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**VENTURA COUNTY AGRICULTURAL
IRRIGATED LANDS GROUP (VCAILG)**

2010 Annual Monitoring Report

DRAFT

submitted to:

**LOS ANGELES REGIONAL WATER QUALITY
CONTROL BOARD**

prepared by:

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On behalf of the

**VENTURA COUNTY AGRICULTURAL
IRRIGATED LANDS GROUP (VCAILG)**



Table of Contents

List of Tables	iii
List of Figures	vi
List of Appendices	vii
Acronyms	viii
Introduction	1
Group Membership and Setting	3
Irrigated Agriculture in Ventura County.....	5
Calleguas Creek Watershed	8
Santa Clara River Watershed	10
Ventura River Watershed.....	12
VCAILG Participation in TMDLs	14
Water Quality Monitoring	14
Monitoring Objectives	14
Monitoring Site Selection	14
Parameters Monitored and Monitoring Frequency	24
Sampling Methods	27
Analytical Methods.....	28
Water Quality Benchmarks.....	29
Water Quality Monitoring Results.....	37
Calleguas Creek Watershed	38
Oxnard Coastal Watershed	70
Santa Clara River Watershed.....	73
Ventura River Watershed.....	93
Chronic Toxicity Test Results	97
Toxicity Sites Determined Most Sensitive Species	97
Single-Species Test Results	97
Evaluation of Data Quality	99
Data Quality Objectives	99
Summary of Benchmark Exceedances	110
Pesticides.....	110
Salts.....	110

Chronic Toxicity	110
Nitrogen	110
Dissolved Oxygen.....	111
Temperature	111
pH.....	111
Summary of TMDL Load Allocation Exceedances	117
Conditional Waiver (Order No. R4-2005-0080) Monitoring Summary	120
Site Specific Trends	127
Education Requirement.....	131
Conclusions and Recommendations.....	132
Monitoring Program Changes.....	132
Pesticide Use Data Submittal.....	132

List of Tables

Table 1. VCAILG Steering Committee Membership.....	3
Table 2. VCAILG Membership Statistics as of October 8, 2010.....	4
Table 3. Ventura County’s Leading Agricultural Commodities–2009.....	7
Table 4. Ventura County’s Statewide Commodity Rank by Gross Value – 2009.....	7
Table 5. VCAILG Monitoring Program Monitoring Site Locations.....	16
Table 6. Estimated Irrigated Acreage Represented at VCAILG Monitoring Sites.....	20
Table 7. Constituents and Monitoring Frequency for the VCAILG Monitoring Program.....	25
Table 8. VCAILG Sites Monitored and Constituents Sampled in 2010.....	26
Table 9. Analytical Methods.....	28
Table 10. Conditional Waiver Benchmarks Derived From Narrative Objectives and Toxicity...	30
Table 11. Conditional Waiver Benchmarks for Salts and Nutrients (Basin Plan Table 3-8 Numeric Water Quality Objectives).....	31
Table 12. Total Maximum Daily Load (TMDL) Load Allocations for Salts and Nutrients	32
Table 13. Conditional Waiver Benchmarks for Organochlorine Pesticides.....	33
Table 14. Total Maximum Daily Load (TMDL) Load Allocations for Organochlorine Pesticides	34
Table 15. Conditional Waiver Benchmarks for Organophosphorus Pesticides.....	35
Table 16. Total Maximum Daily Load (TMDL) Load Allocations for Organophosphorus Pesticides.....	35
Table 17. Conditional Waiver Benchmarks and Total Maximum Daily Load (TMDL) Load Allocations for Pyrethroid Pesticides.....	36
Table 18. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD2_DCH.....	39
Table 19. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD2_DCH.....	40
Table 20. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD3_ARN.....	42
Table 21. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD3_ARN.....	43
Table 22. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 02D_BROOM.....	45
Table 23. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 02D_BROOM.....	46
Table 24. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_ETTG.....	49
Table 25. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_ETTG.....	50
Table 26. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_LAS.....	52
Table 27. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_LAS.....	53
Table 28. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_SANT_VCWPD.....	55

Table 29. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_SANT_VCWPD56	
Table 30. 2010 VCAILG Monitoring Data: 05D_SANT_BKGD.....	58
Table 31. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_LAVD.....	60
Table 32. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_LAVD	61
Table 33. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 06T_FC_BR.....	64
Table 34. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 06T_FC_BR.....	65
Table 35. VCAILG Monitoring Data v. Waiver Benchmarks: 9BD_GERRY.....	68
Table 36. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 9BD_GERRY	69
Table 37. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: OXD_CENTR.....	71
Table 38. VCAILG Monitoring Data v. Waiver Benchmarks: S02T_ELLS	74
Table 39. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_ELLS	75
Table 40. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_TODD.....	77
Table 41. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_TODD.....	78
Table 42. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_TIMB.....	80
Table 43. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_TIMB.....	81
Table 44. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_BOULD	83
Table 45. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_BOULD	84
Table 46. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S03D_BARDS	86
Table 47. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S03D_BARDS	87
Table 48. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_HOPP.....	89
Table 49. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_HOPP.....	89
Table 50. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_TAPO.....	91
Table 51. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_TAPO	91
Table 52. VCAILG Monitoring Data v. Waiver Benchmarks: VRT_THACH.....	94
Table 53. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: VRT_SANTO	96
Table 54. Most Sensitive Species Selected for Toxicity Testing.....	97
Table 55. Chronic Toxicity Results for Single-Species Testing at Freshwater Sites for 2010....	98
Table 56. Chronic Toxicity Results for Single-Species Testing at High-Conductivity Sites for 2010.....	98
Table 57. Analytical Methods and Project Reporting Limits for Field Measurements	99
Table 58. Analytical Methods and Project Detection Limits for Laboratory Analyses: General Water Quality Constituents and Organochlorine Pesticides.....	100

Table 59. Analytical Methods and Project Detection Limits for Laboratory Analyses: Organophosphorus and Pyrethroid Pesticides	101
Table 60. Data Quality Objectives for Precision and Accuracy	102
Table 61. Quality Control Failures – 2010	104
Table 62. Data Completeness – 2010	108
Table 63. Water Quality Benchmark Exceedances in 2010 – by Site & Event.....	112
Table 64. Water Quality Benchmark Exceedances in 2010 – by Constituent & Watershed.....	113
Table 65. Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years	114
Table 66. TMDL Load Allocation Exceedances in 2010 – by Site & Event.....	118
Table 67. TMDL Load Allocation Exceedances in 2010 – by Constituent & Watershed.....	119
Table 68. Dry Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years	121
Table 69. Storm Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years	124
Table 70. Courses Offered in 2010 for Education Credit	131

List of Figures

Figure 1. Ventura County Watersheds.....	6
Figure 2. Calleguas Creek Watershed Agricultural Land Use.....	9
Figure 3. Santa Clara River Watershed Agricultural Land Use.....	11
Figure 4. Ventura River Watershed Agricultural Land Use	13
Figure 5. VCAILG Monitoring Sites Located in the Calleguas Creek/Oxnard Coastal Watersheds.....	17
Figure 6. VCAILG Monitoring Sites Located in the Santa Clara River Watershed.....	18
Figure 7. VCAILG Monitoring Sites Located in the Ventura River Watershed	19
Figure 8. Calleguas Creek Watershed Monitoring Sites and Agricultural Land Use.....	21
Figure 9. Santa Clara River Watershed Monitoring Sites and Agricultural Land Use.....	22
Figure 10. Ventura River Watershed Monitoring Sites and Agricultural Land Use	23
Figure 11. 01T_ODD2_DCH OC Pesticides Concentrations.....	127
Figure 12. 04D_ETTG OC Pesticides Concentrations	128
Figure 13. 04D_LAS OC Pesticides Concentrations.....	129
Figure 14. 05D_SANT_VCWPD Number of Exceedances per Monitoring Event.....	130

List of Appendices

- Appendix A. VCAILG Membership List
- Appendix B. 2010 Field Logbooks
- Appendix C. 2010 Field Measured Data
- Appendix D. 2010 Photo Documentation
- Appendix E. 2010 Chain-of-Custody Forms
- Appendix F. 2010 Water Quality Monitoring Data
- Appendix G. 2010 Chronic Toxicity Data
- Appendix H. VCAILG Member Education Hours Report

Acronyms

BMP	Best Management Practice
CC	Calleguas Creek
CCW	Calleguas Creek Watershed
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
SCRW	Santa Clara River Watershed
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
VRW	Ventura River Watershed
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, 2009, and 2010. 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. Updates to the WQMP were submitted on August 15th of 2009 and 2010. The most recent plan includes a summary of exceedances that occurred during the 2009 monitoring events and survey results, which are being used to track BMP implementation by VCAILG members within priority drainage areas. Survey results from the first tier priority drainage areas were included in the 2008 WQMP and second tier survey results can be found in the 2009 WQMP.

This document serves as the fourth and final Annual Monitoring Report summarizing data collected under the 2005 Conditional Waiver (Order No. R4-2005-0080). This report provides a detailed summary of activities of the VCAILG during 2010, 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. Future Annual Monitoring Reports will serve to comply with the new 2010 Conditional Waiver (Order No. R4-2010-0186), adopted on October 7, 2010 by the Los Angeles Regional Water Quality Control Board.

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 an 18-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, Ojai Basin GMA*	Citrus	Ventura River
Robert Crudup, Valley Crest Tree Company	Nursery Stock	Santa Clara River
Paul DeBusschere, DeBusschere Ranch	Strawberries, Avocados	Calleguas Creek
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 al.*	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
Jesse Gomez, 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
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. All membership statistics are from the end of the 2005 Conditional Waiver. At that time, VCAILG represented 1,380 Ventura County agricultural landowners and 83,661 irrigated acres. According to the Ventura County Assessor’s records, there are an estimated 250 landowners not enrolled in VCAILG at the end of the 2005 Conditional Waiver term. Therefore, at the conclusion of the 2005 Conditional Waiver, VCAILG represented 85 percent of agricultural landowners in Ventura County.

Table 2. VCAILG Membership Statistics as of October 8, 2010

Watershed	Landowner Count	Parcel Count	Irrigated Acres
Calleguas Creek	627	1,276	44,876
Oxnard Coastal	57	114	4,753
Santa Clara River	561	1,238	28,727
Ventura River	199	357	5,971
<i>Total</i>	1,444 ¹	2,985	83,661

1. There are 1,380 unique landowners enrolled, a number of whom own property in more than one watershed.

Since the adoption of the new 2010 Conditional Waiver, VCAILG has been working to re-enroll its members and reach out to those agricultural landowners not previously part of the discharger group. New membership information will be submitted to the Regional Board in April as part of VCAILG’s Notice of Intent to comply with the 2010 Conditional Waiver.

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 47,000), followed by the Santa Clara River Watershed (approximately 31,000), Ventura River Watershed (approximately 6,800), and finally the Oxnard Plain Coastal Watershed (approximately 4,200).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 VCAILG membership database and also includes estimated irrigated acreage for parcels not enrolled in VCAILG.

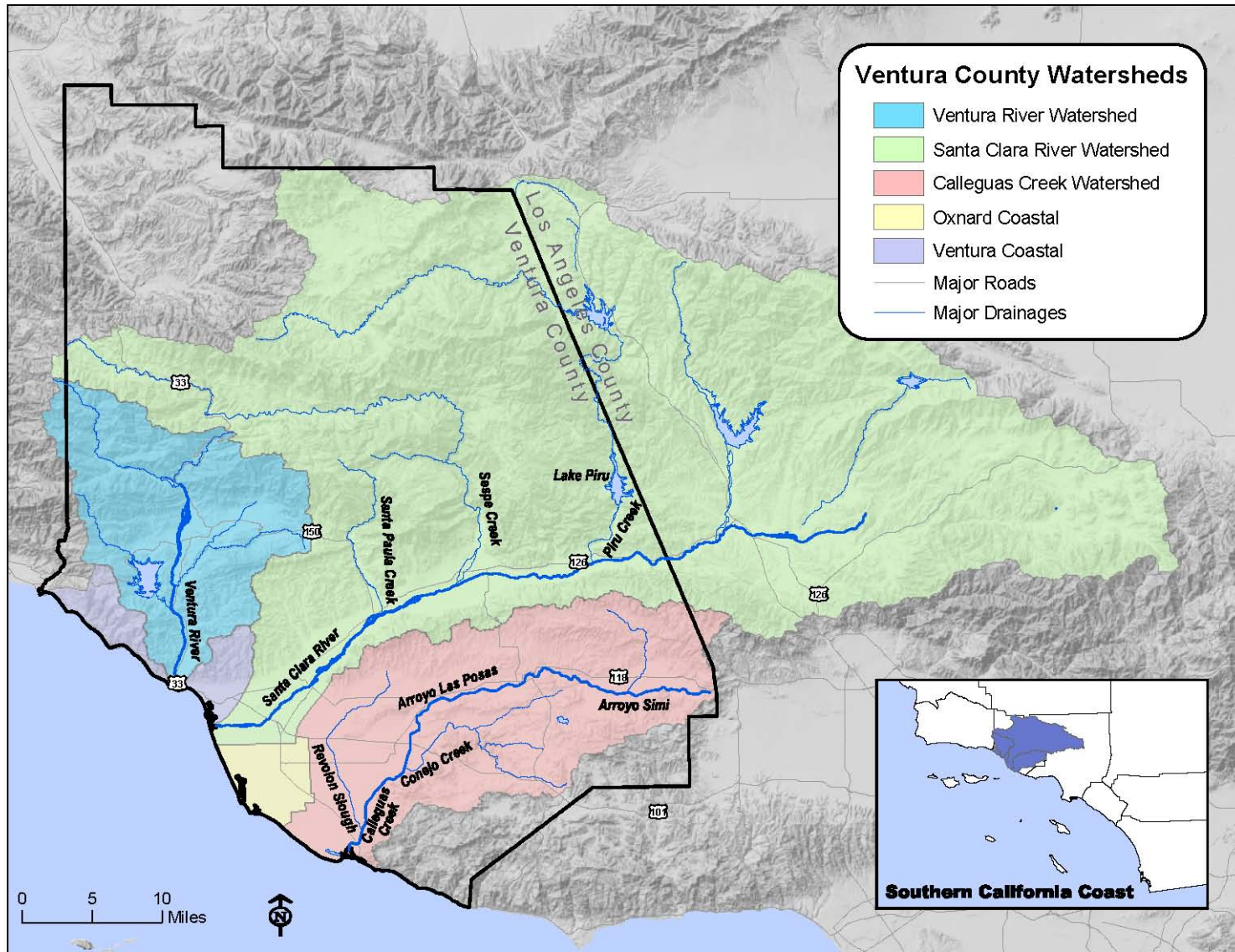


Figure 1. Ventura County Watersheds

Agriculture is a major industry in Ventura County, generating over \$1.62 billion in gross sales for 2009³. This gross value is up 0.7% from 2008⁴. Therefore, in 2009 Ventura County went up from 10th to 8th in statewide ranking. Ventura County was ranked as one of the top five counties in California for eleven agricultural commodities in 2009. Table 3 lists the County's ten leading crops in gross value for 2009. Table 4 lists the commodities for which Ventura County ranked in the top five of California's 58 counties for 2009.

Table 3. Ventura County's Leading Agricultural Commodities--2009

Commodity	Gross Value (\$)
1. Strawberries	515,406,000
2. Nursery Stock	191,300,000
3. Celery	169,488,000
4. Raspberries	155,327,000
5. Lemons	128,784,000
6. Tomatoes	127,130,000
7. Peppers	45,902,000
8. Avocados	43,677,000
9. Cut Flowers	42,763,000
10. Cabbage	20,053,000

Source: Ventura County Agricultural Commissioner. *County of Ventura Agricultural Crop Report 2009*. July 27, 2010.

Table 4. Ventura County's Statewide Commodity Rank by Gross Value – 2009

Commodity	Ventura County Rank Among 58 CA Counties	% of CA Total
Lemons	1	37.2
Celery	2	41.2
Raspberries	1	52.9
Strawberries	2	26.6
Cabbage	2	26.2
Avocados	3	16.5
Nursery Products	4	7.1
Mushrooms	3	18.0
Bell Peppers	2	19.8
Spinach	4	5.2
Oranges	4	1.5

Source: USDA, NASS, CA Field Office. *Summary of County Agricultural Commissioners' Reports,--California -2008-2009*. December 2010.

³ Ventura County Agricultural Commissioner. *Ventura County Crop Report 2009*. July 27, 2010.

⁴ 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.

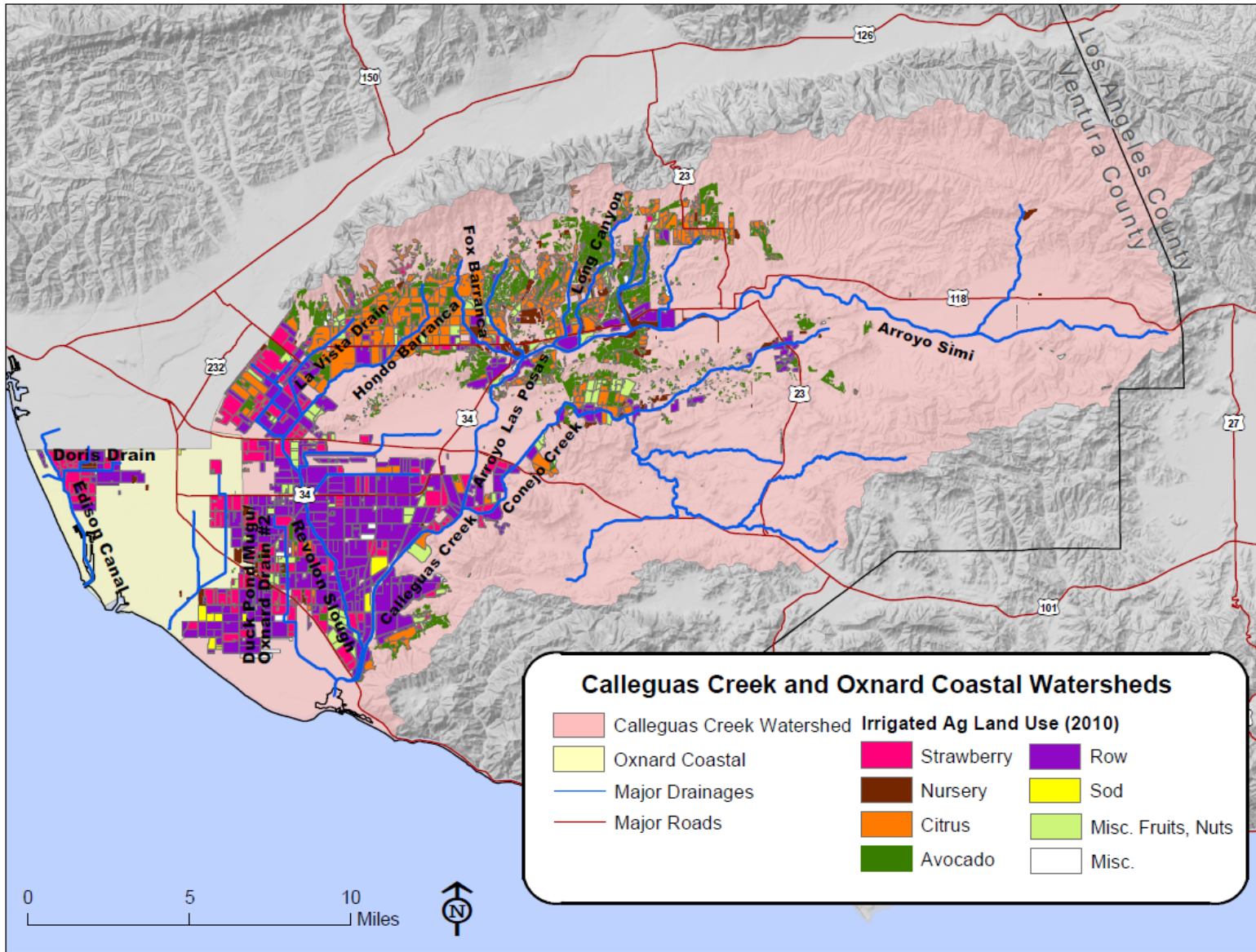


Figure 2. Calleguas Creek Watershed Agricultural Land Use

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 for bacteria in the Santa Clara River Estuary and Reaches 3, 5, 6, and 7 has been adopted by the Regional Board.

