i>Organochlorine Pesticides</i>					
2,4'-DDT	µg/L	---			0.0268
4,4'-DDD	µg/L	0.00084			0.0118
4,4'-DDE	µg/L	0.00059			0.1467
4,4'-DDT	µg/L	0.00059			0.0308
<i>Pyrethroid Pesticides</i>					
Bifenthrin	µg/L	---			0.1516
Fenpropathrin (Danitol)	µg/L	---			0.2355
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025			0.192
Diazinon	µg/L	0.10			0.125
Malathion	µg/L	---			0.387

Not sampled; no flow

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion.

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (no ELS) and are dependent upon the pH and temperature of the water at the time of sample collection.

[3] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 35. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 05T_HONDO

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 ^[1]	NS	NS	2.36

NS – Not Sampled; no flow.

Note: Concentrations in ***bold italics*** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

06T_FC_BR

This monitoring site is located on Fox Barranca just upstream of the Bradley Road bridge, north of Hwy 118. Fox Barranca is a tributary to Calleguas Creek Reach 6 (Arroyo Las Posas).

Site Map



View downstream (E) from sampling location toward Bradley Road.



Water was not present at this monitoring site during Events 1 and 2, indicating a lack of irrigation runoff from crops draining to this site during dry weather. Stormwater runoff was collected at this site during Event 3. Table 35 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 36 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of DDT compounds and chlorpyrifos exceeded benchmarks during Event 3. This site drains mostly citrus orchards and smaller acreages planted in avocados, nurseries and row crops.

Table 36. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: 06T_FC_BR

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---			0.2 EST
pH	Units	$6.5 \leq \text{pH} \leq 8.5$			7.6
Temperature	°C	$\leq 26.7^\circ\text{C}$ [1]			11.9
Dissolved oxygen	mg/L	≥ 5			10.6
Turbidity	NTU	---			201.3
Conductivity	umhos/cm	---			730.8
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	850	Not sampled; no flow	Not sampled; no flow	550
Total Suspended Solids (TSS)	mg/L	---			83
Chloride	mg/L	150			34
Sulfate	mg/L	250			160
Total Ammonia-N	mg/L	--- / --- / 4.8 [2]			0.6
Nitrate-N	mg/L	10			2.57
Phosphate	mg/L	---			2.33
<i>Organochlorine Pesticides</i>					
2,4'-DDT	µg/L				0.0091
4,4'-DDD	µg/L	0.00084			0.0086
4,4'-DDE	µg/L	0.00059			0.0599
4,4'-DDT	µg/L	0.00059			0.0051
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025			0.054

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (no ELS) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 37. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: 06T_FC_BR

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Nitrate-N	mg/L	9 [1]	NS	NS	2.57

NS – Not Sampled; no flow.

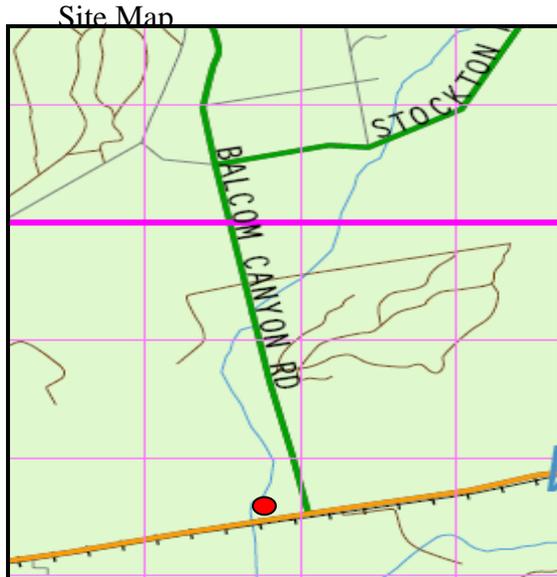
Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The CCW Nitrogen Compounds TMDL load allocation is listed as Nitrate-N + Nitrite-N. Only nitrate is measured as required by the Conditional Waiver; therefore Nitrate-N concentrations are compared with the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

06T_LONG

This monitoring site is located on Long Canyon just upstream of the Hwy 118 Bridge. Long Canyon is a tributary to Calleguas Creek Reach 6 (Arroyo Las Posas).

View upstream (N) from Hwy 118 bridge.
Samples are to be collected upstream from view in photo.

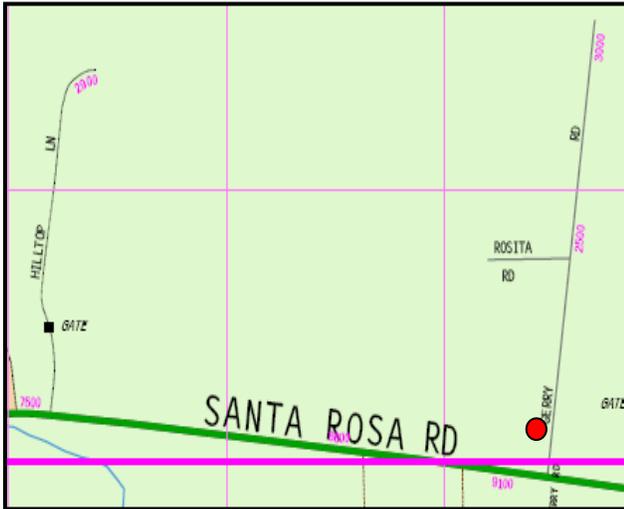


This site was dry during all 3 monitoring events and so has not yet been sampled. Absence of flow at this site signifies an absence of runoff from approximately 1,000 acres each of citrus and avocado orchards, as well as smaller acreages of nursery stock and row crops.

9BD_GERRY

This monitoring site is located on an agricultural drain adjacent to Gerry Road north of Santa Rosa Road. Flow from this drain eventually discharges into Calleguas Creek Reach 9B (Conejo Creek).

Site Map



View toward the N at sampling site (foot bridge).



There was no flow at this site during each of the monitoring events in 2007, signifying the absence of runoff from approximately 300 acres of citrus and avocado orchards and berries.

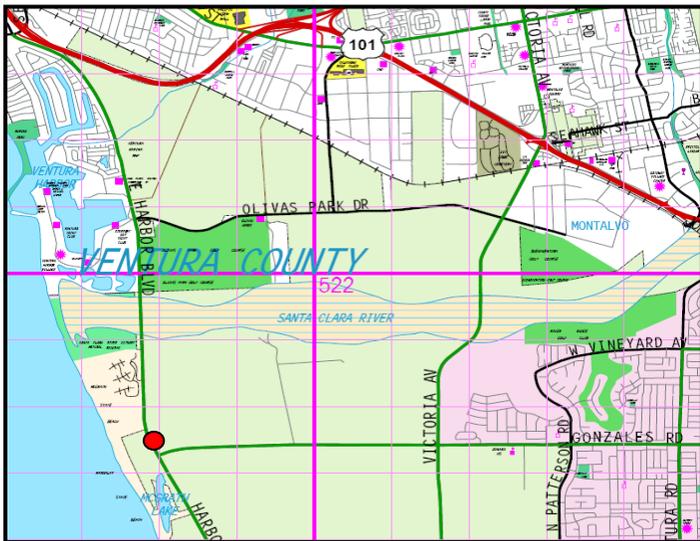
Oxnard Coastal Watershed

The Oxnard Coastal Watershed contains only one VCAILG monitoring site. The monitoring site is located on a drain used primarily for irrigated agriculture.

OXD_CENTR

This is the only VCAILG monitoring site in the Oxnard Coastal Watershed. The site is located on the Central Ditch, which flows under Harbor Blvd and into McGrath Lake. Water from McGrath Lake is pumped periodically into the ocean to prevent the Central Ditch from backing up and flooding Harbor Blvd.

Site Map



View looking downstream.



Sufficient flow was present during all 3 monitoring events. Table 37 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks.

Concentrations of DDT compounds exceeded benchmarks in all 3 monitoring events, and chlorpyrifos exceeded the benchmark in Event 3. Nitrate exceeded benchmarks during all three monitoring events. Besides these exceedances, there were no other benchmark exceedances in 2007 at this site. Strawberries and row crops are the predominant crop types that drain into this site.

Table 38. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: OXD_CENTR

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/11/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	1.3	0.7	6.7 EST
pH	Units	6.5 ≤ pH ≤ 8.5	7.4	7.0	7.5
Temperature	°C	---	17.2	19.7	16.6
Dissolved oxygen	mg/L	≥ 5	7.7	7.8	7.4
Turbidity	NTU	---	ND	2.1	14
Conductivity	umhos/cm	---	3430	3484	3473
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	---	2790	2840	2880
Total Suspended Solids (TSS)	mg/L	---	2	5	12
Chloride	mg/L	---	280	310	196
Sulfate	mg/L	---	1250	1360	1340
Total Ammonia-N	mg/L	3.9 / 4.3 / 3.8 ^[1]	0.2	ND	0.2
Nitrate-N	mg/L	10 ^[2]	16.17	12.23	30.59
Phosphate	mg/L	---	0.092	0.12	0.43
<i>Organochlorine Pesticides</i>					
2,4'-DDT	µg/L	---	ND	ND	0.0074
4,4'-DDD	µg/L	0.00084	ND	0.0147	0.0096
4,4'-DDE	µg/L	0.00059	0.0083	0.0167	0.0311
4,4'-DDT	µg/L	0.00059	ND	ND	0.0201
<i>Pyrethroid Pesticides</i>					
Fenpropathrin (Danitol)	µg/L	---	ND	ND	0.005
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025	ND	ND	1.452

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

- [1] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (no ELS) and are dependent upon the pH and temperature of the water at the time of sample collection.
- [2] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

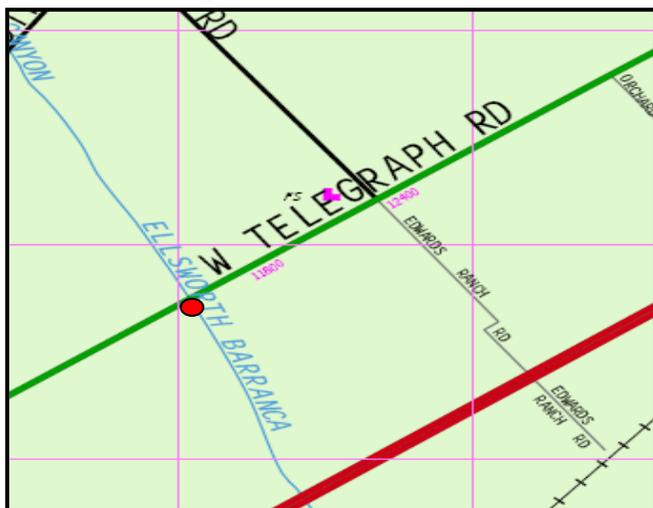
Santa Clara River Watershed

The Santa Clara River Watershed contains 7 VCAILG monitoring sites, all but one of which is located on a tributary of the Santa Clara River. S03D_BARDS is the only monitoring site located on a drainage used primarily for irrigated agriculture. Monitoring sites are discussed below in order of the Santa Clara River reach into which they drain.

S02T_ELLS

This monitoring site is located on Ellsworth Barranca just downstream of the Telegraph Road Bridge. Ellsworth Barranca drains the Aliso Canyon area and is a tributary to Santa Clara River Reach 2.

Site Map



View from W bank looking NE (upstream) at the bridge pier.



Flow was present at this site during Event 1, but the source of flow was a broken domestic water line in an orchard upstream; as soon as the line was repaired, water flow at the monitoring site stopped. Samples were therefore discarded since they were not representative of typical conditions in the channel. There was no flow present during Event 2. The lack of flow present during the two dry events signifies the absence of runoff from irrigated agriculture. Stormwater runoff was collected during Event 3. Table 38 contains a summary of constituents detected in Event 3 samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 39 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Event 3 concentrations of total dissolved solids, chloride, sulfate and chlorpyrifos exceeded benchmarks. There were no other benchmark exceedances at this site in 2007. Chlorpyrifos was the only pesticide detected at this site. Event 3 turbidity, TSS and phosphate results were high compared with results at most of the other VCAILG sites. Although the actual cause has not been determined, higher TSS/turbidity levels are likely due to soil type and land uses adjacent to the channel. The ephemeral nature of flow in this barranca makes it difficult to determine potential impacts of higher TSS and turbidity on beneficial uses. Regarding the higher level of phosphate detected, nutrient cycling is complex, making it difficult to correlate the level of a nutrient present in a surface water sample with any particular beneficial use impact at the monitoring site. Citrus and avocados (over 1000 acres) are the primary crop types associated with this site.

