February 15, 2010

VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS GROUP (VCAILG)

2009 Annual Monitoring Report

submitted to:

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

prepared by:

LARRY WALKER ASSOCIATES

On behalf of the

VENTURA COUNTY AGRICULTURAL IRRIGATED LANDS GROUP (VCAILG)

LARRY WALKER ASSOCIATES

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Acronyms

BMP	Best Management Practice
CC	Calleguas Creek
CCWTMP	Calleguas Creek Watershed TMDL Monitoring Program
CWA	Clean Water Act
DPR	Department of Pesticide Regulation
DQO	Data Quality Objective
EPA	Environmental Protection Agency
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
NS	Not Sampled; insufficient flow present
OC	Organochlorine
OP	Organophosphorus
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
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.

Previous Annual Monitoring Reports were submitted by the VCAILG to the Regional Board on February 15th in 2008 and 2009. On August 15, 2008 the VCAILG submitted its first Water Quality Management Plan (WQMP). The WQMP was developed in response to water quality benchmark exceedances that occurred during the 2007 monitoring year and details a plan to reduce water quality impacts from agricultural discharges. An update to the WQMP was submitted on August 15, 2009. The most recent plan includes a summary of exceedances that occurred during the 2008 monitoring events and survey results, which are being used to track BMP implementation by VCAILG members within priority drainage areas.

This document serves as the third Annual Monitoring Report; it provides a detailed summary of activities of the VCAILG during 2009, including administration of the VCAILG, an overview of farming in Ventura County, 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 wet and dry monitoring events conducted. Also included is a discussion of monitoring results that exceeded water quality benchmarks, therefore triggering the requirement to update the existing WQMP.

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, 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 District*	N/A	N/A
Jonathan Chase, Hailwood, Inc.	Strawberries, Vegetables	Calleguas Creek
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
Mike Friel, Laguna Grove Service	Citrus	Calleguas Creek
Jurgen Gramckow, Southland Sod Farms	Sod, Hay, Oats, Vegetables	Calleguas Creek, Santa Clara River, Ventura River
Gus Gunderson, Limoneira Company	Avocado, Citrus	Santa Clara River
John Krist, Farm Bureau of Ventura County*	N/A	N/A
Jim Lloyd-Butler, Lloyd Butler Ranch	Avocado, Citrus	Calleguas Creek, Santa Clara River
John Mathews, Arnold, Bleuel, LaRochelle, et at.*	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. The VCAILG currently represents 1,412 Ventura County agricultural landowners and 88,002 irrigated acres. According to the Ventura County Assessor's records, there are an estimated 231 landowners who are not enrolled in the VCAILG. Therefore, VCAILG enrollment currently represents 86 percent of agricultural landowners in Ventura County.

Table 2. VCAILG Membership Statistics as of January 5, 2010

Watershed	Landowner Count	Parcel Count	Irrigated Acres
Calleguas Creek	642	1,278	48,321
Oxnard Coastal	54	109	3,865
Santa Clara River	584	1,268	29,830
Ventura River	200	364	5,987
Total	1,480 [1]	3,019	88,002

[1] There are 1,412 unique landowners enrolled, a number of whom own property in more than one watershed.

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 259,055 acres of agricultural land in the county, there are approximately 93,000 acres of irrigated land.[1] The Calleguas Creek Watershed contains the highest number of irrigated acres (roughly 51,000), followed by the Santa Clara River Watershed (approximately 32,000), Ventura River Watershed (approximately 6,400), and finally the Oxnard Plain Coastal Watershed (approximately 4,000).[2]

[1] The estimates of acreage of agricultural and irrigated agricultural land in the county: U.S. Department of Agriculture-National Agricultural Statistics Service, *2007 Census of Agriculture*. Washington, D.C.: Updated September 2009.

[2] Estimates of irrigated agricultural acreage by watershed are based on the VCAIG membership database and also includes estimated irrigated acreage for parcels not enrolled in VCAILG.

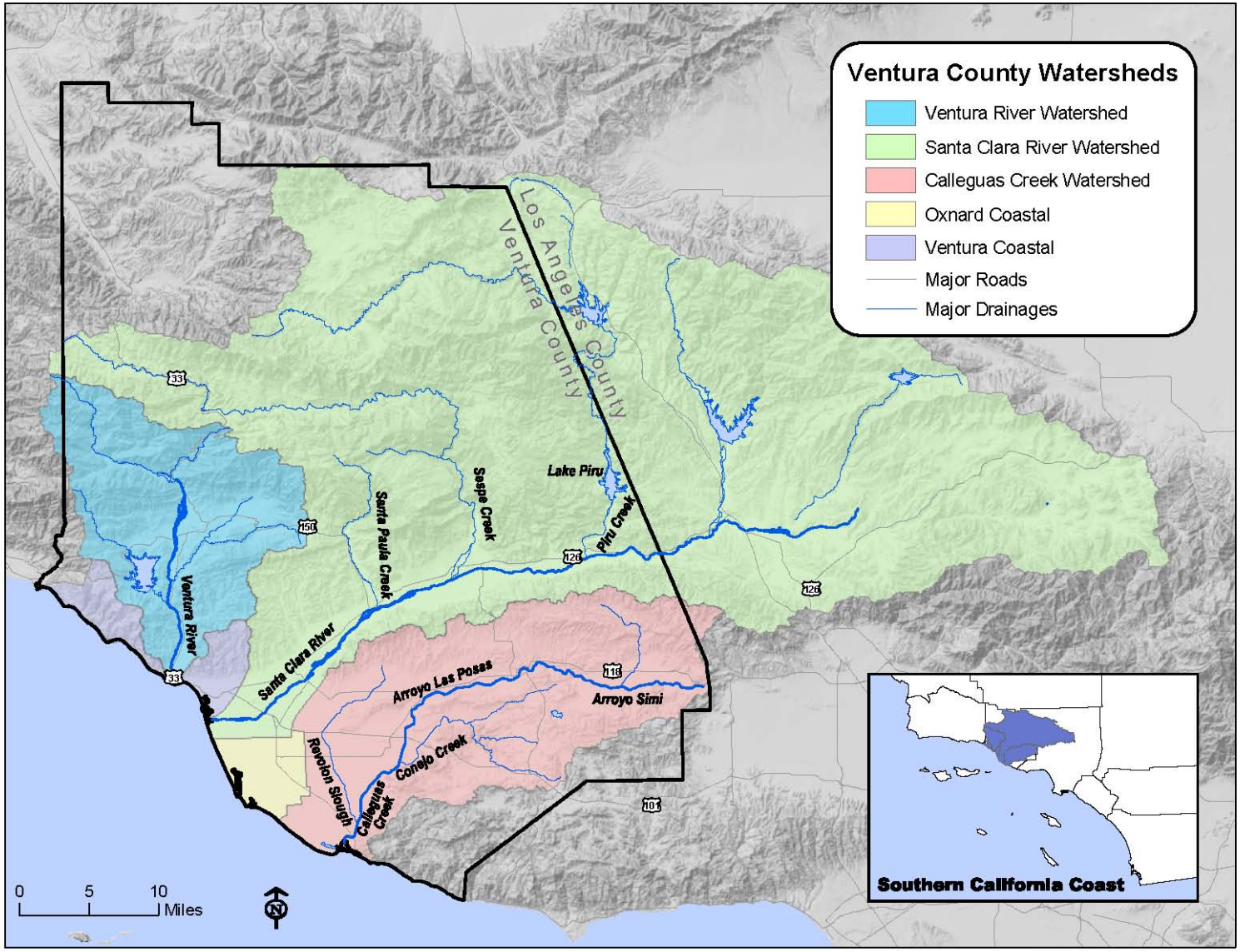


Figure 1. Ventura County Watersheds

Agriculture is a major industry in Ventura County, generating over $1.61 billion in gross sales for 2008. This gross value is up 4% from 2007[3]. Therefore, in 2008 Ventura County dropped from 9th to 10th in statewide ranking. Ventura County was ranked as one of the top five counties in California for thirteen agricultural commodities in 2008. Table 3 lists the County's ten leading crops in gross value for 2008. Table 4 lists the commodities for which Ventura County ranked in the top five of California's 58 counties for 2008.

Table 3. Ventura County's Leading Agricultural Commodities–2008

Commodity	Gross Value ($)
1. Strawberries	393,507,000
2. Nursery Stock	298,690,000
3. Lemons	250,713,000
4. Celery	160,650,000
5. Raspberries	84,594,000
6. Tomatoes	77,505,000
7. Avocados	63,376,000
8. Cut Flowers	51,297,000
9. Peppers	30,773,000
10. Valencia Oranges	18,227,000

Source: Ventura County Agricultural Commissioner. *Ventura County Crop Report 2008.* July 21, 2009.

Table 4. Ventura County's Statewide Commodity Rank by Gross Value – 2008

Commodity	Ventura County Rank Among 58 CA Counties	*% of CA Total*
Lemons	1	*53.2*
Celery	1	*45.6*
Raspberries	2	*39.4*
Strawberries	2	*24.4*
Cabbage	2	*21.6*
Avocados	2	*20.9*
Nursery Stock	2	*10.1*
Mushrooms	3	*18.2*
Bell Peppers	3	*13.7*
Spinach	4	*4.6*
Dry Bean	5	*6.8*
Flowers & Foliage	5	*6.6*
Oranges	*5*	*1.8*

Source: USDA, NASS, CA Field Office. *Summary of County Agricultural Commissioners' Reports,–California -2007-2008.*

[3] Ventura County Agricultural Commissioner. Ventura County Crop Report 2008. July 21, 2009.

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

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, Trash, Organochlorine Pesticides, PCBs and Siltation, Toxicity, Metals, and Salts. In addition, a TMDL for Bacteria is 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.

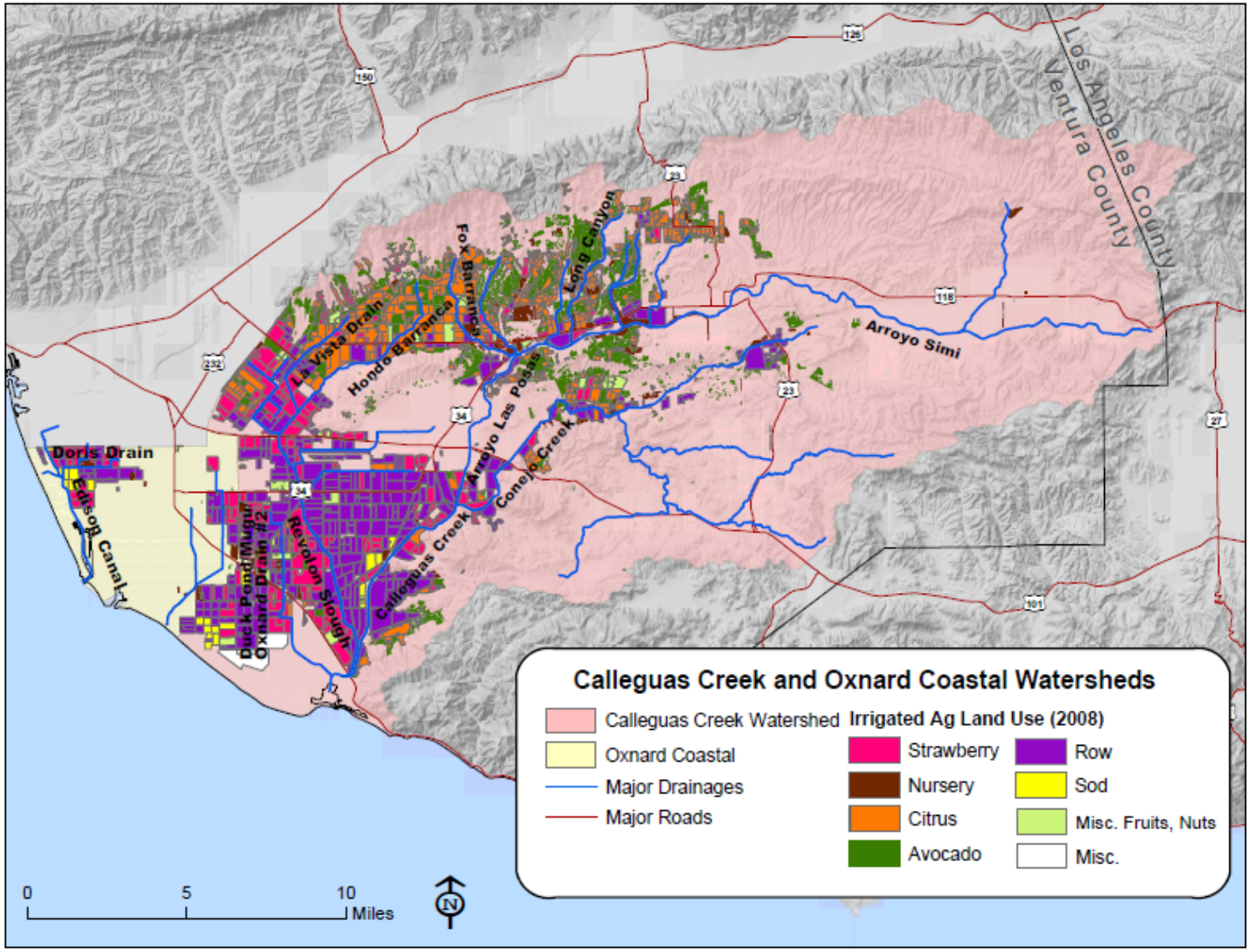


Figure 2. Calleguas Creek Watershed Agricultural Land Use

GIS Crop Data Source: Ventura County Agricultural Commissioner December 2008 shapefile.

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). A TMDL is under development for bacteria in the Santa Clara River Estuary and Reaches 3, 5, 6, and 7.

Just south of the mouth of the Santa Clara River lies a small coastal watershed that drains to McGrath Lake. A TMDL has been approved by the Regional Board to address pesticides and PCBs impairments in the lake. This TMDL will target properties within the Oxnard Coastal watershed that drain to the Central Ditch at Harbor Boulevard (OXD_CENTR monitoring site).

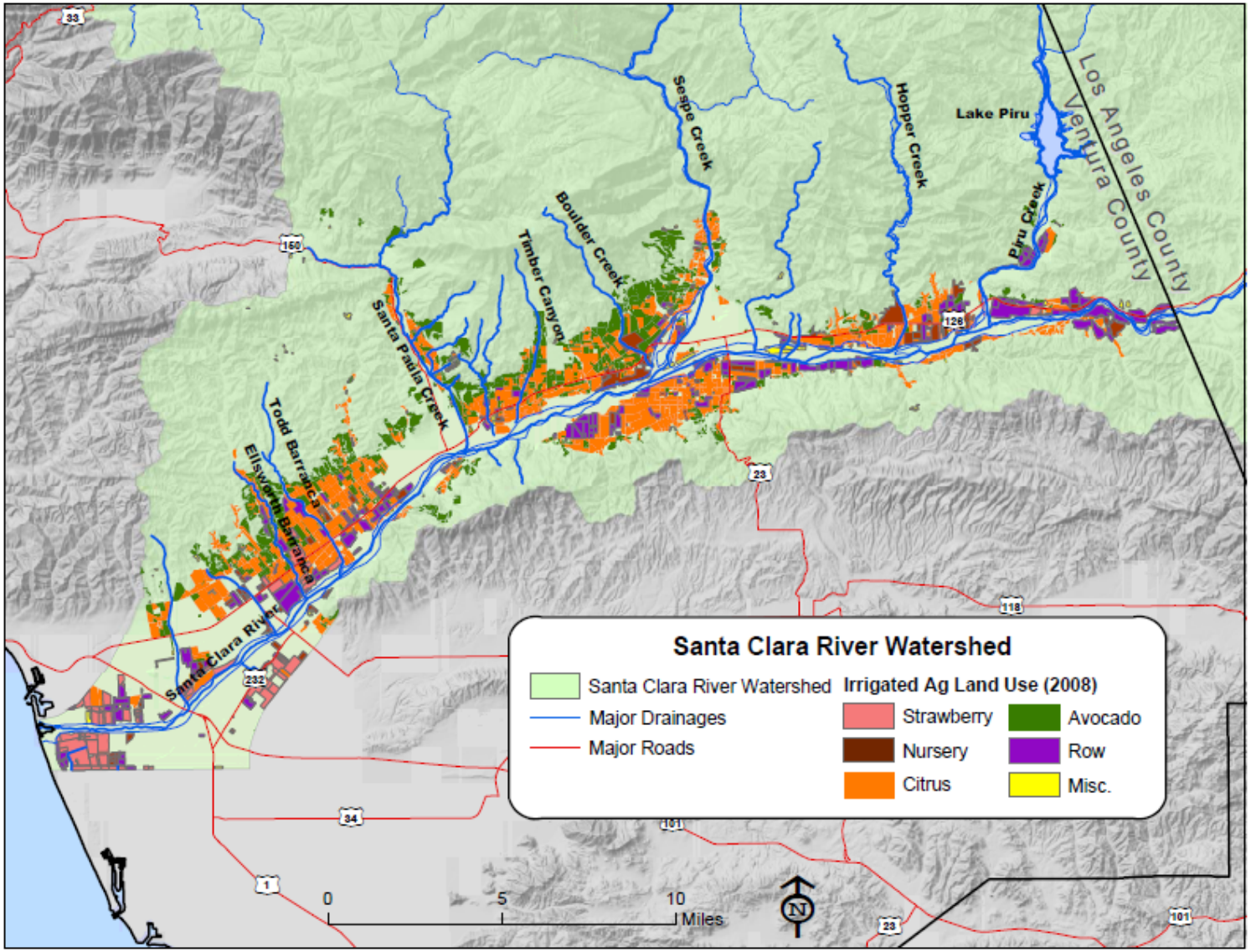


Figure 3. Santa Clara River Watershed Agricultural Land Use

GIS Crop Data Source: Ventura County Agricultural Commissioner December 2008 shapefile.

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, bacteria, pumping/water diversion, and trash. The Ventura River Estuary Trash TMDL became effective in 2008. Development of the Ventura River Algae TMDL is underway.

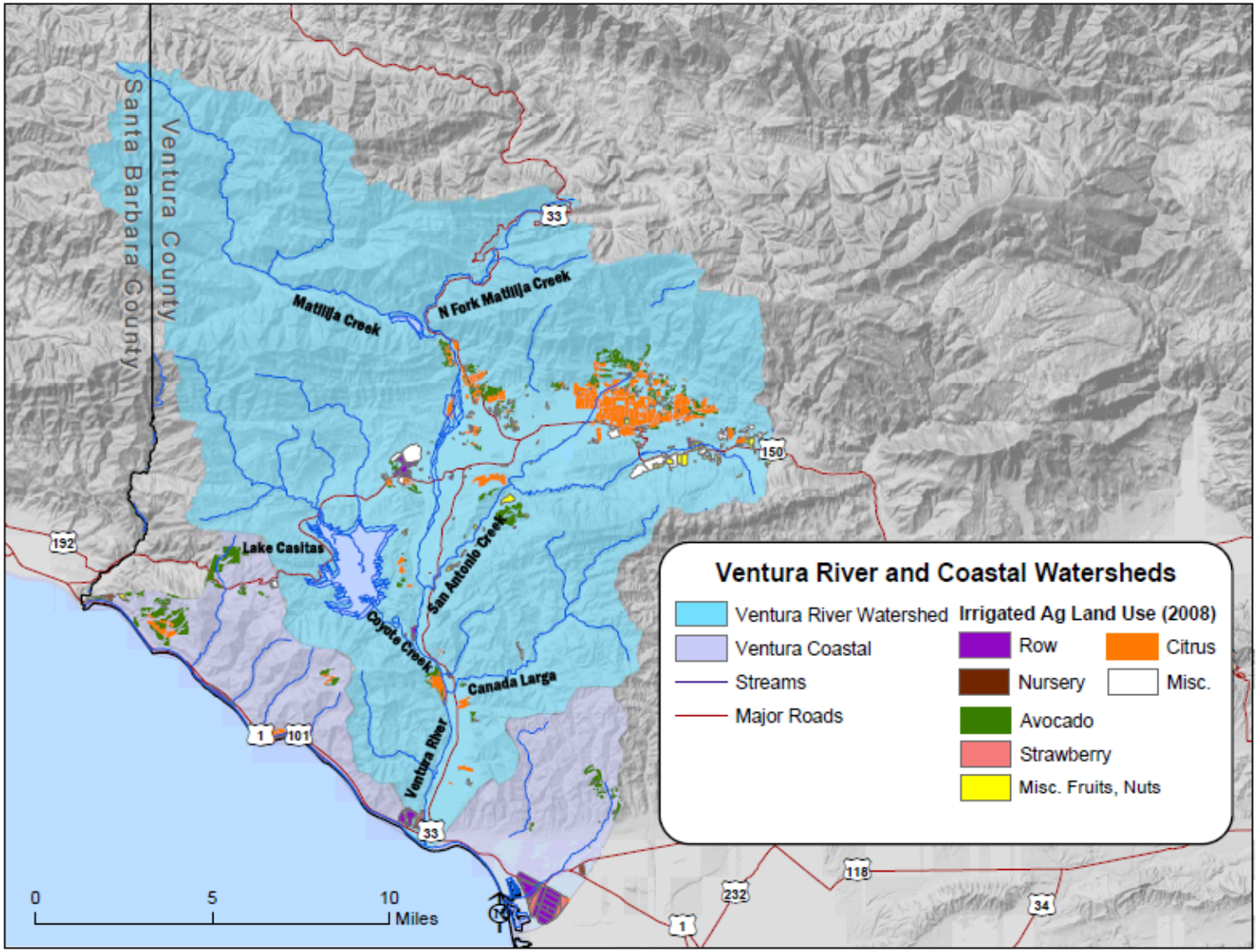


Figure 4. Ventura River Watershed Agricultural Land Use

GIS Crop Data Source: Ventura County Agricultural Commissioner December 2008 shapefile.