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 State 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).

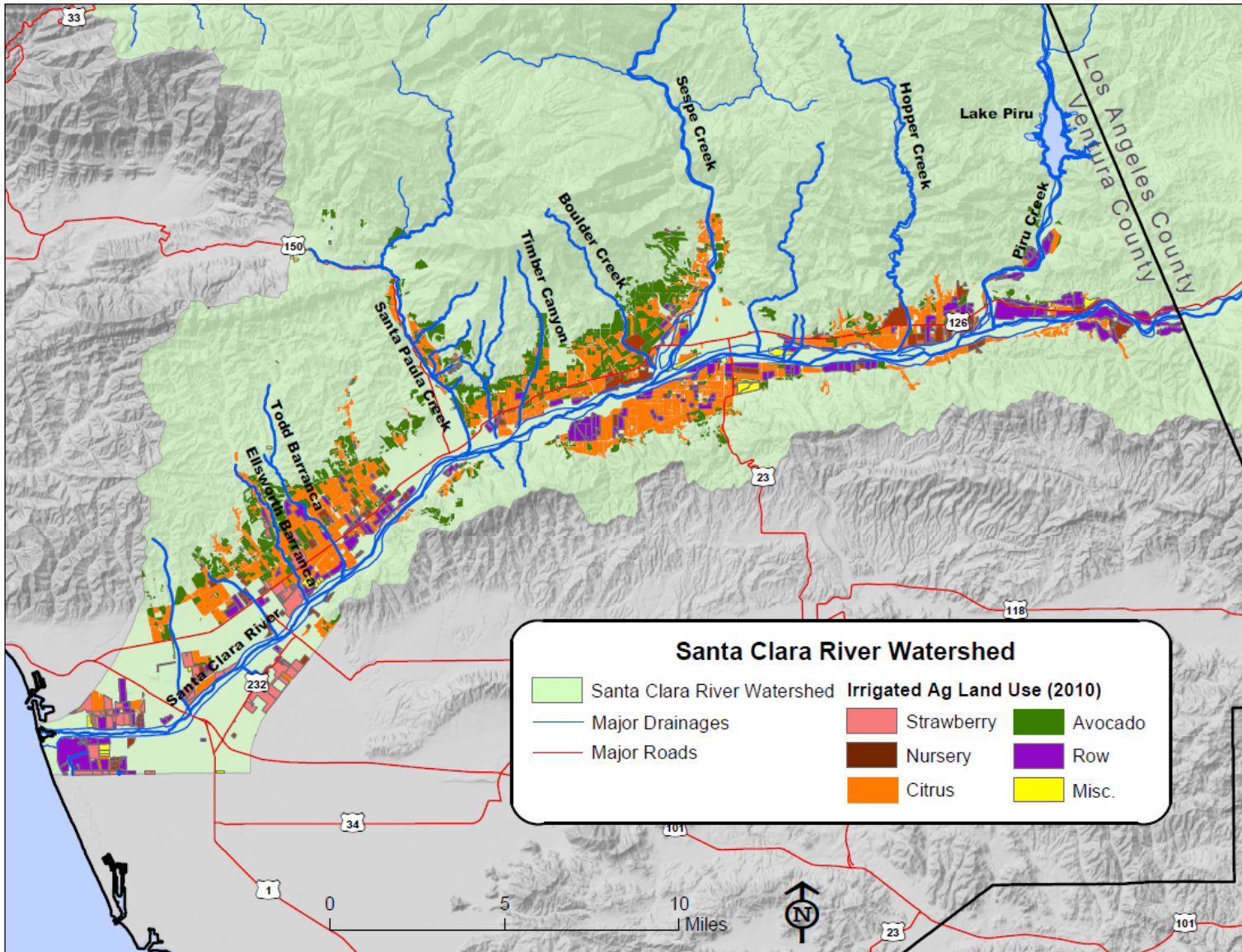


Figure 3. Santa Clara River Watershed Agricultural Land Use

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.

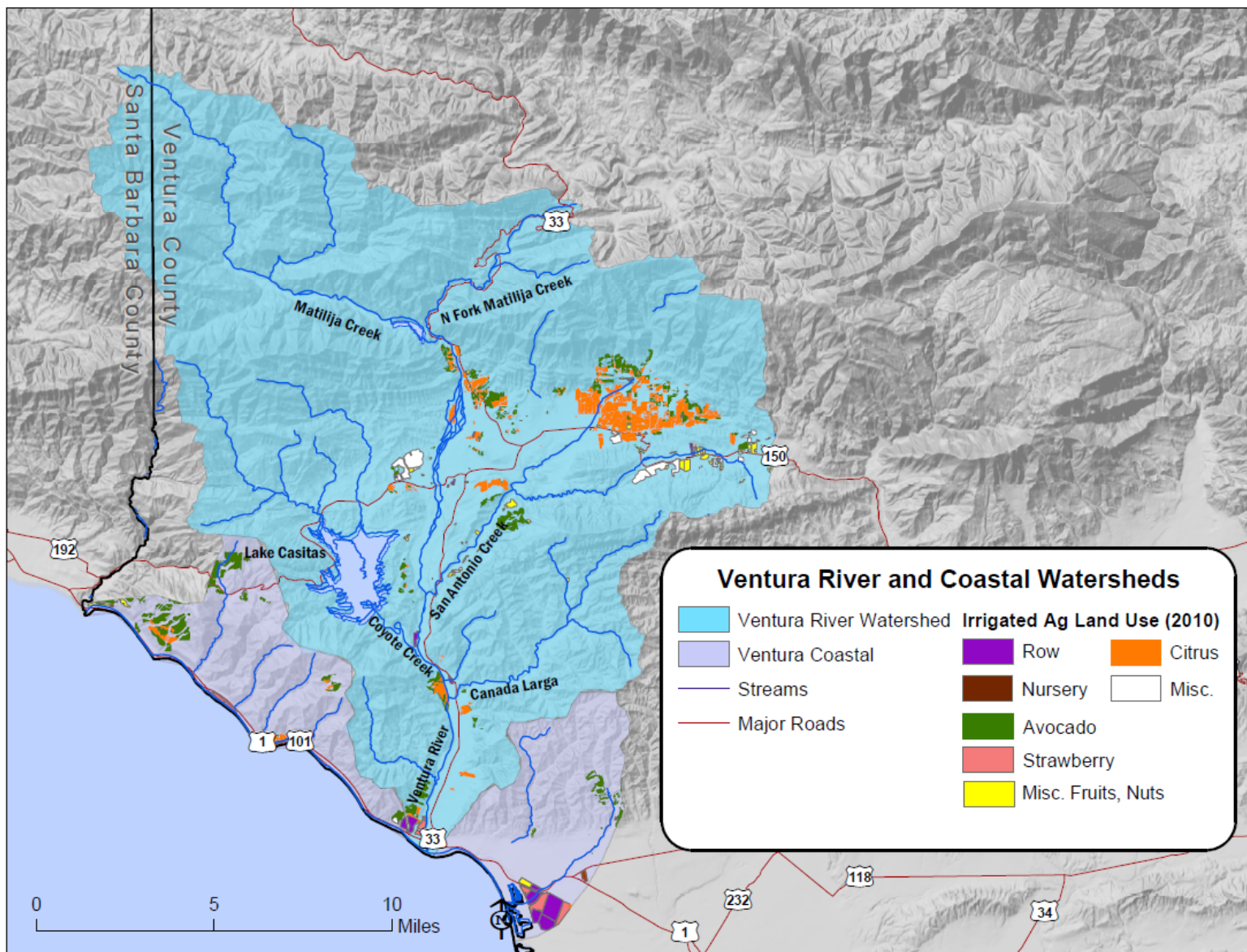


Figure 4. Ventura River Watershed Agricultural Land Use

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.

Effective TMDL monitoring requirements have been incorporated into the new 2010 Conditional Waiver (Order No. R4-2010-0186). Therefore, the VCAILG will coordinate with established TMDL monitoring programs or conduct additional monitoring where necessary in order to meet TMDL requirements.

Water Quality Monitoring

MONITORING OBJECTIVES

The objectives of the VCAILG Monitoring Program are as follows:

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

MONITORING SITE SELECTION

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

Additional site selection criteria included the following:

- Sub-watershed representation;
- Acreage of agricultural irrigated lands represented;

- Drainage into waterbodies included on the federal Clean Water Act 303(d) list of impaired waterbodies;
- Safe access during dry and wet weather.

Monitoring site selection in the Calleguas Creek Watershed was coordinated with monitoring sites identified in the Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP). Data collected at these coordinated sites are designed to augment TMDL implementation monitoring in that watershed by establishing loadings from agricultural inputs.

The format for the monitoring site ID/code is **XXXXA_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
	S02T_ELLS	2	T	Ellsworth Barranca at Telegraph Rd.	34.306805	-119.141275
	S02T_TODD	2	T	Todd Barranca at Hwy. 126	34.313584	-119.117095
	S03T_TIMB	3	T	Timber Canyon at Hwy. 126	34.370172	-119.020939
	S03T_BOULD	3	T	Boulder Creek at Hwy. 126	34.389578	-118.958738
Santa Clara River	S03D_BARDS	3	D	Discharge along Bardsdale Ave. upstream of confluence with Santa Clara River	34.371535	-118.964470
	S04T_HOPP	4	T	Hopper Creek at Hwy. 126	34.401616	-118.826799
	S04T_TAPO	4	T	Tapo Canyon Creek	34.401717	-118.723706
	S04T_TAPO_BKGD	4	B	S04T_TAPO background site upstream of agricultural operations	34.387316	-118.7204509
Ventura River	VRT_THACH	--	T	Thacher Creek at Ojai Avenue	34.446719	-119.210893
	VRT_SANTO	--	T	San Antonio Creek at Grand Avenue	34.454455	-119.221723

[1] Station IDs indicated in **bold** type signify Calleguas Creek Watershed TMDL Monitoring Program sites that 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).

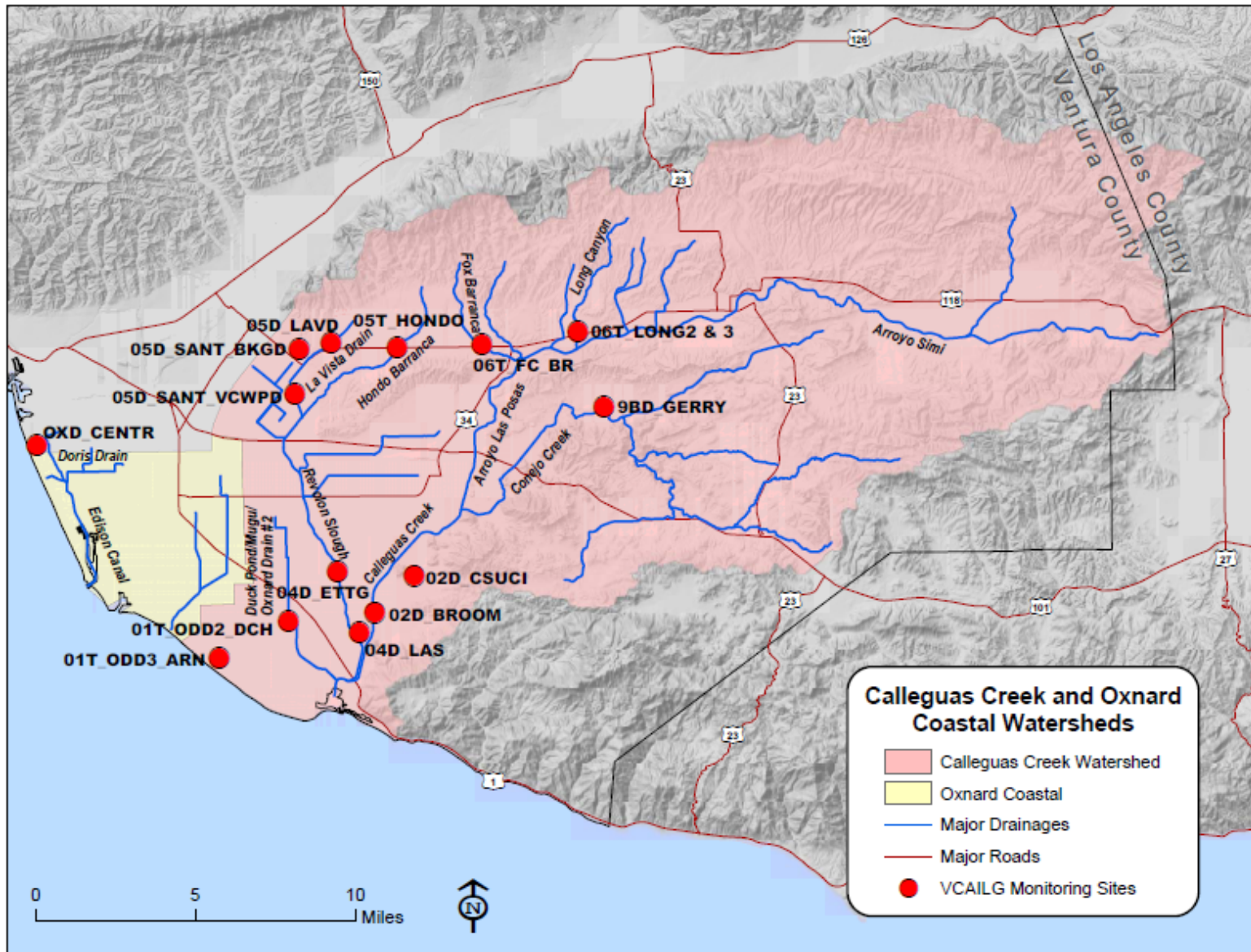


Figure 5. VCAILG Monitoring Sites Located in the Calleguas Creek/Oxnard Coastal Watersheds