Table 39. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_ELLS

Constituent	Units	Benchmark	Results				
			Event 1 6/5/2007	Event 2 9/10/2007	Event 3 12/19/2007		
<i>Field Measurements</i>							
Flow	CFS	---	Not Sampled	Not Sampled; no flow	17.3 EST		
pH	Units	$6.5 \leq \text{pH} \leq 8.5$			8.0		
Temperature	°C	$\leq 26.7^\circ\text{C}^{[1]}$			11.7		
Dissolved oxygen	mg/L	≥ 6			10.9		
Turbidity	NTU	---			3000		
Conductivity	umhos/cm	---			2458		
<i>General Water Quality Constituents</i>							
Total Dissolved Solids (TDS)	mg/L	1200	Not Sampled	Not Sampled; no flow	1720		
Total Suspended Solids (TSS)	mg/L	---			9100		
Chloride	mg/L	150			260		
Sulfate	mg/L	600			710		
Total Ammonia-N	mg/L	--- / --- / 2.5 ^[2]			0.5		
Nitrate-N	mg/L	10 ^[3]			3		
Phosphate	mg/L	---			10.4		
<i>Organophosphorus Pesticides</i>							
Chlorpyrifos	µg/L	0.025					0.038

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

[3] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this SCR reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 40. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_ELLS

Constituent	Units	Benchmark	Results		
			Event 1 6/5/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Ammonia-N + Nitrate-N	mg/L	10 ^[1]	NS	NS	3.5

NS – Not Sampled; no flow.

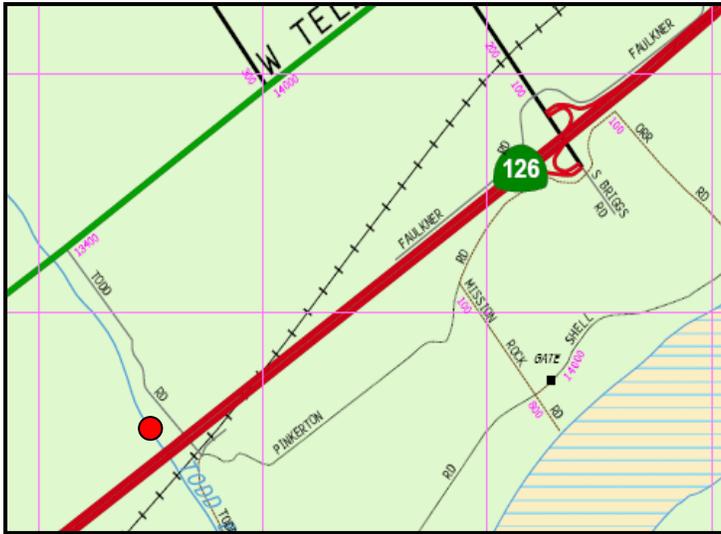
Note: Concentrations in ***bold italics*** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The SCR Nitrogen Compounds TMDL load allocation is expressed as Ammonia-N + Nitrate-N + Nitrite-N. Monitoring for Nitrite-N is not required under the Conditional Waiver; therefore, the sum of Ammonia-N + Nitrate-N is compared with the TMDL benchmark.

S02T_TODD

This monitoring site is located on Todd Barranca upstream of Hwy 126. Todd Barranca drains the Wheeler Canyon area and is a tributary to Santa Clara River Reach 2.

Site Map



View upstream of the sampling site (toward the NW).



Sufficient flow was present during all 3 monitoring events. Table 40 contains a summary of constituents detected in one or more samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 41 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of total dissolved solids and sulfate detected in samples from all events exceeded benchmarks, and chlorpyrifos exceeded benchmarks in Event 3. The 10 mg/L nitrate-N objective from the Basin Plan was exceeded in events 1 and 3, but results were just slightly above the objective. The SCR Nitrogen Compounds TMDL load allocation for Ammonia-N + Nitrate-N was exceeded in samples from Events 1 and 3; in both cases, the result for Nitrate-N alone exceeded the Ammonia-N + Nitrate-N load allocation, but results were just slightly above the load allocation. There were no other benchmark exceedances at this site in 2007. Bolstar and Chlorpyrifos were the only pesticides detected at this site. Citrus, avocados and row crops are the primary crop types associated with this site.

Table 41. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_TODD

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	0.3	0.6	8.2 EST
pH	Units	$6.5 \leq \text{pH} \leq 8.5$	8.0	7.8	7.3
Temperature	°C	$\leq 26.6^\circ\text{C}^{[1]}$	17.1	20.1	15.1
Dissolved oxygen	mg/L	≥ 6	9.4	9.0	8.9
Turbidity	NTU	---	0.7	ND	8.8
Conductivity	umhos/cm	---	2599	2515	3070
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	1200	2150	2030	2530
Total Suspended Solids (TSS)	mg/L	---	3	2	5
Chloride	mg/L	150	94	91	142
Sulfate	mg/L	600	960	901	1160
Total Ammonia-N	mg/L	2.0 / 2.2 / 2.5 ^[2]	0.1	ND	0.2
Nitrate-N	mg/L	10 ^[3]	11.48	9.93	14.04
Phosphate	mg/L	---	0.18	0.03	0.06
<i>Organophosphorus Pesticides</i>					
Bolstar	µg/L	---	ND	0.0045	ND
Chlorpyrifos	µg/L	0.025	ND	ND	0.16

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

[3] There is no site-specific nitrogen objective in the Basin Plan (Table 3-8) applicable to this SCR reach. The Basin Plan objective of 10 mg/L Nitrate-N + Nitrite-N was used for comparison with VCAILG data collected at monitoring sites in this reach.

Table 42. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_TODD

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Ammonia-N + Nitrate-N	mg/L	10 ^[1]	11.58	9.93	14.24

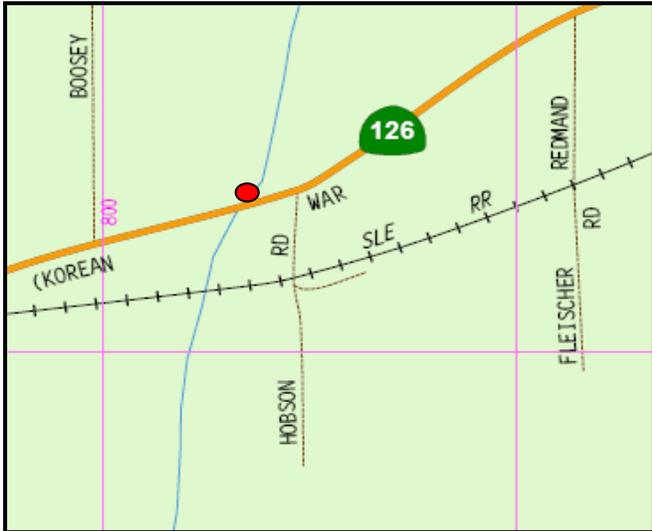
Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The SCR Nitrogen Compounds TMDL load allocation is expressed as Ammonia-N + Nitrate-N + Nitrite-N. Monitoring for Nitrite-N is not required under the Conditional Waiver; therefore, the sum of Ammonia-N + Nitrate-N is compared with the TMDL benchmark.

S03T_TIMB

This monitoring site is located on Timber Canyon Creek just upstream of Hwy 126, east of Santa Paula. Timber Creek is a tributary to Santa Clara River Reach 3.

Site Map



View S toward Hwy 126 bridge.
Samples are collected just upstream from the bridge pier.



There was no flow at this site during both dry events, but the concrete channel appeared wet, signifying intermittent flows. Stormwater samples were collected during Event 3. Table 42 contains a summary of constituents detected in Event 3 samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 43 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of total dissolved solids, sulfate and chloride detected in Event 3 samples exceeded benchmarks. There were no other benchmark exceedances at this site in 2007. There were no pesticides detected at this site, in spite of an extremely high concentration of total suspended solids (TSS). Event 3 turbidity, TSS and phosphate results were high compared with results at most of the other VCAILG sites. Although the actual cause has not been determined, higher TSS/turbidity levels are likely due to soil type and land uses adjacent to the channel. The ephemeral nature of flow in this channel makes it difficult to determine potential impacts of higher TSS and turbidity on beneficial uses. Regarding the higher level of phosphate detected, nutrient cycling is complex, making it difficult to correlate the level of a nutrient present in a surface water sample with any particular beneficial use impact at the monitoring site. Citrus and avocados are the primary crop types associated with this site.

Table 43. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_TIMB

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	Not Sampled; no flow	Not Sampled; no flow	0.2 EST
pH	Units	6.5 ≤ pH ≤ 8.5			8.0
Temperature	°C	≤ 26.7°C ^[1]			12.1
Dissolved oxygen	mg/L	≥ 5			10.7
Turbidity	NTU	---			1230
Conductivity	umhos/cm	---			3453
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	1300	Not Sampled; no flow	Not Sampled; no flow	2750
Total Suspended Solids (TSS)	mg/L	---			78200
Chloride	mg/L	100			220
Sulfate	mg/L	650			1510
Total Ammonia-N	mg/L	--- / --- / 2.3 ^[2]			1.2
Nitrate-N	mg/L	5			0.3
Phosphate	mg/L	---			112

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 44. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_TIMB

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Ammonia-N + Nitrate-N	mg/L	10 ^[1]	NS	NS	1.5

NS – Not Sampled; no flow.

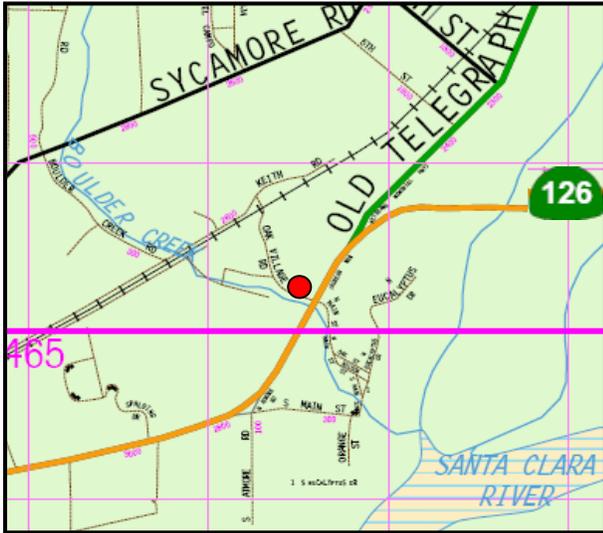
Note: Concentrations in ***bold italics*** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The SCR Nitrogen Compounds TMDL load allocation is expressed as Ammonia-N + Nitrate-N + Nitrite-N. Monitoring for Nitrite-N is not required under the Conditional Waiver; therefore, the sum of Ammonia-N + Nitrate-N is compared with the TMDL benchmark.

S03T_BOULD

This monitoring site is located on Boulder Creek just upstream of Hwy 126, west of Fillmore. Boulder Creek is a tributary to Santa Clara River Reach 3.

Site Map



View from sampling location downstream toward the Hwy 126 Bridge.



Sufficient flow was present during all 3 monitoring events. Table 44 contains a summary of constituents detected in one or more events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 45 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

The dissolved oxygen level measured during Event 2 was depressed below the minimum level established in the Basin Plan, likely because of low-flow conditions. Concentrations of total dissolved solids and nitrate detected in samples from Events 1 and 2 exceeded benchmarks, and ammonia-N exceeded the benchmark during Event 1. The SCR Nitrogen Compounds TMDL load allocation for Ammonia-N + Nitrate-N was exceeded in samples from Events 1 and 2, with the Event 1 concentration being over an order of magnitude higher than the benchmark because of the high nitrate level. There were no other benchmark exceedances at this site in 2007. Two pyrethroid pesticides were also detected in samples from Events 1 and 3. Citrus and avocados are the primary crop types associated with this site; a nursery is located adjacent to the monitoring site.