VCAILG PARTICIPATION IN TMDLS

Within Ventura County, VCAILG plays an active role in facilitating the participation of agriculture in the TMDL development and implementation processes. Acting on behalf of its members, VCAILG representatives participate in stakeholder meetings, provide comments, and contribute to cooperative agreements. For example, VCAILG is a participant and funding partner of the Calleguas Creek Watershed TMDL implementation effort.

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.

Since the inception of the VCAILG Monitoring Program, one site has been relocated. In the April 9, 2009 approval letter of the 2008 Annual Monitoring Report, Regional Board staff requested that an alternative site be selected for 06T_LONG due to a lack of flow for the first seven sampling events. The MRP was revised and 06T_LONG was moved upstream. Since the ninth monitoring event, two sites are now being used to characterize Long Canyon. 06T_LONG2 is one mile upstream from the original site and 06T_LONG3 is an additional three quarters of a mile upstream. The lower site is preferable for sampling since it drains a larger agricultural area, however if 06T_LONG2 is dry, the sampling team will move upstream and attempt sample collection at 06T_LONG3. The Regional Board staff approved this approach on June 24, 2009 and 06T_LONG2 and 06T_LONG3 were visited during the August 4, 2009 dry weather event.

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 XXXA_YYYY_ZZZZ, 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 drain (D) or a tributary (T) to the receiving water;
- "YYYY" is a 3-, 4-, or 5-character abbreviation for the site location;
- "ZZZZ" 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 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.

S04T_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 5 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 are collected as part of the Calleguas Creek Watershed TMDL Monitoring Program.

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 6 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 5. 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_LONG2	6	T	Long Canyon at Balcom Canyon Rd. crossing	34.281721	-118.958565
	06T_LONG3	6	T	Long Canyon on Stockton Rd. just past East Rd.	34.291383	-118.951297
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
Santa Clara River	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
	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 are monitored as part of both programs.

[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).

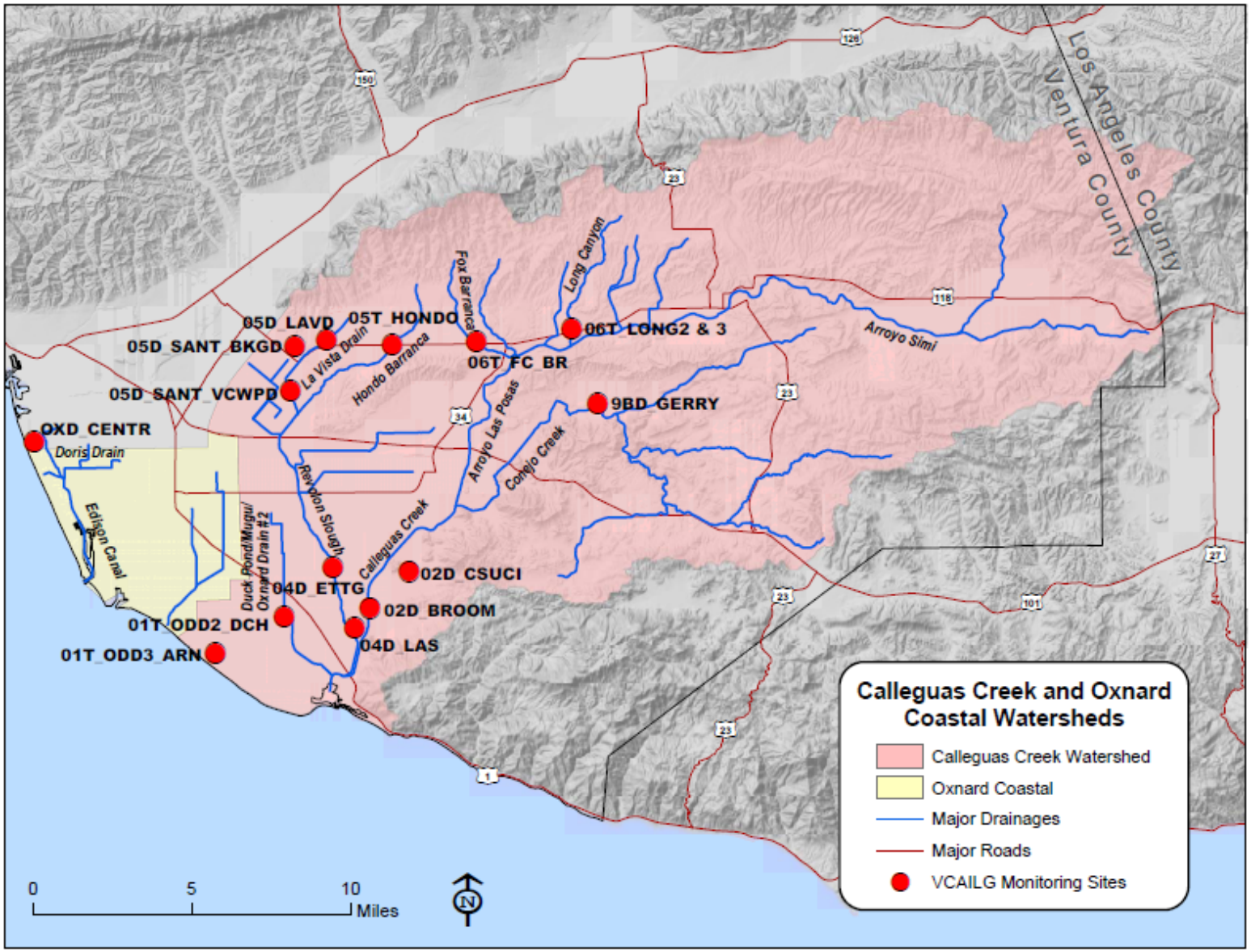


Figure 5. VCAILG Monitoring Sites Located in the Calleguas Creek/Oxnard Coastal Watersheds

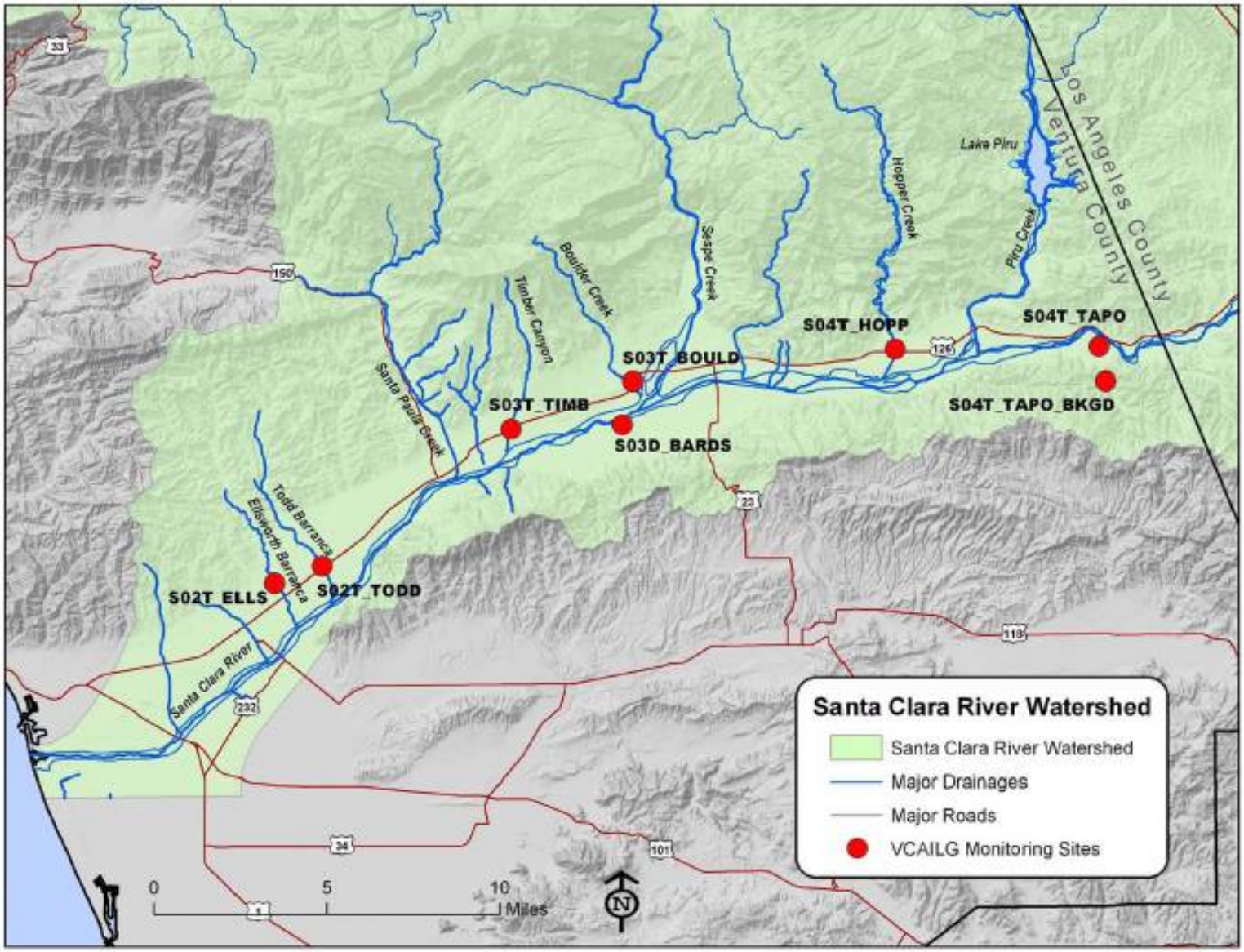


Figure 6. VCAILG Monitoring Sites Located in the Santa Clara River Watershed

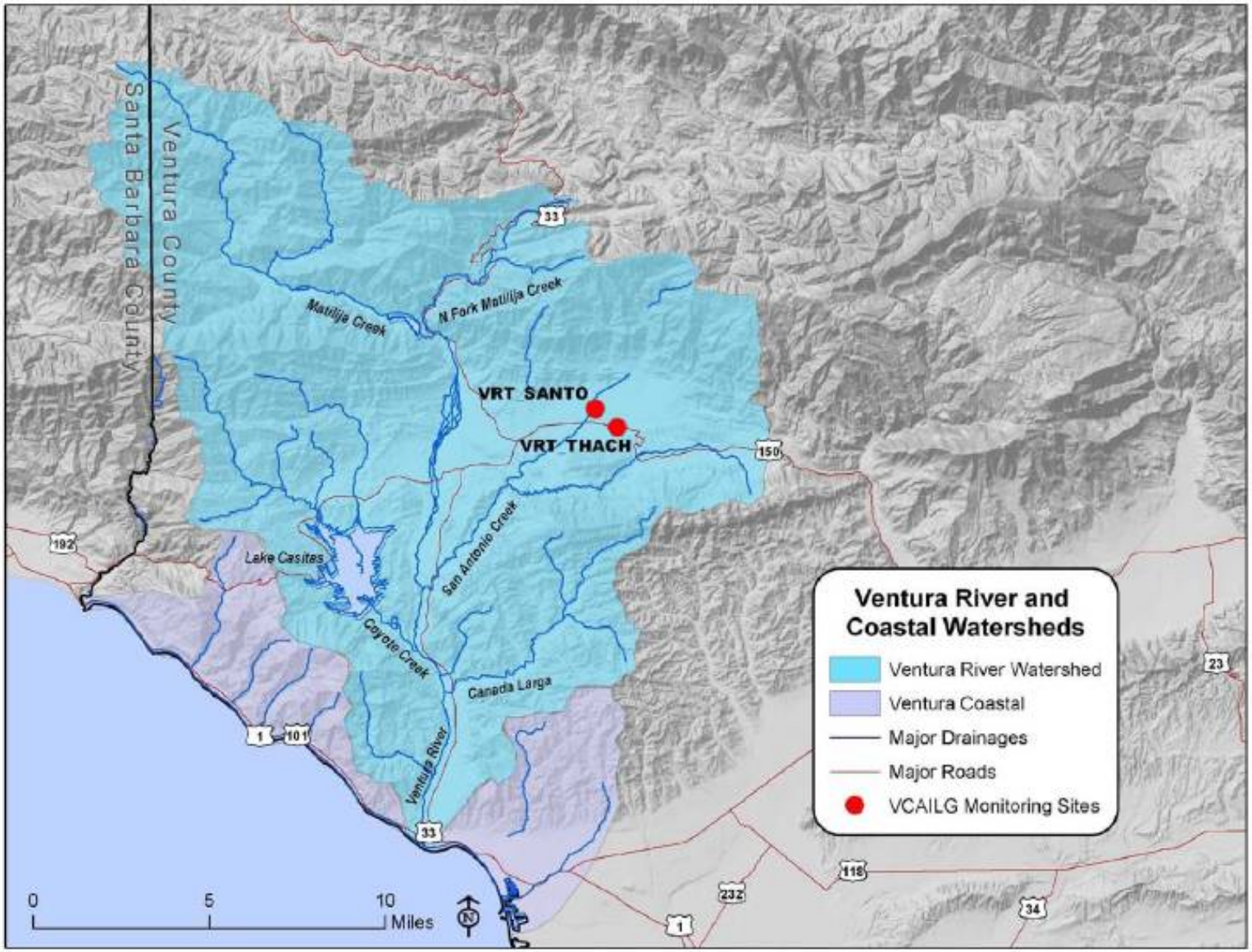


Figure 7. VCAILG Monitoring Sites Located in the Ventura River Watershed

Table 6. Estimated Irrigated Acreage Represented at VCAILG Monitoring Sites

Station ID[1]	Irrigated Agricultural Acreage [2, 3]									Total Acres Drained
	Row Crops	Cut Flowers	Citrus	Avocados	Other Tree Crops	Strawberries	Other Berries	Sod	Nursery	
01T_ODD2_DCH	2,874	3	17			665		368		1,564
01T_ODD3_ARN	818					39		578		800
02D_BROOM	3,639		378	344		283	177		21	8,236
04D_ETTG	6,271		116			952	77			3,779
04D_LAS	2,212	42				209	41	178		1,339
05D_LAVD	12		219	139		199	77			877
05D_SANT_VCWPD	725		502	146		447				1,154
05T_HONDO	16	4	1,050	626	1	78	46		5	3,928
06T_FC_BR	91	9	766	65			66		60	2,602
06T_LONG2	12		472	649		24	29		56	2,813
06T_LONG3			244	510		24			3	2,243
9BD_GERRY			58	100			91			447
OXD_CENTR	435	67	35			943			11	1,243
S02T_ELLS	74		277	524	1		21			9,015
S02T_TODD	51	33	227	160	1					5,748
S03D_BARDS	30		725	74					17	2,214
S03T_BOULD			165	680					167	3,764
S03T_TIMB	9		102	363	3					2,183
S04T_HOPP			7						14	15,141
S04T_TAPO	28		34						50	3,686
VRT_SANTO			279	251	13					7,220
VRT_THACH	6		620	130	8				2	6,003

[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.

[2] Data Source Ventura County Agricultural Commissioner's Office

[3] Some acreage is double or triple counted due to multi-cropping practices.

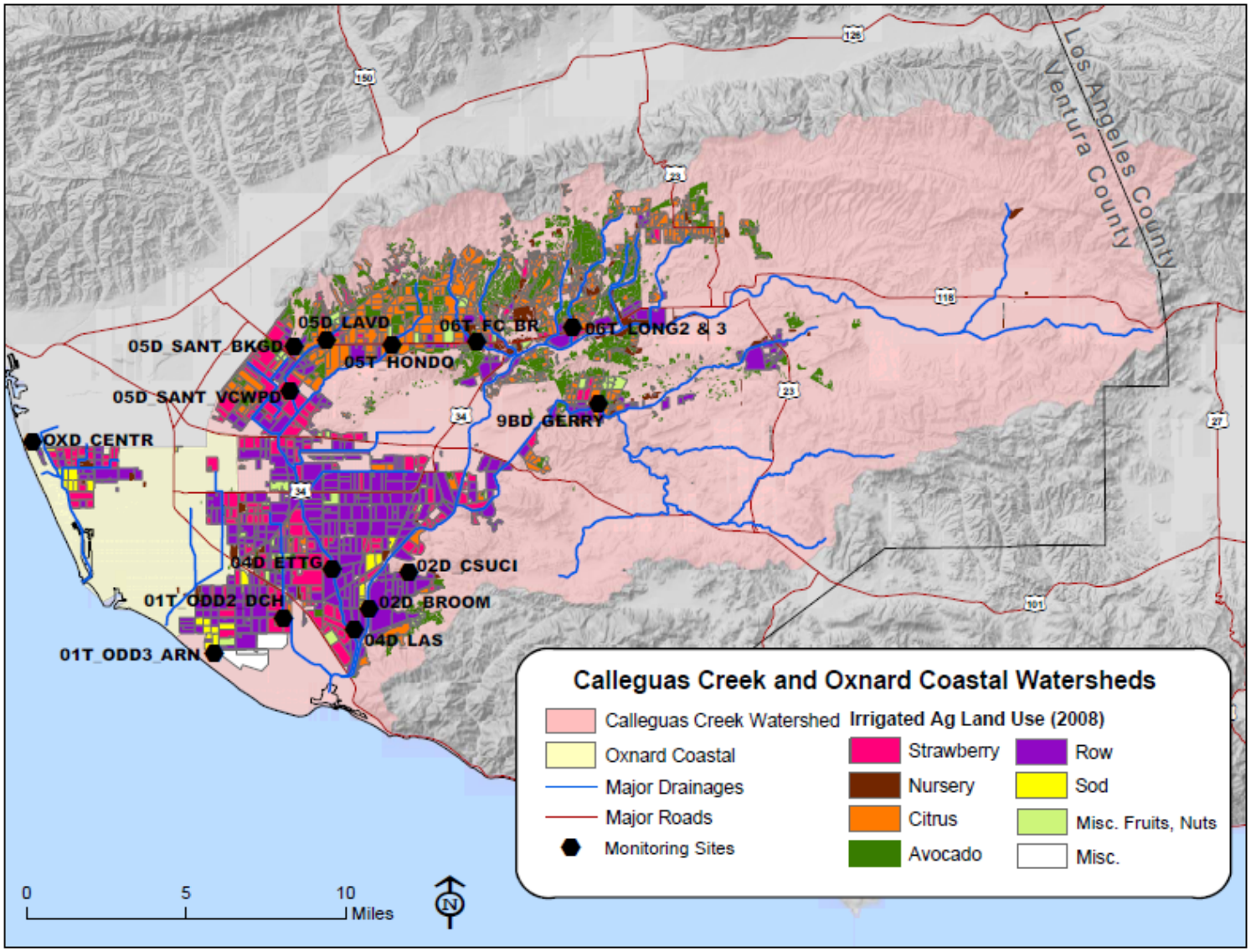


Figure 8. Calleguas Creek Watershed Monitoring Sites and Agricultural Land Use

GIS Crop Data Source: Ventura County Agricultural Commissioner December 2008 shapefile.