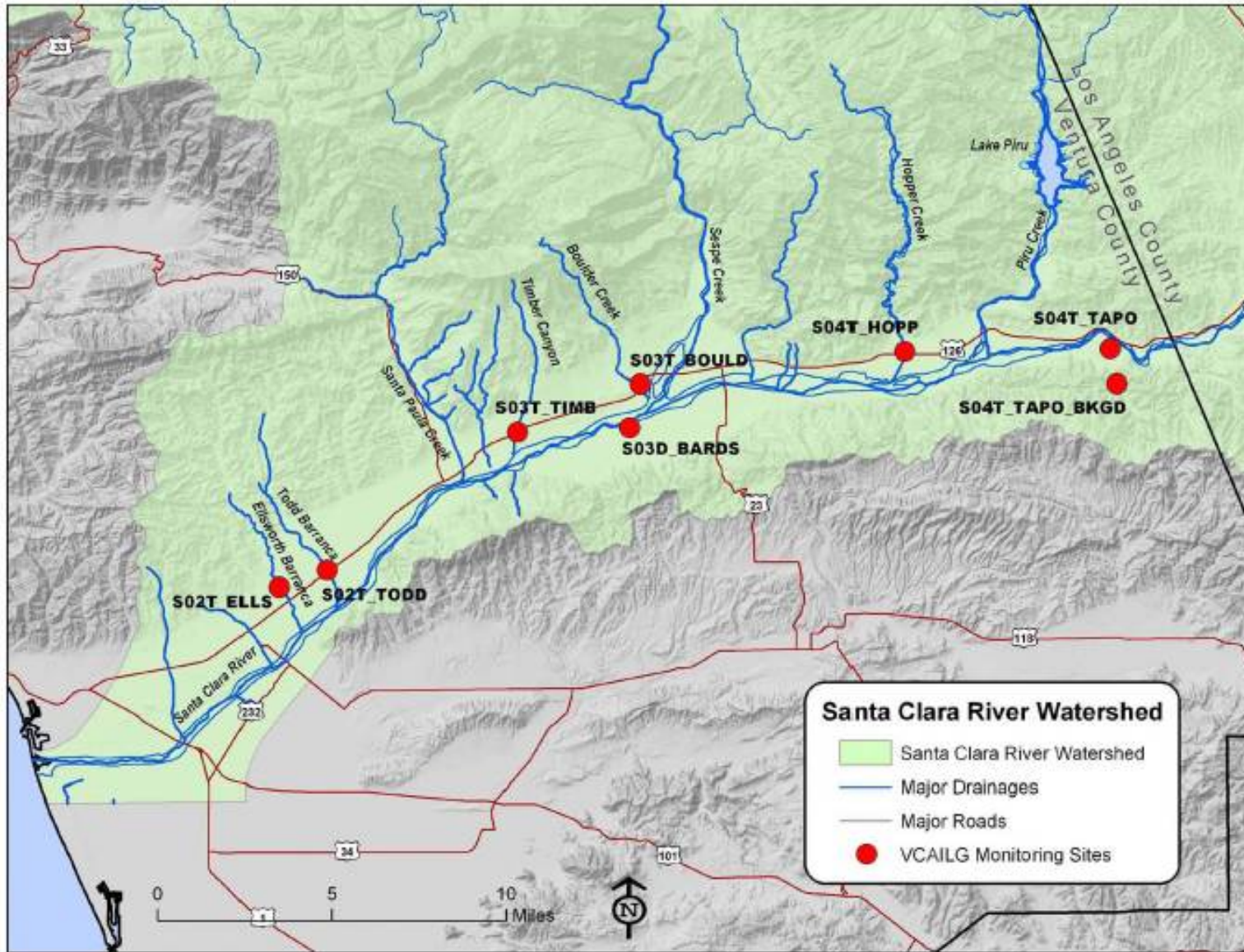


Figure 6. VCAILG Monitoring Sites Located in the Santa Clara River Watershed

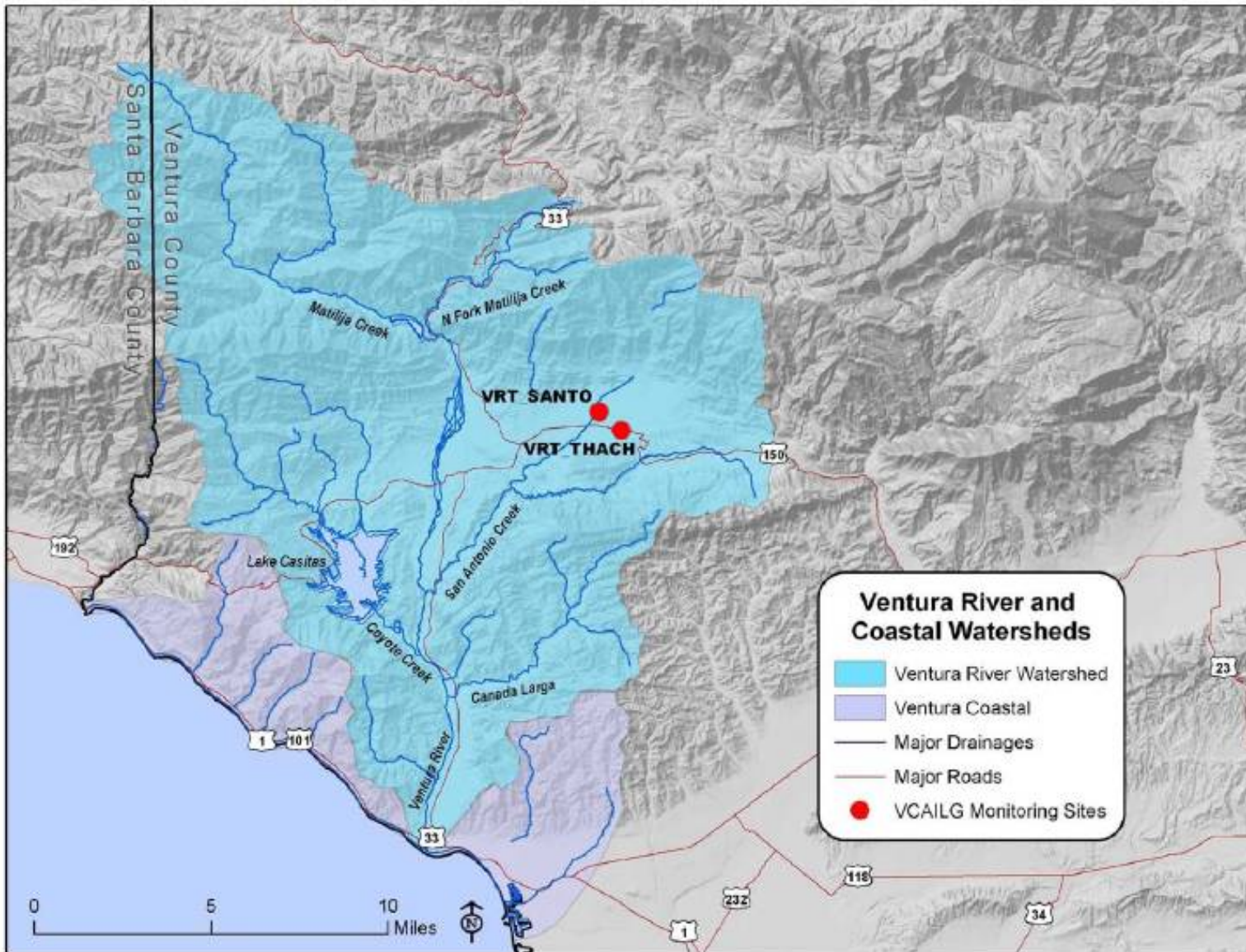


Figure 7. VCAILG Monitoring Sites Located in the Ventura River Watershed

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	2,356	3	17			1,032	11	366		1,564
01T_ODD3_ARN	1,002					76		578		800
02D_BROOM	2,748	0.25	341	327	3	104	423			8,236
04D_ETTG	4,847		116			1,088	52			3,779
04D_LAS	2,118	9				208	0.22	179	8	1,339
05D_LAVD	38		218	151		65	229			877
05D_SANT_VCWPD	675		376	174		161	33			1,154
05T_HONDO	9		1,107	531	1	62	34		5	3,928
06T_FC_BR	198	10	536	64		2	65		59	2,602
06T_LONG2	23		463	851		61	17		39	2,813
06T_LONG3			256	703		50			3	2,243
9BD_GERRY			47	703			89			447
OXD_CENTR	761	84	34			651				1,243
S02T_ELLS	74		276	526	2	98	21			9,015
S02T_TODD	51	33	222	170	1					5,748
S03D_BARDS	39		722	81					17	2,214
S03T_BOULD			175	661					166	3,764
S03T_TIMB	18		104	421	3					2,183
S04T_HOPP			12						14	15,141
S04T_TAPO	28		34						50	3,686
VRT_SANTO			289	242	13					7,220
VRT_THACH	6		636	153	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.

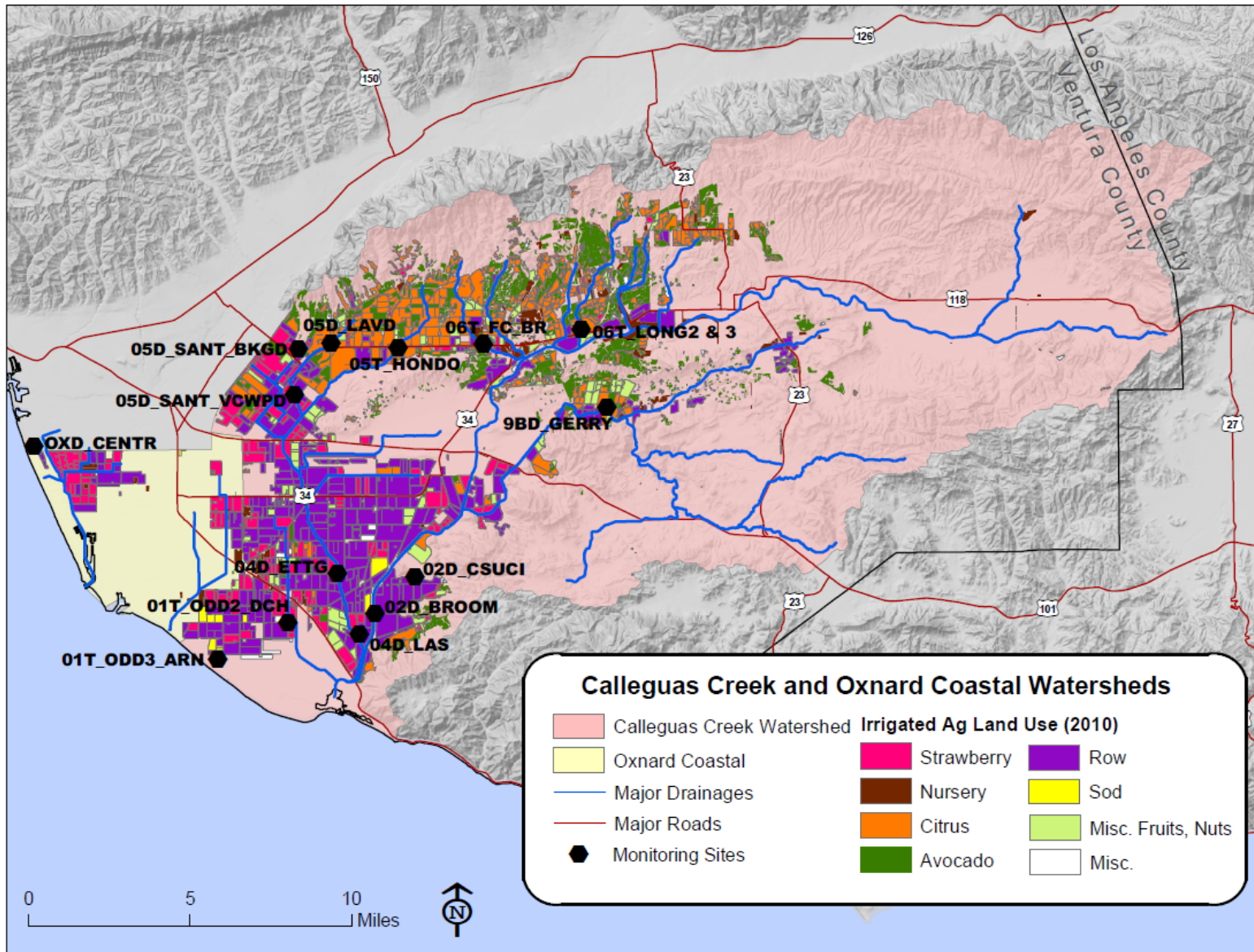


Figure 8. Calleguas Creek Watershed Monitoring Sites and Agricultural Land Use

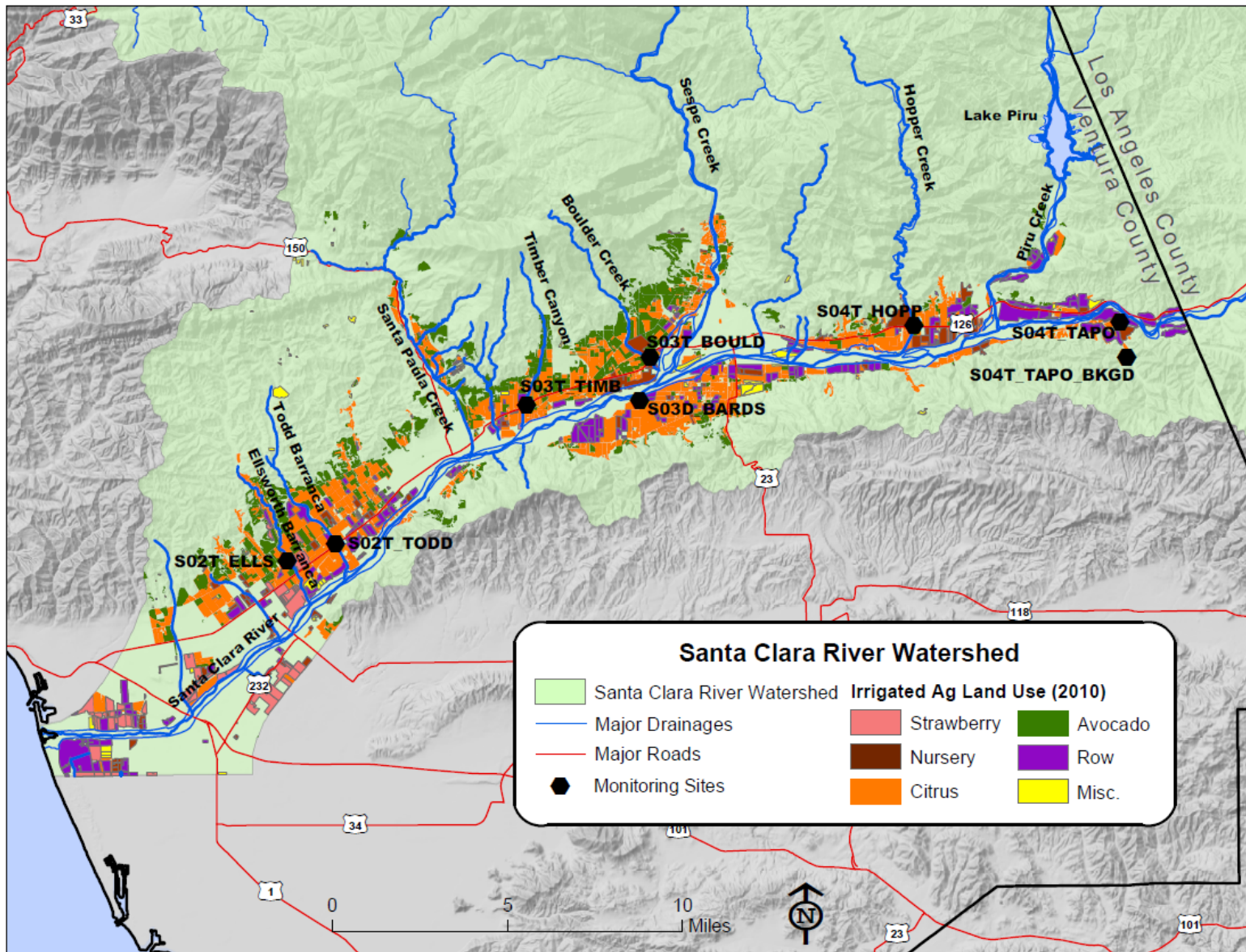


Figure 9. Santa Clara River Watershed Monitoring Sites and Agricultural Land Use

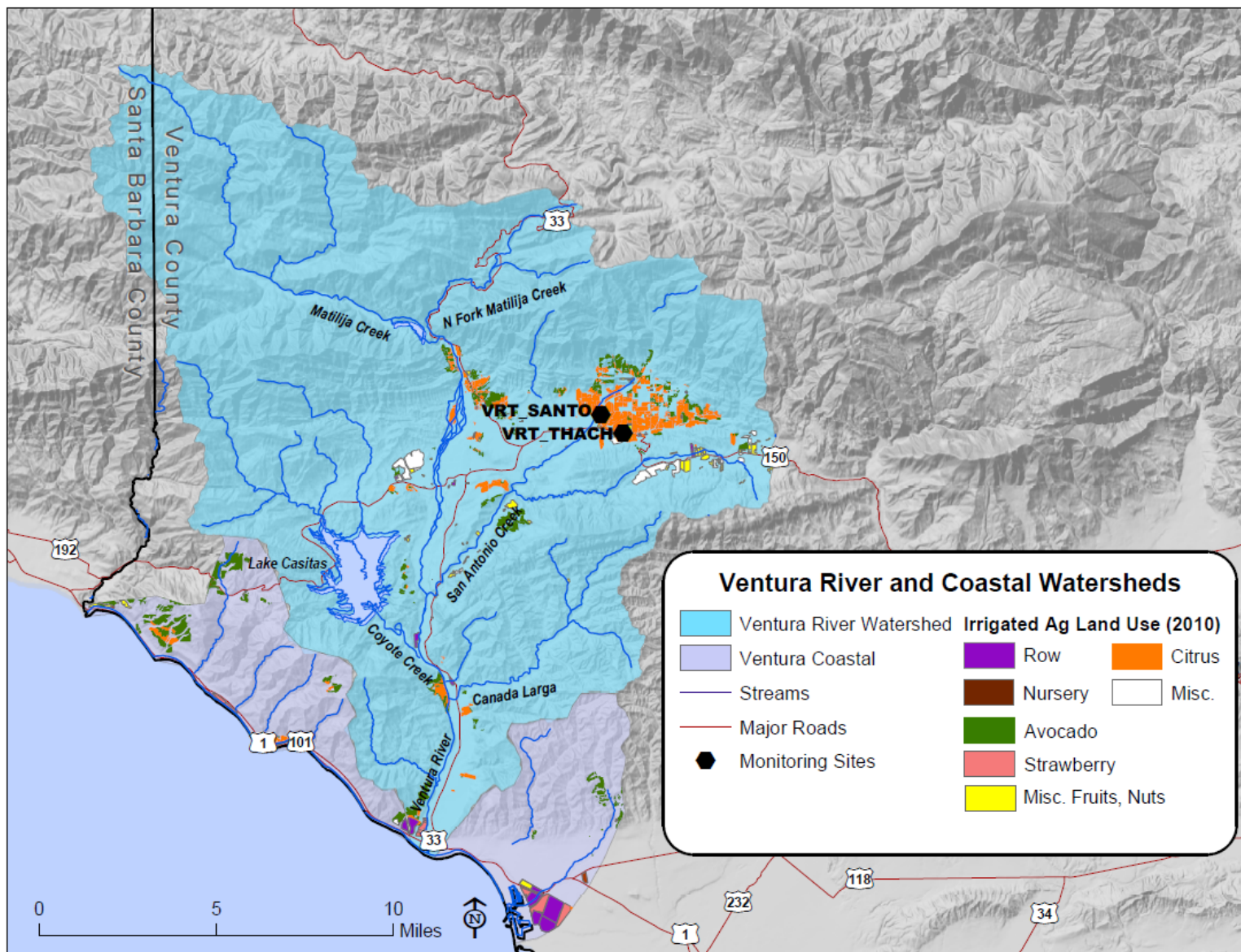


Figure 10. Ventura River Watershed Monitoring Sites and Agricultural Land Use

PARAMETERS MONITORED AND MONITORING FREQUENCY

The Conditional Waiver specifies the constituents to be monitored during each monitoring event as well as the monitoring frequency. 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 continued through 2010. The requirements are summarized in Table 7 for Phase II of the Monitoring Program, which covers the last two years of the previous Conditional Waiver (Order No. R4-2005-0080).

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 2010, the storm sampling event took place on January 20th. The January storm was the first storm of the year significant enough to initiate runoff. Rainfall near VCAILG monitoring sites ranged from greater than one inch to close to two inches. Runoff was produced at twenty sites during this storm sampling event.

The requisite dry weather event was conducted on August 17, 2010. 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 17th and all required samples for both programs were collected at that time. During the dry weather event, samples were collected from 10 monitoring sites. Table 8 provides a summary of monitoring sites and constituents that were sampled during each of the two monitoring events in 2010. 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 (2009 and 2010) of the previous Conditional Waiver (R4-2005-0080).
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, fensulfathion, 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 2010

Watershed / Subwatershed	Station ID	Reach	Wet Event	Dry Event
			January 20	August 17
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	NS	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	WQ, N, P	NS
	05D_LAVD	5	WQ, N, P	NS
	05T_HONDO	5	NS	NS
Calleguas Creek / Arroyo Las Posas	06T_FC_BR	6	WQ, N, P	TOX, WQ, N, P
	06T_LONG2 & 3	6	NS	NS
Calleguas Creek / Conejo Creek	9BD_GERRY	9B	WQ, N, P	NS
Oxnard Coastal	OXD_CENTR	--	WQ, N, P	WQ, N, P
	S02T_ELLS	2	WQ, N, P	TOX, WQ, N, P
	S02T_TODD	2	WQ, N, P	TOX, WQ, N, P
Santa Clara River	S03T_TIMB	3	WQ, N, P	NS
	S03T_BOULD	3	WQ, N, P	NS
	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	NS
Ventura River	VRT_THACH	--	WQ, N, P	NS
	VRT_SANTO	--	WQ, N, P	NS

TOX = Chronic Toxicity WQ = General Water Quality Constituents N = Nutrients P = Pesticides
 NS = Not Sampled; insufficient flow present or inaccessible.

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 January 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 practical. 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.*

During the storm event samples taken from 01T_ODD3_ARN, 04D_LAS, 05D_SANT_VCWPD, and 05D_LAVD were collected using intermediate containers; all other sites were sampled by direct immersion. For the dry weather event, intermediate containers were used at 01T_ODD3_ARN, S02T_ELLS, and 05D_SANT_VCWPD. Flow measurements were made according to the standard operating procedure included in Appendix C-1 of the QAPP, as previously noted.

During both 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 2010. Two new laboratories were used during event 11. Methods used for event 11 that differ from the previous sampling event are shown in parenthesis.

Table 9. Analytical Methods

Constituent	Analytical Method
Aquatic Toxicity ¹	
Chronic (7 day) <i>Ceriodaphnia dubia</i> ²	EPA-821-R-02-013, EPA/500/R-99/064
Chronic (7 day) <i>Pimephales promelas</i> ³	
Chronic (96-hour) <i>Selenastrum capricornutum</i> ⁴	
General Water Quality Constituents (WQ)	
Flow, pH, Temperature, Dissolved Oxygen, Conductivity, Turbidity	Field Measurement
Total Dissolved Solids (TDS)	SM 2540C, E
Total Suspended Solids (TSS)	SM 2540D
Chloride	EPA 300.0
Sulfate	EPA 300.0
Total Ammonia-N	SM 4500-NH ₃ F (SM 4500-NH ₃ B/C)
Nitrate-N	EPA 300.0
Phosphate (Total Orthophosphate as P)	SM4500-PD (EPA 300.0)
Organic Constituents ⁵	
Organochlorine Pesticides	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 2010 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 2010.
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.