Table 45. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_BOULD

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	0.009	0.05	6.5 EST
pH	Units	$6.5 \leq \text{pH} \leq 8.5$	7.9	7.8	8.2
Temperature	°C	$\leq 26.67^\circ\text{C}$ [1]	26.6	18.4	14.3
Dissolved oxygen	mg/L	≥ 5	7.0	3.2	10.2
Turbidity	NTU	---	8.6	1	133.8
Conductivity	umhos/cm	---	2241	1786	694.5
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	1300	1630	1410	480
Total Suspended Solids (TSS)	mg/L	---	7	2	130
Chloride	mg/L	100	97	68	11
Sulfate	mg/L	650	540	551	207
Total Ammonia-N	mg/L	1.3 / 2.4 / 2.3 [2]	10.1	0.3	0.3
Nitrate-N	mg/L	5	107.6	14.59	3.39
Phosphate	mg/L	---	0.64	3.0	0.092
<i>Pyrethroid Pesticides</i>					
Fenpropathrin (Danitol)	µg/L	---	ND	ND	0.0142
Prallethrin	µg/L	---	0.202	ND	ND

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 46. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_BOULD

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Ammonia-N + Nitrate-N	mg/L	10 [1]	117.7	14.89	3.69

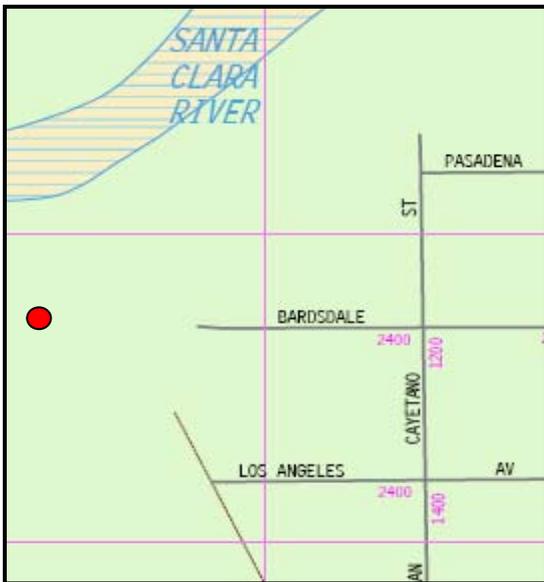
Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The SCR Nitrogen Compounds TMDL load allocation is expressed as Ammonia-N + Nitrate-N + Nitrite-N. Monitoring for Nitrite-N is not required under the Conditional Waiver; therefore, the sum of Ammonia-N + Nitrate-N is compared with the TMDL benchmark.

S03D_BARDS

This monitoring site is located near the end of the agricultural drain that runs parallel to Bardsdale Avenue in Bardsdale. The drain is located on the south side of the Santa Clara River and eventually discharges into Santa Clara River Reach 3.

Site Map



View downstream (toward the E) from the sampling site toward the Santa Clara River.



Insufficient flow was present during Events 1 and 2. Stormwater samples were collected during Event 3. Table 46 contains a summary of constituents detected in Event 3 samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 47 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

The concentrations of 4,4'-DDE and chlorpyrifos in the Event 3 sample exceeded the applicable water quality benchmarks. There were no other benchmark exceedances at this site in 2007. Event 3 turbidity and TSS results were high compared with results at most of the other VCAILG sites. Although the actual cause has not been determined, higher TSS/turbidity levels are likely due to soil type and land uses adjacent to the channel. The ephemeral nature of flow in this channel makes it difficult to determine potential impacts of higher TSS and turbidity on beneficial uses. Citrus is the primary crop type associated with this site.

Table 47. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: S03D_BARDS

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	Not Sampled; no flow	Not Sampled; no flow	0.9 EST
pH	Units	6.5 ≤ pH ≤ 8.5			8.2
Temperature	°C	≤ 26.7°C ^[1]			12.8
Dissolved oxygen	mg/L	≥ 5			10.1
Turbidity	NTU	---			854
Conductivity	umhos/cm	---			386.5
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	1300	Not Sampled; no flow	Not Sampled; no flow	240
Total Suspended Solids (TSS)	mg/L	---			920
Chloride	mg/L	100			11
Sulfate	mg/L	650			84
Total Ammonia-N	mg/L	---/ ---/ 1.9 ^[2]			0.4
Nitrate-N	mg/L	5			2.38
Phosphate	mg/L	---			1.56
<i>Organochlorine Pesticides</i>					
4,4'-DDE	µg/L	0.00059			0.0072
<i>Organophosphorus Pesticides</i>					
Chlorpyrifos	µg/L	0.025			0.322
Dimethoate	µg/L	---			0.032

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 48. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: S03D_BARDS

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Ammonia-N + Nitrate-N	mg/L	10 ^[1]	NS	NS	2.78

Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

NS – Not Sampled; no flow.

[1] The SCR Nitrogen Compounds TMDL load allocation is expressed as Ammonia-N + Nitrate-N + Nitrite-N. Monitoring for Nitrite-N is not required under the Conditional Waiver; therefore, the sum of Ammonia-N + Nitrate-N is compared with the TMDL benchmark.

S04T_HOPP

This monitoring site is located on Hopper Creek just upstream of Hwy 126 and the railroad bridge. Hopper Creek is a tributary to Santa Clara River Reach 4.

Site Map



View upstream (toward the N) from sampling location upstream of the railroad bridge.



Insufficient flow was present during Events 1 and 2. Stormwater samples were collected during Event 3. Table 48 contains a summary of constituents detected in Event 3 samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 49 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

There were no benchmark exceedances at this site in 2007. There were no pesticides detected at this site during Event 3. Primary crop types associated with this site are citrus and nursery stock.

Table 49. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_HOPP

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	Not Sampled; no flow	Not Sampled; no flow	51 EST
pH	Units	$6.5 \leq \text{pH} \leq 8.5$			7.9
Temperature	°C	$\leq 26.7^\circ\text{C}^{[1]}$			11.5
Dissolved oxygen	mg/L	≥ 5			10.9
Turbidity	NTU	---			105
Conductivity	umhos/cm	---			1118
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	1300	Not Sampled; no flow	Not Sampled; no flow	830
Total Suspended Solids (TSS)	mg/L	---			83
Chloride	mg/L	100			14
Sulfate	mg/L	600			433
Total Ammonia-N	mg/L	---/ ---/ 2.8 ^[2]			0.2
Nitrate-N	mg/L	5			0.69
Phosphate	mg/L	---			0.092

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 50. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_HOPP

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Ammonia-N + Nitrate-N	mg/L	10 ^[1]	NS	NS	0.89

Note: Concentrations in ***bold italics*** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

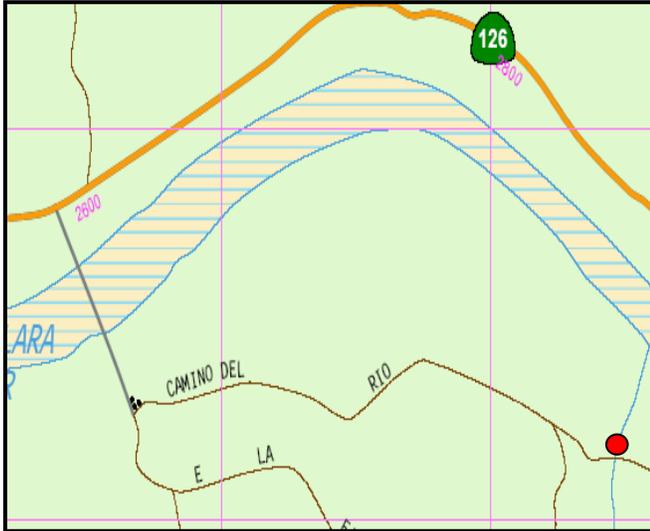
NS – Not Sampled; no flow.

[1] The SCR Nitrogen Compounds TMDL load allocation is expressed as Ammonia-N + Nitrate-N + Nitrite-N. Monitoring for Nitrite-N is not required under the Conditional Waiver; therefore, the sum of Ammonia-N + Nitrate-N is compared with the TMDL benchmark.

S04T_ TAPO

This monitoring site is located on Tapo Creek near the Ventura / Los Angeles County line, south of Hwy 126 and the Santa Clara River. Tapo Creek is a tributary to Santa Clara River Reach 4.

Site Map



View upstream (toward the S) toward the sample site at the culvert outfall.



Sufficient flow was present during all 3 monitoring events. Table 50 contains a summary of constituents detected in one or more events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 51 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of TDS, chloride, and sulfate exceeded applicable benchmarks in all 3 events. Organochlorine pesticides (DDT compounds, total chlordane and dieldrin) also exceeded applicable water quality benchmarks. There were no other benchmark exceedances at this site in 2007. Row crops and citrus are the primary crop types associated with this site.

Table 51. 2007 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_TAPO

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>Field Measurements</i>					
Flow	CFS	---	0.1	0.02	1.5
pH	Units	$6.5 \leq \text{pH} \leq 8.5$	8.3	7.2	8.2
Temperature	°C	$\leq 26.7^\circ\text{C}$ ^[1]	25.1	16.0	12.5
Dissolved oxygen	mg/L	≥ 5	13.4	8.9	10.5
Turbidity	NTU	---	0.5	2.5	359
Conductivity	umhos/cm	---	3989	4024	3267
<i>General Water Quality Constituents</i>					
Total Dissolved Solids (TDS)	mg/L	1300	3320	3340	2590
Total Suspended Solids (TSS)	mg/L	---	5	4	290
Chloride	mg/L	100	204	196	128
Sulfate	mg/L	600	1890	1720	1290
Total Ammonia-N	mg/L	0.8 / 5.0 / 1.9 ^[2]	0.1	0.1	0.3
Nitrate-N	mg/L	5	4.76	6.93	1.93
Phosphate	mg/L	---	ND	0.061	2.76
<i>Organochlorine Pesticides</i>					
Chlordane-alpha	µg/L	---	ND	ND	0.0068
Chlordane-gamma	µg/L	---	ND	ND	0.0055
trans-Nonachlor	µg/L	---	ND	ND	0.0066
Total Chlordane	µg/L	0.00059	ND	ND	0.0189
2,4'-DDT	µg/L	---	ND	0.0103	ND
4,4'-DDD	µg/L	0.00084	ND	0.0372	0.0457
4,4'-DDE	µg/L	0.00059	0.0123	0.0588	0.1517
4,4'-DDT	µg/L	0.00059	ND	0.0202	ND
Dieldrin	µg/L	0.00014	ND	0.009	ND

Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 11 through 19 for a list of benchmarks applicable to this site.

EST: Flow result is a gross estimate and should be used with discretion. ND = Not Detected

[1] The temperature limit for waterbodies designated as WARM is 80°F (26.7°C).

[2] The benchmarks for Ammonia-N are listed in order of monitoring event and were calculated based the April 2002 Basin Plan Amendment chronic equation (ELS present) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 52. 2007 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_TAPO

Constituent	Units	Benchmark	Results		
			Event 1 6/4/2007	Event 2 9/10/2007	Event 3 12/19/2007
<i>General Water Quality Constituents</i>					
Ammonia-N + Nitrate-N	mg/L	10 ^[1]	4.86	7.03	2.23

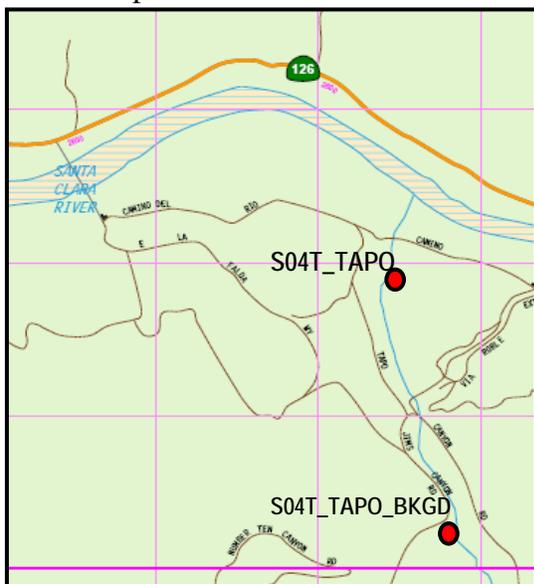
Note: Concentrations in **bold italics** indicate an exceedance of a TMDL load allocation applicable to this site for the specified constituent. See Tables 11 through 19 for a list of TMDL load allocations applicable to this site.

[1] The SCR Nitrogen Compounds TMDL load allocation is expressed as Ammonia-N + Nitrate-N + Nitrite-N. Monitoring for Nitrite-N is not required under the Conditional Waiver; therefore, the sum of Ammonia-N + Nitrate-N is compared with the TMDL benchmark.

S04T_TAPO_BKGD

The monitoring site is a background site for S04T_TAPO that is located upstream of irrigated agricultural land that drains to S04T_TAPO. This site was selected to investigate the formation of a white floc and film on laboratory glassware and test vessels during Event 1 toxicity testing.

Site Map



View of monitoring location



Samples were collected at this site only during Event 2 (dry weather event). Wet weather sampling during Event 3 was not conducted at this site due to inaccessibility during wet weather. Table 52 contains a summary of constituents detected in Event 2 samples. Concentrations detected are not compared with benchmarks because this site is located upstream of irrigated agriculture and benchmarks therefore do not apply.