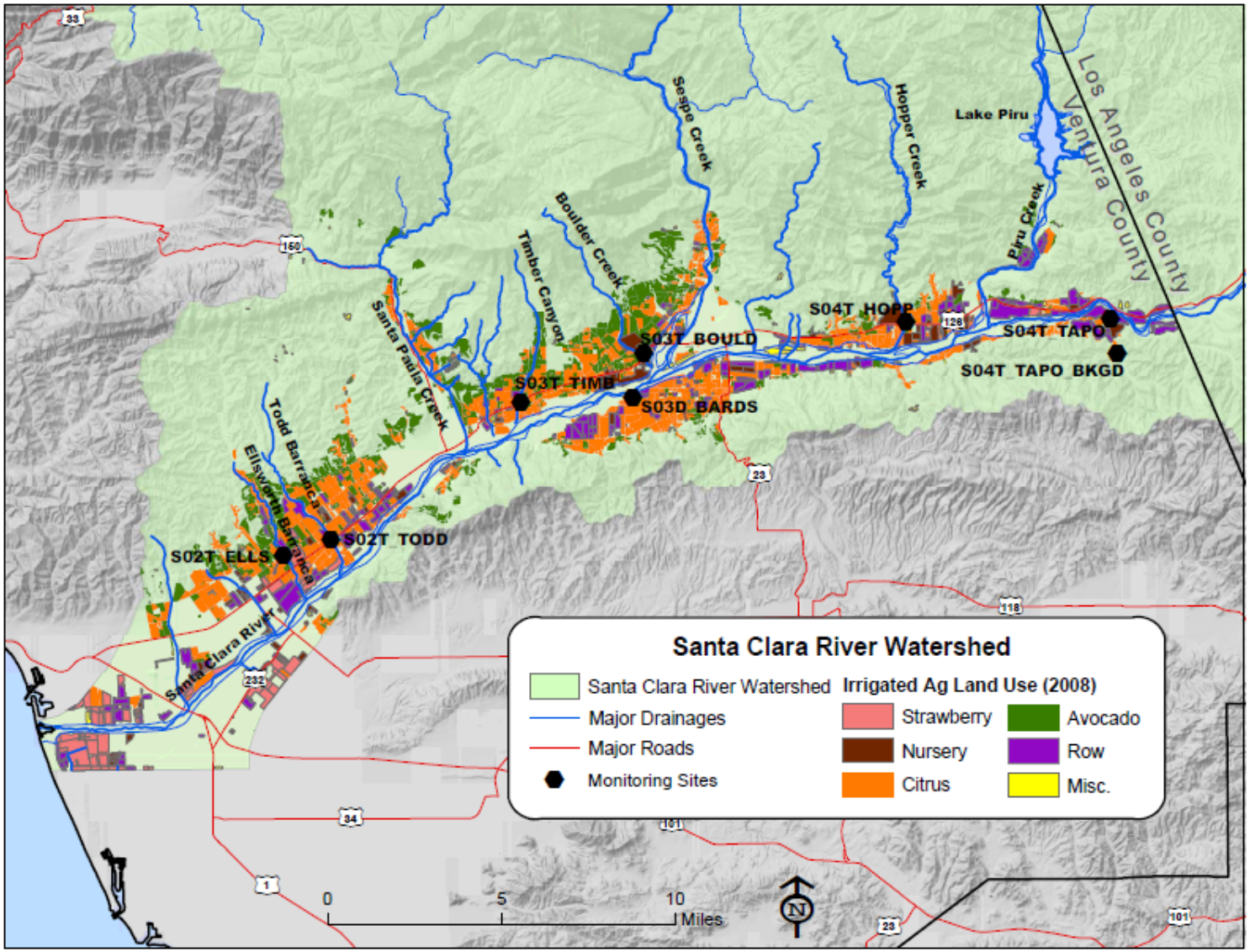


Figure 9. Santa Clara River Watershed Monitoring Sites and Agricultural Land Use

GIS Crop Data Source: Ventura County Agricultural Commissioner December 2008 shapefile.

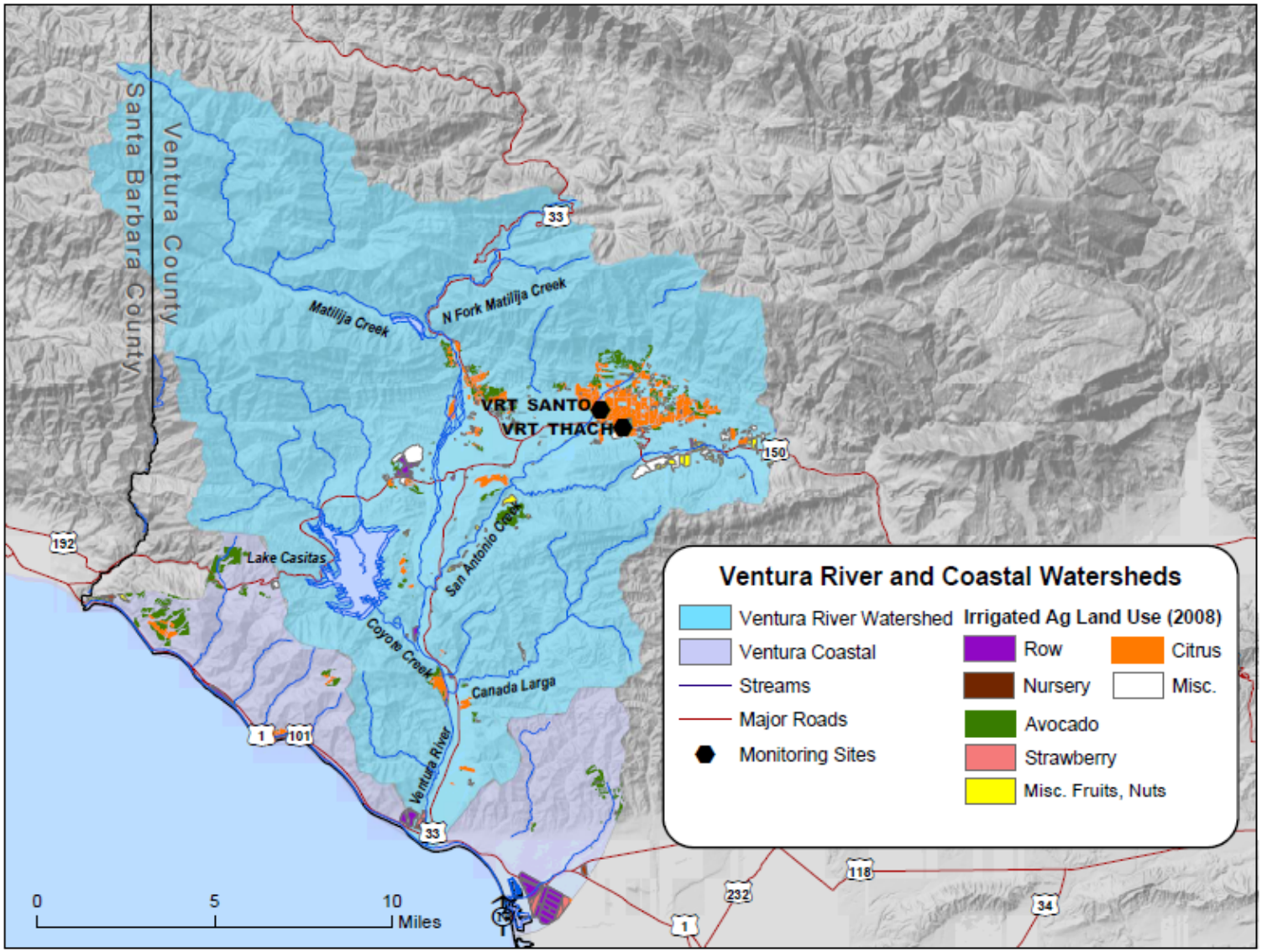


Figure 10. Ventura River Watershed Monitoring Sites and Agricultural Land Use

GIS Crop Data Source: Ventura County Agricultural Commissioner December 2008 shapefile.

PARAMETERS MONITORED AND MONITORING FREQUENCY

The Conditional Waiver specifies the constituents to be monitored during each monitoring event as well as the monitoring frequency. Phase I monitoring took place in 2007 and 2008. Requirements for Phase I monitoring included four monitoring events in a calendar year, two of which were dry weather and the remaining wet weather sampling. Chronic toxicity was measured during one dry and one wet event during Phase I.

Phase II of Conditional Waiver monitoring started in 2009 and is reflected in this Annual Monitoring Report. The requirements are summarized in Table 7 for Phase II of the Monitoring Program, which covers the last two years of this Conditional Waiver.

One wet event must be conducted during each year of Phase II between October 15 and 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. One dry event is also required during each Phase I year between May 16 and October 14 during the irrigation season and following pesticide application.

In 2009, the storm sampling event took place on February 6th. There were a few showers in Ventura County at the end of January, but the February storm was the first with significant rainfall for the 2009 calendar year. Runoff was produced at 19 sites, including one background site. The Tapo Canyon background site was inaccessible on February 6th, but was later sampled for salts by a landowner representative on February 16th during a second storm that came through the County.

The requisite dry weather event was conducted on August 4, 2009. By August most spring and summer pesticide applications have been completed and frequent irrigations are necessary. This sampling event was also coordinated with the quarterly sampling for the Calleguas Creek Watershed TMDL Monitoring Program. There are five monitoring sites that overlap between the two monitoring programs, as indicated in Table 5. These sites were only visited once on August 4th and all required samples for both programs were collected at that time. During the dry weather event, samples were collected from 9 monitoring sites. Table 8

Table 8 provides a summary of monitoring sites and constituents that were sampled during each of the two monitoring events in 2009. Field probe measurements were also performed at the sites where samples were collected.

Table 7. Constituents and Monitoring Frequency for the VCAILG Monitoring Program

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

[1] The Phase II monitoring period covers the last two monitoring years of the Conditional Waiver (2009 and 2010).
[2] For chronic toxicity testing, the "dry" season is defined as May 16 through October 14. 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, fensulfothion, fenthion, malathion, merphos, methyl parathion, mevinphos, phorate, tetrachlorvinphos, tokuthion, trichloronate.
[5] Pyrethroids include allethrin, bifenthrin, cyfluthrin, l-cyhalothrin, cypermethrin, danitol (fenpropathrin), deltamethrin, esfenvalerate, fenvalerate, fluvalinate, permethrin, prallethrin, resmethrin.

Table 8. VCAILG Sites Monitored and Constituents Sampled in 2009

Watershed / Subwatershed	Station ID	Reach	Wet Event	Dry Event
			February 6	August 4
Calleguas Creek / Mugu Lagoon	01T_ODD2_DCH	1	WQ, N, P	TOX, WQ, N, P
	01T_ODD3_ARN	1	WQ, N, P	TOX, WQ, N, P
Calleguas Creek / Calleguas Creek	02D_BROOM	2	WQ, N, P	NS
	02D_CSUCI	2	WQ, N, P	NS
Calleguas Creek / Revolon Slough	04D_ETTG	4	WQ, N, P	WQ, N, P
	04D_LAS	4	WQ, N, P	WQ, N, P
Calleguas Creek / Beardsley Channel	05D_SANT_VCWPD	5	WQ, N, P	WQ, N, P
	05D_SANT_BKGD	5	NS	NS
	05D_LAVD	5	WQ, N, P	NS
	05T_HONDO	5	WQ, N, P	NS
Calleguas Creek / Arroyo Las Posas	06T_FC_BR	6	WQ, N, P	NS
	06T_LONG	6	NS	N/A
	06T_LONG2 & 3	6	N/A	NS
Calleguas Creek / Conejo Creek	9BD_GERRY	9B	WQ, N, P	NS
Oxnard Coastal	OXD_CENTR	--	WQ, N, P	WQ, N, P
Santa Clara River	S02T_ELLS	2	WQ, N, P	NS
	S02T_TODD	2	WQ, N, P	TOX, WQ, N, P
	S03T_TIMB	3	WQ, N, P	NS
	S03T_ BOULD	3	WQ, N, P	TOX, WQ, N, P
	S03D_BARDS	3	WQ, N, P	NS
	S04T_HOPP	4	WQ, N, P	NS
	S04T_TAPO	4	WQ, N, P	TOX, WQ, N, P
	S04T_TAPO_BKGD	4	NS [1]	NS
Ventura River	VRT_THACH	--	NS	NS
	VRT_SANTO	--	NS	NS

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

NS = Not Sampled; insufficient flow present or inaccessible.

N/A = Not Applicable; site was not part of monitoring program at the time this monitoring event took place.

[1] This site was inaccessible on February 6th, but was later visited during a subsequent storm by a landowner representative and sampled for chloride, TDS, and sulfate.

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.

Samples collected during the wet event in February were collected either by the direct immersion technique or by using a secondary container; filled sample containers were immediately put on ice in an ice chest. A secondary container is always used at 01T_ODD3_ARN, where a grab pole with a secured secondary container must be used to reach out into the channel. Notes regarding sample bottle fill method and sample collection depth can be found in the field log sheets (Appendix B). Flow measurements were performed according to the standard operating procedure included in Appendix C-1 of the QAPP using either current-meter or float measurements. During wet events, the float method of measuring flow is most practicable. At some sites channel depth was estimated using a reference photo, painted gauge, or other appropriate tool. Estimated flows are qualified as such in the field data (Appendix C) and site summary tables. *Flow estimates made during the wet event, therefore, should be regarded as gross estimates and used with discretion.*

With the exception of the toxicity sample collected at S04T_TAPO during the dry event and samples collected at 01T_ODD3_ARN, other samples were collected by direct immersion of sample containers at mid-stream and mid-depth, then immediately placed on ice in an ice chest. Flow measurements were made according to the standard operating procedure included in Appendix C-1 of the QAPP, as previously noted.

During all four 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 four 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 9 provides a summary of analytical methods used by contract laboratories for analyzing samples collected for the VCAILG Monitoring Program in 2009.

Following the dry weather monitoring event in August, VCAILG representatives were notified that the lab director for one of the analytical laboratories had taken another position with a local university. This lab director was responsible for developing the modified method and quantification for toxaphene as described in the May 11, 2009 memo to Regional Board Staff, Rebecca Veiga Nascimento. Due to this personnel change, the analytical laboratory was unable to quantify toxaphene for Event 9 samples using the previously agreed upon standard. Therefore, Event 9 samples were quantified with the toxaphene standard mixture instead of the LCG congener standard. For future monitoring events, VCAILG plans to send samples for toxaphene analysis to an alternate laboratory, which has the ability to follow procedures outlined in the previously mentioned May 11th memo.

Table 9. Analytical Methods

Constituent	Analytical Method
Aquatic Toxicity [1]	
Chronic (7 day) *Ceriodaphnia dubia* [2]	EPA-821-R-02-013, EPA/500/R-99/064
Chronic (7 day) *Pimephales promelas* [3]	
Chronic (96-hour) *Selenastrum capricornutum* [4]	
General Water Quality Constituents (WQ)	
Flow, pH, Temperature, Dissolved Oxygen, Conductivity, Turbidity	Field Measurement
Total Dissolved Solids (TDS)	SM 2540C, E
Total Suspended Solids (TSS)	SM 2540D
Chloride	300.0
Sulfate	300.0
Total Ammonia-N	SM4500NH_3F
Nitrate-N	300.0
Phosphate (Total Orthophosphate as P)	SM4500-PD
Organic Constituents [5]	
Organochlorine Pesticides [6]	EPA 625m/8270Cm
Organophosphorus Pesticides	EPA 625m/8270Cm
Pyrethroid Pesticides	EPA 625m/8270Cm / NCI GC/MS

[1] Chronic toxicity tests were performed on three species for the first toxicity monitoring event where water was present at each particular site, after which the most sensitive species was selected for use in subsequent monitoring events. In 2009 only single-species tests were necessary at the sites with water present during the dry weather monitoring.
[2] If sample conductivity exceeded 3000 uS/cm, *Hyalella azteca* was used for toxicity testing.
[3] Fish testing was not required for sites sampled in 2009.
[4] If sample conductivity exceeded 3000 uS/cm, *Thalassiosira pseudonana* was used for toxicity testing.
[5] See Table 7 for the list of constituents in each pesticide group.
[6] Toxaphene was analyzed using EPA 625m/8270Cm / NCI GC/MS for both 2009 events. Toxaphene concentrations are based on the LCG congener standard for Event 8 and the standard mixture for Event 9. Therefore, Event 9 toxaphene results are flagged as estimate.

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 2009. 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 and salts 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 TMDL load allocations technically do not apply to data collected at VCAILG monitoring sites. 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 in the Calleguas Creek Watershed TMDL Monitoring Program annual report which includes sample collection 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 Table 10 through Table 17.

Table 10. 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.	$6.5 \leq pH \leq 8.5$ 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: $\leq$ 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.	$\geq$ 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: $\geq$ 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: $\geq$ 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: ▪ 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 11 and 12.
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 13,15, and 17.
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.	$\leq$ 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 11. 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 All Waterbodies	-----	-----	-----	-----	-----	pH, temperature dependent	-----
CC above Potrero Rd.	-----	150	250	850	-----	pH, temperature dependent	-----
OXD	-----	-----	-----	-----	-----	pH, temperature dependent	-----
SCR Reach 1	Tidally-influenced mouth of Santa Clara River upstream to 101 Bridge	-----	-----	-----	-----	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 benchmark listed for VR is 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 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.

Table 12. Total Maximum Daily Load (TMDL) Load Allocations for Salts and Nutrients

Watershed / Reach	Reach Description	Chloride (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Nitrogen (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)
CC All Waterbodies	-----	-----	-----	-----	9 [1]	-----	-----
Receiving Water at the Base of Each Subwatershed	See CCW Salts TMDL Technical Report for Compliance Monitoring Sites	230 [2]	1962 [2]	3995 [2]	-----	-----	-----
OXD	-----	-----	-----	-----	-----	-----	-----
SCR Reach 1	Tidally-influenced mouth of Santa Clara River upstream to 101 Bridge	-----	-----	-----	10 [3]	-----	-----
SCR Reach 2	Upstream of Hwy 101 Bridge to Freeman Diversion	-----	-----	-----	10 [3]	-----	-----
SCR Reach 3	Upstream of Freeman Diversion to A Street Bridge in Fillmore	----- [4]	-----	-----	10 [3]	-----	-----
SCR Reach 4	Upstream of A Street Bridge in Fillmore to Blue Cut Gaging Station	-----	-----	-----	10 [3]	-----	-----
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] 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). This TMDL became effective December 2, 2008, Final load allocations must be fully achieved by 15 years after the effective date of the TMDL, and can be found in the Basin Plan Amendment. These interim dry weather TMDL load allocations 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, so technically these TMDL load allocations cannot be directly compared to the VCAILG monitoring data. If data collected at the base of each subwatershed under the CCW TMDL Monitoring Program exceed TMDL load allocations for salts, VCAILG monitoring data collected at VCAILG monitoring sites within each subwatershed will be evaluated to determine whether agricultural discharges may be contributing to the exceedance.

[3] 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. The Basin Plan Amendment does not specify the date to achieve full compliance. The load allocation listed is as Ammonia-N + Nitrate-N + Nitrite-N.

[4] 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 13. 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 14. Total Maximum Daily Load (TMDL) Load Allocations for Organochlorine Pesticides

Constituent	CC Watershed Load Allocation (ug/L) [1]	OXD, SCR Watersheds Load Allocation (ug/L) [2]	VR Watershed 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.

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

Table 15. 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 16. 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 subwatershed. However, there are no VCAILG monitoring sites located at the base of each sub-watershed, so technically these TMDL load allocations cannot be directly compared to the VCAILG monitoring data. If data collected at the base of each subwatershed under the CCW TMDL Monitoring Program exceed TMDL load allocations for chlorpyrifos and diazinon, VCAILG monitoring data collected at VCAILG monitoring sites within each subwatershed 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 17. Conditional Waiver Benchmarks and Total Maximum Daily Load (TMDL) Load Allocations for Pyrethroid Pesticides

	CC, OXD, SCR, VR Watersheds
Constituent	Benchmark / Load Allocation (ug/L) [1]
Allethrin	-----
Bifenthrin	-----
Cyfluthrin	-----
l-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 currently are 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 two monitoring events conducted in 2009. 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 6. 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 reporting limit are not included in this section, but instead are included with all of the water quality monitoring data for 2009 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 10 through 17 where applicable, all exceedances are indicated in ***bold italic type*** in the 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/mole). The converted result is reported as "Phosphate" on data tables presented in this section. The electronic data file remains unconverted and is labeled "Total Orthophosphate as P."

As noted in the Analytical Methods section, toxaphene was analyzed using different standards for the two VCAILG 2009 monitoring events. In event 8, toxaphene was quantified using the Regional Board approved LCG congener standard. Event 9 samples were reverted back to the toxaphene standard mixture; therefore, this data is flagged as estimated.

Results of toxicity tests conducted in 2009 are discussed separately in a subsequent section.