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 as specified in the 2005 Conditional Waiver (R4-2005-0080) used to evaluate monitoring data collected at VCAILG monitoring sites in 2010. Benchmarks used for this purpose include numeric and narrative water quality objectives contained in Appendix 1 and Appendix 2 in the previous 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. Comparisons against TMDL load allocations are included solely for the purpose of evaluating compliance with applicable load allocations, but not as a trigger for WQMPs. 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 ≤ pH ≤ 8.5 Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Temperature	CC, OXD, SCR, VR	For waters designated WARM, water temperature shall not be altered by more than 5°F above the natural temperature. At no time shall WARM-designated waters be raised above 80°F as a result of waste discharges.	WARM: ≤ 80°F Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
	SCR, VR	For waters designated COLD, water temperature shall not be altered by more than 5°F above the natural temperature.	COLD: No numeric benchmark. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Dissolved Oxygen	OXD	No single dissolved oxygen determination shall be less than 5 mg/L, except when natural conditions cause lesser concentrations.	≥ 5 mg/L
	CC, SCR, VR	The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges.	WARM: ≥ 5 mg/L
	SCR, VR	The dissolved oxygen content of all surface waters designated as COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.	COLD, SPWN: ≥ 7 mg/L
Turbidity	CC, OXD, SCR, VR	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: <ul style="list-style-type: none"> ▪ Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%; ▪ Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%. 	No numeric benchmarks. Changes to ambient receiving water conditions are not assessed; "ambient" or "natural" conditions have not been established
Biostimulatory Substances	CC, OXD, SCR, VR	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.	No numeric benchmarks. Waterbody-specific benchmarks for nutrients are listed in Tables 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.	≤ 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. R4-2005-0080, 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)

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

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

Constituent	CC Watershed	OXD Watershed	SCR Watershed	VR Watershed
	Load Allocation (ug/L) ¹	Load Allocation (ug/L) ²	Load Allocation (ug/L) ³	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.
3. A Santa Clara River Estuary Toxaphene TMDL was adopted as part of the new 2010 Conditional Waiver. Monitoring data to assess compliance with load allocations in this TMDL will be collected as part of the new VCAILG Monitoring Program. This TMDL was not effective when 2010 monitoring data was collected.

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 ¹ (ug/L)	Final LA (ug/L)	Load Allocation Source ²	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

- 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.
- "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.

Table 17. Conditional Waiver Benchmarks and Total Maximum Daily Load (TMDL) Load Allocations for Pyrethroid Pesticides

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

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

1. There 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 2010. 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 "Total Orthophosphate" on data tables presented in this section. The electronic data file remains unconverted and is labeled "Total Orthophosphate as P."

Results of toxicity tests conducted in 2010 are discussed separately in a subsequent section.

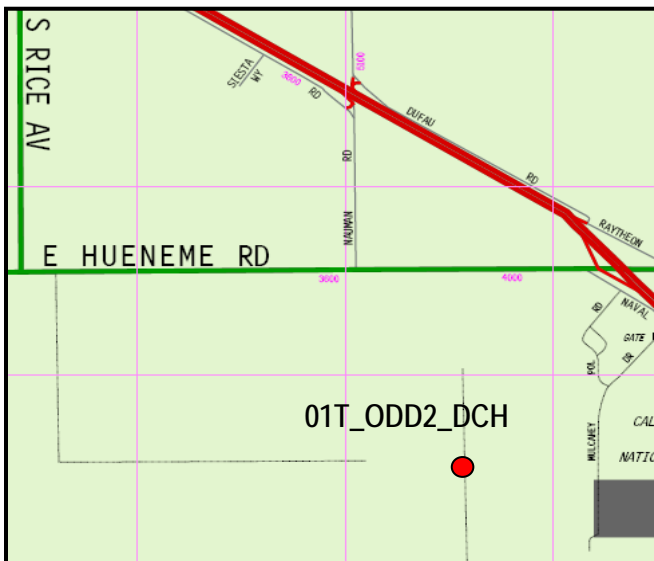
Calleguas Creek Watershed

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 2010. 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, chlordane, and toxaphene exceeded applicable benchmarks only during the event 10 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 and strawberries are the predominant crops that drain to this monitoring site. This site is a second tier priority monitoring drainage as identified in the VCAILG 2008 WQMP.

Table 18. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD2_DCH

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		179.60 EST	3.03
pH		6.5 ≤ pH ≤ 8.5	7.42	7.82
Temperature	°C		12.04	20.87
Dissolved Oxygen	mg/L	≥ 5	NM	12.72
Turbidity	NTU		1876	6.6
Conductivity	µS/cm		1729	3617
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		1380	3200
Total Suspended Solids (TSS)	mg/L		1570	4
Chloride	mg/L		77.2	170
Sulfate	mg/L		663	1640
Total Ammonia-N	mg/L	5.08 / 1.07 ¹	0.21	0.22
Nitrate-N	mg/L	10 ²	30	49
Total Orthophosphate	mg/L		10.20	0.80
Organochlorine Pesticides				
cis-Nonachlor	µg/L		0.0096	ND
trans-Nonachlor	µg/L		0.0275	ND
Chlordane-alpha	µg/L		0.0357	ND
Chlordane-gamma	µg/L		0.0336	ND
Total Chlordane	µg/L	0.00059	0.1064	ND
DCPA (Dacthal)	µg/L		0.051	NM
2,4'-DDD	µg/L		0.0468	ND
2,4'-DDE	µg/L		0.0134	ND
2,4'-DDT	µg/L		0.045	ND
4,4'-DDD	µg/L	0.00084	0.156	ND
4,4'-DDE	µg/L	0.00059	0.7186	ND
4,4'-DDT	µg/L	0.00059	0.2549	ND
Toxaphene	µg/L	0.0002	2.59763	ND
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	2.6457	ND
Diazinon	µg/L	0.1	0.021	ND
Malathion	µg/L		0.0572	ND

Site table continues on next page.

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Pyrethroid Pesticides</i>				
Bifenthrin	µg/L		0.1724	0.0028
Cypermethrin	µg/L		0.0432	ND
Danitol	µg/L		0.1244	ND
Permethrin	µg/L		0.2044	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 19. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD2_DCH

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9 ¹	30	49

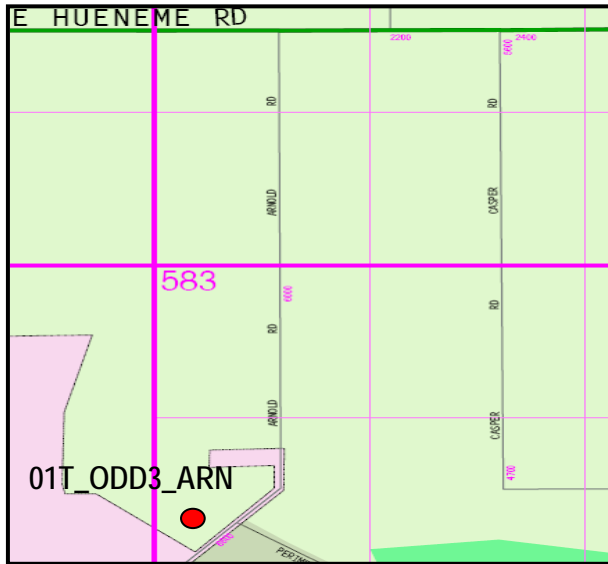
Note: Concentration in ***bold italics*** indicate and exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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.

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 2010 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.

Both measured nitrogen compounds were below the benchmark during the storm event, but exceeded the benchmark during dry weather sampling. Organochlorine pesticides were detected at this site during both dry and wet weather monitoring events. The OP pesticide chlorpyrifos and the OC pesticide toxaphene, exceeded their respective benchmarks only during the wet event. 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. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 01T_ODD3_ARN

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		NM	NM
pH		6.5 ≤ pH ≤ 8.5	7.35	7.66
Temperature	°C		12.09	21.66
Dissolved Oxygen	mg/L	≥ 5	NM	10.03
Turbidity	NTU		99.3	55.7
Conductivity	µS/cm		2674	6782
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		1610	5070
Total Suspended Solids (TSS)	mg/L		60.5	92
Chloride	mg/L		567	1360
Sulfate	mg/L		503	1760
Total Ammonia-N	mg/L	5.96 / 1.47 ¹	0.24	4.4
Nitrate-N	mg/L	10 ²	10	47
Total Orthophosphate	mg/L		1.93	ND
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0056	ND
Chlordane-alpha	µg/L		0.0065	ND
Chlordane-gamma	µg/L		0.0068	ND
Total Chlordane	µg/L	0.00059	0.0189	ND
DCPA (Dacthal)	µg/L		0.0108	NM
2,4'-DDD	µg/L		0.01	0.0096
2,4'-DDT	µg/L		0.0085	0.0059
4,4'-DDD	µg/L	0.00084	0.0334	0.0256
4,4'-DDE	µg/L	0.00059	0.1431	0.0727
4,4'-DDT	µg/L	0.00059	ND	0.0058
Endosulfan Sulfate	µg/L	240	0.0883	ND
Toxaphene	µg/L	0.0002	0.91712	0.0014
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	0.0336	ND
Diazinon	µg/L	0.1	0.0061	ND
Malathion	µg/L		0.0671	ND

Site table continues on next page.

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Pyrethroid Pesticides</i>				
Bifenthrin	µg/L		0.0053	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.

ND = Not Detected

NM = Not Measured

- 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.
- 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. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 01T_ODD3_ARN

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9 ¹	<i>10</i>	<i>47</i>

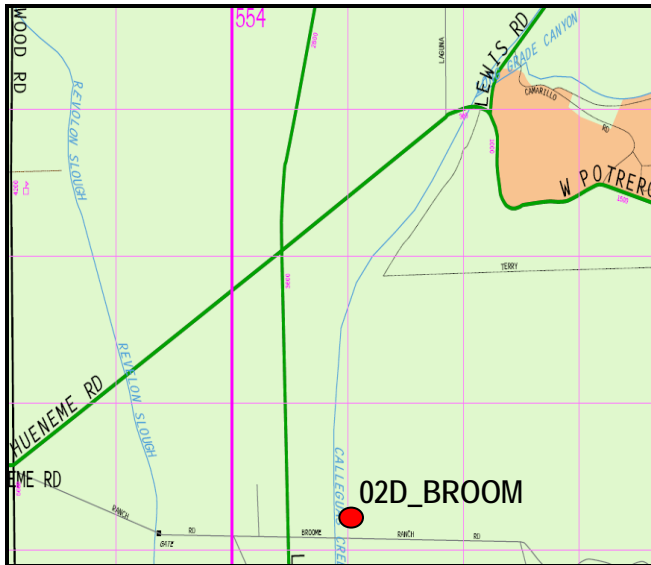
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

- 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.

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 January 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, DDT compounds, and toxaphene. 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. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 02D_BROOM

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
Field Measurements					
Flow	CFS		0.45	Not Sampled; site dry	
pH		6.5 ≤ pH ≤ 8.5	7.47		
Temperature	°C	≤ 26.67°C ¹	13.69		
Dissolved Oxygen	mg/L	≥ 5	NM		
Turbidity	NTU		16.1		
Conductivity	µS/cm		2828		
General Water Quality					
Total Dissolved Solids (TDS)	mg/L		2170		
Total Suspended Solids (TSS)	mg/L		18.6		
Chloride	mg/L		264		
Sulfate	mg/L		961		
Total Ammonia-N	mg/L	4.72 / --- ²	0.18		
Nitrate-N	mg/L	10 ³	45		
Total Orthophosphate	mg/L		1.26		
Organochlorine Pesticides					
Chlordane-alpha	µg/L		0.0052		
Total Chlordane	µg/L	0.00059	0.0101		
DCPA (Dacthal)	µg/L		0.3094		
2,4'-DDD	µg/L		0.0057		
4,4'-DDD	µg/L	0.00084	0.0061		
4,4'-DDE	µg/L	0.00059	0.0475		
4,4'-DDT	µg/L	0.00059	0.0167		
Toxaphene	µg/L	0.0002	0.65784		
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	0.0137		
Diazinon	µg/L	0.1	0.0122		
Malathion	µg/L		0.0763		
Pyrethroid Pesticides					
Danitol	µg/L		0.0022		

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.

NM = Not Measured

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.
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 for this site.

Table 23. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 02D_BROOM

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9 ¹	45	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.

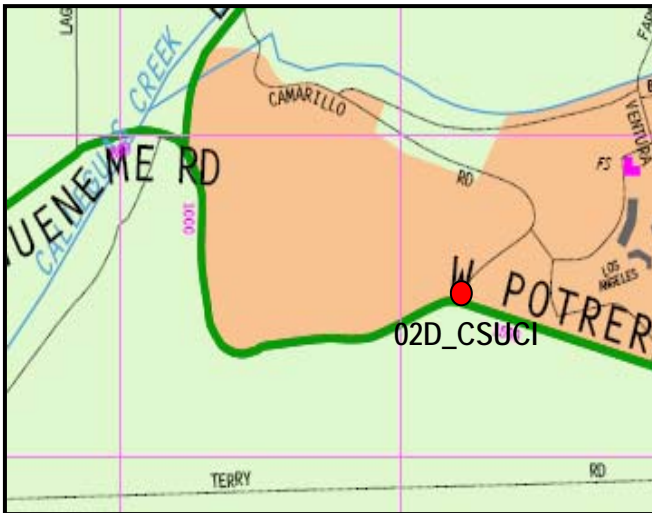
NS = Not Sampled

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.

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.

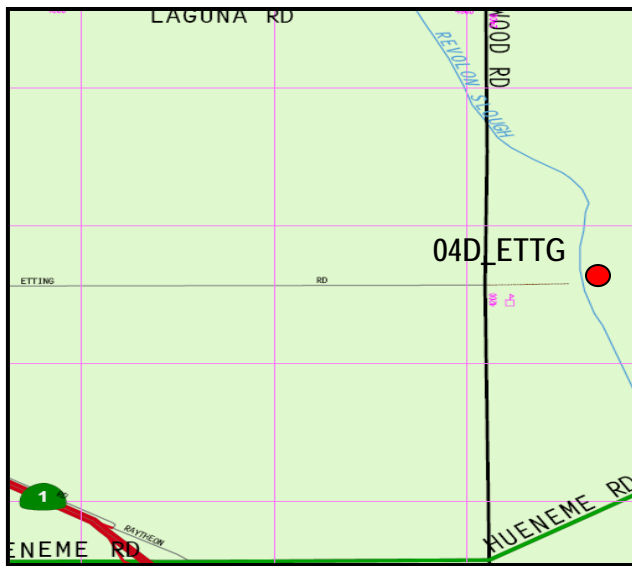


There was not sufficient flow at this site during the January storm when samples were collected at 02D_BROOM.

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 events. Table 24 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 25 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Concentrations of nitrate, 4,4'-DDE exceeded benchmarks during both monitoring events. Chlordane, chlorpyrifos, toxaphene, two DDT compounds benchmarks were exceeded during the storm event. Row crops and strawberries are the predominant crop types that drain to this monitoring site. This site is a second tier priority monitoring site as identified in the VCAILG 2008 WQMP.

Table 24. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_ETTG

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		31.09 EST	3.13
pH		$6.5 \leq \text{pH} \leq 8.5$	7.51	7.84
Temperature	°C	$\leq 26.67^\circ\text{C}^1$	14.47	22.67
Dissolved Oxygen	mg/L	≥ 5	NM	8.89
Turbidity	NTU		597	16
Conductivity	µS/cm		4184	4466
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		3990	3910
Total Suspended Solids (TSS)	mg/L		840	28
Chloride	mg/L		309	360
Sulfate	mg/L		1990	1730
Total Ammonia-N	mg/L	$4.34 / 1.79^2$	0.43	0.45
Nitrate-N	mg/L	10^3	98	82
Total Orthophosphate	mg/L		4.63	22.06
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0093	ND
Chlordane-alpha	µg/L		0.0112	ND
Chlordane-gamma	µg/L		0.012	ND
Total Chlordane	µg/L	0.00059	0.0371	ND
DCPA (Dacthal)	µg/L		0.0588	NM
2,4'-DDD	µg/L		0.0532	ND
2,4'-DDE	µg/L		0.0233	ND
2,4'-DDT	µg/L		0.0787	ND
4,4'-DDD	µg/L	0.00084	0.1385	ND
4,4'-DDE	µg/L	0.00059	0.8505	0.0196
4,4'-DDT	µg/L	0.00059	0.2434	ND
Toxaphene	µg/L	0.0002	2.48512	ND
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	0.266	ND
Diazinon	µg/L	0.1	0.0457	ND
Malathion	µg/L		0.2504	ND

Site table continues on next page.

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Pyrethroid Pesticides</i>				
Bifenthrin	µg/L		0.0085	ND
Cypermethrin	µg/L		0.0169	ND
Permethrin	µg/L		0.172	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 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.
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 for this site.

Table 25. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_ETTG

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9 ¹	98	82

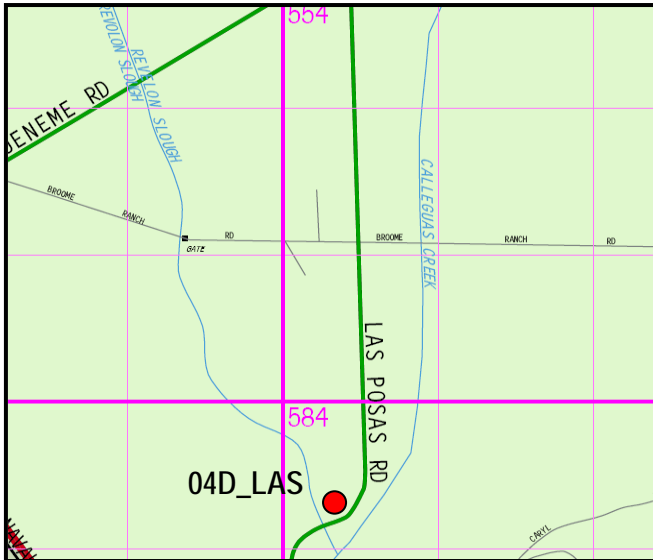
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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.

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 26 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 27 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Benchmarks for nitrate, 4,4'-DDD, and 4,4'-DDE were exceeded during both monitoring event. The following constituents were only exceeded during the storm event: chlordane, 4,4'-DDT, toxaphene, and chlorpyrifos. Row crops are the primary crop type in the vicinity of this site. This is a second tier priority monitoring site drainage area under the VCAILG 2008 WQMP.

Table 26. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 04D_LAS

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		NM	17.28
pH		$6.5 \leq \text{pH} \leq 8.5$	7.68	8.05
Temperature	°C	$\leq 26.67^\circ\text{C}^1$	13.5	25.19
Dissolved Oxygen	mg/L	≥ 5	NM	15.93
Turbidity	NTU		317.5	27.3
Conductivity	$\mu\text{S}/\text{cm}$		3493	3922
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		2820	3170
Total Suspended Solids (TSS)	mg/L		332	45
Chloride	mg/L		323	400
Sulfate	mg/L		1240	1310
Total Ammonia-N	mg/L	$3.91 / 1.14^2$	0.16	0.17
Nitrate-N	mg/L	10^3	52	39
Total Orthophosphate	mg/L		4.20	1.20
Organochlorine Pesticides				
trans-Nonachlor	$\mu\text{g}/\text{L}$		0.0078	ND
Chlordane-alpha	$\mu\text{g}/\text{L}$		0.0074	ND
Chlordane-gamma	$\mu\text{g}/\text{L}$		0.0054	ND
Total Chlordane	$\mu\text{g}/\text{L}$	0.00059	0.0237	ND
DCPA (Dacthal)	$\mu\text{g}/\text{L}$		1.0551	NM
2,4'-DDD	$\mu\text{g}/\text{L}$		0.0218	ND
2,4'-DDE	$\mu\text{g}/\text{L}$		0.0071	ND
2,4'-DDT	$\mu\text{g}/\text{L}$		0.022	ND
4,4'-DDD	$\mu\text{g}/\text{L}$	0.00084	0.0528	0.007
4,4'-DDE	$\mu\text{g}/\text{L}$	0.00059	0.3398	0.0234
4,4'-DDT	$\mu\text{g}/\text{L}$	0.00059	0.1007	ND
Toxaphene	$\mu\text{g}/\text{L}$	0.0002	1.19914	ND
Organophosphorus Pesticides				
Chlorpyrifos	$\mu\text{g}/\text{L}$	0.025	0.1368	ND
Diazinon	$\mu\text{g}/\text{L}$	0.1	0.0078	ND

Site table continues on next page.