Elevated concentrations of TDS, chloride and sulfate were detected in Event 2 samples, but levels are commensurate with levels detected at other high-conductivity sites. As expected, pesticides were not detected, and nutrient levels were low. If it weren't for elevated salts concentrations, water quality at this site would be good; a cause for the precipitate formation in S04T_TAPO toxicity test vessels during Event 1 has not been determined. However, data collected at this background site provide useful information that will inform Water Quality Management Plans required to address benchmark exceedances for salts and pesticides at S04T_TAPO.

Table 53. 2007 VCAILG Monitoring Data: S04T_TAPO_BKGD

Constituent	Units	Results		
		6/4/2007	9/10/2007	12/19/2007
<i>Field Measurements</i>				
Flow	CFS	Not Sampled	0.01	Not Sampled; unsafe
pH	Units		7.8	
Temperature	°C		17.8	
Dissolved oxygen	mg/L		6.5	
Turbidity	NTU		13.2	
Conductivity	umhos/cm		5064	
<i>General Water Quality Constituents</i>				
Total Dissolved Solids (TDS)	mg/L	Not Sampled	3920	Not Sampled; unsafe
Total Suspended Solids (TSS)	mg/L		3	
Chloride	mg/L		348	
Sulfate	mg/L		2090	
Total Ammonia-N	mg/L		ND	
Nitrate-N	mg/L		ND	
Ammonia-N + Nitrate-N	mg/L		ND	
Phosphate	mg/L		0.64	

ND = Not Detected

Ventura River Watershed

There are 2 VCAILG monitoring sites located in this watershed, both tributaries to the Ventura River and located on the east end of the City of Ojai.

VRT_THACH

This monitoring site is located on Thacher Creek just upstream of Ojai Avenue in Ojai. Thacher Creek is a tributary to San Antonio Creek, which is tributary to the Ventura River.

Site Map



View upstream (toward NE),
upstream of the Ojai Ave. Bridge.

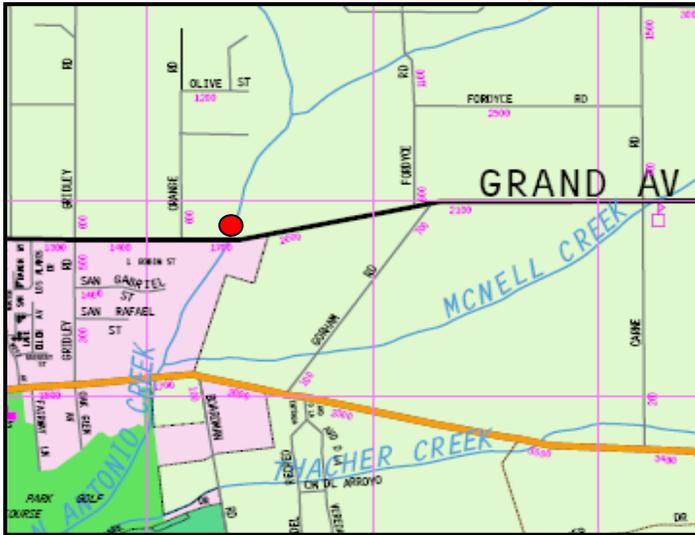


This site was dry during all 3 monitoring events in 2007, signifying a lack of runoff from irrigated agricultural lands that drain to this site. In spite of a storm that dropped upwards of 2 inches or rain in the Ojai Valley in late January 2007, the creek bed still contained no flow. Avocado and citrus are the predominant crop types associated with this site.

VTR_SANTO

This monitoring site is located on San Antonio Creek just upstream of Grand Avenue in Ojai. San Antonio Creek is a tributary to the Ventura River.

Site Map



View downstream toward the Grand Ave. Bridge



This site was also dry during all 3 monitoring events in 2007, signifying the lack of runoff from irrigated agricultural lands that drain to this site. In spite of a storm that dropped upwards of 2 inches in the Ojai Valley in late January 2007, the creek bed still contained no flow. Avocado and citrus are the predominant crop types associated with this site.

CHRONIC TOXICITY TEST RESULTS

Two types of toxicity testing were performed on samples collected at VCAILG monitoring sites in 2007: 3-species screening to determine the most sensitive species to use for the duration of the Monitoring Program, and Toxicity Identification Evaluation (TIE) test procedures to identify the toxicant(s) causing reduced growth in algae species. This section discusses both types of tests in detail and includes a summary of toxicity data.

Toxicity reports submitted by the toxicity laboratory for Event 1 and Event 2 tests contain test results and raw data as well as a more detailed discussion of 3-species screen and TIE test procedures. Two types of reports were submitted by the laboratory, an electronic data deliverable (EDD) and PDF of the hard copy narrative report. Both reports are included as Appendix G on the Annual Report Data CD.

3-Species Screen to Determine the Most Sensitive Species

The Conditional Waiver requires that 3-species chronic toxicity testing be performed on samples collected at each site during the first monitoring event. The 3-species screen is designed to provide an indication of the most sensitive species among the invertebrate, vertebrate, and algae; the most sensitive species is then used for subsequent toxicity testing for the duration of the VCAILG Monitoring Program. Flow was present at only 6 of 14 toxicity sites during the June monitoring event, so the 3-species screen was run on samples collected at those sites. The conductivity at 3 sites measured less than 3000 uS/cm, so freshwater organisms were used for the 3-species screen at those sites. The 3-species screen for freshwater sites was successful. Because the conductivity at the other 3 sites exceeded 3000 uS/cm, alternative, non-freshwater species were used for the 3-species screen for those sites. Although the invertebrate and algae tests were successful, the vertebrate species (*Atherinops affinis*) exhibited excessive mortality (“crashed”) during the 3-species screen, invalidating test results for those 3 sites. Because there is only one supplier of *Atherinops affinis* in the United States, the Regional Board approved use of *Menidia beryllina*, a more readily available and more commonly-used species, for subsequent 3-species testing for high-conductivity sites. The 3-species screen was rerun during the September event for the 3 high-conductivity sites. Tests using *Menidia* and the algae were successful for the September event, but the invertebrate species (*Hyaella azteca*) experienced a high mortality rate, invalidating *Hyaella* results for the September event. Despite that test failure, the toxicity lab at that point had generated at least one successful test for each species for each site so that the most sensitive species could be selected.

In summary, in 2007, the 3-species screen was completed for the following 6 toxicity sites (the only toxicity sites with flow present during the two dry events in 2007):

- 01T_ODD2_DCH (high conductivity)
- 01T_ODD3_ARN (high conductivity)
- 05D_LAVD

- S02T_TODD
- S04T_BOULD
- S04T_TAPO (high conductivity)

Toxicity Results for the 3-Species Screen

Chronic toxicity is defined as a significant difference in a deleterious effect (e.g., reduced growth, reproduction) on an organism relative to a control. Organisms are exposed to aliquots of 100% environmental sample for a period of time defined in the method for each organism. When the test is complete, viable organisms are measured, counted, or weighed, and results are evaluated statistically to determine whether effects on organisms exposed to environmental sample are significantly different from the same effects on organisms in lab water (*i.e.*, the control).

At freshwater sites (*i.e.*, conductivity <3000 uS/cm), *Ceriodaphnia* experienced the greatest reductions relative to controls for S03T_BOULD and 05D_LAVD. Although *Selenastrum* exposed to water collected at S02T_TODD experienced a 94% reduction in growth that triggered a TIE, the recommended single species to use for subsequent toxicity tests on all freshwater sites is *Ceriodaphnia*. The most important reason for that recommendation is that toxicity tests using algae (in this case *Selenastrum*) are confounded by the presence of nutrients, which are present in high concentrations in agricultural discharges. In addition, *Ceriodaphnia* exhibits sensitivity to a wider range of agricultural chemicals than algae, including metals, pesticides and herbicides.

At high-conductivity sites (*i.e.*, conductivity >3000 uS/cm), the algae (*Thalassiosira*) experienced a reduction in growth when exposed to water from two sites: 01T_ODD3_ARN and S04T_TAPO. The invertebrate (*Hyalella*) and fish (*Menidia*) did not experience reductions in survival or biomass relative to controls. Although the algae was the only salt-tolerant species to experience reductions in effect, the recommended single species to use for subsequent toxicity tests on high-conductivity sites is *Hyalella*. The reasons for this recommendation are the same as those for freshwater sites – tests using algae species are confounded by the presence of nutrients, and *Hyalella* exhibits sensitivity to a wider range of agricultural chemicals than algae.

A single-species recommendation for these 6 sites was submitted to Regional Board staff for approval on December 5, 2007. Regional Board staff granted conditional approval verbally for use of *Ceriodaphnia dubia* for freshwater sites and *Hyalella azteca* for high-conductivity sites for subsequent toxicity tests.

The 3-species screen was run on additional toxicity sites during a storm event in early January 2008. A formal letter containing the single species recommendation for all toxicity sites for which the 3-species screen was successfully run will be submitted to the Regional Board in early March, 2008.

Summary tables of data from 3-species toxicity testing for both freshwater sites (Table 53) and high-conductivity sites (Table 54) are on the following page.

Table 54. Chronic Toxicity Results for 3-Species Screen at Freshwater Sites

Site	Event	<i>Selenastrum</i> ^[1]		<i>Ceriodaphnia</i> ^[2]			<i>Pimephales. Promelas</i> ^[3]			TIE Triggered?
		Cell Growth Toxicity	Growth % Reduct.	Survival Toxicity	Reprod. Toxicity	Reprod.% Reduct.	Survival Toxicity	Biomass Toxicity	Biomass % Red.	
S03T_BOULD	1: June 2007	Y	54.4	N	Y	84.0	N	Y	26.4	Selenastrum
S03T_BOULD_dup	1: June 2007	Y	62.7	N	Y	96.2	N	Y	24.7	Selenastrum
S02T_TODD	1: June 2007	Y	93.7	N	Y	23.2	N	N	-----	Selenastrum
05D_LAVD	1: June 2007	N	-----	N	Y	25.9	N	N	-----	N

[1] *Selenastrum capricornutum* (algae) is evaluated for the growth endpoint.

[2] *Ceriodaphnia dubia* (invertebrate – water flea) is evaluated for the survival and reproduction endpoints.

[3] *Pimephales promelas* (vertebrate – fathead minnow) is evaluated for survival and biomass endpoints.

Table 55. Chronic Toxicity Results for 3-Species Screen at High-Conductivity Sites

Site	Event	<i>Thalassiosira</i> ^[1]		<i>Hyalella</i> ^{[2],[4]}	<i>Atherinops</i> ^{[3],[5]}		<i>Menidia</i> ^{[3],[6]}		TIE Triggered?
		Cell Growth Toxicity	Growth % Reduct.	Survival Toxicity	Survival Toxicity	Biomass Toxicity	Survival Toxicity	Biomass Toxicity	
01T_ODD2_DCH	1: June 2007	N		N	NR	NR	-----	-----	N
01T_ODD2_DCH	2: Sept 2007	N		NR	-----	-----	N	N	N
01T_ODD3_ARN	1: June 2007	Y	39.1	N	NR	NR	-----	-----	N
01T_ODD3_ARN	2: Sept 2007	N		NR	-----	-----	N	N	N
S04T_TAPO	1: June 2007	Y	63.8	N	NR	NR	-----	-----	<i>Thalassiosira</i>
S04T_TAPO	2: Sept 2007	N		NR	-----	-----	N	N	N

[1] *Thalassiosira pseudonana* (algae) is evaluated for the growth endpoint.

[2] *Hyalella azteca* (invertebrate – crustacean) is evaluated for the survival endpoint.

[3] *Atherinops affinis* and *Menidia beryllina* (vertebrates – fish) are evaluated for the survival and biomass endpoints.

[4] NR = No Results; invalid test due to control failure. Quality of culture obtained from supplier suspected, as mortality occurred in all test treatments. Potential salt sensitivity also suspected, demonstrated by excessive mortality in the salt control.

[5] NR = No Results; invalid test due to control failure. Culture obtained from supplier exhibited significant mortalities, indicating poor test organism quality.

[6] *Menidia beryllina* was selected as a replacement species for *Atherinops affinis* for use in 3-species screening due to greater availability and common use of *Menidia*.

Exceedances of the 1.0 TUC toxicity benchmark occurred at S03T_BOULD, S02_TODD, 05D_LAVD, 01T_ODD3_ARN, AND S04T_TAPO, triggering the requirement to develop Water Quality Management Plans for agricultural lands draining through these sites.