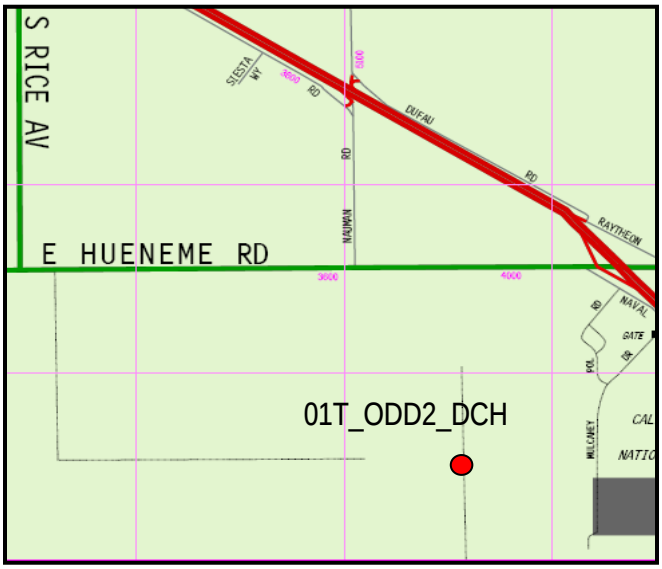
Calleguas Creek Watershed

The Calleguas Creek Watershed contains 13 VCAILG monitoring sites, the highest number of VCAILG sites in one watershed. Five of the Calleguas Creek Watershed VCAILG monitoring sites overlap with the CCW TMDL monitoring program. Monitoring sites are discussed below in order of the Calleguas Creek reach into which they drain

01T_ODD2_DCH

Duck Pond Agricultural Drains / Mugu Drain / Oxnard Drain No. 2. The monitoring site is located on an agricultural drain just south of Hueneme Road near the Duck Ponds. Flow from this drain eventually discharges into the western arm of Mugu Lagoon (Calleguas Creek Reach 1).

Site Map



View toward the NE (looking downstream)

This agricultural drain contained sufficient flow for sampling during both monitoring events in 2009. Table 18 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 19 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Results for DDT compounds exceeded applicable benchmarks only during the event 8 storm. The organophosphorous pesticide, chlorpyrifos, benchmark was only exceeded during the storm as well. Nitrate results were high during both the dry and wet weather monitoring events. Row crops are the predominant crop type that drains to this monitoring site. This site is a second tier priority monitoring drainage as identified in the VCAILG 2008 WQMP.

Table 18. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD2_DCH

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		47.1 EST	2.252
pH		6.5≤ pH ≤8.5	8.02	7.72
Temperature	°C		15.48	27.21
Dissolved Oxygen	mg/L	≥ 5	7.73	21.64
Turbidity	NTU		441	2.4
Conductivity	µS/cm		1890	3737
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		1420	3290
Total Suspended Solids (TSS)	mg/L		374	8
Chloride	mg/L		87.1	190
Sulfate	mg/L		888	1830
Total Ammonia-N	mg/L	1.01 / 0.85 [1]	0.27	0.07
Nitrate-N	mg/L	10 [2]	***29.26***	***59.55***
Phosphate	mg/L		5.026	0.245
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0067	ND
Chlordane-alpha	µg/L		0.0161	ND
Chlordane-gamma	µg/L		0.0119	ND
Total Chlordane	µg/L	0.00059	***0.0347***	ND
DCPA (Dacthal)	µg/L		0.0406	0.35
2,4'-DDD	µg/L		0.0341	ND
2,4'-DDE	µg/L		0.0126	ND
2,4'-DDT	µg/L		0.0615	ND
4,4'-DDD	µg/L	0.00084	***0.0649***	ND
4,4'-DDE	µg/L	0.00059	***0.7283***	ND
4,4'-DDT	µg/L	0.00059	***0.5131***	ND
Toxaphene	µg/L	0.0002	***2.29***	***0.0935*** EST
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.1112	ND
Danitol	µg/L		1.1681	ND
Fluvalinate	µg/L		0.0024	ND
Permethrin	µg/L		0.0395	ND
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.6033***	ND
Malathion	µg/L		6.8894	ND

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 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, temperature, and salinity 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 for this site.

Table 19. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD2_DCH

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9 [1]	***29.26***	***59.55***

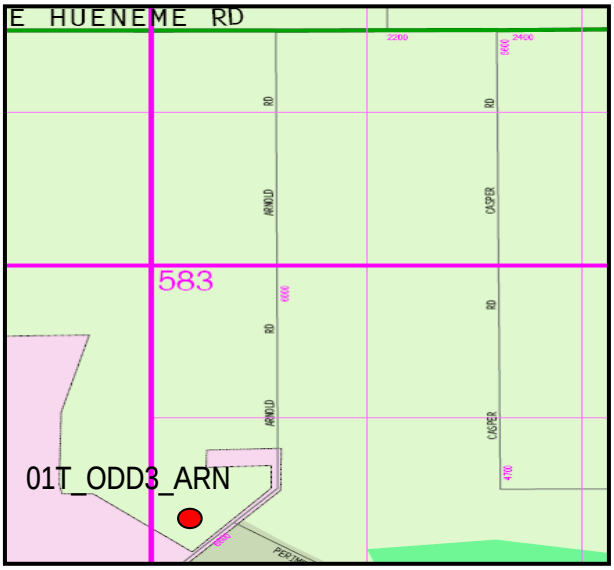
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 to 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

Samples were collected at this site during both 2009 monitoring events. Table 20 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 21 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.

Dissolved oxygen was three one hundredths below the minimum acceptable level during the storm event. Organochlorine pesticides were detected at this site during both dry and wet weather monitoring events. Organophosphorus pesticide exceedances only occurred during the wet event. Nitrate concentrations were above the benchmark for both events and the ammonia benchmark was exceeded during dry weather sampling. Row crops and sod are the primary crop types in the vicinity of this site. This site is a second tier priority monitoring drainage as identified in the VCAILG 2008 WQMP.

Table 20. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD3_ARN

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		NM	NM
pH		6.5≤ pH ≤8.5	7.8	7.55
Temperature	°C		14.78	25.44
Dissolved Oxygen	mg/L	≥ 5	***4.97***	18.45
Turbidity	NTU		79.8	53.9
Conductivity	µS/cm		1822	6232
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		1210	4630
Total Suspended Solids (TSS)	mg/L		57.5	55
Chloride	mg/L		232	1090
Sulfate	mg/L		574	1680
Total Ammonia-N	mg/L	1.75 / 1.42 [1]	0.47	***2.47***
Nitrate-N	mg/L	10 [2]	***13.08***	***49.03***
Phosphate	mg/L		3.31	0.49
Organochlorine Pesticides				
Chlordane-alpha	µg/L		0.0076	ND
Total Chlordane	µg/L	0.00059	***0.014***	ND
DCPA (Dacthal)	µg/L		0.0161	ND
2,4'-DDD	µg/L		0.01	ND
2,4'-DDT	µg/L		0.0063	ND
4,4'-DDD	µg/L	0.00084	***0.0249***	***0.0148***
4,4'-DDE	µg/L	0.00059	***0.1159***	***0.0424***
4,4'-DDT	µg/L	0.00059	***0.054***	***0.0067***
Methoxychlor	µg/L		0.0071	ND
Toxaphene	µg/L	0.0002	***0.524***	***0.32477*** EST
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0091	ND
Danitol	µg/L		0.0097	ND
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.4443***	ND
Diazinon	µg/L	0.1	***0.1496***	ND
Dimethoate	µg/L		ND	0.0261
Malathion	µg/L		57.9094	ND

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated and should be used with discretion. ND = Not Detected NM = Not Measured

[1] The 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, temperature, and salinity 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 for this site.

Table 21. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD3_ARN

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9 [1]	***13.08***	***49.03***

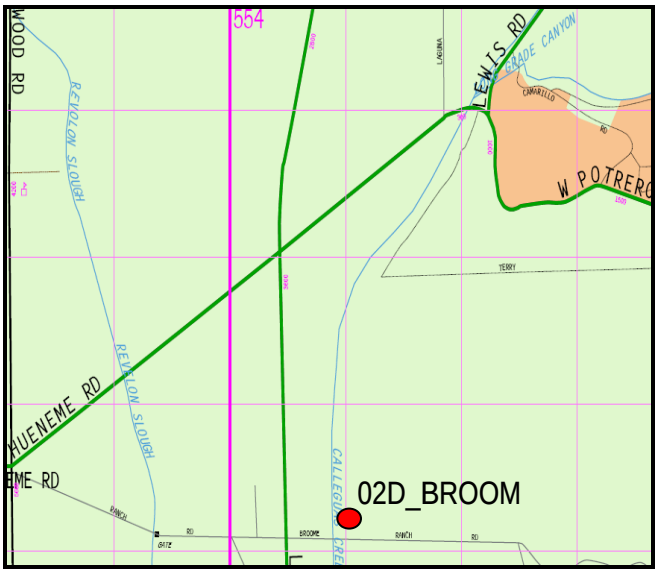
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 to 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 flowing through the discharge pipe when the monitoring crew visited the site during the February storm event. Table 22 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 23 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

The storm sample exceeded water quality benchmarks for nitrate, chlordane, and DDT compounds. Row crops are the predominant crop type in the vicinity of the monitoring site. This site is one of the second tier priority monitoring site drainages as identified in the VCAILG 2008 WQMP.

Table 22. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 02D_BROOM

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		0.45	
pH		6.5≤ pH ≤8.5	7.54	
Temperature	°C	≤ 26.67°C [1]	14.78	
Dissolved Oxygen	mg/L	≥ 5	7.57	
Turbidity	NTU		44.7	
Conductivity	µS/cm		3590	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		2970	
Total Suspended Solids (TSS)	mg/L		36.5	
Chloride	mg/L		344	
Sulfate	mg/L		1580	
Total Ammonia-N	mg/L	4.14 / --- [2]	0.57	
Nitrate-N	mg/L	10	***79.33***	
Phosphate	mg/L		1.716	
Organochlorine Pesticides				
Chlordane-gamma	µg/L		0.0052	
Total Chlordane	µg/L	0.00059	***0.0113***	
DCPA (Dacthal)	µg/L		0.1975	
2,4'-DDD	µg/L		0.0093	
2,4'-DDT	µg/L		0.0085	
4,4'-DDD	µg/L	0.00084	***0.0103***	
4,4'-DDE	µg/L	0.00059	***0.1046***	
4,4'-DDT	µg/L	0.00059	***0.0293***	
Toxaphene	µg/L	0.0002	***0.489***	
Pyrethroid Pesticides				
Cypermethrin	µg/L		0.002	
Permethrin	µg/L		0.0941	
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	0.0082	
Diazinon	µg/L	0.1	0.0082	
Dimethoate	µg/L		0.4446	
Disulfoton	µg/L		0.0138	
Malathion	µg/L		0.2031	

Not Sampled; no discharge out of pipe for collection

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 23. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 02D_BROOM

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9 [1]	***79.33***	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

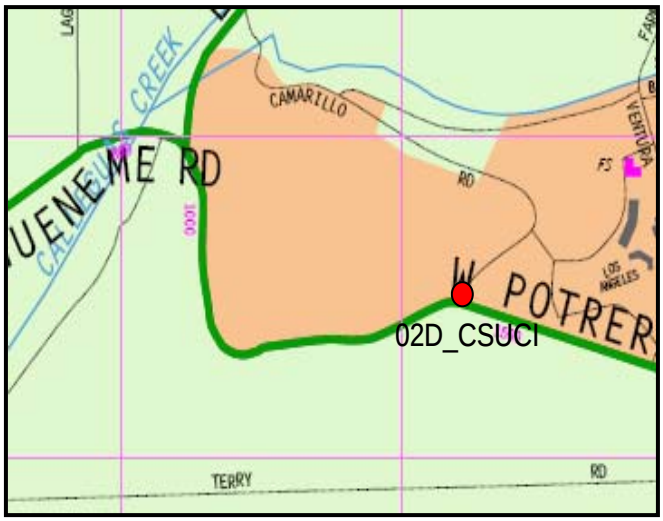
NS = Not Sampled

[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 to 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 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.

Samples were collected from 02D_CSUCI following 02D_BROOM during the 2009 storm event. Detected concentrations for 4,4'-DDE and 4,4'-DDT were approximately half of the concentrations found at 02D_BROOM. Chlorpyrifos and diazinon concentrations were greater at the background site than at 02D_BROOM, though all were below the water quality benchmark.

Table 24. 2009 VCAILG Monitoring Data: 02D_CSUCI

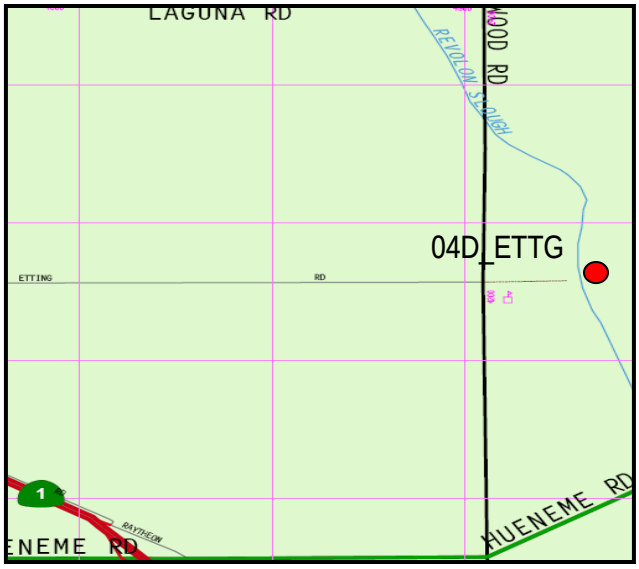
Constituent	Units	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements			Not Sampled; site dry
Flow	CFS	NM	
pH		8.51	
Temperature	°C	13.65	
Dissolved Oxygen	mg/L	7.95	
Turbidity	NTU	65.4	
Conductivity	µS/cm	98	
General Water Quality			
Total Dissolved Solids (TDS)	mg/L	39	
Total Suspended Solids (TSS)	mg/L	38.5	
Chloride	mg/L	6.37	
Sulfate	mg/L	8.55	
Total Ammonia-N	mg/L	0.07	
Nitrate-N	mg/L	0.4	
Phosphate	mg/L	1.624	
Organochlorine Pesticides			
DCPA (Dacthal)	µg/L	0.1237	
4,4'-DDE	µg/L	0.0467	
4,4'-DDT	µg/L	0.0147	
Pyrethroid Pesticides			
Bifenthrin	µg/L	0.0211	
Organophosphorus Pesticides			
Chlorpyrifos	µg/L	0.0096	
Diazinon	µg/L	0.0201	

Note: This is the background site for 02D_BROOM; therefore results are not compared to water quality benchmarks.
NM = Note Measured

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 at this site during both monitoring event. 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 nitrate, DDT compounds, and toxaphene exceeded benchmarks during both monitoring events. Additionally, chlordane and chlorpyrifos benchmarks were exceeded during the storm event. Multiple pyrethroid pesticides were detected at this site, only during the February storm. Row crops are the predominant crop type that drains to this monitoring site. This site is a second tier priority monitoring site as identified in the VCAILG 2008 WQMP.

Table 25. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_ETTG

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		37.543 EST	1.66
pH		6.5≤ pH ≤8.5	7.72	7.92
Temperature	°C	≤ 26.67°C [1]	15.63	22
Dissolved Oxygen	mg/L	≥ 5	8.04	12.8
Turbidity	NTU		444	1.8
Conductivity	µS/cm		2663	4354
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		2040	4050
Total Suspended Solids (TSS)	mg/L		545	6
Chloride	mg/L		175	290
Sulfate	mg/L		1060	1870
Total Ammonia-N	mg/L	3.26 / 1.69 [2]	1.26	ND
Nitrate-N	mg/L	10 [3]	***46.5***	***87.09***
Phosphate	mg/L		6.405	3.187
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.01	ND
Chlordane-alpha	µg/L		0.0159	ND
Chlordane-gamma	µg/L		0.0119	ND
Total Chlordane	µg/L	0.00059	***0.0378***	ND
DCPA (Dacthal)	µg/L		0.0989	ND
2,4'-DDD	µg/L		0.0401	ND
2,4'-DDE	µg/L		0.0213	ND
2,4'-DDT	µg/L		0.043	ND
4,4'-DDD	µg/L	0.00084	***0.071***	ND
4,4'-DDE	µg/L	0.00059	***0.9725***	***0.013***
4,4'-DDT	µg/L	0.00059	***0.2556***	ND
Toxaphene	µg/L	0.0002	***3.23***	***0.399*** EST
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0204	ND
Cyfluthrin	µg/L		0.0094	ND
Cypermethrin	µg/L		0.0377	ND
Danitol	µg/L		0.0044	ND
Permethrin	µg/L		0.2012	ND

Site table continues on next page.

Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.4556***	ND
Dimethoate	µg/L		3.5689	ND
Malathion	µg/L		0.9857	ND

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) 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 this monitoring site.

Table 26. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_ETTG

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9	***46.5***	***87.09***

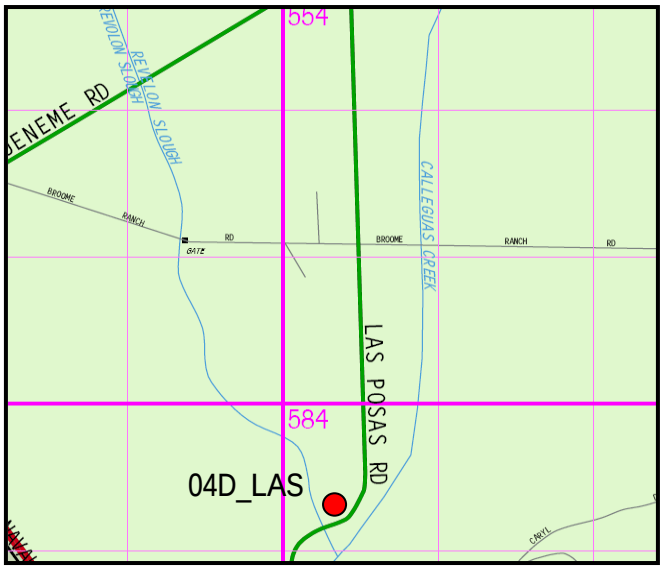
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 to 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).

Site Map



View toward S looking downstream on ag drain before the culvert draining into Revolon Slough

Flow was present at this site during both monitoring 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.

The temperature benchmark was exceeded at this site during the August event. Both air and water temperatures were above the benchmark by approximately 1.5°C. Nitrate, toxaphene, and some DDT compounds were exceeded during both monitoring events. Chlordane, chlorpyrifos, and diazinon concentrations were above the benchmark for the storm sample. Row crops and sod are the primary crop types in the vicinity of this site. This is a second tier priority monitoring site drainage area under the VCAILG 2008 WQMP.

Table 27. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_LAS

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		6.621 EST	1.908
pH		6.5≤ pH ≤8.5	7.7	7.99
Temperature	°C	≤ 26.67°C [1]	15.14	***28.18***
Dissolved Oxygen	mg/L	≥ 5	8.76	23.5
Turbidity	NTU		297.9	2.3
Conductivity	µS/cm		3010	3591
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		2250	2870
Total Suspended Solids (TSS)	mg/L		358	10
Chloride	mg/L		301	410
Sulfate	mg/L		971	1360
Total Ammonia-N	mg/L	3.44 / 1.02 [2]	1.2	0.16
Nitrate-N	mg/L	10 [3]	***39.96***	***16.08***
Phosphate	mg/L		5.976	0.889
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.008	ND
Chlordane-alpha	µg/L		0.01	ND
Chlordane-gamma	µg/L		0.0076	ND
Total Chlordane	µg/L	0.00059	***0.0276***	ND
DCPA (Dacthal)	µg/L		1.6472	ND
2,4'-DDD	µg/L		0.0256	ND
2,4'-DDE	µg/L		0.0071	ND
2,4'-DDT	µg/L		0.0102	ND
4,4'-DDD	µg/L	0.00084	***0.0409***	ND
4,4'-DDE	µg/L	0.00059	***0.3684***	***0.0063***
4,4'-DDT	µg/L	0.00059	***0.0401***	ND
Toxaphene	µg/L	0.0002	***3.54***	***0.2501*** EST
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0059	ND
Danitol	µg/L		0.0109	ND
Permethrin	µg/L		0.0755	ND

Site table continues on next page.

Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.0907***	ND
Diazinon	µg/L	0.1	***0.1139***	0.0208
Dimethoate	µg/L		36.1364	ND
Malathion	µg/L		0.0086	ND

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) 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 this monitoring site.

Table 28. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_LAS

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water4 Quality				
Nitrate-N	mg/L	9	***39.96***	***16.08***

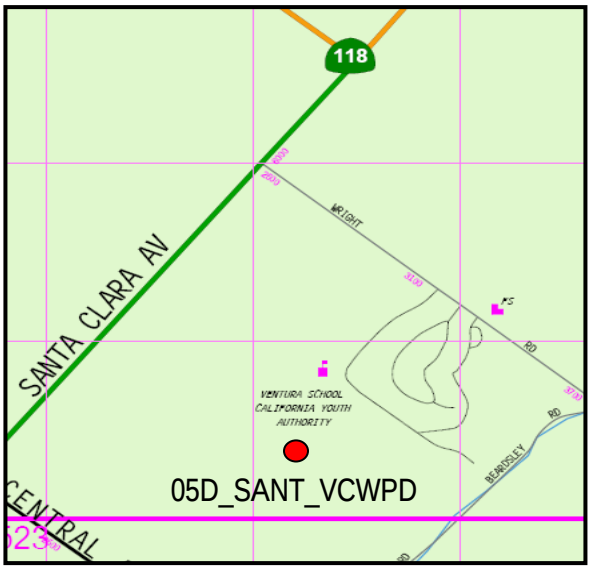
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 to 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 (NW) facing gage #781

Flow was present during both 2009 monitoring 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.

General water quality parameters were exceeded during the dry weather event for TDS, chloride, sulfate, and nitrate. The only dry weather pesticide exceedance was for toxaphene. During the February storm event, benchmarks were exceeded for DDT compounds, toxaphene, and chlorpyrifos. Flows to 05D_SANT_VCWPD are influenced by a golf course and residential area upstream. Accordingly, background site 05D_SANT_BKGD was selected to characterize non-agricultural inputs. However, flow was not present at the background site during the 2009 monitoring. Row crops, berries, citrus, and avocado crops are all present within the drainage area for the 05D_SANT_VCWPD monitoring site. This is a first tier priority monitoring drainage as first identified in the VCAILG 2007 WQMP.

Table 29. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_SANT_VCWPD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		23.15	1.112 EST
pH		6.5≤ pH ≤8.5	7.39	8.06
Temperature	°C	≤ 26.67°C [1]	14.5	19.57
Dissolved Oxygen	mg/L	≥ 5	10.07	9.38
Turbidity	NTU		2793	24.3
Conductivity	µS/cm		769.9	2938
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	850	535	***2260***
Total Suspended Solids (TSS)	mg/L		1710	9
Chloride	mg/L	150	47.6	***260***
Sulfate	mg/L	250	247	***1150***
Total Ammonia-N	mg/L	4.78 / 1.61 [2]	0.12	0.04
Nitrate-N	mg/L	10	8.75	***34.48***
Phosphate	mg/L		11.584	ND
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0083	ND
Chlordane-alpha	µg/L		0.0144	ND
Chlordane-gamma	µg/L		0.0092	ND
Total Chlordane	µg/L	0.00059	***0.0343***	ND
2,4'-DDD	µg/L		0.0169	ND
2,4'-DDT	µg/L		0.0111	ND
4,4'-DDD	µg/L	0.00084	***0.0789***	ND
4,4'-DDE	µg/L	0.00059	***0.3166***	ND
4,4'-DDT	µg/L	0.00059	***0.022***	ND
Toxaphene	µg/L	0.0002	***0.713***	***0.0707*** EST
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0108	ND
Cyfluthrin	µg/L		0.0098	ND
Cypermethrin	µg/L		0.0227	ND
Danitol	µg/L		0.007	ND

Site table continues on next page.

Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.3306***	ND
Diazinon	µg/L	0.1	0.0173	ND
Ethyl Parathion	µg/L		0.094	ND
Malathion	µg/L		0.0498	ND

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 30. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_SANT_VCWPD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9 [1]	8.75	***34.48***

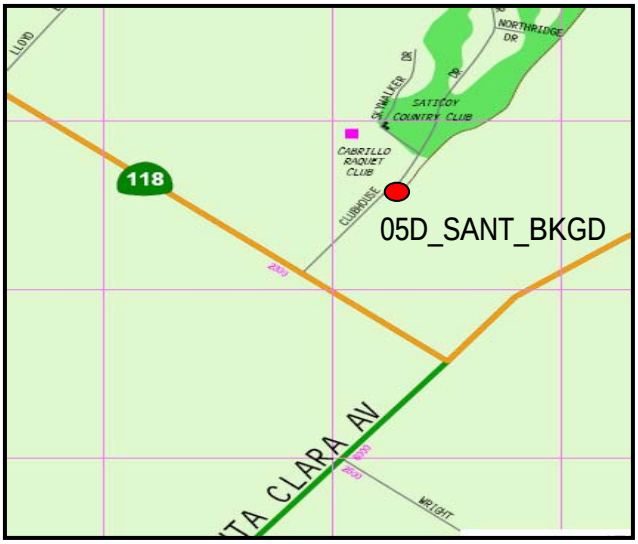
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 to 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



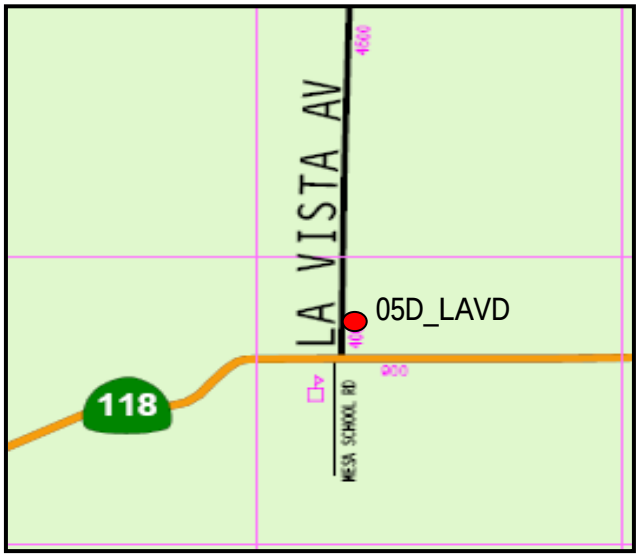
View of sampling location on channel upstream of Clubhouse Dr.

Though 05D_SANT_VCWPD was sampled during both 2009 monitoring events, this background site was dry during all sampling attempts.

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.

Site Map



View upstream (NE) from sampling location

Sufficient flow was only present at this site during the storm event. Table 31 contains a summary of constituents detected in the storm sample 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.

None of the general water quality parameters were elevated above applicable benchmarks during the February storm sample. Benchmarks were exceeded for chlordane, DDT compounds, toxaphene, and chlorpyrifos. This is a first tier priority monitoring drainage as first identified in the VCAILG 2007 WQMP.

Table 31. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_LAVD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; insufficient flow
Flow	CFS		4.183 EST	
pH		6.5≤ pH ≤8.5	7.7	
Temperature	°C	≤ 26.67°C [1]	13.56	
Dissolved Oxygen	mg/L	≥ 5	10.96	
Turbidity	NTU		1911	
Conductivity	µS/cm		14.4	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	850	286	
Total Suspended Solids (TSS)	mg/L		1310	
Chloride	mg/L	150	17.6	
Sulfate	mg/L	250	126	
Total Ammonia-N	mg/L	3.81 / --- [2]	0.16	
Nitrate-N	mg/L	10	2.6	
Phosphate	mg/L		6.681	
Organochlorine Pesticides				
Chlordane-alpha	µg/L		0.0083	
Chlordane-gamma	µg/L		0.0059	
Total Chlordane	µg/L	0.00059	***0.0199***	
2,4'-DDT	µg/L		0.0066	
4,4'-DDD	µg/L	0.00084	***0.0241***	
4,4'-DDE	µg/L	0.00059	***0.1498***	
4,4'-DDT	µg/L	0.00059	***0.0123***	
Toxaphene	µg/L	0.0002	***0.269***	
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0067	
Danitol	µg/L		0.0094	
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.4209***	
Diazinon	µg/L	0.1	0.0527	
Ethyl Parathion	µg/L		0.119	
Malathion	µg/L		0.1789	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.

Table 32. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_LAVD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9 [1]	2.6	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

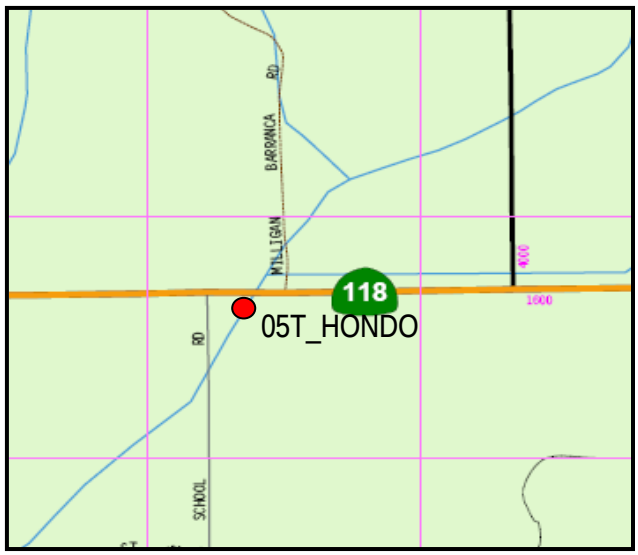
NS = Not Sampled

[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 to 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 only present at this site during the February storm event. Table 33 contains a summary of constituents detected in the storm event sample and provides a comparison of those concentrations to applicable water quality benchmarks. Table 34 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Only pesticide benchmarks were exceeded at this site, including: chlordane, DDT compounds, toxaphene, and chlorpyrifos. Hondo Barranca drains land planted primarily in citrus, avocado, and row crops.

Table 33. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 05T_HONDO

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; site dry
Flow	CFS		51.269	
pH		6.5≤ pH ≤8.5	7.99	
Temperature	°C	≤ 26.67°C [1]	12.35	
Dissolved Oxygen	mg/L	≥ 5	10.86	
Turbidity	NTU		2109	
Conductivity	µS/cm		276.4	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	850	177	
Total Suspended Solids (TSS)	mg/L		2440	
Chloride	mg/L	150	13.1	
Sulfate	mg/L	250	51.5	
Total Ammonia-N	mg/L	2.84 / --- [2]	0.23	
Nitrate-N	mg/L	10	4.61	
Phosphate	mg/L		12.074	
Organochlorine Pesticides				
cis-Nonachlor	µg/L		0.005	
trans-Nonachlor	µg/L		0.0095	
Chlordane-alpha	µg/L		0.0148	
Chlordane-gamma	µg/L		0.0116	
Total Chlordane	µg/L	0.00059	***0.0409***	
DCPA (Dacthal)	µg/L		0.0228	
2,4'-DDD	µg/L		0.101	
2,4'-DDE	µg/L		0.059	
2,4'-DDT	µg/L		0.1763	
4,4'-DDD	µg/L	0.00084	***0.371***	
4,4'-DDE	µg/L	0.00059	***2.7017***	
4,4'-DDT	µg/L	0.00059	***0.7167***	
Dicofol	µg/L		0.1175	
Toxaphene	µg/L	0.0002	***3.16***	
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0332	
Danitol	µg/L		0.0045	

Site table continues on next page.

Organophosphorus Pesticides				Not Sampled; site dry
Chlorpyrifos	µg/L	0.025	***0.0957***	
Diazinon	µg/L	0.1	0.073	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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

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

Table 34. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 05T_HONDO

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9	4.61	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

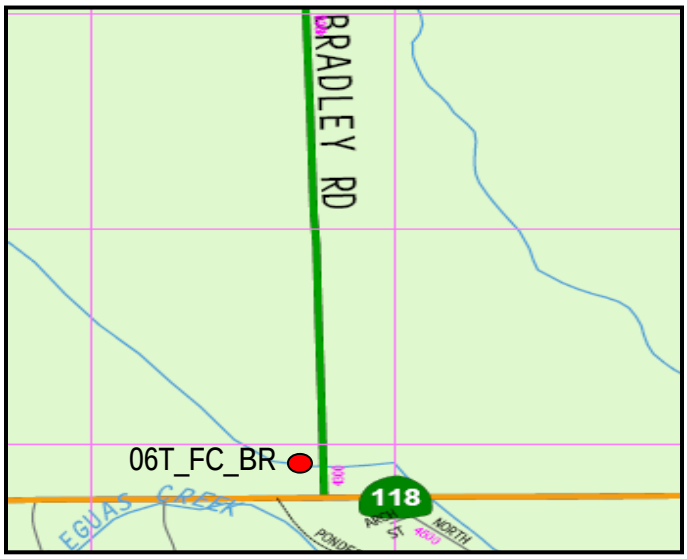
NS = Not Sampled

[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 to 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 site during the dry weather monitoring event. 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.

Exceedances in water quality benchmarks were limited to pesticides: chlordane, DDT compounds, toxaphene, and chlorpyrifos. This site drains mostly citrus orchards and smaller acreages planted in avocados, nursery stock, and row crops.

Table 35. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 06T_FC_BR

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; site dry
Flow	CFS		24.288	
pH		6.5≤ pH ≤8.5	7.58	
Temperature	°C	≤ 26.67°C [1]	12.84	
Dissolved Oxygen	mg/L	≥ 5	10.31	
Turbidity	NTU		2653	
Conductivity	µS/cm		416.2	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	850	240	
Total Suspended Solids (TSS)	mg/L		2860	
Chloride	mg/L	150	15.8	
Sulfate	mg/L	250	83.2	
Total Ammonia-N	mg/L	4.52 / --- [2]	0.38	
Nitrate-N	mg/L	10	3.64	
Phosphate	mg/L		9.806	
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0116	
Chlordane-alpha	µg/L		0.0123	
Chlordane-gamma	µg/L		0.0065	
Total Chlordane	µg/L	0.00059	***0.0338***	
DCPA (Dacthal)	µg/L		0.012	
2,4'-DDD	µg/L		0.0327	
2,4'-DDE	µg/L		0.0111	
2,4'-DDT	µg/L		0.0243	
4,4'-DDD	µg/L	0.00084	***0.116***	
4,4'-DDE	µg/L	0.00059	***0.8149***	
4,4'-DDT	µg/L	0.00059	***0.0667***	
Toxaphene	µg/L	0.0002	***1.57***	
Pyrethroid Pesticides				
Permethrin	µg/L		0.0603	
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.2648***	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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

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

Table 36. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 06T_FC_BR

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9	3.64	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

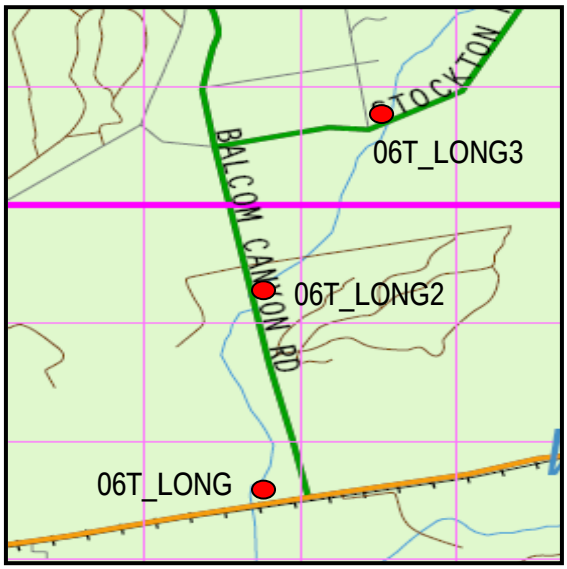
NS = Not Sampled

[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 to the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

06T_LONG, 06T_LONG2, & 06T_LONG3

The original 06T_LONG site was visited during Event 8. Following direction from Regional Board staff, the alternative upstream sites, 06T_LONG2 and 06T_LONG3 were visited for the remaining 2009 sampling event. As shown in the site map below both 06T_LONG2 and 06T_LONG3 are upstream of the original Long Canyon site where the channel is narrower and there is a greater likelihood of flow during wet events.

Map of Sites



06T_LONG view upstream from Hwy 118 bridge

06T_LONG2 view upstream

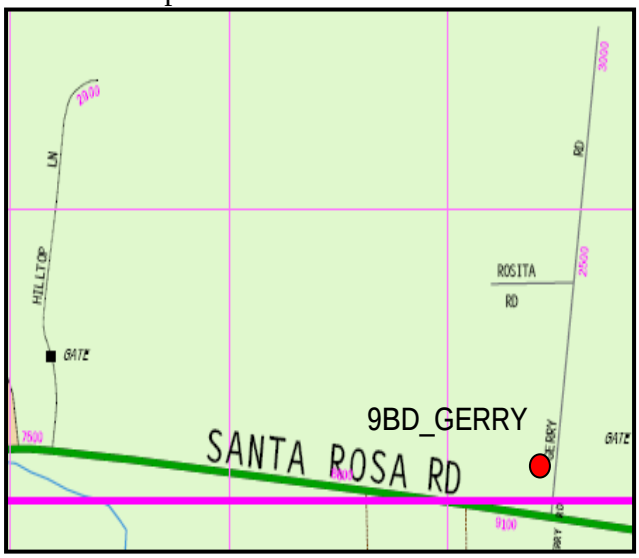
06T_LONG3 view upstream

This site has been dry during all 9 VCAILG monitoring events. Absence of flow at this site signifies a lack of runoff from the citrus and avocado orchards, as well as smaller acreages of nursery stock and row crops that drain to this location.

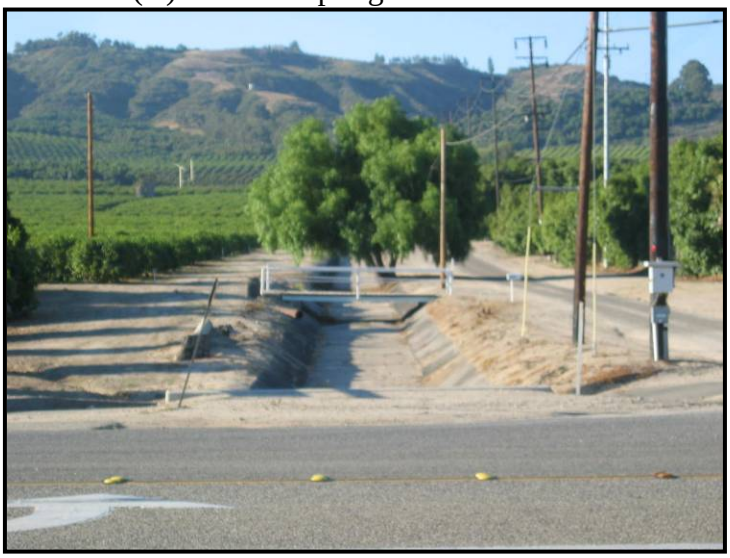
9BD_GERRY

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 (N) of the sampling site



The 2009 storm was the first monitoring event where flow was present at this site. Table 37 contains a summary of constituents detected during the storm event and provides a comparison of those concentrations with applicable water quality benchmarks. Table 38 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Sample pH was slightly elevated at this site. Other benchmark exceedances include chlordane, DDT compounds, toxaphene, and chlorpyrifos. Acreage planted in citrus and avocado orchards and berries drain to this site.

Table 37. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: 9BD_GERRY

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; site dry
Flow	CFS		0.779	
pH		6.5≤ pH ≤8.5	***8.62***	
Temperature	°C	≤ 26.67°C [1]	14.64	
Dissolved Oxygen	mg/L	≥ 5	9.63	
Turbidity	NTU		418	
Conductivity	µS/cm		203.9	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	850	116	
Total Suspended Solids (TSS)	mg/L		392	
Chloride	mg/L	150	12.7	
Sulfate	mg/L	250	15.8	
Total Ammonia-N	mg/L	0.88 / --- [2]	0.12	
Nitrate-N	mg/L	10	1.27	
Orthophosphate-P	mg/L		4.811	
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0149	
Chlordane-alpha	µg/L		0.0114	
Chlordane-gamma	µg/L		0.0097	
Total Chlordane	µg/L	0.00059	***0.0396***	
DCPA (Dacthal)	µg/L		0.0317	
4,4'-DDE	µg/L	0.00059	***0.0579***	
4,4'-DDT	µg/L	0.00059	***0.0262***	
Toxaphene	µg/L	0.0002	***0.0908***	
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0111	
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.7155***	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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

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

Table 38. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: 9BD_GERRY

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Nitrate-N	mg/L	9	1.27	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

NS = Not Sampled

[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 to the TMDL load allocation. Compliance with this load allocation is not required until July 16, 2010.