Constituent	Units	Benchmark	Event 10	Event 11
			Wet 1/20/2010	Dry 8/17/2010
<i>Pyrethroid Pesticides</i>				
Cyfluthrin	µg/L		0.0217	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.

ND = Not Detected

NM = Not Measured

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.
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 for this site.

Table 27. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 04D_LAS

Constituent	Units	Load Allocation	Event 10	Event 11
			Wet 1/20/2010	Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9 ¹	52	39

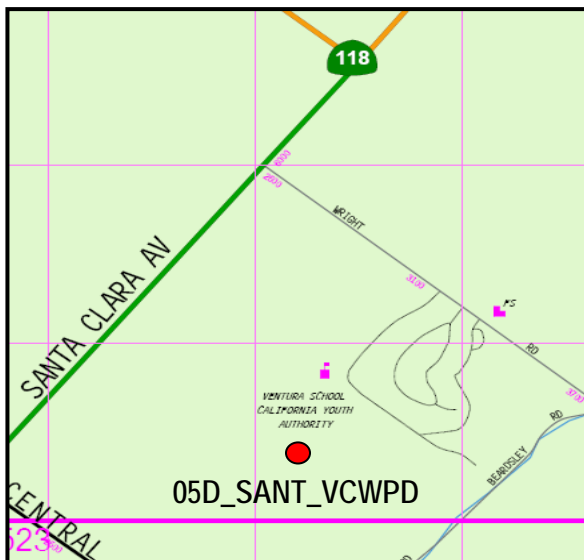
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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.

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 2010 monitoring events. Table 28 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 29 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

During the dry weather event the following general water quality parameters were exceeded: TDS, sulfate, and nitrate. 4,4'-DDE was exceeded during both events. During the storm additional pesticides were detected and exceeded benchmarks. 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. Flow was present at 05D_SANT_BKGD during the January storm. Two pesticides were detected at the background site above the corresponding benchmarks, chlordane and 4,4'-DDE. 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 28. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_SANT_VCWPD

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Field Measurements</i>				
Flow	CFS		90.49	2.30
pH		6.5 ≤ pH ≤ 8.5	8.22	8.07
Temperature	°C	≤ 26.67°C ¹	9.81	17.39
Dissolved Oxygen	mg/L	≥ 5	10.99	11.4
Turbidity	NTU		3000	1.1
Conductivity	µS/cm		494.9	2193
<i>General Water Quality</i>				
Total Dissolved Solids (TDS)	mg/L	850	394	1680
Total Suspended Solids (TSS)	mg/L		4300	9
Chloride	mg/L	150	35	140
Sulfate	mg/L	250	158	760
Total Ammonia-N	mg/L	2.35 / 1.82 ²	0.49	ND
Nitrate-N	mg/L	10	5.7	16
Total Orthophosphate	mg/L		8.80	ND
<i>Organochlorine Pesticides</i>				
cis-Nonachlor	µg/L		0.0094	ND
trans-Nonachlor	µg/L		0.0295	ND
Chlordane-alpha	µg/L		0.0419	ND
Chlordane-gamma	µg/L		0.0302	ND
Total Chlordane	µg/L	0.00059	0.111	ND
DCPA (Dacthal)	µg/L		0.2267	NM
2,4'-DDD	µg/L		0.0719	ND
2,4'-DDE	µg/L		0.0265	ND
2,4'-DDT	µg/L		0.0393	ND
4,4'-DDD	µg/L	0.00084	0.3199	ND
4,4'-DDE	µg/L	0.00059	1.6405	0.0069
4,4'-DDT	µg/L	0.00059	0.192	ND
Toxaphene	µg/L	0.0002	2.45101	ND
<i>Organophosphorus Pesticides</i>				
Chlorpyrifos	µg/L	0.025	2.5667	ND
Diazinon	µg/L	0.1	0.0267	ND
Malathion	µg/L		0.2161	ND

Site table continues on next page.

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Pyrethroid Pesticides</i>				
Bifenthrin	µg/L		0.1465	ND
Cypermethrin	µg/L		1.1408	ND
Permethrin	µg/L		0.7262	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.

ND = Not Detected

NM = Not Measured

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 29. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_SANT_VCWPD

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9 ¹	5.7	16

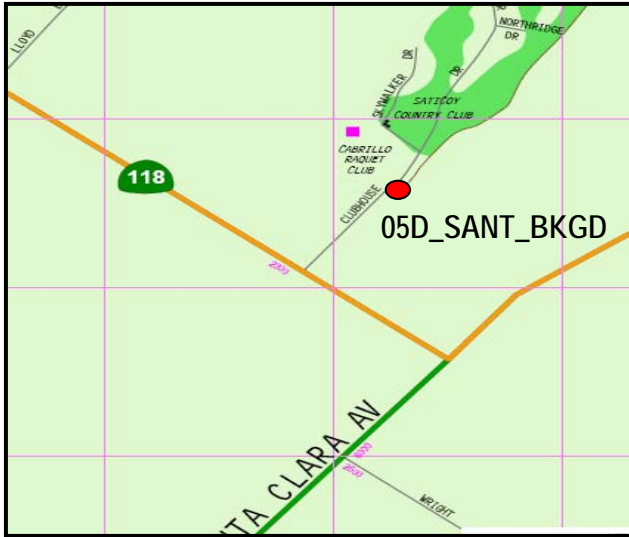
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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.

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.



Samples were collected from 05D_SANT_VCWPD during both 2010 monitoring events. This background site was sampled during the January storm and results show that there was a non-agricultural contribution to exceedances in 4,4'-DDE and chlordane.

Table 30. 2010 VCAILG Monitoring Data: 05D_SANT_BKGD

Constituent	Units	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
<i>Field Measurements</i>				
Flow	CFS	11.28	Not Sampled; site dry	
pH		8.03		
Temperature	°C	10.42		
Dissolved Oxygen	mg/L	10.72		
Turbidity	NTU	539		
Conductivity	µS/cm	340.1		
<i>General Water Quality</i>				
Total Dissolved Solids (TDS)	mg/L	248		
Total Suspended Solids (TSS)	mg/L	413		
Chloride	mg/L	24.3		
Sulfate	mg/L	67.3		
Total Ammonia-N	mg/L	0.13		
Nitrate-N	mg/L	0.4		
Total Orthophosphate	mg/L	2.97		
<i>Organochlorine Pesticides</i>				
Chlordane-alpha	µg/L	0.0059		
Total Chlordane	µg/L	0.0156		
4,4'-DDE	µg/L	0.0117		

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.

General water quality parameters of TDS, sulfate, and nitrate were elevated above applicable benchmarks during the January storm sample. Benchmarks were exceeded for DDT compounds, toxaphene, and chlorpyrifos. This is a first tier priority monitoring drainage as first identified in the VCAILG 2007 WQMP.

Table 31. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 05D_LAVD

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
Field Measurements					
Flow	CFS		1.14 EST	Not Sampled; site dry	
pH		$6.5 \leq \text{pH} \leq 8.5$	8.0		
Temperature	°C	$\leq 26.67^\circ\text{C}^1$	10.61		
Dissolved Oxygen	mg/L	≥ 5	10.64		
Turbidity	NTU		1457		
Conductivity	µS/cm		1381		
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	850	947		
Total Suspended Solids (TSS)	mg/L		855		
Chloride	mg/L	150	74.4		
Sulfate	mg/L	250	412		
Total Ammonia-N	mg/L	$3.13 / \text{---}^2$	0.15		
Nitrate-N	mg/L	10	27		
Total Orthophosphate	mg/L		3.98		
Organochlorine Pesticides					
2,4'-DDT	µg/L		0.0059		
4,4'-DDD	µg/L	0.00084	0.0251		
4,4'-DDE	µg/L	0.00059	0.1206		
4,4'-DDT	µg/L	0.00059	0.0342		
Toxaphene	µg/L	0.0002	0.26557		
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	0.7929		
Diazinon	µg/L	0.1	0.0243		
Malathion	µg/L		0.0974		
Pyrethroid Pesticides					
Bifenthrin	µg/L		0.011		
Cypermethrin	µg/L		0.0575		

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. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 05D_LAVD

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
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.

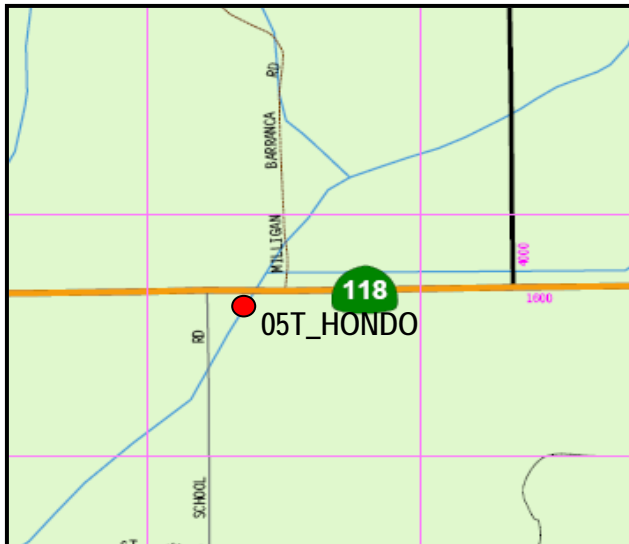
NS = Not Sampled

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.

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

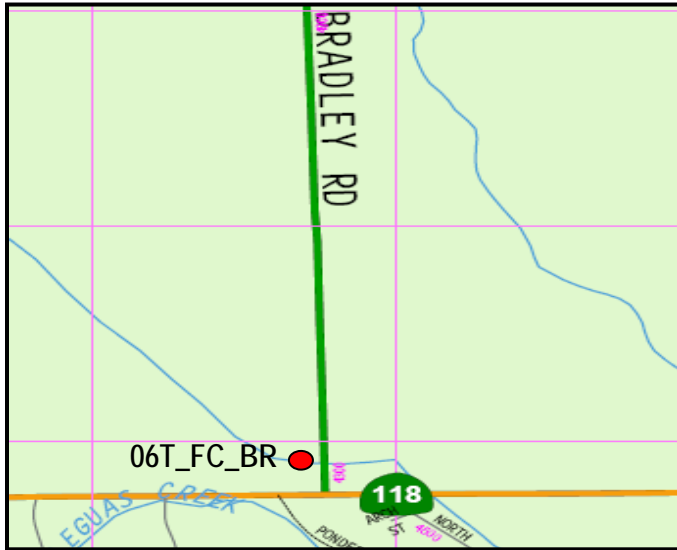


No flow was present at this site during the 2010 monitoring events. Hondo Barranca drains land planted primarily in citrus, avocado, and row crops. This site is a third tier priority monitoring site under the 2010 WQMP.

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 present at this site during both 2010 monitoring events. Table 33 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 34 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Exceedances of pesticides benchmarks occurred during the storm and dry weather events. During dry weather there were also exceedances for pH and temperature. This site drains mostly citrus orchards and smaller acreages planted in avocados, nursery stock, and row crops. As per the 2009 WQMP, this site is ranked as a third tier priority drainage.

Table 33. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: 06T_FC_BR

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		0.65	0.02
pH		6.5 ≤ pH ≤ 8.5	8.2	8.72
Temperature	°C	≤ 26.67°C ¹	9.76	27.11
Dissolved Oxygen	mg/L	≥ 5	10.61	7.03
Turbidity	NTU		3000	194.6
Conductivity	µS/cm		347.9	704.2
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	850	230	500
Total Suspended Solids (TSS)	mg/L		3220	1420
Chloride	mg/L	150	27.8	16
Sulfate	mg/L	250	43.5	156
Total Ammonia-N	mg/L	2.44 / 0.33 ²	0.5	0.22
Nitrate-N	mg/L	10	3	1.9
Total Orthophosphate	mg/L		11.12	0.17
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0055	ND
Chlordane-alpha	µg/L		0.0069	0.006
Total Chlordane	µg/L	0.00059	0.0188	0.0132
DCPA (Dacthal)	µg/L		0.0133	NM
2,4'-DDD	µg/L		0.0126	0.008
2,4'-DDE	µg/L		0.0071	0.008
2,4'-DDT	µg/L		0.0173	0.0323
4,4'-DDD	µg/L	0.00084	0.0601	0.0233
4,4'-DDE	µg/L	0.00059	0.2678	0.423
4,4'-DDT	µg/L	0.00059	0.0503	0.0953
Dieldrin	µg/L	0.00014	ND	0.032
Toxaphene	µg/L	0.0002	0.74154	0.0025
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	0.0307	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.

ND = Not Detected

NM = Not Measured

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. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 06T_FC_BR

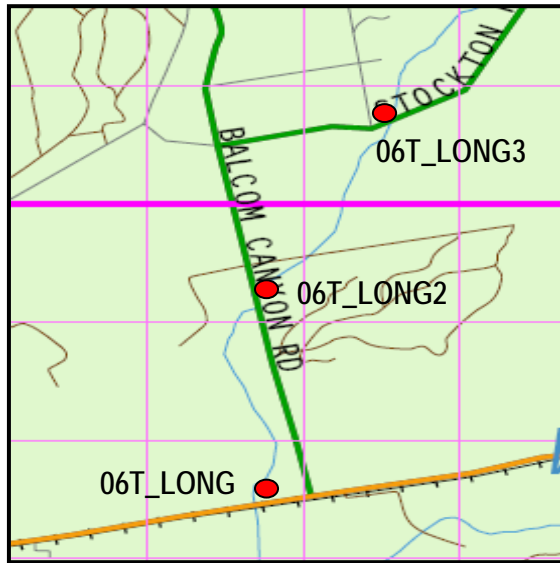
Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9 ¹	3	1.9

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.

06T_LONG2 and 06T_LONG3

Following direction from Regional Board staff, the following upstream sites were established due to multiple years of no flow at 06T_LONG; 06T_LONG2 and 06T_LONG3 were visited for all 2010 sampling events. 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.

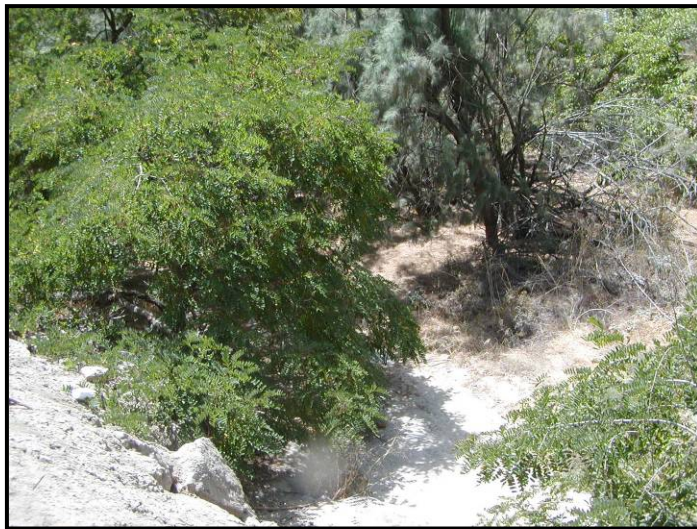
Map of Sites



06T_LONG2 view upstream



06T_LONG3 view upstream

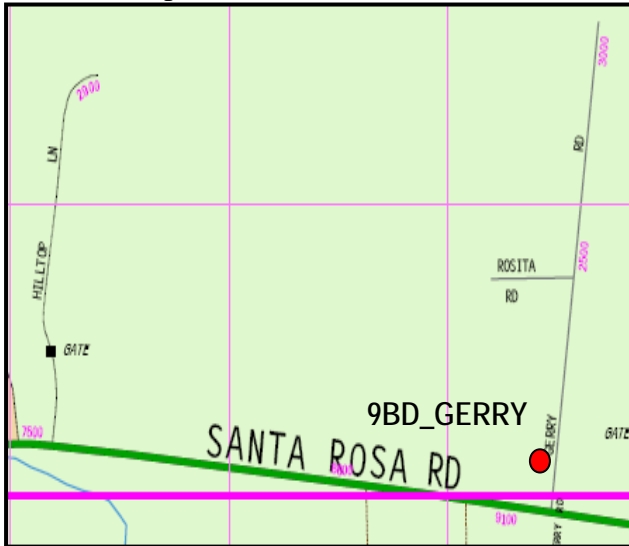


The original site, 06T_LONG, as well as the new upstream locations (06T_LONG2 and 06T_LONG3) have been dry during all 11 VCAILG monitoring events. Absence of flow at this site signifies a lack of runoff from the citrus and avocado orchards, as well as smaller acreages of nursery stock and row crops that 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 2010 storm was the second monitoring event where flow was present at this site. Table 35 contains a summary of constituents detected during the storm event 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.

Benchmark exceedances include chlordane, DDT compounds, toxaphene, and chlorpyrifos. Acreage planted in citrus and avocado orchards and berries drain to this site.

Table 35. VCAILG Monitoring Data v. Waiver Benchmarks: 9BD_GERRY

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
Field Measurements					
Flow	CFS		2.19	Not Sampled; site dry	
pH		6.5 ≤ pH ≤ 8.5	8.12		
Temperature	°C	≤ 26.67°C ¹	10.27		
Dissolved Oxygen	mg/L	≥ 5	NM		
Turbidity	NTU		2939		
Conductivity	µS/cm		301.7		
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	850	230		
Total Suspended Solids (TSS)	mg/L		4640		
Chloride	mg/L	150	33		
Sulfate	mg/L	250	37.2		
Total Ammonia-N	mg/L	2.67 / --- ²	0.58		
Nitrate-N	mg/L	10	9.6		
Total Orthophosphate	mg/L		13.3		
Organochlorine Pesticides					
cis-Nonachlor	µg/L		0.0652		
trans-Nonachlor	µg/L		0.1819		
Chlordane-alpha	µg/L		0.1945		
Chlordane-gamma	µg/L		0.1823		
Total Chlordane	µg/L	0.00059	0.6239		
DCPA (Dacthal)	µg/L		0.0228		
4,4'-DDD	µg/L	0.00084	0.1215		
4,4'-DDE	µg/L	0.00059	0.4184		
Heptachlor Epoxide	µg/L		0.0086		
Toxaphene	µg/L	0.0002	1.22504		
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	0.4927		

Site table continues on next page.

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Pyrethroid Pesticides</i>				
Bifenthrin	µg/L		0.3373	Not sampled; site dry
Cyfluthrin	µg/L		0.1062	
L-Cyhalothrin	µg/L		0.0558	
Cypermethrin	µg/L		0.1667	
Danitol	µg/L		0.0107	

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.

NM = Not Measured

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. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: 9BD_GERRY

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Nitrate-N	mg/L	9	9.6	NS

2. 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.