Toxicity Identification Evaluation (TIE) Testing

As discussed in the VCAILG QAPP, significant toxicity is used to trigger further investigation to determine the cause of observed toxicity. If testing indicates the presence of significant toxicity in the sample, TIE procedures may be initiated to investigate the cause of toxicity. For the purpose of triggering TIE procedures, significant toxicity is defined as at least 50% mortality (*P. promelas* and *C. dubia* for freshwater sites, *Menidia* and *Hyaella* for high-conductivity sites) or a 50% reduction in growth (*Selenastrum* for freshwater sites and *Thalassiosira* for high-conductivity sites). The 50% threshold is consistent with the approach recommended in guidance published by U.S. EPA for conducting TIEs (USEPA 1996b), which recommends a minimum threshold of 50% mortality because the probability of completing a successful TIE decreases rapidly for samples with less than this degree of toxicity. A targeted Phase I TIE will be conducted to determine the general class of constituents (e.g., non-polar organics, metals) causing toxicity. The targeted TIE will focus on classes of constituents anticipated to be observed in drainages dominated by urban and agricultural discharges and those previously observed to cause toxicity. These classes of constituents have been determined to be primarily non-polar organics and metals. TIE methods will generally adhere to EPA procedures documented in conducting TIEs (USEPA 1991, 1992, 1993a-b). For samples exhibiting toxic effects consistent with carbofuran, diazinon, or chlorpyrifos, TIE procedures will follow those documented in Bailey *et al.* (1996).

The Conditional Waiver Monitoring and Reporting Program (MRP, CI-8836) requires that any exceedance of the 1.0 TUC trigger be followed up with two consecutive months of toxicity testing, and that a TIE must be initiated if the toxicity exceedances persist. Although the follow-up approach is consistent with NPDES monitoring protocols, it will not provide information that will lead to the identification of specific toxicants which can allow for toxicity reductions in agricultural discharges through implementation of best management practices. Although the follow-up testing approach may provide a temporal assessment of low-level toxicity, there will be no concurrent chemical analysis of the sample to identify a potential toxicant and therefore no indication that the same toxicant is causing toxicity from one sampling event to the next. The toxicity monitoring approach developed for the VCAILG Monitoring Program is designed to identify toxicants and thereby provide a mechanism for achieving toxicity reductions in agricultural discharges. This approach was used successfully in the Calleguas Creek Watershed for toxicity monitoring in support of toxicity TMDL development, and it has been recommended by US EPA toxicologists because of its success in identifying toxicants. It is therefore the approach selected for the VCAILG Monitoring Program.

There were significant reductions (>50%) in algal growth in samples collected at the following sites during the monitoring event in June:

- S03T_BOULD (*Selenastrum capricornutum* – freshwater algae)
- S03T_BOULD duplicate (*Selenastrum capricornutum*)
- S02T_TODD (*Selenastrum capricornutum*)
- S04T_TAPO (*Thalassiosira pseudonana* – non-freshwater algae)

Follow-up Phase I TIEs targeted for pesticides and metals were performed on all four samples. In all 4 samples, toxicity observed in the original sample was persistent, which is a prerequisite for continuing with the TIE process. Conclusions based on TIE test results are as follows:

- S03T_BOULD: non-polar organics may have been impairing algal growth.
- S03T_BOULD duplicate: TIE treatments did not remove toxicity, suggesting that the toxicity was not caused by divalent cations (*i.e.*, metals) or organic compounds alone.
- S02T_TODD: data suggest the presence of multiple contaminants (*e.g.*, a non-polar organic and a metal) acting in concert, such that each contaminant contributes to overall toxicity and the removal of either contaminant alone does not remove all of the toxicity.
- S04T_TAPO: TIE treatments did not remove toxicity, suggesting that the toxicity was not caused by divalent cations (*i.e.*, metals) or organic compounds alone.

Although TIEs did not positively identify the toxicant(s) for the 4 samples, information provided by TIE test results will likely inform future TIEs.

EVALUATION OF DATA QUALITY

The VCAILG QAPP specifies monitoring program requirements and procedures designed to ensure that the quality of data generated through the VCAILG Monitoring Program are such that data can be used to 1) accurately assess environmental conditions and 2) make environmentally-sound decisions. This section provides a summary of the data quality evaluation performed on data collected through the VCAILG Monitoring Program in 2007. The evaluation is based on data quality objectives and quality control requirements specified in the VCAILG QAPP.

Data Quality Objectives

Data quality objectives specified in the QAPP for the VCAILG Monitoring Program include requirements pertaining to maximum detection limits achieved by field methods and analytical laboratories, and acceptance criteria for quality control samples. Additional data quality objectives were defined in the QAPP for percent completeness.

Detection Limits

Tables 55, 56 and 57 list Project Method Detection Limits (MDLs) and Reporting Limits (RLs) for field measurements and laboratory data specified in the QAPP. Detection limits that were not achieved in 2007 are explained in footnotes and in the discussion immediately following these tables.

Table 56. Analytical Methods and Project Reporting Limits for Field Measurements

Parameter	Method	Range	Project Reporting Limit
Flow	Electromagnetic	-0.5 to +20 ft/s	0.05 ft/s
pH	Electrometric	0 – 14 pH units	NA
Temperature	High stability thermistor	-5 – 50 °C	NA
Dissolved oxygen	Membrane	0 – 50 mg/L	0.5 mg/L
Turbidity	Nephelometric	0 – 3000 NTU	0.2 NTU
Conductivity	Graphite electrodes	0 – 10 mmhos/cm	2.5 umhos/cm

NA = Not Applicable

Table 57. Analytical Methods and Project Detection Limits for Laboratory Analyses: General Water Quality Constituents, Organochlorine Pesticides, and Pyrethroids

Parameter	Units	Project MDL	MDL Reported by Lab	Project RL	RL Reported By Lab
General Water Quality Constituents					
Total Dissolved Solids (TDS)	mg/L	4	7.7 ^[1]	20	20
Total Suspended Solids (TSS)	mg/L	2	0.28 ^[1]	5	1
Chloride	mg/L	0.2	0.2	1	1
Sulfate	mg/L	0.03	0.26 ^[1]	1	1
Total Ammonia-N	mg/L	0.04	0.04	0.2	0.1
Nitrate-N	mg/L	0.008	0.01 ^[1]	0.1	0.05
Phosphate	mg/L	0.01	0.01	0.05	0.01
Organochlorine Pesticides					
Aldrin	ng/L	1	1	5	5
alpha-BHC	ng/L	1	1	5	5
beta-BHC	ng/L	1	1	5	5
gamma-BHC (Lindane)	ng/L	1	1	5	5
Delta-BHC	ng/L	1	1	5	5
Chlordane-alpha	ng/L	1	1	5	5
Chlordane-gamma	ng/L	1	1	5	5
2,4'-DDD	ng/L	1	1	5	5
2,4'-DDE	ng/L	1	1	5	5
2,4'-DDT	ng/L	1	1	5	5
4,4'-DDD	ng/L	1	1	5	5
4,4'-DDE	ng/L	1	1	5	5
4,4'-DDT	ng/L	1	1	5	5
Dieldrin	ng/L	1	1	5	5
Endosulfan I	ng/L	1	1	5	5
Endosulfan II	ng/L	1	1	5	5
Endosulfan Sulfate	ng/L	1	1	5	5
Endrin	ng/L	1	1	5	5
Endrin Aldehyde	ng/L	1	1	5	5
Endrin Ketone	ng/L	1	1	5	5
Toxaphene	ng/L	10	10	50	50
Pyrethroid Pesticides ^[2]					
Allethrin	ng/L	--	5 / 0.5	--	25 / 2
Bifenthrin	ng/L	5	5 / 0.5	5	25 / 2
Cyfluthrin	ng/L	4	5 / 0.5	5	25 / 2
I-Cyhalothrin	ng/L	4	5 / 0.5	5	25 / 2
Cypermethrin	ng/L	3	5 / 0.5	5	25 / 2
Deltamethrin ^[3]	ng/L	3	5 / 0.5	10	25 / 2
Esfenvalerate ^[4]	ng/L	4	5 / 0.5	5	25 / 2
Fenpropathrin	ng/L	3	5 / 0.5	5	25 / 2
Fenvalerate	ng/L	4	5 / 0.5	5	25 / 2
Fluvalinate	ng/L	3	5 / 0.5	5	25 / 2
Permethrin	ng/L	3	5	5	25
Prallethrin	ng/L	--	5 / 0.5	--	25 / 2
Resmethrin	ng/L	6	5	10	25

MDL = Method Detection Limit RL = Reporting Limit

- [1] Project MDLs were not met in 2007. However, Project RLs were met, and concentrations in environmental samples greatly exceeded RLs for these constituents; none of these constituents was reported as "not detected".
- [2] The laboratory originally retained to analyze samples for pyrethroids had not completed method development to achieve Project MDLs or RLs by the time monitoring commenced. A different laboratory with different MDLs and RLs was retained for pyrethroids analysis. Limits achieved during Events 1 and 2 are higher than those for Event 3 (separated by a "/") because the laboratory started using a more sensitive method (NCI GC/MS) with Event 3 samples. The laboratory reports two additional pyrethroids that were not included in the QAPP.
- [3] The QAPP originally listed Deltamethrin/Tralomethrin because they coelute. The analyzing laboratory has chosen to report only Deltamethrin because of uncertainties with respect to MDLs and RLs for Tralomethrin.
- [4] The QAPP originally listed Esfenvalerate/Fenvalerate because they coelute. The analyzing laboratory is able to separate the two compounds and therefore reports them separately.

Table 58. Analytical Methods and Project Detection Limits for Laboratory Analyses: Organophosphorus Pesticides

Parameter	Units	MDL		RL	
		Project MDL	Reported by Lab	Project RL	Reported By Lab
Bolstar	ng/L	2	2	4	4
Chlorpyrifos	ng/L	1	1	2	2
Demeton	ng/L	1	1	2	2
Diazinon	ng/L	2	2	4	4
Dichlorovos	ng/L	3	3	6	6
Dimethoate	ng/L	3	3	6	6
Disulfoton	ng/L	1	1	2	2
Ethoprop	ng/L	1	1	2	2
Fenclorophos	ng/L	2	2	4	4
Fensulfothion	ng/L	1	1	2	2
Fenthion	ng/L	2	2	4	4
Malathion	ng/L	3	3	6	6
Merphos	ng/L	1	1	2	2
Methyl Parathion	ng/L	1	1	2	2
Mevinphos	ng/L	8	8	16	16
Phorate	ng/L	6	6	12	12
Tetrachlorvinphos	ng/L	2	2	4	4
Tokuthion	ng/L	3	3	6	6
Trichloronate	ng/L	1	1	2	2

MDL = Method Detection Limit RL = Reporting Limit

All project detection limits were met in 2007 for field measurements.

MDLs for TDS, TSS and sulfate were not met during 2007. However, the RLs for these constituents were met, and levels of these analytes in environmental samples greatly exceeded MDLs. Therefore, higher MDLs for these constituents is not considered a quality control failure.

MDLs and RLs for pyrethroids that are listed in the QAPP were provided by a laboratory that had not yet completed method development to achieve those limits by the time monitoring commenced. Another qualified laboratory was selected to perform the analysis but was unable to meet Project RLs and MDLs for the first two monitoring events. However, the laboratory began using a more sensitive method for Event 3 pyrethroids analysis and was able to meet all but 1 MDL and all but 2 RLs for that event (limits achieved for Events 1 and 2 are separated by a “/” from Event 3 limits in Table 38). Because there are no established / approved methods or water quality objectives for pyrethroids, MDLs and RLs achieved during 2007 are acceptable and not considered to be a quality control failure.

All project detection limits were met in 2007 for organophosphorus pesticides.

Data Quality Objectives for Precision and Accuracy

Table 58 lists data quality objectives for precision and accuracy for field measurements and laboratory analyses.