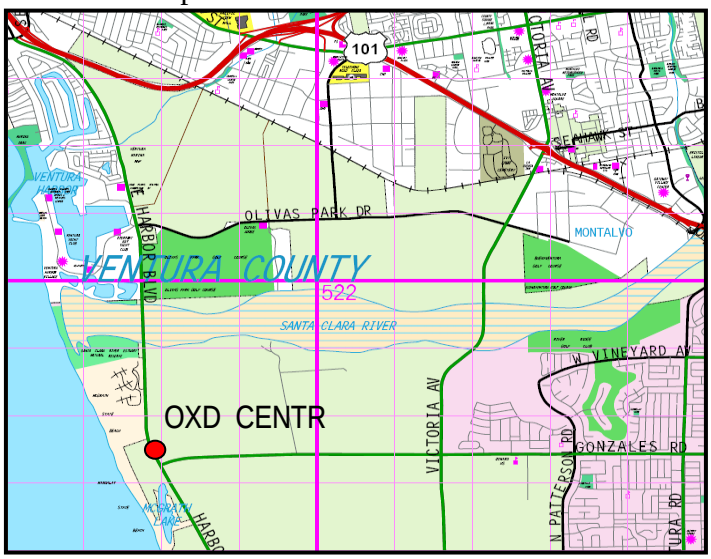
Oxnard Coastal Watershed

The Oxnard Coastal Watershed contains only one VCAILG monitoring site. The 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 Boulevard 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 Boulevard.

Site Map



View looking downstream

Sufficient flow was present during both monitoring events. Table 39 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks.

Benchmarks were exceeded during both monitoring events for nitrate, DDT compounds, and toxaphene. Additionally, chlordane and chlorpyrifos benchmarks were only exceeded during the storm event. Strawberries and row crops are the predominant crop types that drain to this site. This is a first tier priority monitoring drainage as first identified in the VCAILG 2007 WQMP.

Table 39. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: OXD_CENTR

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		8.628	7.738
pH		6.5≤ pH ≤8.5	7.67	7.32
Temperature	°C		14.41	22.47
Dissolved Oxygen	mg/L	≥ 5	8.19	11.41
Turbidity	NTU		125	6.8
Conductivity	µS/cm		2417	3106
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		1810	2410
Total Suspended Solids (TSS)	mg/L		95.3	14
Chloride	mg/L		127	260
Sulfate	mg/L		1060	1340
Total Ammonia-N	mg/L	3.72 / 3.00 [1]	0.25	0.19
Nitrate-N	mg/L	10 [2]	***19.62***	***14.68***
Phosphate	mg/L		1.808	0.337
Organochlorine Pesticides				
Chlordane-alpha	µg/L		0.0075	ND
Chlordane-gamma	µg/L		0.0078	ND
Total Chlordane	µg/L	0.00059	***0.0176***	ND
2,4'-DDD	µg/L		0.0308	ND
2,4'-DDE	µg/L		0.0094	ND
2,4'-DDT	µg/L		0.0336	0.0086
4,4'-DDD	µg/L	0.00084	***0.051***	***0.0066***
4,4'-DDE	µg/L	0.00059	***0.3641***	***0.0452***
4,4'-DDT	µg/L	0.00059	***0.1828***	***0.0365***
Toxaphene	µg/L	0.0002	***1.41***	***0.6588*** EST
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0337	0.0027
Danitol	µg/L		0.0026	ND
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.7919***	ND

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on the April 2002 Basin Plan Amendment chronic equation (ELS absent) and are dependent upon the pH and temperature of the water at the time of sample collection.

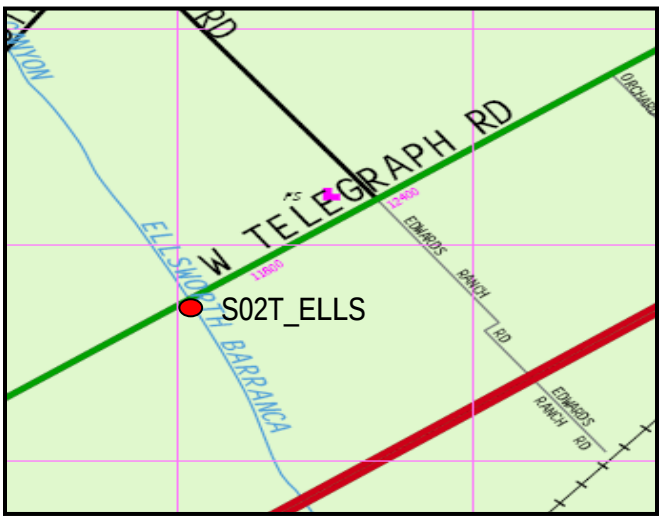
Santa Clara River Watershed

The Santa Clara River Watershed contains 7 VCAILG monitoring sites, all but one of which is located on a tributary to the Santa Clara River. S03D_BARDS is the only monitoring site located on a drain 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 upstream at the bridge pier

Flow was only present at this site during the event 8 storm. Table 40 contains a summary of constituents detected in 2009 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.

During the storm event chlordane, DDT compounds, and chlorpyrifos exceeded benchmarks. Citrus and avocados are the primary crop types associated with this site.

Table 40. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_ELLS

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; site dry
Flow	CFS		13.135	
pH		6.5≤ pH ≤8.5	7.8	
Temperature	°C	≤ 26.67°C [1]	12.31	
Dissolved Oxygen	mg/L	≥ 6	10.94	
Turbidity	NTU		282.9	
Conductivity	µS/cm		1115	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1200	694	
Total Suspended Solids (TSS)	mg/L		204	
Chloride	mg/L	150	109	
Sulfate	mg/L	600	305	
Total Ammonia-N	mg/L	3.67 / --- [2]	0.05	
Nitrate-N	mg/L	10	1.65	
Phosphate	mg/L		2.452	
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0071	
Chlordane-alpha	µg/L		0.01	
Chlordane-gamma	µg/L		0.0086	
Total Chlordane	µg/L	0.00059	***0.0281***	
4,4'-DDD	µg/L	0.00084	***0.0071***	
4,4'-DDE	µg/L	0.00059	***0.061***	
4,4'-DDT	µg/L	0.00059	***0.0251***	
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.0624***	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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

[2] The benchmarks for Ammonia-N are listed in monitoring event order and were calculated based on 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 41. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_ELLS

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10	1.7	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

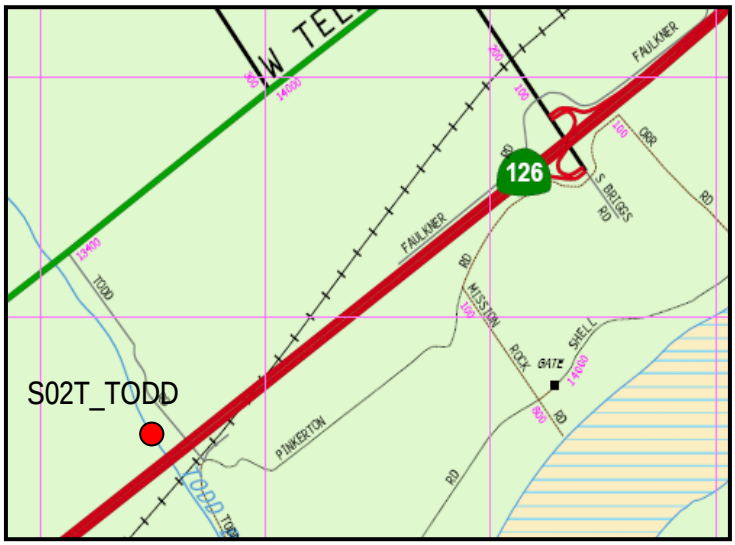
NS = Not Sampled

[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 allocation.

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

Sufficient flow was present during both 2009 monitoring events. Table 42 contains a summary of constituents detected in one or more 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.

During the dry weather event, concentrations of TDS, sulfate, toxaphene, and diazinon were elevated above the water quality benchmarks. Exceedances of chlordane, DDT compounds, toxaphene, and chlorpyrifos occurred during the storm event. Citrus, avocado, and row crops are the primary crop types associated with this site. This is a first tier priority monitoring drainage as first identified in the VCAILG 2007 WQMP.

Table 42. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_TODD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		7.733	3.462
pH		6.5≤ pH ≤8.5	6.93	7.55
Temperature	°C	≤ 26.67°C [1]	12.88	19.45
Dissolved Oxygen	mg/L	≥ 6	9.94	8.91
Turbidity	NTU		1071	22.3
Conductivity	µS/cm		1432	2127
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1200	1030	***1660***
Total Suspended Solids (TSS)	mg/L		877	17
Chloride	mg/L	150	60.6	88
Sulfate	mg/L	600	508	***900***
Total Ammonia-N	mg/L	6.73 / 3.04 [2]	0.19	0.03
Nitrate-N	mg/L	10	6.56	7.64
Phosphate	mg/L		6.313	0.337
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0053	ND
Chlordane-alpha	µg/L		0.0108	ND
Chlordane-gamma	µg/L		0.0106	ND
Total Chlordane	µg/L	0.00059	***0.0292***	ND
2,4'-DDT	µg/L		0.0119	ND
4,4'-DDD	µg/L	0.00084	***0.0241***	ND
4,4'-DDE	µg/L	0.00059	***0.0526***	ND
4,4'-DDT	µg/L	0.00059	***0.0901***	ND
Toxaphene	µg/L	0.0002	***0.25***	***0.1734*** EST
Pyrethroid Pesticides				
Cypermethrin	µg/L		0.3111	0.0171
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.0741***	ND
Diazinon	µg/L	0.1	ND	***0.2827***

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on 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 43. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_TODD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10	6.75	7.67

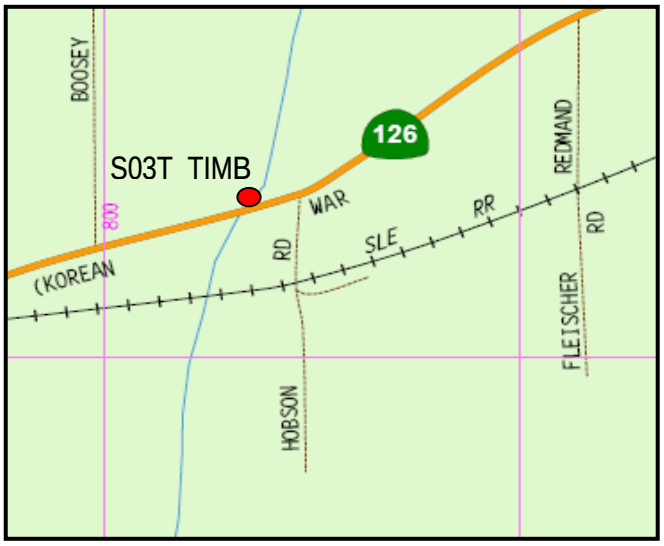
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 allocation.

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 of site (S) toward Hwy 126 bridge

There was no flow at this site during the August dry weather event. Stormwater results are contained in Table 44 and provide a comparison of those concentrations with applicable water quality benchmarks. Table 45 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of nitrate, DDT compounds, chlorpyrifos, and diazinon exceeded benchmarks during the February storm. Citrus and avocados are the primary crop types that drain to this site.

Table 44. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_TIMB

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; site dry
Flow	CFS		0.033 EST	
pH		6.5≤ pH ≤8.5	7.74	
Temperature	°C	≤ 26.67°C [1]	13.1	
Dissolved Oxygen	mg/L	≥ 5	9.2	
Turbidity	NTU		1045	
Conductivity	µS/cm		642.4	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1300	446	
Total Suspended Solids (TSS)	mg/L		920	
Chloride	mg/L	100	23.7	
Sulfate	mg/L	650	165	
Total Ammonia-N	mg/L	3.75 / --- [2]	0.47	
Nitrate-N	mg/L	5	***5.91***	
Phosphate	mg/L		13.545	
Organochlorine Pesticides				
DCPA (Dacthal)	µg/L		0.2553	
4,4'-DDD	µg/L	0.00084	***0.0073***	
4,4'-DDE	µg/L	0.00059	***0.0129***	
Pyrethroid Pesticides				
Cyfluthrin	µg/L		0.0211	
Cypermethrin	µg/L		0.0561	
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.1143***	
Diazinon	µg/L	0.1	***0.3029***	
Malathion	µg/L		5.6778	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on 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 45. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_TIMB

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10	6.38	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

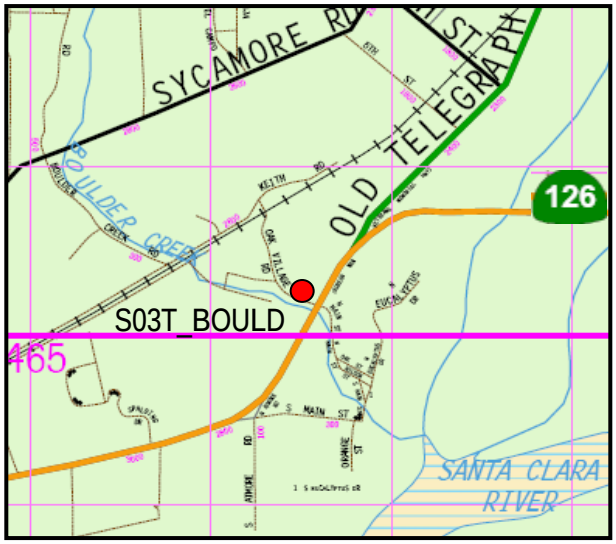
NS = Not Sampled

[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 allocation.

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 of sampling location (upstream)

Sufficient flow was present during both 2009 monitoring events. Table 46 contains a summary of constituents detected in one or more events 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.

Nitrate and chlordane were the only stormwater benchmark exceedances. During dry weather the benchmarks for salts and nitrate were exceeded. Citrus and avocados are the primary crop types associated with this site, though a nursery is located adjacent to the monitoring site.

Table 46. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_BOULD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		0.479	0.169
pH		6.5≤ pH ≤8.5	8.17	7.53
Temperature	°C	≤ 26.67°C [1]	13.76	17.72
Dissolved Oxygen	mg/L	≥ 5	9.83	7.03
Turbidity	NTU		120.6	0.9
Conductivity	µS/cm		1305	2971
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1300	967	***2500***
Total Suspended Solids (TSS)	mg/L		85.8	4
Chloride	mg/L	100	36.3	***280***
Sulfate	mg/L	650	519	***1340***
Total Ammonia-N	mg/L	1.98 / 3.46 [2]	0.24	0.16
Nitrate-N	mg/L	5	***12.99***	***51.79***
Phosphate	mg/L		2.145	1.165
Organochlorine Pesticides				
Chlordane-alpha	µg/L		0.0058	ND
Total Chlordane	µg/L	0.00059	***0.0129***	ND
Pyrethroid Pesticides				
Bifenthrin	µg/L		0.0359	0.0112
Danitol	µg/L		0.0441	0.0043
Fluvalinate	µg/L		0.0046	0.0062
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	0.0132	ND
Malathion	µg/L		ND	0.0369

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 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 monitoring event order and were calculated based on 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 47. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_BOULD

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10	***13.23***	***51.95***

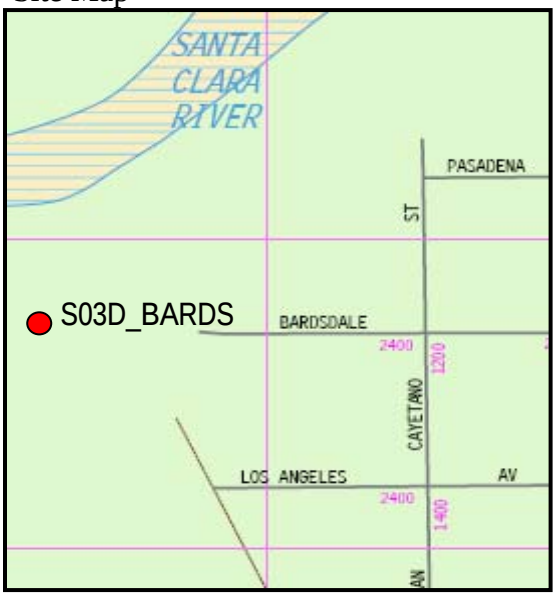
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 allocation.

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 of site looking upstream

Sufficient flow was only present during the February storm event. Table 48 contains a summary of constituents detected in event 8 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.

Only pesticide benchmark exceedances occurred at this site for chlordane, DDT compounds, and chlorpyrifos. Citrus is the primary crop type associated with this site.

Table 48. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: S03D_BARDS

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; site dry
Flow	CFS		2.051	
pH		6.5≤ pH ≤8.5	7.93	
Temperature	°C	≤ 26.67°C [1]	14.16	
Dissolved Oxygen	mg/L	≥ 5	9.02	
Turbidity	NTU		1238	
Conductivity	µS/cm		235.5	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1300	171	
Total Suspended Solids (TSS)	mg/L		1110	
Chloride	mg/L	100	7.78	
Sulfate	mg/L	650	53.9	
Total Ammonia-N	mg/L	2.75 / --- [2]	0.27	
Nitrate-N	mg/L	5	2.12	
Phosphate	mg/L		9.653	
Organochlorine Pesticides				
cis-Nonachlor	µg/L		0.0139	
trans-Nonachlor	µg/L		0.0324	
Chlordane-alpha	µg/L		0.0256	
Chlordane-gamma	µg/L		0.0217	
Total Chlordane	µg/L	0.00059	***0.0936***	
DCPA (Dacthal)	µg/L		0.1725	
4,4'-DDD	µg/L	0.00084	***0.0197***	
4,4'-DDE	µg/L	0.00059	***0.1146***	
Pyrethroid Pesticides				
Cyfluthrin	µg/L		0.0084	
Cypermethrin	µg/L		0.0137	
Esfenvalerate	µg/L		0.003	
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	***0.282***	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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

[2] The benchmarks for Ammonia-N are listed in monitoring event order and were calculated based on 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 49. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: S03D_BARDS

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10	2.39	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

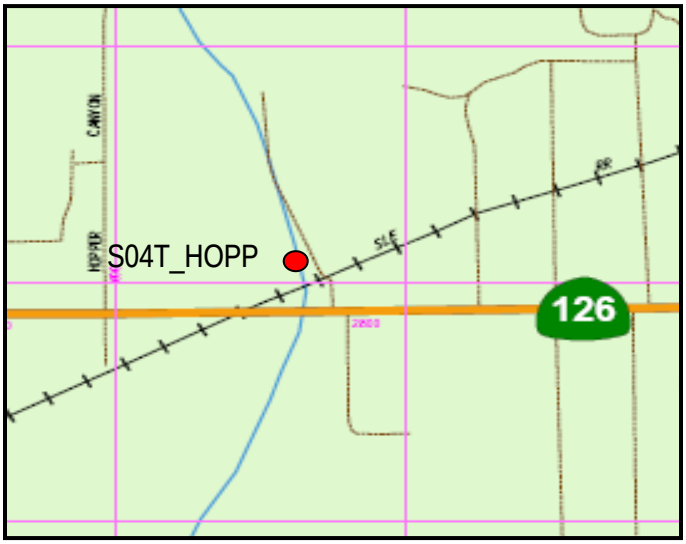
NS = Not Sampled

[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 allocation.

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 the Santa Clara River Reach 4.

Site Map



View downstream from site of RR bridge

Flow was only present at this site during the February storm event. Table 50 contains a summary of constituents detected in samples 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.

There were no benchmark exceedances at this site for 2009. Additionally, no pesticides were detected. Primary crop types associated with this site are citrus and nursery stock.