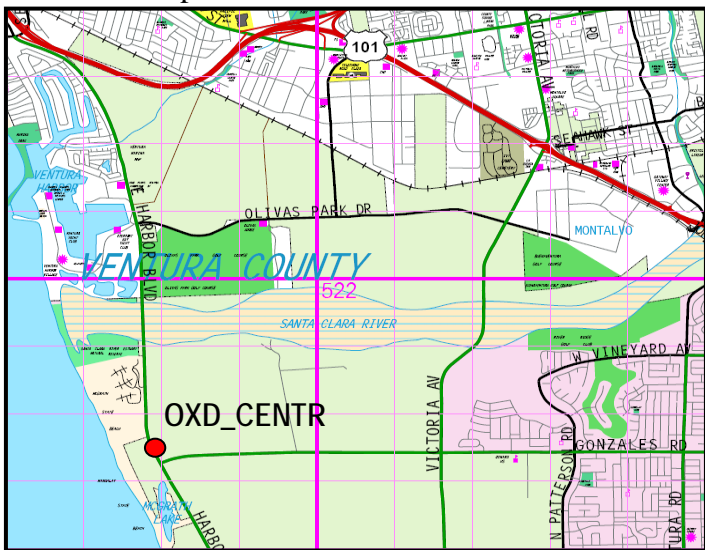
Oxnard Coastal Watershed

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 37 contains a summary of constituents detected in one or more monitoring events and provides a comparison of those concentrations with applicable water quality benchmarks.

Only two benchmark exceedances (nitrate and toxaphene) occurred during the dry weather event. Benchmarks exceeded during the storm event included chlordane, DDT compounds, toxaphene, and chlorpyrifos. 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 37. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: OXD_CENTR

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		93.20	0.96
pH		6.5 ≤ pH ≤ 8.5	7.68	7.55
Temperature	°C		11.51	18.26
Dissolved Oxygen	mg/L	≥ 5	10.02	7.75
Turbidity	NTU		2719	3
Conductivity	µS/cm		2719	3468
General Water Quality				
Total Dissolved Solids (TDS)	mg/L		626	2850
Total Suspended Solids (TSS)	mg/L		1870	8
Chloride	mg/L		46.6	280
Sulfate	mg/L		351	1400
Total Ammonia-N	mg/L	4.44 / 3.28 ¹	0.35	0.28
Nitrate-N	mg/L	10 ²	8.7	17
Total Orthophosphate	mg/L		7.75	ND
Organochlorine Pesticides				
cis-Nonachlor	µg/L		0.0163	ND
trans-Nonachlor	µg/L		0.0462	ND
Chlordane-alpha	µg/L		0.0733	ND
Chlordane-gamma	µg/L		0.0726	ND
Total Chlordane	µg/L	0.00059	0.2084	ND
DCPA (Dacthal)	µg/L		0.0388	NM
2,4'-DDD	µg/L		0.4003	ND
2,4'-DDE	µg/L		0.0741	ND
2,4'-DDT	µg/L		0.5261	ND
4,4'-DDD	µg/L	0.00084	1.3308	ND
4,4'-DDE	µg/L	0.00059	3.8039	ND
4,4'-DDT	µg/L	0.00059	2.3144	ND
Heptachlor Epoxide	µg/L		0.0072	ND
Toxaphene	µg/L	0.0002	15.95876	0.00054
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	7.7413	ND
Diazinon	µg/L	0.1	0.0149	ND

Site table continues on next page.

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Pyrethroid Pesticides</i>				
Bifenthrin	µg/L		0.3735	ND
Cyfluthrin	µg/L		0.0419	ND
Danitol	µg/L		0.1516	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.

ND = Not Detected

NM = Not Measured

1. 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.
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.

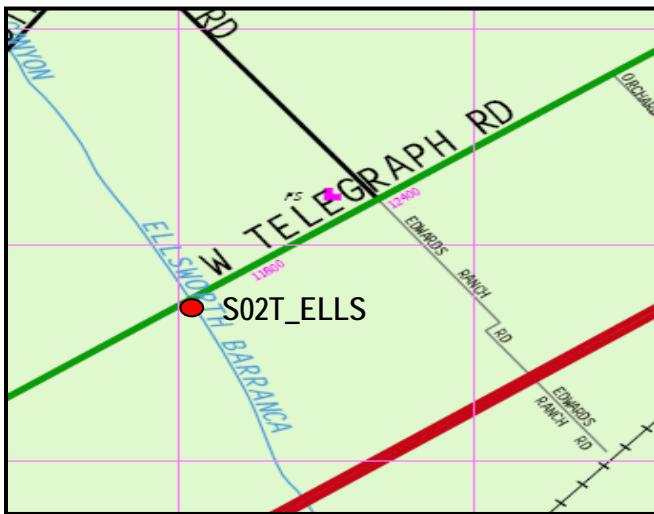
Santa Clara River Watershed

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 present at this site during both monitoring events. Table 38 contains a summary of constituents detected in 2010 and provides a comparison of those concentrations with applicable water quality benchmarks. Table 39 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

No exceedances occurred during the dry weather monitoring event. Storm results show exceedances of pH, chloride, chlordane, and DDT compounds. Citrus and avocados are the primary crop types associated with this site, which is a third tier priority drainage under the 2009 WQMP.

Table 38. VCAILG Monitoring Data v. Waiver Benchmarks: S02T_ELLS

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Field Measurements</i>				
Flow	CFS		6.63	0.015
pH		6.5 ≤ pH ≤ 8.5	8.53	8.09
Temperature	°C	≤ 26.67°C ¹	9.16	20.21
Dissolved Oxygen	mg/L	≥ 6	11.01	10.01
Turbidity	NTU		1022	0
Conductivity	µS/cm		1794	1388
<i>General Water Quality</i>				
Total Dissolved Solids (TDS)	mg/L	1200	1190	1040
Total Suspended Solids (TSS)	mg/L		661	2
Chloride	mg/L	150	160	50
Sulfate	mg/L	600	514	480
Total Ammonia-N	mg/L	1.46 / 1.48 ²	0.16	ND
Nitrate-N	mg/L	10	1.2	1.3
Total Orthophosphate	mg/L		1.53	ND
<i>Organochlorine Pesticides</i>				
trans-Nonachlor	µg/L		0.011	ND
Chlordane-alpha	µg/L		0.0106	ND
Chlordane-gamma	µg/L		0.0081	ND
Total Chlordane	µg/L	0.00059	0.0342	ND
2,4'-DDD	µg/L		0.0163	ND
2,4'-DDT	µg/L		0.0152	ND
4,4'-DDD	µg/L	0.00084	0.0674	ND
4,4'-DDE	µg/L	0.00059	0.2441	ND
4,4'-DDT	µg/L	0.00059	0.0776	ND
Toxaphene	µg/L	0.0002	0.05756	ND
<i>Organophosphorus Pesticides</i>				
Chlorpyrifos	µg/L	0.025	0.0146	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.

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 39. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_ELLS

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Ammonia-N + Nitrate-N	mg/L	10 ¹	1.36	1.3

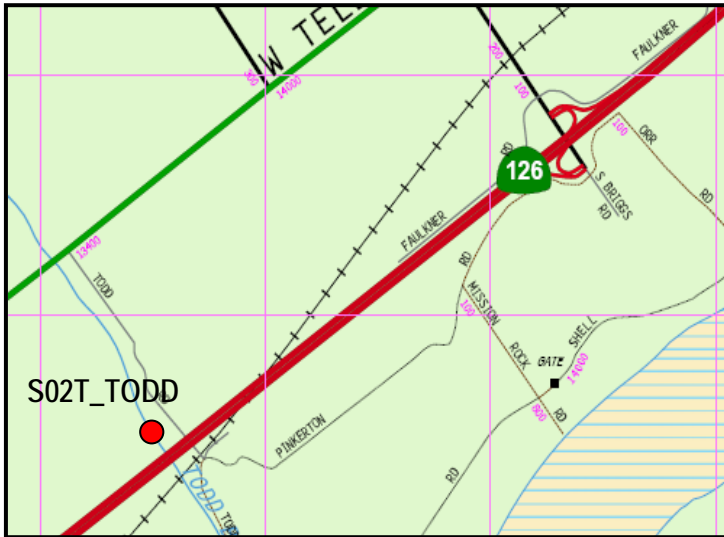
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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.

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 2010 monitoring events. Table 40 contains a summary of constituents detected in one or more samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 41 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Only the TDS benchmark was exceeded during the dry weather event. Exceedances of TDS, sulfate, chlordane, DDT compounds, chlorpyrifos, and diazinon 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 40. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S02T_TODD

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		1.51	2.99
pH		6.5 ≤ pH ≤ 8.5	7.51	7.87
Temperature	°C	≤ 26.67°C ¹	12.21	18.67
Dissolved Oxygen	mg/L	≥ 6	8.91	9.75
Turbidity	NTU		184.5	2
Conductivity	µS/cm		2227	1588
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1200	1770	1220
Total Suspended Solids (TSS)	mg/L		118	5
Chloride	mg/L	150	107	58
Sulfate	mg/L	600	840	560
Total Ammonia-N	mg/L	5.02 / 2.23 ²	0.11	ND
Nitrate-N	mg/L	10	10	2.4
Total Orthophosphate	mg/L		1.35	0.46
Organochlorine Pesticides				
trans-Nonachlor	µg/L		0.0152	ND
Chlordane-alpha	µg/L		0.014	ND
Chlordane-gamma	µg/L		0.0174	ND
Total Chlordane	µg/L	0.00059	0.0513	ND
4,4'-DDD	µg/L	0.00084	0.045	ND
4,4'-DDE	µg/L	0.00059	0.0412	ND
Organophosphorus Pesticides				
Chlorpyrifos	µg/L	0.025	0.0474	ND
Diazinon	µg/L	0.1	0.3285	ND
Pyrethroid Pesticides				
Cypermethrin	µg/L		0.3331	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.

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 41. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S02T_TODD

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Ammonia-N + Nitrate-N	mg/L	10 ¹	<i>10.11</i>	2.4

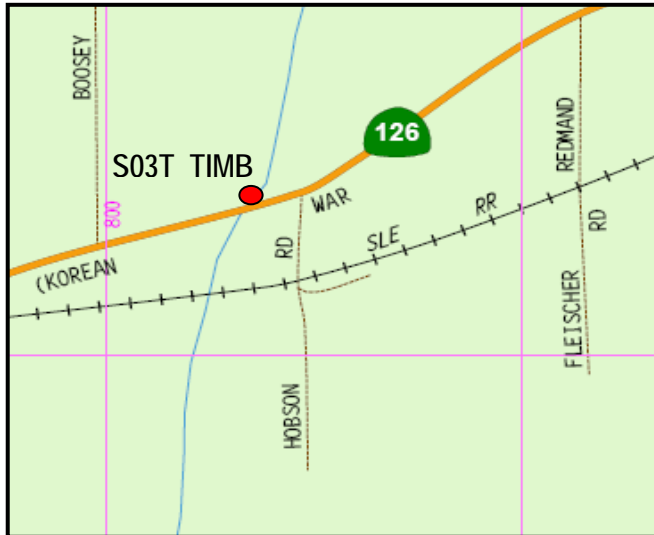
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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 42 and provide a comparison of those concentrations with applicable water quality benchmarks. Table 43 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Only chlorpyrifos exceeded its benchmark during the January storm. Citrus and avocados are the primary crop types that drain to this site. This site is a third tier priority drainage as per the 2009 WQMP.

Table 42. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_TIMB

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
Field Measurements					
Flow	CFS		14.39	Not sampled; site dry	
pH		6.5 ≤ pH ≤ 8.5	8.19		
Temperature	°C	≤ 26.67°C ¹	9.69		
Dissolved Oxygen	mg/L	≥ 5	11.19		
Turbidity	NTU		3000		
Conductivity	µS/cm		1308		
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1300	876		
Total Suspended Solids (TSS)	mg/L		80300		
Chloride	mg/L	100	59.4		
Sulfate	mg/L	650	558		
Total Ammonia-N	mg/L	2.49 / --- ²	1.43		
Nitrate-N	mg/L	5	1.8		
Total Orthophosphate	mg/L		75.75		
Organochlorine Pesticides					
DCPA (Dacthal)	µg/L		0.0549		
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	6.2665		
Pyrethroid Pesticides					
Bifenthrin	µg/L		0.0448		
Fluvalinate	µg/L		0.9391		

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 43. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_TIMB

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Ammonia-N + Nitrate-N	mg/L	10 ¹	3.23	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.

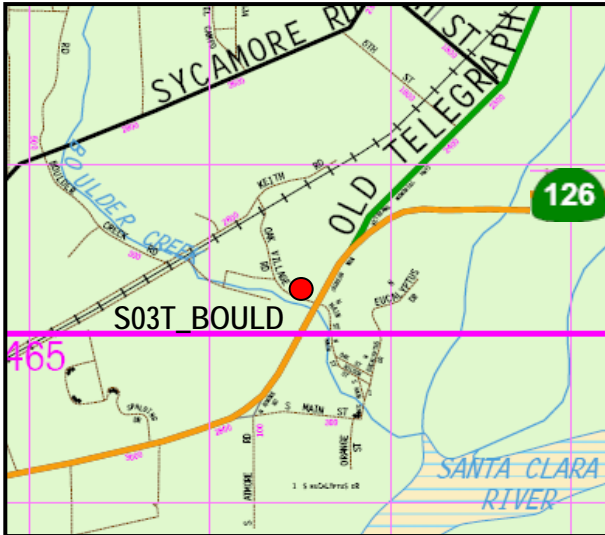
NS = Not Sampled

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 only the 2010 storm event. Table 44 contains a summary of constituents detected in one or more events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 45 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Chlordane was the only stormwater benchmark exceedance. Citrus and avocados are the primary crop types associated with this site, though a nursery is located adjacent to the monitoring site. This site is a third tier priority drainage under the 2009 WQMP.

Table 44. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S03T_BOULD

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
Field Measurements					
Flow	CFS		70.73	Not Sampled; site dry	
pH		6.5 ≤ pH ≤ 8.5	8.26		
Temperature	°C	≤ 26.67°C ¹	10.01		
Dissolved Oxygen	mg/L	≥ 5	11.15		
Turbidity	NTU		688		
Conductivity	µS/cm		517.5		
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1300	365		
Total Suspended Solids (TSS)	mg/L		746		
Chloride	mg/L	100	13.4		
Sulfate	mg/L	650	148		
Total Ammonia-N	mg/L	2.18 / --- ²	0.2		
Nitrate-N	mg/L	5	1.9		
Total Orthophosphate	mg/L		1.59		
Organochlorine Pesticides					
Chlordane-alpha	µg/L		0.0055		
Total Chlordane	µg/L	0.00059	0.0153		
Organophosphorus Pesticides					
Diazinon	µg/L	0.1	0.0258		
Pyrethroid Pesticides					
Bifenthrin	µg/L		0.0135		
Danitol	µg/L		0.0352		
Fluvalinate	µg/L		0.2146		

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 45. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S03T_BOULD

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Ammonia-N + Nitrate-N	mg/L	10 ¹	2.1	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.

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 January storm event. Table 46 contains a summary of constituents detected in event 10 samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 47 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Only pesticide benchmark exceedances occurred at this site for chlordane, DDT compounds, and chlorpyrifos. Citrus is the primary crop type associated with this site. As per the 2009 WQMP, this is a third tier priority monitoring site drainage.

Table 46. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S03D_BARDS

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
Field Measurements					
Flow	CFS		4.44	Not Sampled; site dry	
pH		6.5 ≤ pH ≤ 8.5	8.35		
Temperature	°C	≤ 26.67°C ¹	9.12		
Dissolved Oxygen	mg/L	≥ 5	10.8		
Turbidity	NTU		513		
Conductivity	µS/cm		263.9		
General Water Quality					
Total Dissolved Solids (TDS)	mg/L	1300	175		
Total Suspended Solids (TSS)	mg/L		299		
Chloride	mg/L	100	24.5		
Sulfate	mg/L	650	35.8		
Total Ammonia-N	mg/L	1.99 / --- ²	0.88		
Nitrate-N	mg/L	5	1.9		
Total Orthophosphate	mg/L		1.84		
Organochlorine Pesticides					
cis-Nonachlor	µg/L		0.0063		
trans-Nonachlor	µg/L		0.0118		
Chlordane-alpha	µg/L		0.0104		
Chlordane-gamma	µg/L		0.0088		
Total Chlordane	µg/L	0.00059	0.0373		
DCPA (Dacthal)	µg/L		0.0455		
4,4'-DDD	µg/L	0.00084	0.0105		
4,4'-DDE	µg/L	0.00059	0.1065		
4,4'-DDT	µg/L	0.00059	0.0097		
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	0.0671		

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 47. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S03D_BARDS

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>General Water Quality</i>				
Ammonia-N + Nitrate-N	mg/L	10 ¹	2.1	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.

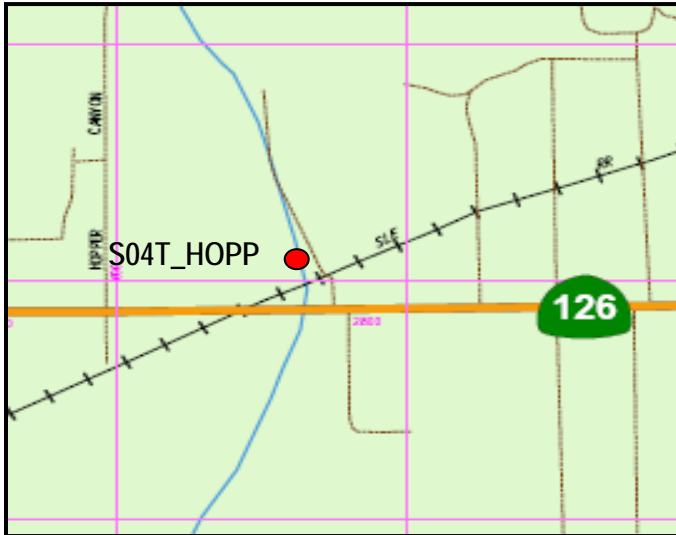
NS = Not Sampled

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 January storm event. Table 48 contains a summary of constituents detected in samples and provides a comparison of those concentrations with applicable water quality benchmarks. Table 49 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

There were no benchmark exceedances at this site for 2010. Additionally, no pesticides were detected. Primary crop types associated with this site are citrus and nursery stock.

Table 48. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_HOPP

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		258.73 EST	Not Sampled; site dry
pH		6.5 ≤ pH ≤ 8.5	8.2	
Temperature	°C	≤ 26.67°C ¹	9.12	
Dissolved Oxygen	mg/L	≥ 5	11.24	
Turbidity	NTU		42.9	
Conductivity	µS/cm		1137	
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1300	905	Not Sampled; site dry
Total Suspended Solids (TSS)	mg/L		43.6	
Chloride	mg/L	100	13.5	
Sulfate	mg/L	600	482	
Total Ammonia-N	mg/L	2.54 / --- ²	0.05	
Nitrate-N	mg/L	5	0.15	
Total Orthophosphate	mg/L		0.46	

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 49. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_HOPP

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10 ¹	0.2	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.