Table 59. Data Quality Objectives for Precision and Accuracy

Parameter	Accuracy	Precision	Recovery
Field Measurements			
Water Velocity (for Flow calc.)	± 2%	NA	NA
pH	± 0.2 pH units	± 0.5 pH units	NA
Temperature	± 0.5 °C	± 5%	NA
Dissolved Oxygen	± 0.5 mg/L	± 10%	NA
Turbidity	± 10%	± 10%	NA
Conductivity	± 5%	± 5%	NA
Laboratory Analyses			
Aquatic Chronic Toxicity	[1]	[2]	NA
Total Suspended Solids (TSS)	80-120%	25%	80-120%
Total Dissolved Solids (TDS)	80-120%	25%	80-120%
Chloride	80-120%	25%	80-120%
Sulfate	80-120%	25%	80-120%
Ammonia-Nitrogen	80-120%	25%	80-120%
Nitrate-Nitrogen	80-120%	25%	80-120%
Orthophosphate	80-120%	25%	80-120%
Organochlorine Pesticides	80-120%	25% ^[3]	50-150% ^[3]
Organophosphorus Pesticides	80-120%	25% ^[3]	50-150% ^[3]
Pyrethroid Pesticides	80-120%	25% ^[3]	50-150% ^[3]

NA: Not Applicable

[1] Must meet all method performance criteria relative to the reference toxicant test.

[2] Must meet all method performance criteria relative to sample replicates.

[3] Or control limits established as the mean ± 3 standard deviations based on laboratory precision and recovery data.

Hydrolab MS5 Data Sondes (field meters) were calibrated the morning of each monitoring day, and calibration was verified for each probe by analyzing a mid-range standard. If a calibration failure occurred, the probe that failed calibration was not used for monitoring. At the end of each monitoring day, mid-range standards were rerun to verify that each probe was still in calibration. Calibration data are recorded on the calibration sheet in the field logbook, and ultimately entered into the VCAILG Monitoring database. All calibration checks performed on field meters met data quality objectives for accuracy, signifying the validity of all field measurements.

Flow results for Events 1 and 2 were obtained using a velocity meter. Higher flows that occurred during Event 3 prevented crews from entering streams to measure flow. Rough estimates of flow were obtained by either measuring or estimating stream width and the average depth, and multiplying those estimates by the reciprocal of the time required for a floating object to travel over a measured distance. Event 3 flow values, therefore, are gross estimates and should be used with discretion.

Table 59 lists quality control failures reported by the analytical laboratories for samples collected during all 3 monitoring events in 2007 and includes the laboratory's explanation (qualifier) for each failure.

Table 60. Quality Control Failures - 2007

Event	Lab	Parameter	QC Type	Failure	Lab Qualifier
1	FGL	Ammonia-N	FD	RPD did not meet acceptance criteria.	Concentration of sample was such that it was diluted in the lab prior to analysis, which may have introduced additional error.
1	FGL	Chloride	MS/MSD	MS % recovery did not meet acceptance criteria.	435 Sample matrix may be affecting this analyte. Data were accepted based on the LCS or CCV recovery.
1	FGL	Sulfate	MS/MSD	MSRPD did not meet acceptance criteria.	400 Relative Percent Difference (RPD) not within Maximum Allowable Value (MAV) because of matrix interferences affecting this analyte. Data was accepted based on the LCS or CCV recovery.
2	FGL	Ammonia	FB	Analyte detected in Field Blank at twice the laboratory's RL.	Laboratory is obtaining a different supply of reagent water.
2	CRG	Bolstar	FD	RPD did not meet acceptance criteria.	RPD maximum allowable value is based on detected values that are greater than 10x the MDL. Duplicate sample concentrations were less than 10x the MDL.
2	FGL	TSS	LD	RPD did not meet acceptance criteria.	400 Relative Percent Difference (RPD) not within Maximum Allowable Value (MAV) because of matrix interferences affecting this analyte. Data was accepted based on the LCS or CCV recovery.
2	CRG	Nitrate	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control, and therefore the sample data were reported without further clarification.
2	CRG	Demeton	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control, and therefore the sample data were reported without further clarification.
2	CRG	Disulfoton	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control, and therefore the sample data were reported without further clarification.
2	CRG	Fenthion	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control, and therefore the sample data were reported without further clarification.

FB = Field Blank FD = Field Duplicate LD = Lab Duplicate MS/MSD = Matrix Spike/Matrix Spike Duplicate
 RPD = Relative Percent Difference

Table 59. Quality Control Failures – 2007, continued

Event	Lab	Parameter	QC Type	Failure	Lab Qualifier
2	CRG	Merphos	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control, and therefore the sample data were reported without further clarification.
2	CRG	Phorate	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control, and therefore the sample data were reported without further clarification.
2	CRG	Resmethrin	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control, and therefore the sample data were reported without further clarification.
3	FGL	Ammonia	FB	Analyte detected in Field Blank at twice the laboratory's RL.	Laboratory is obtaining a different supply of reagent water.
3	FGL	Ammonia	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	408 Matrix Spike (MS) or Post Digestion Spike (PDS) has no Acceptance Range (DQO) because of high analyte concentration in the sample. Data were accepted based on the LCS or CCV recovery.
3	CRG	2,4' -DDT	FD	RPD did not meet acceptance criteria.	RPD maximum allowable value is based on detected values that are greater than 10x the MDL. Duplicate sample concentrations were less than 10x the MDL.
3	CRG	4,4' -DDD	FD	RPD did not meet acceptance criteria.	RPD maximum allowable value is based on detected values that are greater than 10x the MDL. Duplicate sample concentrations were less than 10x the MDL.
3	CRG	4,4' -DDT	FD	RPD did not meet acceptance criteria.	RPD maximum allowable value is based on detected values that are greater than 10x the MDL. Duplicate sample concentrations were less than 10x the MDL.

FB = Field Blank FD = Field Duplicate LD = Lab Duplicate MS/MSD = Matrix Spike/Matrix Spike Duplicate
 RPD = Relative Percent Difference

In all cases, quality control failures listed in Table 40 did not result in the rejection of data. Specific failures are discussed in more detail below.

Ammonia-N

Concentrations of ammonia-N were detected in field blanks collected during Event 1 and Event 3. FGL explained that they are in the process of obtaining a different source of reagent water for this test. Irrespective of reagent water contamination, concentrations of ammonia in environmental samples were well below benchmarks.

Matrix Interferences – Event 2

The Todd Road site (S02T_TODD) was selected as the QC site for Event 2. It appears as though site water contained unidentified interferences that affected quality control results for both inorganics (ammonia-N) and organics (organophosphate pesticides). The organics laboratory (CRG) suggested that the interferences might have been petroleum based as evidenced by the fragmentation pattern detected by the mass spectrometer.

FGL Qualifiers Questionable

Upon closer examination of qualifiers (located in the DQF column) in electronic data deliverables (EDDs) submitted by FGL, it was discovered that incorrect qualifiers were used in many cases, and some were omitted altogether. Therefore, data qualifiers in FGL's EDDs should be considered as preliminary and not used to evaluate the quality of their data. FGL's EDDs will be reviewed by FGL in early March, and corrected information will be uploaded to the VCAILG Monitoring database. At that time, the corrected data set will be submitted to Regional Board staff to replace the data set included in the February 15, 2008 submittal.

Completeness

Data completeness is a measure of the percent of successfully collected and validated data relative to the amount of data planned to be collected for the monitoring program. A project objective for percent completeness is typically based on the percentage of data needed for the program to reach valid conclusions.

Establishing a data quality objective for percent completeness for the VCAILG Monitoring Program is complicated by the fact that dry sites contribute valuable information necessary to identify areas where discharges from irrigated agriculture are not occurring. For this reason, not all of the data planned for collection can be considered absolutely critical, so it is difficult to set a meaningful objective for percent completeness. As explained in the QAPP, some reasonable objectives for data are desirable, if only to measure the effectiveness of the program. Program goals for data completeness were established at the 90% level for field measurements, general water quality constituents, organic constituents, and aquatic toxicity. Table 60 lists the percent completeness of data collected during 2007 in comparison with the established DQO.

Table 61. Data Completeness – 2007

Monitoring Element	% Completeness Objective	% Completeness Achieved
<i>Chronic Toxicity</i>	90	50%
<i>Field Measurements</i>	90	75%
Flow	90	75%
pH	90	75%
Temperature	90	75%
Dissolved oxygen	90	75%
Turbidity	90	75%
Conductivity	90	75%
<i>General Water Quality</i>	90	75%
Total Dissolved Solids (TDS)	90	75%
Total Suspended Solids (TSS)	90	75%
Chloride	90	75%
Sulfate	90	75%
Total Ammonia-N	90	75%
Nitrate-N	90	75%
Phosphate	90	75%
<i>Organochlorine Pesticides</i>	90	75%
<i>Pyrethroid Pesticides</i>	90	75%
<i>Organophosphorus Pesticides</i>	90	75%

Values listed for percent completeness achieved are based on successfully collecting samples at all VCAILG monitoring sites with sufficient flow present, and successfully generating analytical data for all planned constituents. Percent completeness dropped to 50 % for chronic toxicity because only 1 of the 2 planned toxicity events was conducted in 2007 due to lack of rainfall. The % completeness figure for all other constituents dropped to 75% because only 3 monitoring events were conducted out of the 4 planned events for 2007. Only 1 of 2 planned wet events were conducted because of drought conditions that existed in 2007.

Additional Program Requirements

Training

Data quality is dependent on samples that are collected properly by following established protocols. To ensure that samples are collected properly, the QAPP requires field crews to receive sampling training prior to initiation of sampling. Refresher training is required annually thereafter.

The first sampling training event occurred on January 5, 2007 at FGL Environmental Laboratory in anticipation of a wet event. Larry Walker Associates (LWA) used a PowerPoint presentation to describe sampling procedures in detail and highlight important features of event preparation and the actual sampling event that could easily be overlooked. A field exercise followed the “classroom” session. Crews met at the S02T_TODD site and practiced techniques of wet and dry weather sampling and learned how to use the Hydrolab MS5 Data Sondes (field probes).

LWA conducted the second training event on December 14, 2007, again at FGL. The purpose of the refresher training was to prepare for the first wet event. The December training event was a classroom session only, where site-specific details were discussed in addition to the standard sampling training material. Training documentation is kept on file with other VCAILG Monitoring Program documents and is available for review upon request.

SWAMP-Compatible Data Format

The QAPP requires that data collected through the VCAILG Monitoring Program conform to SWAMP reporting protocols so that data can be included in the SWAMP database. Monitoring data have not been formatted to conform to SWAMP specifications because of a lack of clear direction from the State regarding data formatting specifics. LWA database administrators are working toward obtaining guidance so that once a format is agreed upon, the VCAILG Monitoring Database will be formatted accordingly and submitted for inclusion in the SWAMP database.

In summary, data collected in 2007 through the VCAILG Monitoring Program are of acceptable quality and fulfilled Monitoring Program objectives to the extent feasible, considering a limited data set from just 3 monitoring events.

Summary of Benchmark Exceedances

Monitoring data from samples collected at 16 of the 21 VCAILG monitoring sites exceeded benchmarks and triggered the requirement to develop Water Quality Management Plans (WQMPs) to address the exceedances. Background sites are not included in the total number of monitoring sites because they are located upstream of irrigated agricultural operations. Exceedances of water quality benchmarks occurred in all watersheds except the Ventura River Watershed; there were no samples collected in the Ventura River Watershed during 2007 because of lack of flow.

Because TMDLs require the development of WQMPs regardless of whether monitoring data exceed TMDL load allocations, TMDL load allocation exceedances are discussed separately in the next section.

Table 61 contains a summary of benchmark exceedances that occurred at each site during 2007. Table 61 also identifies sites that were sampled but where no exceedances occurred, as well as sites that were not sampled. Table 62 contains the same exceedance summary organized by constituent and by watershed. Organochlorine (legacy) pesticides, primarily DDT compounds, caused the highest number of exceedances overall, followed by organophosphorus pesticides and nitrogen compounds, salts, and chronic toxicity. During Event 1 (June 2007) and Event 2 (September 2007), exceedances occurred at all sites sampled. During Event 3 (December 2007), exceedances occurred at 14 of 16 sites sampled.

PESTICIDES

Exceedances of benchmarks for organochlorine (OC) and organophosphorus (OP) pesticides occurred at 14 VCAILG sites, 10 of which are located in the Calleguas Creek Watershed. Exceedances of benchmarks for DDT compounds occurred during all 3 events at the site located in the Oxnard Coastal Watershed and at 5 sites in the Calleguas Creek Watershed. Exceedances of benchmarks for dieldrin and chlordane also occurred at two sites. The greatest number of benchmarks exceedances for OP pesticides occurred in the Calleguas Creek Watershed during Event 3, which was a wet event.