Table 50. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_HOPP

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				Not Sampled; site dry
Flow	CFS		113.55 EST	
pH		6.5≤ pH ≤8.5	8.01	
Temperature	°C	≤ 26.67°C [1]	11.4	
Dissolved Oxygen	mg/L	≥ 5	10.37	
Turbidity	NTU		698	
Conductivity	µS/cm		541.9	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1300	338	
Total Suspended Solids (TSS)	mg/L		739	
Chloride	mg/L	100	5.67	
Sulfate	mg/L	600	183	
Total Ammonia-N	mg/L	2.93 / --- [2]	0.09	
Nitrate-N	mg/L	5	0.08	
Phosphate	mg/L		5.21	

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

EST = Listed value is estimated 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 monitoring event order and were calculated based on 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 51. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_HOPP

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10	0.17	NS

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

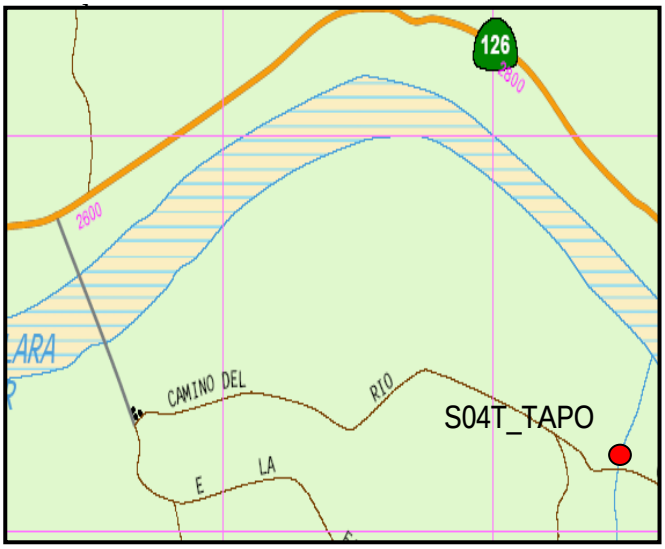
NS = Not Sampled

[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 allocation.

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 sample site at the

Sufficient flow was present for sampling at this site during all monitoring events. Table 52 contains a summary of constituents detected in one or more events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 53 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Benchmark exceedances of chlordane and two DDT compounds occurred during the storm event. TDS and DDT compounds exceeded benchmarks during dry weather in addition to both ammonia and nitrate. A large area crop change took place in August and establishment of the crop required overhead sprinkler irrigation. Tillage of the soil may have led to an exposure and release of nitrogen followed by flushing from overhead irrigation. These events may account for the nitrogen surge detected in the event 9 sample. Row crops and citrus are the primary crop types associated with this site. This is a first tier priority monitoring drainage as first identified in the VCAILG 2007 WQMP.

Table 52. 2009 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_TAPO

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
Field Measurements				
Flow	CFS		4.566	1.27
pH		6.5≤ pH ≤8.5	8.42	7.74
Temperature	°C	≤ 26.67°C [1]	14.81	16.24
Dissolved Oxygen	mg/L	≥ 5	9.53	9.09
Turbidity	NTU		899	104.9
Conductivity	µS/cm		1802	2773
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1300	1180	***1870***
Total Suspended Solids (TSS)	mg/L		1010	96
Chloride	mg/L	100	62.6	100
Sulfate	mg/L	600	569	580
Total Ammonia-N	mg/L	1.22 / 3.06 [2]	0.1	***76.1***
Nitrate-N	mg/L	5	2.26	***179.54***
Phosphate	mg/L		6.435	0.827
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0166	ND
Chlordane-alpha	µg/L		0.0147	ND
Chlordane-gamma	µg/L		0.0107	ND
Total Chlordane	µg/L	0.00059	***0.0469***	ND
DCPA (Dacthal)	µg/L		0.0251	ND
2,4'-DDD	µg/L		0.0281	0.0053
2,4'-DDT	µg/L		ND	0.023
4,4'-DDD	µg/L	0.00084	***0.1251***	***0.02***
4,4'-DDE	µg/L	0.00059	***0.5***	***0.2584***
4,4'-DDT	µg/L	0.00059	ND	***0.1106***
Pyrethroid Pesticides				
Esfenvalerate	µg/L		0.0108	0.073
Fenvalerate	µg/L		0.0045	0.0384
Fluvalinate	µg/L		0.002	ND
Organophosphorus Pesticides				
Malathion	µg/L		0.1652	1.7226

Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 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 monitoring event order and were calculated based on 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 53. 2009 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_TAPO

Constituent	Units	Benchmark	Event 8 2/6/2009	Event 9 8/4/2009
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10	2.36	***255.64***

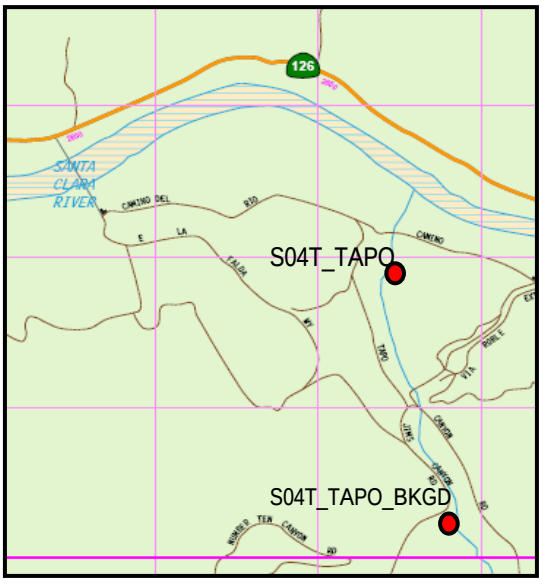
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

[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 allocation.

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 and determine whether high salts concentrations are a background condition for the area. Since this site can only be reached by dirt roads, it has been too muddy to gain access for sampling during storm events.

Site Map



View of monitoring location

This site was inaccessible during the February storm by field personnel. However, the land manager was able to collect salts samples at the end of this long storm period, ten days following the sampling of S04T_TAPO. TDS levels were elevated at the background site and sulfate was almost twice as high at S04T_TAPO_BKGD. This further confirms the natural source of salts that have been detected at the Tapo Canyon monitoring site, especially since the background sample was taken following additional rain and flushing.

Table 54. 2009 VCAILG Monitoring Data: S04T_TAPO_BKGD

Constituent	Units	Event 8 2/16/2009	Event 9 8/4/2009
Field Measurements			Not Sampled; site dry
Flow	CFS	NM	
pH		NM	
Temperature	°C	NM	
Dissolved Oxygen	mg/L	NM	
Turbidity	NTU	NM	
Conductivity	µS/cm	NM	
General Water Quality			
Total Dissolved Solids (TDS)	mg/L	1930	
Total Suspended Solids (TSS)	mg/L	NM	
Chloride	mg/L	66.5	
Sulfate	mg/L	1070	
Total Ammonia-N	mg/L	NM	
Nitrate-N	mg/L	NM	
Phosphate	mg/L	NM	

Note: This is the background site for S04T_TAPO; therefore results are not compared to water quality benchmarks.
NM = Not Measured

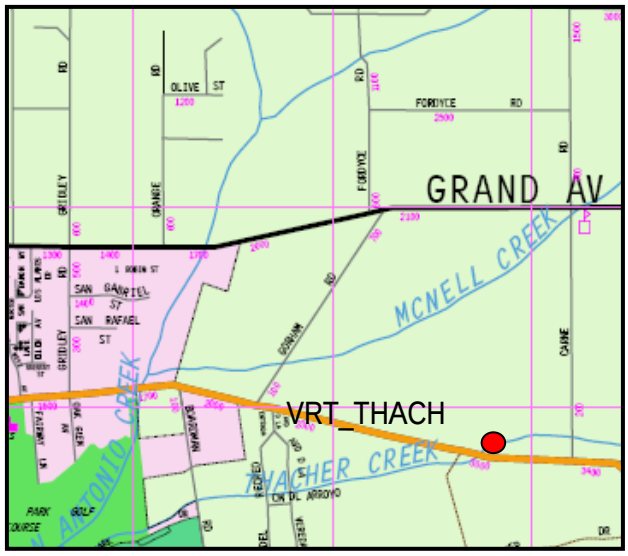
Ventura River Watershed

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 of San Antonio Creek, which is a tributary of the Ventura River.

Site Map



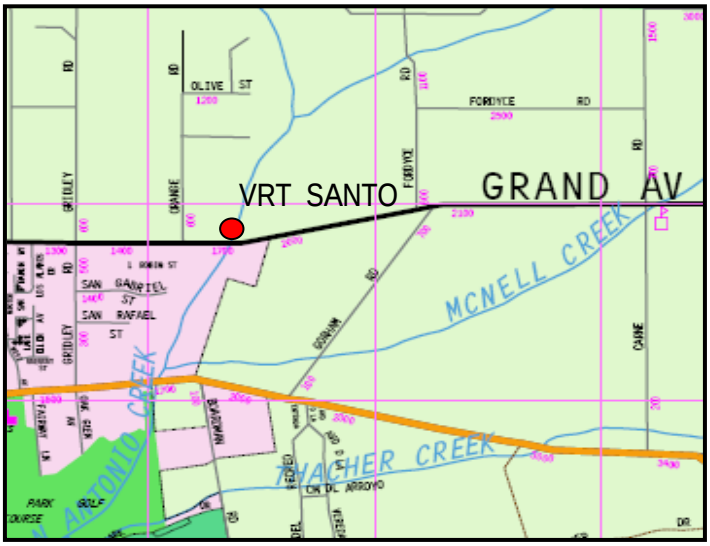
View downstream from site looking towards Ojai Ave. bridge

This site remained dry during all 2009 monitoring events. Avocado and citrus are the predominant crop types associated with this site.

VRT_SANTO

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

Site Map



View downstream at the Grand Ave. bridge

This site remained dry during both of the 2009 monitoring events. To date there have not been any water quality benchmark exceedances at this site. Avocado and citrus orchards 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 2009: single-species tests on pre-determined most sensitive species and Toxicity Identification Evaluation (TIE) test procedures to identify the toxicant(s) causing reduced growth in the algal species. This section discusses the types of tests in detail and includes a summary of toxicity data.

The Event 9 toxicity report submitted by the laboratory contains test results, raw data, and a more detailed discussion of the TIE test procedures. Two types of reports were submitted by the laboratory, an electronic data deliverable (EDD) that is SWAMP compatible and a pdf of the hard copy narrative report. Both reports are included as Appendix G on the Annual Report Data CD.

Toxicity Sites Determined Most Sensitive Species

There are 14 toxicity sites that are part of the VCAILG Monitoring Program. The Conditional Waiver requires that 3-species chronic toxicity testing be performed on samples collected at each site to determine 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. Three-species screenings were completed for 13 of the 14 toxicity sites during the 2007 and 2008 monitoring years. One toxicity site, 06T_LONG has not had flow during any of the monitoring events for sampling.

Based on the 3-species screening tests, the Regional Board has determined the species to be used at each toxicity site for the remainder of this Conditional Waiver (Table 55).

Table 55. Most Sensitive Species Selected for Toxicity Testing

Site ID	Species
01T_ODD2_DCH	*Hyalella or Ceriodaphnia* (depending on EC)
01T_ODD3_ARN	*Thalassiosira*
05D_LAVD	*Ceriodaphnia*
S02T_TODD	*Selenastrum*
S03T_BOULD	*Ceriodaphnia*
05T_HONDO	*Ceriodaphnia*
06T_FC_BR	*Selenastrum*
S02T_ELLS	*Ceriodaphnia*
S03T_TIMB	*Ceriodaphnia*
S04T_HOPP	*Selenastrum, Ceriodaphnia*
VTR_SANTO	*Selenastrum, Ceriodaphnia*
VTR_THACH	*Selenastrum, Ceriodaphnia*
06T_LONG	*Selenastrum, Ceriodaphnia, Pimephales*
S04T_TAPO	*Thalassiosira*

Single-Species Test Results

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).

Appropriate single-species tests were completed at five sites during the Event 9 sampling according to Table 55. Results from the single-species tests at freshwater sites in 2009 can be found in Table 56. High-conductivity single-species test results are in Table 57. "Plating" or settling of algae within the sample during testing was observed in the S02T_TODD and 01T_ODD3_ARN samples. Plating was not observed in the Lab Control treatments, suggesting this phenomenon was sample specific. The contract laboratory re-suspended the settled algae and post-resuspension results are reported below.

Table 56. Chronic Toxicity Results for Single-Species Testing at Freshwater Sites for 2009

Site	Event	*Selenastrum* [1]		TIE Triggered?
		Cell Growth Toxicity	Growth % Reduction	
S02T_TODD	9: Aug 4, 2009	Y	**12.89**	N
S02T_TODD (duplicate)	9: Aug 4, 2009	Y	**19.12**	N
S04T_TAPO	9: Aug 4, 2009	Y	**92.67**	Y

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

Table 57. Chronic Toxicity Results for Single-Species Testing at High-Conductivity Sites for 2009

Site	Event	*Thalassiosira* [1]		*Hyalella* [2]		TIE Triggered?
		Cell Growth Toxicity	Growth % Reduction	Survival Toxicity	Survival % Reduction	
01T_ODD3_ARN	9: Aug 2009	N	----			N
01_ODD2_DCH	9: Aug 2009			N	----	N
S03T_BOULD	9: Aug 2009			Y	**8.16**	N

[1] *Thalassiosira pseudonana* (algae) is evaluated for the growth endpoint.
[2] *Hyalella azteca* (invertebrate–crustacean) is evaluated for the survival endpoint.

Exceedances of the 1.0 TUc toxicity benchmark occurred at S02T_TODD, S03T_BOULD, and S04T_TAPO during the 2009 monitoring year. Toxicity Identification Evaluations (TIEs) are required for samples that exhibit significant toxicity as defined by at least 50% mortality or a 50% reduction in growth for algal species.

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 *Hyalella* 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 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 survival survival in samples collected at the following site during the event 9 monitoring event:

- S04T_TAPO (*Selenastrum capricornutum* – freshwater algae)

Follow-up Phase I TIEs targeted for pesticides and metals were performed on the event 9 sample from Tapo Canyon. 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:

- C8 SPE treatment, which eliminates pesticides (non-polar organics) still resulted is some reduction in growth following treatment
- CHELEX treatment, which extracts metals, also removed some toxicity
- Both treatments were partially effective at removing toxicity. However, no single treatment completely removed all of the toxicity; therefore it is likely due to a combination of an organic contaminant and divalent cations. It is possible that the C8 SPE treatment removed a small amount of metals, resulting in improved growth.

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 2009. 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

Table 58. 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	Luminescent dissolved oxygen	0 – 20 mg/L	0.1 mg/L
Turbidity	Nephelometric	0 – 3000 NTU	0.2 NTU
Conductivity	Graphite electrodes	0 – 10 mmhos/cm	2.5 µmhos/cm

NA = Not Applicable

Table 59. Analytical Methods and Project Detection Limits for Laboratory Analyses: General Water Quality Constituents and Organochlorine Pesticides

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	7.2 [1]	20	20
Total Suspended Solids (TSS)	mg/L	2	0.28	5	1
Chloride	mg/L	0.2	0.2	1	1
Sulfate [2]	mg/L	0.03	0.12	1	2
Total Ammonia-N	mg/L	0.04	0.03	0.2	0.03
Nitrate-N	mg/L	0.008	0.01	0.1	0.05
Phosphate	mg/L	0.01	0.01	0.05	0.01
Organochlorine Pesticides [3]					
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

MDL = Method Detection Limit RL = Reporting Limit

[1] Project MDLs were not met in 2009. However, project RLs were met, and concentrations in environmental samples greatly exceeded RLs for these constituents.

[2] Both the Project RL and MDL were exceeded by the analyzing laboratory in 2009. However, the concentrations in environmental samples greatly exceeded the RL for this constituent.

[3] The laboratory reports nine additional organochlorine pesticides that were not included in the QAPP: cis-Nonachlor, DCPA (dacthal), dicofol, heptachlor, heptachlor epoxide, methoxychlor, mirex, oxychlordane, and perthane.

Table 60. Analytical Methods and Project Detection Limits for Laboratory Analyses: Organophosphorus and Pyrethroid Pesticides

Parameter	Units	Project MDL	MDL Reported by Lab	Project RL	RL Reported by Lab
Pyrethroid Pesticides [1]					
Allethrin	ng/L	---	0.5	---	2
Bifenthrin	ng/L	5	0.5	5	2
Cyfluthrin	ng/L	4	0.5	5	2
l-Cyhalothrin	ng/L	4	0.5	5	2
Cypermethrin	ng/L	3	0.5	5	2
Deltamethrin	ng/L	3	0.5	10	2
Esfenvalerate	ng/L	4	0.5	5	2
Fenvalerate	ng/L	4	0.5	5	2
Fluvalinate	ng/L	3	0.5	5	2
Permethrin	ng/L	3	5	5	25
Prallethrin	ng/L	---	0.5	---	2
Resmethrin	ng/L	6	5	10	25
Organophosphorus Pesticides [4]					
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
Fenchlorophos	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

[1] The laboratory originally retained to analyze samples for pyrethroids was not prepared to achieve project MDLs or RLs by the time monitoring commenced in 2007. A different laboratory with different MDLs and RLs was retained for pyrethroids analyses. The laboratory reports two additional pyrethroids that were not included in the QAPP.

[2] 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.

[3] The QAPP originally listed esfenvalerate/fenvalerate because they coelute. The analyzing laboratory is able to separate the two compounds and therefore reports them separately.

[4] In Event 7 the laboratory began reporting 6 additional organophosphorus pesticides that were not included in the QAPP. Only one of those pesticides, ethyl parathion, was detected in two VCAILG storm samples in 2009.

All project detection limits were met in 2009 for field measurements.

MDLs for TDS and nitrate-N were not met during 2009. However RLs for these constituents were met, and levels of these analytes in environmental samples greatly exceeded the MDLs. Therefore, higher MDLs for these constituents are not considered quality control failures.

Both the MDLs and RLs for sulfate and permethrin were not met for 2009 samples. Sulfate was detected in all environmental samples at concentrations much greater than the RL. Samples in which permethrin was detected, the concentration was significantly greater than the RL. Therefore, these detection and reporting limits are not considered quality control failures.

The RL was not met for resmethrin in 2009. However, this constituent was not detected in any of the VCAILG samples. Additionally, there are no established/approved methods or water quality objectives for pyrethroids, MDLs and RLs achieved during 2009 are acceptable.

All project detection limits were met in 2009 for organophosphorus and organochlorine pesticides.

Data Quality Objectives for Precision and Accuracy

Table 61 lists data quality objectives for precision and accuracy for field measurements and laboratory analyses.

Table 61. 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			
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-N	80-120%	25%	80-120%
Nitrate-N	80-120%	25%	80-120%
Phosphate	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 the 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 dat, 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 re-run 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 8 and 9 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. Higher flows that occurred during the storm event prevented crews from entering streams to measure flow at some sites. In such instances, the flow is noted as estimated and should be considered a gross estimate. When feasible, the velocity meter was used to measure flow velocity.

Table 62 lists quality control failures reported by the analytical laboratories for samples collected during both monitoring events in 2009 and includes the laboratory's explanation (qualifier) for each failure.

Table 62. Quality Control Failures – 2009

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
8	CRG	Phosphate	H	Samples were analyzed past the recommended holding time.	H Holding time exceeded and therefore, sample results are estimated.
8	CRG	2,4'-DDD	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 was reported without further clarification.
8	CRG	2,4'-DDE	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 was reported without further clarification.
8	CRG	4,4'-DDE	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 was reported without further clarification.
8	CRG	Chlordane-alpha	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 was reported without further clarification.
8	CRG	Chlordane-gamma	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 was reported without further clarification.
8	CRG	DCPA (Dacthal)	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 was reported without further clarification.
8	CRG	Dicofol	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 was reported without further clarification.
8	CRG	Endrin	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

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
					sample data was reported without further clarification.
8	CRG	Heptachlor	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 was reported without further clarification.
8	CRG	Heptachlor Epoxide	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 was reported without further clarification.
8	CRG	Trans-Nonachlor	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 was reported without further clarification.
8	CRG	Methoxychlor	MSD	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 was reported without further clarification.
8	CRG	DCPA (Dacthal)	LD	RPD did not meet acceptance criteria.	Q3 RPD values are <10 times the MDL.
8	CRG	Dicofol	LD	RPD did not meet acceptance criteria.	Q3 RPD values are <10 times the MDL.
8	CRG	Trans-Nonachlor	LD	RPD did not meet acceptance criteria.	Q3 RPD values are <10 times the MDL.
8	CRG	Azinphos Methyl	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 was reported without further clarification.
8	CRG	Chlorpyrifos	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 was reported without further clarification.
8	CRG	Dichlorvos	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

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
					sample data was reported without further clarification.
8	CRG	Fensulfothion	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 was reported without further clarification.
8	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 was reported without further clarification.
8	CRG	Tetrachlorvinphos	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 was reported without further clarification.
8	CRG	Methidathion	MSD	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 was reported without further clarification.
8	CRG	Allethrin	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 was reported without further clarification.
8	CRG	Cypermethrin	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 was reported without further clarification.
8	CRG	Prallethrin	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 was reported without further clarification.
9	CRG	Nitrate	H	Samples were analyzed past the recommended holding time.	H Holding time exceeded and therefore, sample results are estimated.
9	CRG	Resmethrin	BSD	BSD % recovery did not meet acceptance criteria.	Laboratory QA Program Document allows for 5% of the target compounds greater than >10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy.