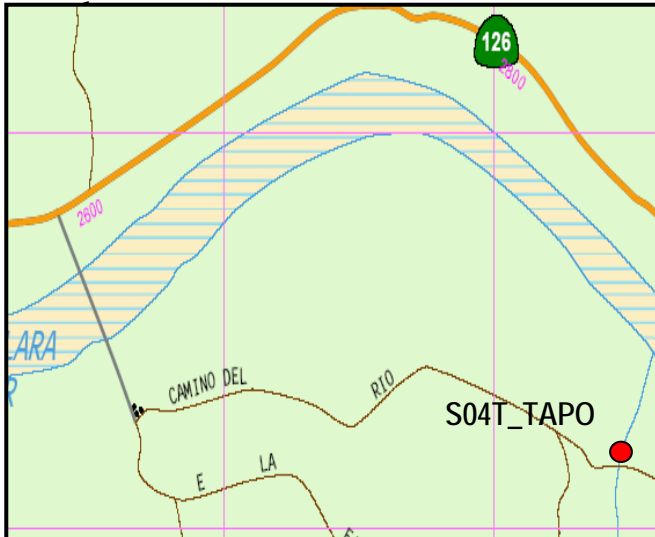
NS = Not Sampled

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 both monitoring events. Table 50 contains a summary of constituents detected in one or more events and provides a comparison of those concentrations with applicable water quality benchmarks. Table 51 provides a comparison of detected constituent concentrations with applicable TMDL load allocations.

Salts and nitrate exceedances occurred during both monitoring events at this site. Elevated salts levels have previously been shown in samples from the background site, indicating natural sources for the salts detected at the VCAILG monitoring site. Only one pesticide was detected, 4,4'-DDE during the January storm. 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 50. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: S04T_TAPO

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
Field Measurements				
Flow	CFS		1.38	0.057
pH		6.5 ≤ pH ≤ 8.5	7.57	7.93
Temperature	°C	≤ 26.67°C ¹	10.19	22.55
Dissolved Oxygen	mg/L	≥ 5	10.74	9.24
Turbidity	NTU		312.6	0
Conductivity	µS/cm		3557	3721
General Water Quality				
Total Dissolved Solids (TDS)	mg/L	1300	2780	3110
Total Suspended Solids (TSS)	mg/L		176	1
Chloride	mg/L	100	159	210
Sulfate	mg/L	600	1370	1480
Total Ammonia-N	mg/L	5.41 / 1.6 ²	0.12	ND
Nitrate-N	mg/L	5	5.3	25
Total Orthophosphate	mg/L		0.98	ND
Organochlorine Pesticides				
4,4'-DDE	µg/L	0.00059	0.0246	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.

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 51. 2010 VCAILG Monitoring Data v. TMDL Load Allocations: S04T_TAPO

Constituent	Units	Load Allocation	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
General Water Quality				
Ammonia-N + Nitrate-N	mg/L	10 ¹	5.42	25

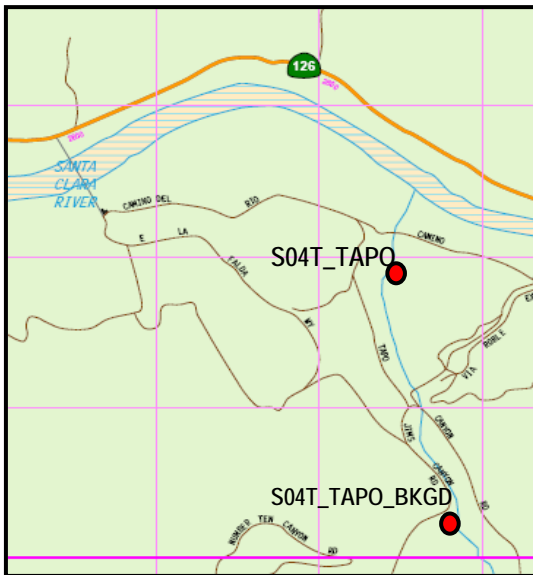
Note: Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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

This 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 January storm by field personnel. Previous sampling events have shown elevated salts at this background site, which confirms the natural source of salts that have been detected at the Tapo Canyon monitoring site.

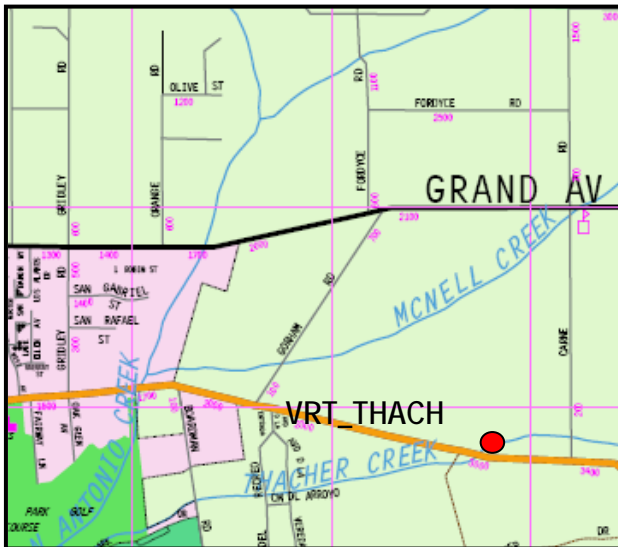
Ventura River Watershed

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



Flow was only present at this site during the January storm. Table 52 contains a summary of constituents detected during the storm event and provides a comparison of those concentrations with applicable water quality benchmarks.

There were no benchmark exceedances during the storm event. Avocado and citrus are the predominant crop types associated with this site.

Table 52. VCAILG Monitoring Data v. Waiver Benchmarks: VRT_THACH

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010	
<i>Field Measurements</i>					
Flow	CFS		0.91	Not Sampled; site dry	
pH		$6.5 \leq \text{pH} \leq 8.5$	7.51		
Temperature	°C	$\leq 26.67^{\circ}\text{C}^1$	8.98		
Dissolved Oxygen	mg/L	≥ 7	11.13		
Turbidity	NTU		516		
Conductivity	µS/cm		404.2		
<i>General Water Quality</i>					
Total Dissolved Solids (TDS)	mg/L	800	242		
Total Suspended Solids (TSS)	mg/L		306		
Chloride	mg/L	60	25.3		
Sulfate	mg/L	300	98.5		
Total Ammonia-N	mg/L	$6.18 / \text{---}^2$	ND		
Nitrate-N	mg/L	5	0.48		
Total Orthophosphate	mg/L		1.56		
<i>Pyrethroid Pesticides</i>					
Bifenthrin	µg/L		0.0099		

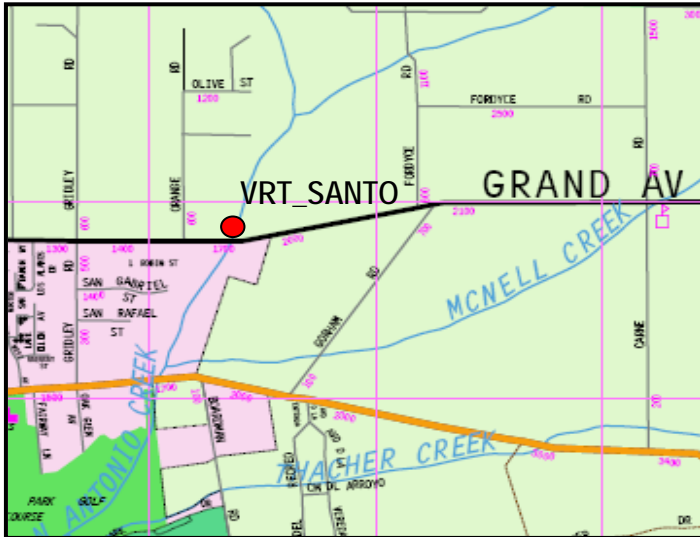
Note: Concentrations in ***bold italics*** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent. See Tables 10 through 17 for a list of benchmarks applicable to this site.

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.

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



Flow was only present at this site during the January storm event. Table 53 contains a summary of constituents detected in collected samples and provides a comparison of those concentrations with applicable water quality benchmarks.

To date there have not been any water quality benchmark exceedances at this site. Avocado and citrus are the predominant crop types associated with this site.

Table 53. 2010 VCAILG Monitoring Data v. Waiver Benchmarks: VRT_SANTO

Constituent	Units	Benchmark	Event 10 Wet 1/20/2010	Event 11 Dry 8/17/2010
<i>Field Measurements</i>				
Flow	CFS		30.32	Not Sampled; site dry
pH		$6.5 \leq \text{pH} \leq 8.5$	7.7	
Temperature	°C	$\leq 26.67^\circ\text{C}^1$	10.46	
Dissolved Oxygen	mg/L	≥ 7	10.82	
Turbidity	NTU		8.1	
Conductivity	µS/cm		758.6	
<i>General Water Quality</i>				
Total Dissolved Solids (TDS)	mg/L	800	557	
Total Suspended Solids (TSS)	mg/L		6.77	
Chloride	mg/L	60	15.7	
Sulfate	mg/L	300	216	
Total Ammonia-N	mg/L	$4.65 / \text{---}^2$	ND	
Nitrate-N	mg/L	5	1.1	
Total Orthophosphate	mg/L		0.09	

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 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.

CHRONIC TOXICITY TEST RESULTS

During the 2010 monitoring year only single-species tests on pre-determined most sensitive species were performed. This section discusses the required types of tests in detail and includes a summary of toxicity data.

The Event 11 toxicity report submitted by the laboratory contains test results, and raw data. 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, which later became 06T_LONG2 and 06T_LONG3, 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 54).

Table 54. Most Sensitive Species Selected for Toxicity Testing

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

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 six sites during the Event 11 monitoring event. Results from the single-species tests at freshwater sites in 2010 can be found in Table 55. High-conductivity single-species test results are in Table 56.

Table 55. Chronic Toxicity Results for Single-Species Testing at Freshwater Sites for 2010

Site	Event	<i>Selenastrum</i> ¹		<i>Ceriodaphnia</i> ²			TIE Triggered?
		Cell Growth Toxicity	Growth Reduction %	Survival Toxicity	Reproduction Toxicity	Reproduction % Reduction	
S02T_TODD	11	Y	26.6				N
06T_FC_BR	11	N	---				N
S02T_ELLS	11			N	Y	19.0	N

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

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

Table 56. Chronic Toxicity Results for Single-Species Testing at High-Conductivity Sites for 2010

Site	Event	<i>Thalassiosira</i> ¹		<i>Hyalella</i> ²		TIE Triggered?
		Cell Growth Toxicity	Growth % Reduction	Survival Toxicity	Survival % Reduction	
S04T_TAPO	11	N	---			N
S04T_TAPO (duplicate)	11	N	---			N
01T_ODD3_ARN	11	N	---			N
01T_ODD2_DCH	11			N	---	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 TU_c toxicity benchmark occurred at S02T_TODD and S02T_ELLS during the 2010 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. None of the samples collected fit the criteria to trigger a TIE.

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 2010. 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 57. 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 58. Analytical Methods and Project Detection Limits for Laboratory Analyses: General Water Quality Constituents and Organochlorine Pesticides

Parameter	Units	Project MDL	MDL Reported by Lab (Event 10)	MDL Reported by Lab (Event 11)	Project RL	RL Reported by Lab (Event 10)	RL Reported by Lab (Event 11)
General Water Quality Constituents							
Total Dissolved Solids (TDS)	mg/L	4	13 ¹	13 ¹	20	20	20
Total Suspended Solids (TSS)	mg/L	2	0.39	0.39	5	1	1
Chloride	mg/L	0.2	0.36 ¹	0.36 ¹	1	1	1
Sulfate ²	mg/L	0.03	0.24	0.24	1	2	2
Total Ammonia-N	mg/L	0.04	0.03	0.1 ³	0.2	0.03	0.1 ³
Nitrate-N	mg/L	0.008	0.06 ¹	0.1 ¹	0.1	0.11	0.1
Phosphate	mg/L	0.01	0.01	0.1 ³	0.05	0.01	0.1 ³
Organochlorine Pesticides⁴							
Aldrin	ng/L	1	1	1	5	5	5
alpha-BHC	ng/L	1	1	1	5	5	5
beta-BHC	ng/L	1	1	1	5	5	5
gamma-BHC (Lindane)	ng/L	1	1	1	5	5	5
Delta-BHC	ng/L	1	1	1	5	5	5
Chlordane-alpha	ng/L	1	1	1	5	5	5
Chlordane-gamma	ng/L	1	1	1	5	5	5
2,4'-DDD	ng/L	1	1	1	5	5	5
2,4'-DDE	ng/L	1	1	1	5	5	5
2,4'-DDT	ng/L	1	1	1	5	5	5
4,4'-DDD	ng/L	1	1	1	5	5	5
4,4'-DDE	ng/L	1	1	1	5	5	5
4,4'-DDT	ng/L	1	1	1	5	5	5
Dieldrin	ng/L	1	1	1	5	5	5
Endosulfan I	ng/L	1	1	1	5	5	5
Endosulfan II	ng/L	1	1	1	5	5	5
Endosulfan Sulfate	ng/L	1	1	1	5	5	5
Endrin	ng/L	1	1	1	5	5	5
Endrin Aldehyde	ng/L	1	1	1	5	5	5
Endrin Ketone	ng/L	1	1	1	5	5	5
Toxaphene	ng/L	10	10	0.1	50	50	0.5

MDL = Method Detection Limit

RL = Reporting Limit

1. Project MDL not met in 2010. However, project RL was met, and concentrations in environmental samples greatly exceeded the RL for this constituent.
2. Both the project MDL and RL were exceeded by the analyzing laboratory in 2010. However, the concentrations in environmental samples greatly exceeded the RL for this constituent.
3. Both the project MDL and RL were exceeded by an alternative laboratory used for event 11 in order to meet hold times.
4. The laboratory used for event 10 reports ten additional organochlorine pesticides and the event 11 lab reports an additional seven constituents that were not included in the QAPP; these constituents are reported when detected in VCAILG samples.

Table 59. Analytical Methods and Project Detection Limits for Laboratory Analyses: Organophosphorus and Pyrethroid Pesticides

Parameter	Units	Project MDL	MDL Reported by Lab (Event 10)	MDL Reported by Lab (Event 11)	Project RL	RL Reported by Lab (Event 10)	RL Reported by Lab (Event 11)
Pyrethroid Pesticides ¹							
Allethrin	ng/L	---	0.5	0.5	---	2	2
Bifenthrin	ng/L	5	0.5	0.5	5	2	2
Cyfluthrin	ng/L	4	0.5	0.5	5	2	2
I-Cyhalothrin	ng/L	4	0.5	0.5	5	2	2
Cypermethrin	ng/L	3	0.5	0.5	5	2	2
Deltamethrin ²	ng/L	3	0.5	0.5	10	2	2
Esfenvalerate ³	ng/L	4	0.5	0.5	5	2	2
Fenvalerate ³	ng/L	4	0.5	0.5	5	2	2
Fluvalinate	ng/L	3	0.5	0.5	5	2	2
Permethrin ⁴	ng/L	3	5	5	5	25	25
Prallethrin	ng/L	---	0.5	0.5	---	2	2
Resmethrin	ng/L	6	NM	5	10	NM	25
Organophosphorus Pesticides ⁵							
Bolstar	ng/L	2	2	2	4	4	4
Chlorpyrifos	ng/L	1	1	1	2	2	2
Demeton	ng/L	1	1	1	2	2	2
Diazinon	ng/L	2	2	2	4	4	4
Dichlorovos	ng/L	3	3	3	6	6	6
Dimethoate	ng/L	3	3	3	6	6	6
Disulfoton	ng/L	1	1	1	2	2	2
Ethoprop	ng/L	1	1	1	2	2	2
Fenchlorophos	ng/L	2	2	2	4	4	4
Fensulfothion	ng/L	1	1	1	2	2	2
Fenthion	ng/L	2	2	2	4	4	4
Malathion	ng/L	3	3	3	6	6	6
Merphos	ng/L	1	1	1	2	2	2
Methyl Parathion	ng/L	1	1	1	2	2	2
Mevinphos	ng/L	8	8	8	16	16	16
Phorate	ng/L	6	6	6	12	12	12
Tetrachlorvinphos	ng/L	2	2	2	4	4	4
Tokuthion	ng/L	3	3	3	6	6	6
Trichloronate	ng/L	1	1	1	2	2	2

MDL = Method Detection Limit RL = Reporting Limit

- 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 has been used for pyrethroids analyses. The laboratories used report two additional pyrethroids that were not included in the QAPP.
- 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.
- The QAPP originally listed esfenvalerate/fenvalerate because they coelute. The analyzing laboratory is able to separate the two compounds and therefore reports them separately.
- Both the project MDL and RL were exceeded by the analyzing laboratory in 2010. However, the concentrations in environmental samples greatly exceeded the RL for this constituent.
- Starting with event 7 the laboratory began reporting six additional organophosphorus pesticides that were not included in the QAPP, these constituents are reported when detected in VCAILG samples.

All project detection limits were met in 2010 for field measurements.

MDLs for TDS, chloride, and nitrate-N were not met during 2010. 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 2010 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.

During event 11, MDLs and RLs for ammonia-N and phosphate were not met due to an alternative laboratory being used in order to meet hold time requirements.

All project detection limits were met in 2010 for organophosphorus and organochlorine pesticides.

Data Quality Objectives for Precision and Accuracy

Table 60 lists data quality objectives for precision and accuracy for field measurements and laboratory analyses.

Table 60. 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 date, 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. During event 10, one of the field meter's DO sensor did not meet the post sampling event calibration check, therefore, DO results from that meter were not reported. All other calibration checks performed on field meters met data quality objectives for accuracy, signifying the validity of those field measurements.

Flow results for events 10 and 11 were obtained using a velocity meter when feasible. During high flow conditions or when a velocity meter was not available, flows were estimated by measuring stream width and average depth, and multiplying those estimates by the reciprocal of the time required for a floating object to travel over a measured distance. Estimated flows are appropriately flagged in the site data tables.

Table 61 lists quality control failures reported by the analytical laboratories for samples collected during both 2010 monitoring events and includes the laboratory's explanation (qualifier) for each failure.

Table 61. Quality Control Failures – 2010

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
10	CRG	Toxaphene	BS/BSD	BS and BSD % recovery did not meet acceptance criteria.	Q10 A Marginal Exceedance is defined as a LCS percent recovery beyond the normal 3 standard deviation Control Limits but still within the marginal exceedance limits (set at 4 standard deviations from the mean).
10	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.
10	CRG	Toxaphene	MSD	MSD % recovery did not meet acceptance criteria.	Q10 A Marginal Exceedance is defined as a LCS percent recovery beyond the normal 3 standard deviation Control Limits but still within the marginal exceedance limits (set at 4 standard deviations from the mean).
10	CRG	Ammonia-N	BS/BSD	RPD did not meet acceptance criteria.	Q5 Precision failed due to one of the sample extractions having lower recoveries than the duplicate.
10	CRG	Merphos	BS/BSD	BS and BSD % recovery did not meet acceptance criteria.	Q6 CRG's Quality Assurance 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. This is often due to random error and cannot be attributed to a specific issue.
10	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.
10	CRG	Demeton	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M4 Spike or surrogate compound recovery was out of control due to matrix interference. The associated method blank spike or surrogate compound was in control and therefore the sample data was reported without further clarification.
10	CRG	Dimethoate	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.

Table 61. Quality Control Failures – 2010

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
10	CRG	Ethyl Parathion	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.
10	CRG	Fenitrothion	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.
10	CRG	Merphos	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M1 Recovery of the MS and MSD compound was out of control due to matrix interference.
10	CRG	Methidathion	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.
10	CRG	Methyl Paration	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.
10	CRG	Mevinphos	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.
10	CRG	Phosmet	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.
10	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.