SALTS

Exceedances of salts benchmarks (TDS, chloride, sulfate, or a combination thereof) occurred at 7 sites, five of which are located in the Santa Clara River Watershed. It is noteworthy that when the Calleguas Creek Watershed Salts TMDL is approved by USEPA, load allocations will apply to receiving water locations at the base of each subwatershed. There are no VCAILG monitoring sites located at the base of each watershed, so the Salts TMDL load allocations will not apply and so weren't compared with VCAILG monitoring data in this Annual Monitoring Report. However, the Calleguas Creek Watershed TMDL Monitoring Program will monitor those compliance points for salts, and VCAILG data will be used to evaluate whether any exceedances detected at TMDL compliance monitoring sites may be caused by agricultural discharges.

CHRONIC TOXICITY

Toxicity was detected in all but one of the 6 samples that were collected during Event 1. Toxicity was not detected in any of the samples rerun during Event 2.

NITROGEN

Exceedances of nitrate-N and ammonia-N occurred at 11 VCAILG sites, 7 of which are in the Calleguas Creek Watershed. The nitrate-N benchmark applicable to the Oxnard Coastal monitoring site was exceeded during all three sampling events. In the Santa Clara River Watershed, nitrogen objectives were exceeded at 3 monitoring sites. It should be noted here that there are nitrogen compounds TMDLs in both the Calleguas Creek and Santa Clara River Watersheds; exceedances of the applicable load allocations are discussed in the next section; however the compliance date for the nitrogen compounds TMDL in Calleguas Creek Watershed is not until July 16, 2010.

DISSOLVED OXYGEN

An exceedance of the dissolved oxygen benchmark occurred during Event 2 at once site in the Santa Clara River Watershed.

TEMPERATURE

An exceedance of the temperature benchmark occurred during Event 2 at once site in the Calleguas Creek Watershed.

Table 62. Water Quality Benchmark Exceedances in 2007 – by Site & Event

Site ID	Constituents that Exceeded Applicable Benchmarks		
	Event 1 – Dry June 4-5, 2007	Event 2 – Dry Sept. 10-11, 2007	Event 3 – Wet Dec. 19, 2007
01T_ODD2_DCH	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
01T_ODD3_ARN	Nitrate-N, 4,4'-DDD, 4,4'-DDE Chronic Toxicity	4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT
02D_BROOM	NS	4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDE
04D_ETTG	Nitrate-N, 4,4'-DDD, 4,4'-DDE	4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
04D_LAS	Nitrate-N, 4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Nitrate-N, 4,4'-DDD, 4,4'-DDE, Chlorpyrifos
05D_SANT_VCWPD	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT	Temperature, TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDE	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDE, Chlorpyrifos
05D_LAVD	TDS, Sulfate, Nitrate-N, 4,4'-DDE, Chlorpyrifos, Chronic Toxicity	TDS, Sulfate, Nitrate-N, Chlordane, 4,4'-DDD, 4,4'-DDE	NS
05T_HONDO	NS	NS	4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos, Diazinon
06T_FC_BR	NS	NS	4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
06T_LONG	NS	NS	NS
9BD_GERRY	NS	NS	NS
OXD_CENTR	Nitrate-N, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE	Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos
S02T_ELLS	NS	NS	TDS, Chloride, Sulfate, Chlorpyrifos
S02T_TODD	TDS, Sulfate, Nitrate-N Chronic Toxicity	TDS, Sulfate	Nitrate-N, TDS, Sulfate, Chlorpyrifos
S03T_TIMB	NS	NS	TDS, Chloride, Sulfate
S03T_BOULD	TDS, Ammonia-N, Nitrate-N Chronic Toxicity	Dissolved Oxygen, TDS, Nitrate-N	None
S03D_BARDS	NS	NS	4,4'-DDE, Chlorpyrifos
S04T_HOPP	NS	NS	None
S04T_TAPO	TDS, Chloride, Sulfate, 4,4'-DDE Chronic Toxicity	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Dieldrin	TDS, Chloride, Sulfate, Total Chlordane, 4,4'-DDD, 4,4'-DDE
VRT_THACH	NS	NS	NS
VRT_SANTO	NS	NS	NS
Total Number of Sites Sampled	10	11	16
Total Number of Sites with Exceedances	10	11	14

NS = Not Sampled; insufficient or no flow.

Table 63. Water Quality Benchmark Exceedances in 2007 – by Pollutant & Watershed

Pollutant	VCAILG Monitoring Sites with Benchmark Exceedances		
	CC / OXN	SCR	VR
Salts	05D_SANT_VCWPD 05D_LAVD	S02T_ELLS S02T_TODD S03T_TIMB S03T_BOULD S04T_TAPO	Not Sampled
Nitrogen	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD OXD_CENTR	S02T_TODD S03T_BOULD S04T_TAPO	Not Sampled
Chronic Toxicity	01T_ODD3_ARN 05D_LAVD	S02T_TODD S03T_BOULD S04T_TAPO	Not Sampled
OC Pesticides	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD 05T_HONDO 06T_FC_BR OXD_CENTR	S03D_BARDS S04T_TAPO	Not Sampled
OP Pesticides	01T_ODD2_DCH 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD 05T_HONDO 06T_FC_BR OXD_CENTR	S02T_ELLS S02T_TODD S03D_BARDS	Not Sampled
Dissolved Oxygen	None	S03T_BOULD	Not Sampled
Temperature	05D_SANT_VCWPD	None	Not Sampled

CC = Calleguas Creek OXN = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

Benchmark exceedances that occurred in 2007 trigger the requirement to develop Water Quality Management Plans (WQMPs) for those constituents causing exceedances in each watershed. WQMPs will be targeted toward reducing pollutant loads to surface waters and may include the following elements:

- An evaluation of management practices currently in use;
- an evaluation of potential strategies, including best management practices; (BMPs), to reduce pollutant loads to surface waters if current management practices are determined to be ineffective;
- implementation and evaluation of pollutant management strategies if deemed necessary and appropriate;
- grower outreach designed to disseminate information on the effectiveness (or lack thereof) of management practices;
- continued water quality monitoring to evaluate whether management strategies are reducing pollutant loads to surface waters.

Summary of TMDL Load Allocation Exceedances

As stated previously, VCAILG monitoring data were also compared with applicable TMDL load allocations to evaluate compliance, but not to determine whether Water Quality Management Plans are required; TMDL implementation plans already include the requirement to develop Water Quality Management Plans to address water quality impairments caused by irrigated agriculture. VCAILG data collected in 2007 are compared with TMDL load allocations in this section to evaluate compliance with established load allocations.

Three Calleguas Creek Watershed (CCW) TMDLs were not included in the comparison with VCAILG data:

- the CCW Organochlorine Pesticides TMDL (load allocations are established in sediment);
- the CCW Chlorpyrifos and Diazinon TMDL (compliance monitoring is required at receiving water sites located at the base of each subwatershed, which are not co-located with VCAILG monitoring sites);
- and the CCW Salts TMDL (compliance monitoring is required at receiving water sites located at the base of each subwatershed).

There are two TMDLs that apply to VCAILG monitoring sites:

- the CCW Nitrogen Compounds TMDL, which establishes load allocations as nitrate-N + nitrite-N;
- and the SCR Nitrogen Compounds TMDL, which establishes load allocations as ammonia-N + nitrate-N + nitrite-N.

Because the Conditional Waiver does not require that samples be analyzed for nitrite-N, the comparison with load allocations is based on nitrate-N only for the CCW Nitrogen Compounds TMDL, and ammonia-N + nitrate-N for the SCR Nitrogen Compounds TMDL.

Table 63 lists exceedances of both TMDL load allocations by site for each event, and Table 64 lists exceedance of the TMDL load allocations by constituent and by watershed.

Table 64. TMDL Load Allocation Exceedances in 2007 – by Site & Event

Site ID	Constituents that Exceeded Applicable TMDL Load Allocations		
	Event 1 – Dry June 4-5, 2007	Event 2 – Dry Sept. 10-11, 2007	Event 3 – Wet Dec. 19, 2007
01T_ODD2_DCH	Nitrate-N	Nitrate-N	Nitrate-N
01T_ODD3_ARN	Nitrate-N	None	Nitrate-N
02D_BROOM	NS	None	Nitrate-N
04D_ETTG	Nitrate-N	Nitrate-N	Nitrate-N
04D_LAS	Nitrate-N	Nitrate-N	Nitrate-N
05D_SANT_VCWPD	Nitrate-N	Nitrate-N	Nitrate-N
05D_LAVD	Nitrate-N	Nitrate-N	NS
05T_HONDO	NS	NS	None
06T_FC_BR	NS	NS	None
06T_LONG	NS	NS	NS
9BD_GERRY	NS	NS	NS
OXD_CENTR	None	None	None
S02T_ELLS	NS	NS	None
S02T_TODD	Ammonia-N + Nitrate-N	None	Ammonia-N + Nitrate-N
S03T_TIMB	NS	NS	None
S03T_BOULD	Ammonia-N + Nitrate-N	Ammonia-N + Nitrate-N	None
S03D_BARDS	NS	NS	None
S04T_HOPP	NS	NS	None
S04T_TAPO	None	None	None
VRT_THACH	NS	NS	NS
VRT_SANTO	NS	NS	NS
Total Number of Sites Sampled	10	11	16
Total Number of Sites with Exceedances	8	6	7

NS = Not Sampled; insufficient or no flow.

Table 65. TMDL Load Allocation Exceedances in 2007 – by Pollutant & Watershed

Pollutant	VCAILG Monitoring Sites with TMDL Load Allocation Exceedances		
	CC / OXN	SCR	VR
Nitrate-N (9 mg/L LA)	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD	-----	No TMDLs
Ammonia-N + Nitrate-N (10 mg/L LA)	-----	S02T_TODD S03T_BOULD	No TMDLs

CC = Calleguas Creek OXN = Oxnard Coastal SCR = Santa Clara River VR = Ventura River

Education Requirement

The Conditional Waiver requires Group participants to earn 8 hours of education credit in the year following issuance of the NOA. VCAILG members were given many opportunities to fulfill the education requirement in 2007. The VCAILG sponsored meetings in each of the 3 major watersheds and collaborated with the University of California Cooperative Extension (UCCE) on demonstration tours for tree crop growers. UCCE also sponsored various crop-specific and general education meetings as part of their outreach and Proposition 13 and 50 grant programs. The Regional Board also granted reciprocity for courses offered in Region 3, allowing hours fulfilled in Region 3 to be credited toward Region 4. This benefitted VCAILG members who have agricultural operations in both regions. Table 63 summarizes the courses offered in Ventura County that were approved by the Regional Board for education credit. Because not all VCAILG members were able to fulfill the education requirement in 2007, the VCAILG obtained Regional Board approval to offer additional opportunities to earn education hours in March 2007. Appendix H lists the number of education hours earned by each VCAILG member to date.

Table 66. Courses Offered in 2007 for Education Credit

Date	Education Hours	Course Title	Summary
6/21/2006	3	Mitigating Runoff and Complying with the Conditional Waiver	Lecture topics included a presentation on complying with the Conditional Waiver, managing fertilizers to limit runoff, mitigating pesticide runoff, and irrigation management practices to reduce runoff.
9/26/2006	6	IPM Practices for Nurseries and Greenhouses	This course outlined how to implement an IPM program, controlling pests of concern while considering runoff risks, research on specific pests of interest, treating recycle water to limit pathogen and disease spread, and weed control. Lecturers included UC Cooperative Extension specialists, UC Davis and UC Riverside professors and researchers, and the Los Angeles County Ag Commissioner.
10/19/06	6	ABCs of Plant Nutrition and Fertilizer Management (Spanish)	Instruction was presented in Spanish and was geared toward helping farm workers understand why it is important to apply proper amounts and types of fertilizer and how the overuse of these products can cause stress to plants and harm the environment.
11/27/06	3	Education Workshop and Briefing	This was the first VCAILG-sponsored meeting, summarizing the Conditional Waiver and the regulatory process. Food safety and water use were also discussed.
1/23/2007	6	ABCs of Plant Nutrition and Fertilizer Management	This training provided instruction to identify symptoms of nutrient disorders, calculate nutrient content of various fertilizers, identify practices and conditions that may impact optimum fertilizer use, and ways to customize fertilizer application programs to optimize nutrient uptake and reduce nutrient runoff from nursery production facilities and landscapes.
6/6/2007	7	CORF Tour: Management Practices to Protect Water Quality in Greenhouses and Nurseries	Four facilities were visited with an emphasis on demonstrating BMPs that protect water quality and allow operations to remain profitable. Topics included IPM, pathogen treatment in recycled water, the use of PAM to prevent sediment movement off-site, grassed waterways and drainages, and irrigation retrofitting to improve distribution uniformity and reduce runoff.
9/20/2007	7	ABCs of Integrated Pest Management	The concept of IPM was introduced at this meeting followed by in-depth talks about cultural, physical, mechanical control and monitoring of pests and beneficial insects followed by biological control principles and practices, and chemical pest management. These presentations were given by specialists from UC Davis, UC Riverside, and UC Cooperative Extension.
10/8/2007	2	Water, Irrigation and What the Drought Means to You	This meeting was sponsored by the California Avocado Commission, California Avocado Society, and the UC Cooperative Extension. Presentations described water sources and paths within California, the effects of long term drought, and what growers can do to manage their water usage wisely to ensure continued water supply.
10/17/2007	8	Orchard Water Quality Tour	Tour participants visited 3 orchards where various BMPs were viewed and discussed. The afternoon portion consisted of wrap-up presentations by presenters and a question-and-answer session.
10/18/2007	4	Santa Paula Community Center (morning)	This meeting began with an overview of the Conditional Waiver and current activities of VCAILG including the monitoring and results to date. The Ag Commissioner's Office presentation concerned the use of pesticides and groundwater contamination. The final lecture covered regulatory issues and sediment transfer.
10/18/2007	4	Santa Paula Community Center (afternoon)	Same as morning session above.