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
9	CRG	Cypermethrin	MS	MS % 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 was reported without further clarification.
9	CRG	Deltamethrin	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 was reported without further clarification.
9	CRG	Esfenvalerate	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 was reported without further clarification.
9	CRG	Fenvalerate	MS	MS % 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 was reported without further clarification.
9	CRG	Fluvalinate	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 was reported without further clarification.
9	CRG	Resmethrin	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	Laboratory QA Program Document allows for 5% of the target compounds greater than >10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy.
9	CRG	Cyfluthrin	LD	RPD did not meet acceptance criteria.	Q3 RPD values are <10 times the MDL.
9	CRG	Merphos	BSD	BSD % RPD did not meet acceptance criteria.	Laboratory QA Program Document allows for 5% of the target compounds greater than >10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy.
9	CRG	Azinphos Methyl	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 was reported without further clarification.
9	CRG	Bolstar	MS	MS % 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

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
					sample data was reported without further clarification.
9	CRG	Tetrachlorvinphos	MS	MS % 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 was reported without further clarification.
9	CRG	Fensulfothion	MSD	RPD 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 was reported without further clarification.
9	CRG	Merphos	MSD	RPD 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 was reported without further clarification.
9	CRG	Methidathion	MSD	RPD 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 was reported without further clarification.
9	CRG	Phosmet	MSD	RPD did not meet acceptance criteria.	Q3 RPD values are <10 times the MDL.
9	CRG	BHC-beta	BS/BSD	BS and BSD % recovery did not meet acceptance criteria.	Laboratory QA Program Document allows for 5% of the target compounds greater than >10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy.
9	CRG	Aldrin	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 was reported without further clarification.
9	CRG	BHC-beta	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	Laboratory QA Program Document allows for 5% of the target compounds greater than >10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy.
9	CRG	Endrin ketone	MS	MS % 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 was reported without further clarification.
9	CRG	Heptachlor	MS/MSD	MS % recovery did not meet	M4 Spike or surrogate compound recovery was out of control

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
				acceptance criteria.	due to matrix interference. The associated method blank spike or surrogate compound was in control and therefore the sample data was reported without further clarification.
9	CRG	Endrin ketone	MSD	RPD 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 was reported without further clarification.
9	CRG	4,4'-DDD	LD	RPD did not meet acceptance criteria.	Q3 RPD values are <10 times the MDL.
9	CRG	4,4'-DDT	LD	RPD did not meet acceptance criteria.	Q3 RPD values are <10 times the MDL.

BS = Blank Spike BSD = Blank Spike Duplicate H = Holding Time LD = Lab Duplicate MS = Matrix Spike MS/MSD = Matrix Spike/Matrix Spike Duplicate RPD = Relative Percent Difference

Completeness

Data completeness is the 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 63 lists the percent completeness of data collected during 2009 in comparison with the established DQO.

Table 63. Data Completeness – 2009

Monitoring Element	% Completeness Objective	% Completeness Achieved
Field Measurements		
Flow	90	100
pH	90	100
Temperature	90	100
Dissolved Oxygen	90	100
Turbidity	90	100
Conductivity	90	100
General Water Quality		
Total Dissolved Solids (TDS)	90	100
Total Suspended Solids (TSS)	90	100
Chloride	90	100
Sulfate	90	100
Total Ammonia-N	90	100
Nitrate-N	90	100
Phosphate	90	100
Organochlorine Pesticides	***90***	***100***
Pyrethroid Pesticides	***90***	***100***
Organophosphorus Pesticides	***90***	***100***
Chronic Toxicity	***90***	***100***

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. All percent completeness objectives were surpassed during the 2009 sampling year.

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 of the 2008 monitoring year. The December training event was a classroom only session, where site-specific details were discussed in addition to the standard sampling training material.

Prior to sampling in 2009, training took place at FGL on December 19, 2008. Training consisted of a PowerPoint presentation as a refresher of proper sample collection, field log completion, and site specific issues. There was also a demonstration of proper use of the flow pole and meter, followed by a question and answer session. New toxicity sampling requirements were also discussed. Since most sensitive species had been determined for toxicity sites, sampling crews needed to be informed of which species will be tested and the required sample volume and EC considerations.

Training for the upcoming 2010 sampling year took place at FGL on December 4, 2009. The training presentation was similar to 2008. Additions included maps and information regarding the new Long Canyon sites, 06T_LONG2 and 06T_LONG3 including instructions on the order to visit these sites and actions to be taken depending on whether flowing water is present.

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. Toxicity data has been formatted to be SWAMP compatible based on communications between Pacific EcoRisk and State Board Staff. However, it is understood that this format is not finalized nor has it been standardized statewide. Other monitoring data have not been formatted to conform to SWAMP specifications because of a lack of clear direction regarding data formatting specifics. Once LWA database administrators receive appropriate guidance on data format, the VCAILG Monitoring Database will be modified accordingly and submitted for inclusion in the SWAMP database.

In summary, data collected in 2009 through the VCAILG Monitoring Program are of acceptable quality and fulfilled Monitoring Program objectives.

Summary of Benchmark Exceedances

Monitoring data from samples collected at 17 of the 21 VCAILG monitoring sites exceeded benchmarks and triggered the requirement to update the VCAILG WQMP to address these new 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 Ventura River.

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 64 contains a summary of benchmark exceedances that occurred at each site during 2009. Table 64 also identifies sites that were sampled but where no exceedances occurred, as well as sites that were not sampled. Table 65 contains the same exceedance summary organized by constituent and by watershed. Finally, Table 66 and Table 67 provide a comparison of benchmark exceedances at each monitoring site over the three years of completed Conditional Waiver monitoring. Organochlorine (legacy) pesticides, primarily DDT compounds, caused the highest number of exceedances overall, followed by organophosphorus pesticides, nitrogen, salts, and chronic toxicity. During the storm event, 18 sites were sampled; all but one had benchmark exceedances. Nine sites were sampled for dry weather runoff in August, all of which had benchmark exceedances.

PESTICIDES

Exceedances of benchmarks for OC pesticides occurred at 16 out of 21 VCAILG sites, 11 of which are located in the Calleguas Creek watershed. Eight Calleguas Creek watershed sites also had exceedances in OP pesticides, most commonly chlorpyrifos. An additional four Santa Clara River sites and the Oxnard Coastal site also had OP pesticides exceedances.

SALTS

Exceedances of salts benchmarks (TDS, chloride, sulfate, or any combinations thereof) occurred at 4 sites out of 21, three of which are located in the Santa Clara River watershed. This is four fewer sites with salts exceedances than during the 2008 monitoring year.

CHRONIC TOXICITY

Toxicity samples were collected during the 2009 dry weather event. Of the five sites that were sampled, three resulted in toxic responses as compared to the control. One site triggered a TIE test due to a greater than 50% reduction in algal growth.

NITROGEN

Exceedances of the nitrate-N objective occurred at 10 out of 21 VCAILG sites; only 2 sites exceeded the ammonia-N objective. The nitrate-N objective was exceeded at six Calleguas Creek watershed sites and three sites in the Santa Clara River watershed. It should be noted here that there are nitrogen compounds TMDLs in both the Calleguas Creek and Santa Clara River

Watersheds for which the VCAILG monitoring results can be compared to load allocations; exceedances of the applicable load allocations are discussed in the next section.

DISSOLVED OXYGEN

There were no dry weather exceedances of the dissolved oxygen benchmark. However, an exceedance of the DO benchmark did occur during the wet event at 01T_ODD3_ARN (Rio de Santa Clara/Oxnard Drain #3 at Arnold Road), in the Calleguas Creek watershed.

TEMPERATURE

There were no wet weather exceedances of the temperature benchmark. During the dry weather event in August, 04D_LAS, which is a discharge point to Revolon Slough at South Las Posas Road, exceeded the temperature benchmark. At the time of sampling both the air and water temperatures were greater than the water temperature benchmark and the flow was very slow.

PH

There were no dry weather exceedances of the pH benchmark. One exceedance did occur at one site during the storm event at 9BD_GERRY, which is a drain crossing Santa Rosa Road at Gerry Road. The field measured pH was 0.12 pH units above the acceptable upper limit of 8.5.

Table 64. Water Quality Benchmark Exceedances in 2009 – by Site & Event

Site	Event 8 – *Wet* February 6, 2009	Event 9 – *Dry* August 4, 2009
01T_ODD2_DCH	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	Nitrate-N, Toxaphene
01T_ODD3_ARN	Dissolved Oxygen, Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos, Diazinon	Ammonia-N, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene
02D_BROOM	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene	NS
04D_ETTG	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	Nitrate-N, 4,4'-DDE, Toxaphene
04D_LAS	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos, Diazinon	Temperature, Nitrate-N, 4,4'-DDE, Toxaphene
05D_SANT_VCWPD	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	TDS, Chloride, Sulfate, Nitrate-N, Toxaphene
05D_LAVD	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	NS
05T_HONDO	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	NS
06T_FC_BR	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	NS
06T_LONG	NS	NA
06T_LONG2 & 3	NA	NS
9BD_GERRY	pH, Total Chlordane, 4,4'-DDE, 4,4'-DDT, Toxaphene Chlorpyrifos	NS
OXD_CENTR	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene
S02T_ELLS	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	NS
S02T_TODD	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	TDS, Sulfate, Toxaphene, Diazinon, Chronic Toxicity
S03T_TIMB	Nitrate-N, 4,4'-DDD, 4,4'-DDE, Chlorpyrifos, Diazinon	NS
S03T_BOULD	Nitrate-N, Total Chlordane	TDS, Chloride, Sulfate, Nitrate-N, Chronic Toxicity
S03D_BARDS	Total Chlordane, 4,4'-DDD, 4,4'-DDE, Chlorpyrifos	NS
S04T_HOPP	None	NS
S04T_TAPO	Total Chlordane, 4,4'-DDD, 4,4'-DDE	TDS, Ammonia-N, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chronic Toxicity
VRT_THACH	NS	NS
VRT_SANTO	NS	NS
Total Number of Sites Sampled	18	9
Total Number of Sites with Exceedances	17	9

NS = Not Sampled; insufficient or no flow

NA = Not Applicable; site was not part of the monitoring program at the time of sampling.

Table 65. Water Quality Benchmark Exceedances in 2009 – by Constituent & Watershed

Constituent	VCAILG Monitoring Sites with Benchmark Exceedances		
	CC / OXD	**SCR**	**VR**
Salts	05D_SANT_VCWPD	S02T_TODD S03T_BOULD S04T_TAPO	None
Nitrogen	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD OXD_CENTR	S03T_TIMB S03T_BOULD S04T_TAPO	None
Chronic Toxicity	None	S02T_TODD S03T_BOULD S04T_TAPO	None
OC Pesticides	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD 05D_LAVD 05T_HONDO 06T_FC_BR 9BD_GERRY OXD_CENTR	S02T_ELLS S02T_TODD S03T_TIMB S03T_BOULD S03D_BARDS S04T_TAPO	None
OP Pesticides	01T_ODD2_DCH 01T_ODD3_ARN 04D_ETTG 04D_LAS 05D_LAVD 05T_HONDO 06T_FC_BR 9BD_GERRY OXD_CENTR	S02T_ELLS S02T_TODD S03T_TIMB S03D_BARDS	None
Dissolved Oxygen	01T_ODD3_ARN	None	None
pH	9BD_GERRY	None	None
Temperature	04D_LAS	None	None

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

Table 66. Water Quality Benchmark Exceedance Comparison for 2007-2009 Monitoring Years in the Calleguas Creek and Oxnard Coastal Watersheds

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
01T_ODD2_DCH	2007		x		x	x			
	2008		x	x	x	x			
	2009		x		x	x			
01T_ODD3_ARN	2007		x	x	x				
	2008		x		x				
	2009		x		x	x	x		
02D_BROOM	2007		x		x				
	2008		x		x		x		
	2009		x		x				
04D_ETTG	2007		x		x	x			
	2008		x		x	x			
	2009		x		x	x			
04D_LAS	2007		x		x	x			
	2008		x		x	x			x
	2009		x		x	x			x
05D_SANT_VCWPD	2007	x	x		x	x			x
	2008	x	x		x	x			
	2009	x	x		x	x			
05D_LAVD	2007	x	x	x	x	x			
	2008				x	x			
	2009				x	x			
05T_HONDO	2007				x	x			
	2008	x		x	x	x			
	2009				x	x			
06T_FC_BR	2007				x	x			
	2008	x	x	x	x				
	2009				x	x			
06T_LONG, 06T_LONG2&3	2007 [1]								
	2008 [1]								
	2009 [1]								
9BD_GERRY	2007 [1]								
	2008 [1]								
	2009				x	x		x	
OXD_CENTR	2007		x		x	x			
	2008		x		x	x			
	2009		x		x	x			

X = Water quality benchmark exceedance occurred during the corresponding year for at least one constituent within the categories noted in the above column.
[1] Site was dry during all monitoring events this year.

Table 67. Water Quality Benchmark Exceedance Comparison for 2007-2009 Monitoring Years in the Santa Clara River and Ventura River Watersheds

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
S02T_ELLS	2007	x				x			
	2008	x		x		x		x	
	2009				x	x			
S02T_TODD	2007	x	x	x		x			
	2008	x	x	x	x				
	2009	x		x	x	x			
S03T_TIMB	2007	x							
	2008	x	x	x	x	x			
	2009		x		x	x			
S03T_BOULD	2007	x	x	x			x		
	2008	x	x	x	x				
	2009	x	x	x	x				
S03D_BARDS	2007				x	x			
	2008				x	x			
	2009				x	x			
S04T_HOPP	2007								
	2008	x							
	2009								
S04T_TAPO	2007	x	x	x	x				
	2008	x	x		x				
	2009	x	x	x	x				
VRT_THACH	2007 [1]								
	2008				x				
	2009 [1]			Site was dry during all monitoring events this year.					
VRT_SANTO	2007 [1]			Site was dry during all monitoring events this year.					
	2008								
	2009 [1]			Site was dry during all monitoring events this year.					

X = Water quality benchmark exceedance occurred during the corresponding year for at least one constituent within the categories noted in the above column.
[1] Site was dry during all monitoring events this year.

The previous two tables summarize the classes of exceedances that have been found at all monitoring sites during the three completed years of VCAILG monitoring. It is important to note that 05D_LAVD (La Vista Drain) is a first tier priority site under the VCAILG Water Quality Management Plan and for the past two years, this site has not had exceedances in salts, nitrogen, or chronic toxicity, which are improvements from the 2007 monitoring results. Additionally, there are other sites that remain dry during all but the most intense storms, and therefore are not contributing runoff pollutants during dry weather and small storm events. These include 9BD_GERRY (Gerry Road at Santa Rosa Road), 06T_LONG, 06T_LONG2, and 06T_LONG3 (Long Canyon), S04T_HOPP (Hopper Creek at Hwy 126), VRT_THACH (Thacher Creek at Ojai Avenue), and VRT_SANTO (San Antonio Creek at Grand Avenue). Sites that have consistently shown exceedances are ranked as first or second tier priority sites and therefore receive BMP outreach efforts under the WQMP.

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 2008 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, but are evaluated in the Calleguas Creek Watershed TMDL Monitoring Program Annual Report:

- CCW Organochlorine Pesticides TMDL (load allocations are established in sediment);
- 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);
- 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:

- CCW Nitrogen Compounds TMDL, which establishes load allocations as nitrate-N + nitrite-N;
- 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 68 lists exceedances of both TMDL load allocations by site for each event, and Table 69 lists exceedances of the TMDL load allocations by constituent and by watershed.

Table 68. TMDL Load Allocation Exceedances in 2009 – by Site & Event

	Constituents that Exceeded Applicable TMDL Load Allocations	
Site ID	**Event 8 – *Wet* February 6, 2009**	**Event 9 – *Dry* August 4, 2009**
01T_ODD2_DCH	Nitrate-N	Nitrate-N
01T_ODD3_ARN	Nitrate-N	Nitrate-N
02D_BROOM	Nitrate-N	*NS*
04D_ETTG	Nitrate-N	Nitrate-N
04D_LAS	Nitrate-N	Nitrate-N
05D_SANT_VCWPD	None	Nitrate-N
05D_LAVD	None	*NS*
05T_HONDO	None	*NS*
06T_FC_BR	None	*NS*
06T_LONG	*NS*	*NS*
9BD_GERRY	None	*NS*
OXD_CENTR	No TMDLs	No TMDLs
S02T_ELLS	None	*NS*
S02T_TODD	None	None
S03T_TIMB	None	*NS*
S03T_ BOULD	Ammonia-N + Nitrate-N	Ammonia-N + Nitrate-N
S03D_BARDS	None	*NS*
S04T_HOPP	None	*NS*
S04T_TAPO	None	Ammonia-N + Nitrate-N
VRT_THACH	No TMDLs	No TMDLs
VRT_SANTO	No TMDLs	No TMDLs
Total Number of Sites Sampled with TMDLs	**17**	**8**
Total Number of Sites with Exceedances	**6**	**7**

NS = Not Sampled; insufficient or no flow.

Table 69. TMDL Load Allocation Exceedances in 2009 – by Constituent & Watershed

Constituent	VCAILG Monitoring Sites with TMDL Load Allocation Exceedances		
	CC/OXD	SCR	VR
Nitrate-N (9 mg/L LA)	01T_ODD2_DCH 01T_ODD3_ARN 02D_BROOM 04D_ETTG 04D_LAS 05D_SANT_VCWPD	----------	No TMDLs
Ammonia-N + Nitrate-N (10 mg/L LA)	----------	S03T_BOULD S04T_TAPO	No TMDLs

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

Education Requirement

The Conditional Waiver requires Group participants to earn 8 hours of education credit. VCAILG members were given additional opportunities to fulfill the education requirement in 2009. The VCAILG sponsored and/or coordinated meetings focused on meeting education requirements as prescribed in the Water Quality Management Plan. Additional collaboration between the University of California Cooperative Extension (UCCE) and Resource Conservation District (RCD) to provide applicable field demonstrations of BMPs also took place in 2009. Table 70 lists the courses offered during 2009 that were attended by VCAILG members for education credit. Over the course of this Conditional Waiver, VCAILG members have taken advantage of 64 opportunities for education credits and a chance to learn about the Conditional Waiver and TMDL processes and requirements, results of the VCAILG Monitoring Program, complete surveys of management practices, and attend field demonstrations highlighting best management practices for improving water quality. Appendix H lists the number of education hours earned by each VCAILG member to date. Since the adoption of this Conditional Waiver, VCAILG members have completed 13,472 hours of water quality education, which is an average of 9.7 hours for each member.

Table 70. Courses Offered in 2009 for Education Credit

Date	Education Hours	Course Title	Course Coordinator and/or Sponsor [1]
3/25/09	2	Water Quality Management Plan Survey: First Priority	VCAILG
4/2/09	3	IPM Practices for Bedding Plants and Container Color	CORF/UCCE
4/15/09	3	CA Avocado Grower's Seminar: Creating our Future	CA Avocado Commission/UCCE
6/30/09	5	Vegetated Treatment Systems: Seminar	VCAILG/UCCE/RCD
Ongoing	1	VCAILG Management Practice Survey	VCAILG
6/10/09	1	Water Best Management Practices	CA Strawberry Commission
8/6/09	6.5	Vegetated Treatment Systems for Nurseries	UCCE
9/27/09	2	Water Quality Management Plan Survey: Second Priority	VCAILG
11/4/09	2	Sustainable Soil Seminar	VCAA

Conclusions and Recommendations

MONITORING PROGRAM REVISIONS

The only monitoring program change in 2009 was to move 06T_LONG upstream and investigate flow at two new sites, 06T_LONG2 and 06T_LONG3. Additional information regarding this site relocation can be found in the Monitoring Site Selection section.

RECOMMENDED MONITORING PROGRAM CHANGES

There are no monitoring program changes recommended at this time. 2010 is the last monitoring year under the current Conditional Waiver; therefore changes to the monitoring program will be discussed and explored through the Conditional Waiver renewal process.

PESTICIDE USE DATA SUBMITTAL

In the VCAILG 2008 Water Quality Management Plan (WQMP), pesticide usage was evaluated for 2007 and 2008. Site specific application data was obtained from the Ventura County Agricultural Commissioner's office and used to link pesticide applications to VCAILG monitoring sites. Amounts of chlorpyrifos and diazinon used within monitoring site drainage areas were then compared to water quality benchmark exceedances at each monitoring site. Data for 2009 will be available later in 2010 and a similar analysis will be performed for and included in the 2009 WQMP.