Table 66. Courses Offered in 2007 for Education Credit, continued

10/23/2007	4	Oxnard Marriott (morning)	The meeting began with an overview of the VCAILG monitoring that has been completed and the results from those sampling events. A presentation on the Calleguas Creek Watershed TMDLs followed, and the meeting was wrapped up with a discussion of irrigation management strategies and practices to protect water quality.
10/23/2007	4	Oxnard Marriott (afternoon)	The meeting began with an overview of the VCAILG monitoring that has been completed and the results from those sampling events. This was followed by presentations on irrigation management strategies and practices to protect water quality. The final presentation summarized results from a Prop 13 grants and BMP effectiveness findings.
10/24/2007	4	Soule Park, Ojai	The first presentation covered the VCAILG monitoring and results to date, followed by a presentation on Calleguas Creek Watershed TMDLs and how they will impact VCAILG members. The final two presentations covered proper irrigation management and the evaluation of practices to protect water quality.
10/25/2007	4	Camarillo Airport (morning)	Same as the Soule Park, Ojai meeting.
10/25/2007	4	Camarillo Airport (evening)	This meeting began with an overview of the Conditional Waiver and current activities of VCAILG including monitoring and results to date. The Ag Commissioner's Office presentation concerned the use of pesticides and groundwater contamination. For the final section, growers were given the opportunity to fill out the applicable survey for their operation (see survey descriptions below).
11/8/2007	4	Oxnard Marriott (morning)	Two UC Cooperative Extension specialists presented current information on fumigants used in Ventura County and their impacts on surface and groundwater discharges followed by pesticide use and handling including mitigations to protect groundwater and surface water runoff. A case study involving debris cleanup in Calleguas Creek as well as a summary of required permits and project suggestions to control erosion and sediment transfer followed.
11/8/2007	4	Oxnard Marriott (afternoon)	Same as morning session above.
11/16/2007	4	Orchard Water Quality Tour	This tour consisted of 3 orchard stops with presentations about irrigation management tools, methods for testing irrigation distribution uniformity, erosion control methods, and cover crops.
11/20/2007	4	Orchard Water Quality Tour	Same as the tour described above.
11/28/2007	4	Soule Park, Ojai	The first presentation covered pesticide use selection and handling to ensure both worker safety and minimize off-site movement. This was followed by an overview of irrigation practices to control runoff and maximize plant health. Proper fertilization practices were also summarized. The RCD and NRCS described a new service they are offering to streamline the permit process for the Calleguas Creek Watershed as well as other services offered through the EQIP program. The final presentation detailed irrigation testing and ways to attain appropriate distribution uniformity of irrigation water.
11/29/2007	4	Camarillo Airport (morning)	Irrigation and fertilizer management practices to control runoff and maximize plant health were covered in the first presentation. The RCD and NRCS described their permitting service for the Calleguas Creek Watershed and other services offered through the EQIP program. This was followed by a detailed description of requirements that concern work done on stream beds and banks and projects that can be done to control erosion and sediment transfer in these critical areas. The last presentation summarized the findings of the United Water Conservation District's Prop 13 grant.

Table 66. Courses Offered in 2007 for Education Credit, continued

11/29/2007	4	Camarillo Airport (evening)	Same first 3 presentations as above. The last presentation covered the use of distribution uniformity testing in all cropping systems as well as nutrient issues as they apply to nurseries and tree crops.
Ongoing	1	Positive Points System for California Avocado Orchards	This survey covers seven categories of management practices relevant to avocado production: horticulture, soil management, water management, pest management, post harvest, food safety, and continuing education. Growers receive "positive points" for implementing good practices.
Ongoing	1	Positive Points System for California Citrus Orchards	This survey covers seven categories of management practices relevant to citrus production: horticulture, soil management, water management, pest management, post harvest, food safety, and continuing education. Growers receive "positive points" for implementing good practices.
Ongoing	1	Checklist for Assessing and Mitigating Runoff in Greenhouses and Nurseries	This survey has 142 questions, with descriptions of appropriate management practices below the questions. Question categories include: general operation, irrigation practices and runoff management, soil management, nutrient and fertilizer management, pest management, and property management.

Note: This list does not include meetings offered in Region 3 that may have been attended by VCAILG Members.

Conclusions and Recommendations

RESOURCES FOR WATER QUALITY MANAGEMENT PLAN DEVELOPMENT

There are many programs and resources currently available for assistance with implementing management practices. Ongoing assistance is available through the Natural Resources Conservation Service (NRCS) and UCCE Farm Advisors. Four State Water Resources Control Board (SWRCB) grant programs have also provided funding for outreach programs and management practice construction or implementation. Other assistance in permitting and restoration is provided by the Resource Conservation District (RCD).

The Environmental Quality Incentives Program (EQIP) is a cost share program for farmers and ranchers administered by NRCS. This is a voluntary program to promote agricultural production and environmental quality goals. Within the period of the Conditional Waiver there have been 9 improvements on 8 farms to address gully erosion problems. NRCS contributed the technical assistance and \$142,464 and the cooperating farmers then matched that amount. Mulch has been applied to four farms at a cost share rate of \$300 per acre and cover crops have been grown on 2 farms. 10 locations have installed irrigation improvements, which includes irrigation upgrades, reservoirs, and tail-water return systems. Over \$400,000 was spent on irrigation improvements by the farmers and NRCS.

Through the SWRCB Proposition 13 project entitled “Use of Improved Technologies and Best Management Practices for the Control of Nursery Runoff into Region 4 Watersheds”, \$1.2 million in cost-share funds were distributed to 16 Ventura County and 3 Los Angeles County nurseries for the installation of 36 improvement projects. Project types included water recycling systems, detention basins, irrigation upgrades, and mulching. There was also an educational component to this grant. During the 3-year grant period, 16 workshops and tours were held to educate growers regarding management practices that can be used to improve water quality or mitigate runoff. Nursery growers were also asked to fill out a self-assessment survey which was used to evaluate current nursery operation practices and post-training practices. The 65 nurseries (covering 2,376 acres) that participated in the survey represent 46% of the total number of nurseries in the county and all of the major watersheds. Information from this survey will provide information on the types of water quality management practices growers are currently using and will also identify gaps or areas for improvement.

“Reduction of Nitrogen/Pesticide Runoff in Calleguas Creek and Santa Clara River Watersheds” is a SWRCB Proposition 50 grant currently being carried out by UCCE-Ventura. 10 orchards and 7 nursery growers are currently participating in this program through on-site monitoring and the implementation of BMPs. Management objectives were classified as either water conservation or water quality improvement practices. 2 site tours and 4 education training seminars are also a part of this grant. Surveys for citrus and avocado operations have also been developed. 64 citrus and 94 avocado surveys have been submitted to date. A preliminary data summary indicates that 54% of surveyed avocado growers had positive responses to questions regarding soil management and

erosion control. There was a positive response of 60% for questions about water and nutrient management; the pest management category had 59% affirmative answers. This is a continuing project, so further information will be available when the monitoring and surveys are complete. Survey data will be used to develop and recommend Water Quality Management Plan practices.

United Water Conservation District is another partner that has been working on grants to test and implement projects that will have a positive impact on water quality within Ventura County watersheds. Participants in the “Modifying Agricultural Practices, Nutrients and Pesticides, Calleguas Creek and Santa Clara River” and PRISM programs chose BMPs appropriate for their field site. BMPs were installed at the growers’ expense and included mulch, cover crops, wattles, grassed filter strips, grassed ditches, polyacrylamide (PAM) cakes, and improvements to drainage structures. Fifty-six growers representing all major Ventura County crops and watersheds participated through the completion of these two studies.

In many cases obtaining the permits necessary for restoration or management practice installation can be an extensive and tedious process. The local RCD has created a fast track permitting assistance program for growers in the Calleguas Creek Watershed. Private restoration specialist companies have also provided similar assistance to growers. Following VCAILG education meeting presentations by local restoration specialists, there was a surge in the number of growers contacting the RCD and private organizations for permitting assistance. One such project that has been completed was the clean-up of legacy waste and the reseeded of a barranca following a large fire that uncovered the waste.

FUTURE OPPORTUNITIES FOR COLLABORATION IN WATER QUALITY MANAGEMENT PLAN DEVELOPMENT

Water Quality Management Plans must be developed in response to benchmark exceedances that occurred in 2007. In addition to these plans, the VCAILG will continue to collaborate with and encourage VCAILG members to participate in assistance opportunities with local government and non-government agencies. Many of the projects and organizations that provide site consults and other benefits to growers were discussed in the previous section.

There are two additional projects that are currently in the development and planning stages. The Nature Conservancy is exploring the possibility of having landowners along the riparian corridor of the Santa Clara River transfer ownership of sections of this prime habitat to the Coastal Conservancy. They would then work with NRCS and the RCD to convert these areas to filter strips, sediment conveyance, sediment control systems, and restored habitat. These types of projects will have the joint benefits of properly controlling and improving the quality of agricultural runoff and providing a wider riparian corridor. The second project is a 319(h) grant that has been applied for by UCCE-Ventura. This grant would provide education meetings and site visits with an emphasis on suggesting water quality improvement BMPs in areas where benchmark exceedances occurred.

MONITORING PROGRAM REVISIONS

The Regional Board approved several VCAILG Monitoring Program changes prior to the submittal of this final report, including the following:

- *Menidia beryllina* replaced *Atherinops affinis* as the vertebrate species for non-freshwater samples.
- *Ceriodaphnia dubia* is the single species selected for routine toxicity testing at the three freshwater sites for which the 3-species screen has been completed (05D_LAVD, S02T_TODD, S03T_BOULD). *Hyalella azteca* is the single species to be used for routine toxicity testing at the 3 high-conductivity sites for which the 3-species screen has been completed (01T_ODD2_DCH, 01T_ODD3_ARN, S04T_TAPO).
- The Annual Monitoring Report due date was revised from December 18, 2007 to February 15, 2008 to allow time for the analysis and incorporation of monitoring data collected in late December.
- The due date for Water Quality Management Plans was initially June 18th, which is 1 year and 6 months after issuance of the NOA. An extension was granted allowing Water Quality Management Plans to be submitted six months after issuance of the Annual Monitoring Report, changing the due date to August 15th.

Additional changes to the VCAILG Monitoring Program include the addition of the background site at S04T_TAPO_BKGD, and the requirement to note on field logs the presence of crop residue in or around waterways that are observed during monitoring events. To assist with development of the Santa Clara River Estuary Pesticides TMDL, Regional Board staff proposed that the VCAILG Monitoring Program conduct one fish tissue monitoring event in the Santa Clara River Estuary in Spring 2008 in exchange for other monitoring in that watershed. The California Department of Fish and Game office in Folsom is currently preparing a cost estimate for that work.

RECOMMENDED MONITORING PROGRAM CHANGES

The only recommended program revisions at this point are to change the Annual Monitoring Report and Water Quality Management Plan due dates to reflect the schedule included in the VCAILG QAPP. The QAPP schedule specifies a March 1 Annual Monitoring Report due date to allow sufficient time for laboratories to report results from samples collected in December of the previous year and to address numerous data issues that typically occur. The due date for WQMPs should be adjusted accordingly so that they're due 6 months after the Annual Monitoring Report due date, or September 1.

Once the second monitoring year is complete, additional improvements to the Monitoring and Reporting Program Plan should be considered (*e.g.*, replacing typically dry sites with sites where there's typically flow present).

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