Table 61. Quality Control Failures – 2010

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
10	CRG	Allethrin	BS	BS % recovery did not meet acceptance criteria.	Q10 A Marginal Exceedance is defined as a LCS percent recovery beyond the normal 3 standard deviation Control Limits but still within the marginal exceedance limits (set at 4 standard deviations from the mean).
10	CRG	Prallethrin	BS	BS % recovery did not meet acceptance criteria.	Q10 A Marginal Exceedance is defined as a LCS percent recovery beyond the normal 3 standard deviation Control Limits but still within the marginal exceedance limits (set at 4 standard deviations from the mean).
10	CRG	Allethrin	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M1 Recovery of the MS and MSD compound was out of control due to matrix interference.
10	CRG	Prallethrin	MS/MSD	MS and MSD % recovery did not meet acceptance criteria.	M1 Recovery of the MS and MSD compound was out of control due to matrix interference.
10	CRG	Bifenthrin	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.
10	CRG	Danitol	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.
10	CRG	Cypermethrin	LD	RPD did not meet acceptance criteria.	Q5 Precision failed due to one of the sample extractions having lower recoveries than the duplicate.
10	CRG	Permethrin	LD	RPD did not meet acceptance criteria.	Q5 Precision failed due to one of the sample extractions having lower recoveries than the duplicate.
10	CRG	Nitrate-N	MSD	MSD % recovery did not meet acceptance criteria.	M1 The MSD was above the acceptance limits due to sample matrix interference. he associated method blank spike or surrogate compound was in control and therefore the sample data was reported without further clarification.
11	IIRMES	Cis-Nonachlor	BS	BS% recovery did not meet acceptance criteria.	Unable to determine cause of low recovery.

Table 61. Quality Control Failures – 2010

Event	Lab	Constituent	QC Type	Failure	Lab Qualifier
11	IIRMES	Endosulfan Sulfate	BS/BSD	RPD did not meet acceptance criteria.	Endosulfan compounds tend to have higher than acceptable variation due to several possible reasons. 1) Breakdown or adsorption in the injector. 2) Poor extraction efficiency due to their polar properties. 3) Lower sensitivity using mass spectrometry because they are highly fragmented.
11	IIRMES	Endosulfan II	MS	MS % recovery did not meet acceptance criteria.	Endosulfan compounds tend to have higher than acceptable variation due to several possible reasons. 1) Breakdown or adsorption in the injector. 2) Poor extraction efficiency due to their polar properties. 3) Lower sensitivity using mass spectrometry because they are highly fragmented.
11	IIRMES	Endrin	MS/MSD	MS % recovery did not meet acceptance criteria.	Result was higher than the acceptable range possible due to interference from a co-eluting peak.
11	IIRMES	Endrin Aldehyde	MS	MS % recovery did not meet acceptance criteria.	Endrin compounds tend to have higher than acceptable variation due to several possible reasons. 1) Breakdown or adsorption in the injector. 2) Poor extraction efficiency due to their polar properties. 3) Lower sensitivity using mass spectrometry because they are highly fragmented.
11	IIRMES	Endosulfan II	MS/MSD	RPD did not meet acceptance criteria.	Endosulfan compounds tend to have higher than acceptable variation due to several possible reasons. 1) Breakdown or adsorption in the injector. 2) Poor extraction efficiency due to their polar properties. 3) Lower sensitivity using mass spectrometry because they are highly fragmented.
11	IIRMES	Endrin	MS/MSD	RPD did not meet acceptance criteria.	Endrin compounds tend to have higher than acceptable variation due to several possible reasons. 1) Breakdown or adsorption in the injector. 2) Poor extraction efficiency due to their polar properties. 3) Lower sensitivity using mass spectrometry because they are highly fragmented.
11	IIRMES	Endrin Aldehyde	MS/MSD	RPD did not meet acceptance criteria.	Endrin compounds tend to have higher than acceptable variation due to several possible reasons. 1) Breakdown or adsorption in the injector. 2) Poor extraction efficiency due to their polar properties. 3) Lower sensitivity using mass spectrometry because they are highly fragmented.

BS = Blank Spike
MS = Matrix Spike

BSD = Blank Spike Duplicate
MSD = Matrix Spike Duplicate

LD = Lab 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 62 lists the percent completeness of data collected during 2010 in comparison with the established DQO.

Table 62. Data Completeness – 2010

Monitoring Element	% Completeness Objective	% Completeness Achieved
<i>Field Measurements</i>		
Flow	90	97.9
pH	90	100
Temperature	90	100
Dissolved Oxygen	90	87.5
Turbidity	90	100
Conductivity	90	100
<i>General Water Quality</i>		
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
<i>Organochlorine Pesticides</i>	90	100
<i>Pyrethroid Pesticides</i>	90	100
<i>Organophosphorus Pesticides</i>	90	100
<i>Chronic Toxicity</i>	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 2010 sampling year.

Additional Program Requirements

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 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 2010 through the VCAILG Monitoring Program are of acceptable quality and fulfilled Monitoring Program objectives.

Summary of Benchmark Exceedances

Exceedances of water quality benchmarks occurred in all watersheds, except Ventura River, 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.

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 63 contains a summary of benchmark exceedances that occurred at each site during 2010. Table 63 also identifies sites that were sampled but where no exceedances occurred, as well as sites that were not sampled.

Table 64 contains the same exceedance summary organized by constituent and by watershed. Finally, Table 65 provides a comparison of benchmark exceedances at each monitoring site over the four years of Conditional Waiver monitoring (Order No. R4-2005-0080). Organochlorine (legacy) pesticides, primarily DDT compounds, were exceeded at the most sites overall, followed by organophosphorus pesticides, nitrogen, and salts. During the January storm event, 19 sites were sampled, three of which did not have any water quality benchmark exceedances. Two additional sites did not have flow during the storm sampling. Ten sites were sampled for dry weather runoff in August with the remaining eleven sites having no discharge. All of the sampled dry weather sites had benchmark exceedances.

PESTICIDES

Exceedances of benchmarks for OC pesticides occurred at 15 out of 21 VCAILG sites, 9 of which are located in the Calleguas Creek Watershed (CCW). Eight of the 9 CCW sites with OC pesticides exceedances, also had OP pesticide exceedances. Five sites in the Santa Clara River Watershed (SCRW) had OC pesticide exceedances and three of those also had OP pesticide exceedances. The Oxnard Coastal site also had exceedances in both OP and OC pesticides.

SALTS

Exceedances of the salts benchmarks (TDS, chloride, sulfate, or any combinations thereof) occurred at 5 out of 21 monitoring sites, three of which are located in the SCRW.

CHRONIC TOXICITY

Toxicity samples were collected during the 2010 dry weather event. Of the 6 sites that were sampled, 2 resulted in toxic responses as compared to the control. TIEs were not triggered by any of the samples.

NITROGEN

Exceedances of the nitrate-N objective occurred at 8 out of 21 VCAILG sites; only 1 site exceeded the ammonia-N objective. The nitrate-N benchmark was exceeded at 7 sites in the CCW and 1 SCRW site, as well as the Oxnard Coastal site. 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

No exceedances of dissolved oxygen benchmarks occurred during 2010 monitoring.

TEMPERATURE

There were no wet weather exceedances of the temperature benchmark. During the dry weather event in August, 06T_FC_BR, which is a monitoring site in the Fox Barranca, a tributary to Calleguas Creek Reach 6. At the time of sampling both air and water temperatures were greater than the water temperature benchmark; flow was extremely shallow and slow.

PH

There was one wet weather and one dry weather exceedance of the pH benchmark. During the storm event, the pH benchmark was exceeded at S02T_ELLS by three hundredths of a pH unit. 06T_FC_BR exceeded the pH benchmark during the dry weather monitoring event.

Table 63. Water Quality Benchmark Exceedances in 2010 – by Site & Event

Site	Event 10 – Wet January 20, 2010	Event 11 – Dry August 17, 2010
01T_ODD2_DCH	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	Nitrate-N
01T_ODD3_ARN	Total Chlordane, 4,4'-DDD, 4,4'-DDE, Toxaphene, Chlorpyrifos	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
04D_LAS	Nitrate-N, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	Nitrate-N, 4,4'-DDD, 4,4'-DDE
05D_SANT_VCWPD	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	TDS, Sulfate, Nitrate-N, 4,4'-DDE
05D_LAVD	TDS, Sulfate, Nitrate-N, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	NS
05T_HONDO	NS	NS
06T_FC_BR	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	pH, Temperature, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Dieldrin, Toxaphene
06T_LONG2 & 3	NS	NS
9BD_GERRY	Total Chlordane, 4,4'-DDD, 4,4'-DDE, Toxaphene, Chlorpyrifos	NS
OXD_CENTR	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene, Chlorpyrifos	Nitrate-N, Toxaphene
S02T_ELLS	pH, Chloride, Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Toxaphene	Chronic Toxicity
S02T_TODD	TDS, Sulfate, Total Chlordane, 4,4'-DDD, 4,4'-DDE, Chlorpyrifos, Diazinon	TDS, Chronic Toxicity
S03T_TIMB	Chlorpyrifos	NS
S03T_BOULD	Total Chlordane	NS
S03D_BARDS	Total Chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Chlorpyrifos	NS
S04T_HOPP	None	NS
S04T_TAPO	TDS, Chloride, Sulfate, Nitrate-N, 4,4'-DDE	TDS, Chloride, Sulfate, Nitrate-N
VRT_THACH	None	NS
VRT_SANTO	None	NS
Total Number of Sites Sampled	19	10
Total Number of Sites with Exceedances	16	10

NS = Not Sampled; insufficient or no flow.

Table 64. Water Quality Benchmark Exceedances in 2010 – by Constituent & Watershed

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

CC = Calleguas Creek

OXD = Oxnard Coastal

SCR = Santa Clara River

VR = Ventura River

Table 65. Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

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			
	2010		x		x	x			
01T_ODD3_ARN	2007		x	x	x				
	2008		x		x				
	2009		x		x	x	x		
	2010		x		x	x			
02D_BROOM	2007		x		x				
	2008		x		x		x		
	2009		x		x				
	2010		x		x				
04D_ETTG	2007		x		x	x			
	2008		x		x	x			
	2009		x		x	x			
	2010		x		x	x			
04D_LAS	2007		x		x	x			
	2008		x		x	x			x
	2009		x		x	x			x
	2010		x		x	x			
05D_SANT_VCWPD	2007	x	x		x	x			x
	2008	x	x		x	x			
	2009	x	x		x	x			
	2010	x	x		x	x			
05D_LAVD	2007	x	x	x	x	x			
	2008				x	x			
	2009				x	x			
	2010	x	x		x	x			
05T_HONDO	2007				x	x			
	2008	x		x	x	x			
	2009				x	x			
	2010								

Table 65. Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
06T_FC_BR	2007				x	x			
	2008	x	x	x	x				
	2009				x	x			
	2010				x	x		x	x
06T_LONG2 & 3	2007								
	2008								
	2009								
	2010								
9BD_GERRY	2007								
	2008								
	2009				x	x		x	
	2010				x	x			
OXD_CENTR	2007		x		x	x			
	2008		x		x	x			
	2009		x		x	x			
	2010		x		x	x			
S02T_ELLS	2007	x				x			
	2008	x		x		x		x	
	2009				x	x			
	2010	x		x	x			x	
S02T_TODD	2007	x	x	x		x			
	2008	x	x	x	x				
	2009	x		x	x	x			
	2010	x		x	x	x			
S03T_TIMB	2007	x							
	2008	x	x	x	x	x			
	2009		x		x	x			
	2010					x			
S03T_BOULD	2007	x	x	x			x		
	2008	x	x	x	x				
	2009	x	x	x	x				
	2010				x				

Table 65. Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
S03D_BARDS	2007				x	x			
	2008				x	x			
	2009				x	x			
	2010				x	x			
S04T_HOPP	2007								
	2008	x							
	2009								
	2010								
S04T_TAPO	2007	x	x	x	x				
	2008	x	x		x				
	2009	x	x	x	x				
	2010	x	x		x				
VRT_THACH	2007								
	2008				x				
	2009								
	2010								
VRT_SANTO	2007								
	2008								
	2009								
	2010								

X = Water quality benchmark exceedance occurred during the corresponding year for at least one constituent within the categories noted in the above column.

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 WQMPs to address water quality impairments caused by irrigated agriculture. VCAILG data collected in 2010 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 66 lists exceedances of both TMDL load allocations by site for each event, and Table 67 lists exceedances of the TMDL load allocations by constituent and by watershed.

Table 66. TMDL Load Allocation Exceedances in 2010 – by Site & Event

Site ID	Constituents that Exceeded Applicable TMDL Load Allocations	
	Event 10 – <i>Wet</i> January 20, 2010	Event 11 – <i>Dry</i> August 17, 2010
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	Nitrate-N	NS
05T_HONDO	NS	NS
06T_FC_BR	None	None
06T_LONG	NS	NS
9BD_GERRY	Nitrate-N	NS
OXD_CENTR	No TMDLs	No TMDLs
S02T_ELLS	None	None
S02T_TODD	Ammonia-N + Nitrate-N	None
S03T_TIMB	None	NS
S03T_BOULD	None	NS
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	16	9
Total Number of Sites with Exceedances	8	6

NS = Not Sampled; insufficient or no flow.

Table 67. TMDL Load Allocation Exceedances in 2010 – 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 05D_LAVD 9BD_GERRY	No TMDLs	-----	No TMDLs
Ammonia-N + Nitrate-N (10 mg/L LA)	-----	No TMDLs	S02T_TODD S04T_TAPO	No TMDLs

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

Conditional Waiver (Order No. R4-2005-0080)

Monitoring Summary

Overall, VCAILG was successful in implementing the monitoring program required by the 2005 Conditional Waiver and following the 2006 MRP and QAPP. Four years of monitoring were completed under the 2005 Conditional Waiver. The first phase of monitoring was completed during 2007 and 2008. During this time the required monitoring frequency was two storm and two dry weather events. The first year of sampling was particularly dry and only one storm produced sufficient rainfall and runoff to initiate sample collection. Toxicity samples were to be collected during one storm and one dry weather event during each year of phase one monitoring. In 2007, dry weather toxicity sampling was successful; however, samples were not collected during the storm since the analytical laboratory was closed for the holidays. The required number and type of monitoring events were completed for the remainder of phase one. The second phase of monitoring occurred during 2009 and 2010. For this phase, one storm and one dry weather event took place each year, with toxicity samples only being collected during dry weather, as required.

The following two tables summarize water quality benchmark exceedances by site separated by dry weather and wet weather monitoring events. In reviewing the information presented in these tables, it is important to remember the following:

- There were 2 dry weather monitoring events in both 2007 and 2008. One dry weather monitoring event took place in each of the two following years.
- There was only one storm event sampled per year, with the exception of 2008, during which two storms were sampled.

Table 68. Dry Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
01T_ODD2_DCH	2007		2		2				
	2008		2		3				
	2009		1		1				
	2010		1						
01T_ODD3_ARN	2007		1	1	4				
	2008		1		3				
	2009		2		4				
	2010		2		4				
02D_BROOM	2007				2				
	2008		2		7		1		
	2009								
	2010								
04D_ETTG	2007		1		5				
	2008		3		7	1			
	2009		1		2	1			
	2010		1		1				
04D_LAS	2007		2		5				
	2008		2		8	2			1
	2009		1		2				1
	2010		1		2				
05D_SANT_VCWPD	2007	6	2		4				1
	2008	6	2		4	1			
	2009	3	1		1				
	2010	2	1		1				
05D_LAVD	2007	4	2	1	4	1			
	2008								
	2009								
	2010								
05T_HONDO	2007								
	2008								
	2009								
	2010								

Table 68. Dry Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
06T_FC_BR	2007								
	2008								
	2009								
	2010				6			1	1
06T_LONG2 & 3	2007								
	2008								
	2009								
	2010								
9BD_GERRY	2007								
	2008								
	2009								
	2010								
OXD_CENTR	2007		2		3				
	2008		2		4				
	2009		1		4				
	2010		1		1				
S02T_ELLS	2007								
	2008					1		1	
	2009								
	2010			1					
S02T_TODD	2007	4	1	1					
	2008	2	1						
	2009	2		1	1	1			
	2010	1		1					
S03T_TIMB	2007								
	2008								
	2009								
	2010								
S03T_BOULD	2007	2	3	1			1		
	2008	3	2						
	2009	3	1	1					
	2010								

Table 68. Dry Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
S03D_BARDS	2007								
	2008								
	2009								
	2010								
S04T_HOPP	2007								
	2008	2							
	2009								
	2010								
S04T_TAPO	2007	6	1	1	5				
	2008	6	2						
	2009	1	2	1	3				
	2010	3	1						
VRT_THACH	2007								
	2008								
	2009								
	2010								
VRT_SANTO	2007								
	2008								
	2009								
	2010								

Numbers represent the number of exceedances that occurred for the named constituent or constituent category.

Table 69. Storm Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
01T_ODD2_DCH	2007		1		3	1			
	2008		2	1	4	2			
	2009		1		5	1			
	2010		1		5	1			
01T_ODD3_ARN	2007		1		3				
	2008		2		7				
	2009		1		5	2	1		
	2010				4	1			
02D_BROOM	2007		1		1				
	2008		2		8				
	2009		1		5				
	2010		1		5				
04D_ETTG	2007		1		3	1			
	2008		2		8	2			
	2009		1		4	1			
	2010		1		5	1			
04D_LAS	2007		1		2	1			
	2008		2		8	2			
	2009		1		5	2			
	2010		1		5	1			
05D_SANT_VCWPD	2007	3	1		1	1			
	2008	6	2		6	2			
	2009				5	1			
	2010				5	1			
05D_LAVD	2007								
	2008				4	1			
	2009				5	1			
	2010	2	1		4	1			
05T_HONDO	2007				3	2			
	2008	1		1	6	1			
	2009				5	1			
	2010								

Table 69. Storm Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
06T_FC_BR	2007				3	1			
	2008	2	1	1	3				
	2009				5	1			
	2010				5	1			
06T_LONG2 & 3	2007								
	2008								
	2009								
	2010								
9BD_GERRY	2007								
	2008								
	2009				4	1		1	
	2010				4	1			
OXD_CENTR	2007		1		3	1			
	2008		2		7	2			
	2009		1		5	1			
	2010				5	1			
S02T_ELLS	2007	3				1			
	2008	5		1					
	2009				4	1			
	2010	1			5			1	
S02T_TODD	2007	2	1			1			
	2008	4		1	1				
	2009				5	1			
	2010	2			3	2			
S03T_TIMB	2007	3							
	2008	1	1	1	1	1			
	2009		1		2	2			
	2010					1			
S03T_BOULD	2007								
	2008			1	1				
	2009		1		1				
	2010				1				

Table 69. Storm Event Water Quality Benchmark Exceedance Comparison for 2007-2010 Monitoring Years

Site	Sampling Year	Salts	Nitrogen	Chronic Toxicity	OC Pesticides	OP Pesticides	Dissolved Oxygen	pH	Temperature
S03D_BARDS	2007				1	1			
	2008				4	2			
	2009				3	1			
	2010				4	1			
S04T_HOPP	2007								
	2008								
	2009								
	2010								
S04T_TAPO	2007	3			3				
	2008	6			4				
	2009				2				
	2010	3	1		1				
VRT_THACH	2007								
	2008				1				
	2009								
	2010								
VRT_SANTO	2007								
	2008								
	2009								
	2010								

Numbers represent the number of exceedances that occurred for the named constituent or constituent category.

SITE SPECIFIC TRENDS

01T_ODD2_DCH

As shown in the figure below, 4,4'-DDE concentrations significantly decreased over time with a statistically significant R^2 value of 0.86. This monitoring site is a second tier priority monitoring site as per the VCAILG WQMP. The number of exceedances by constituent or constituent category remained relatively stable at this site, with the exception of OC pesticides during dry weather, which decreased over the monitoring period.

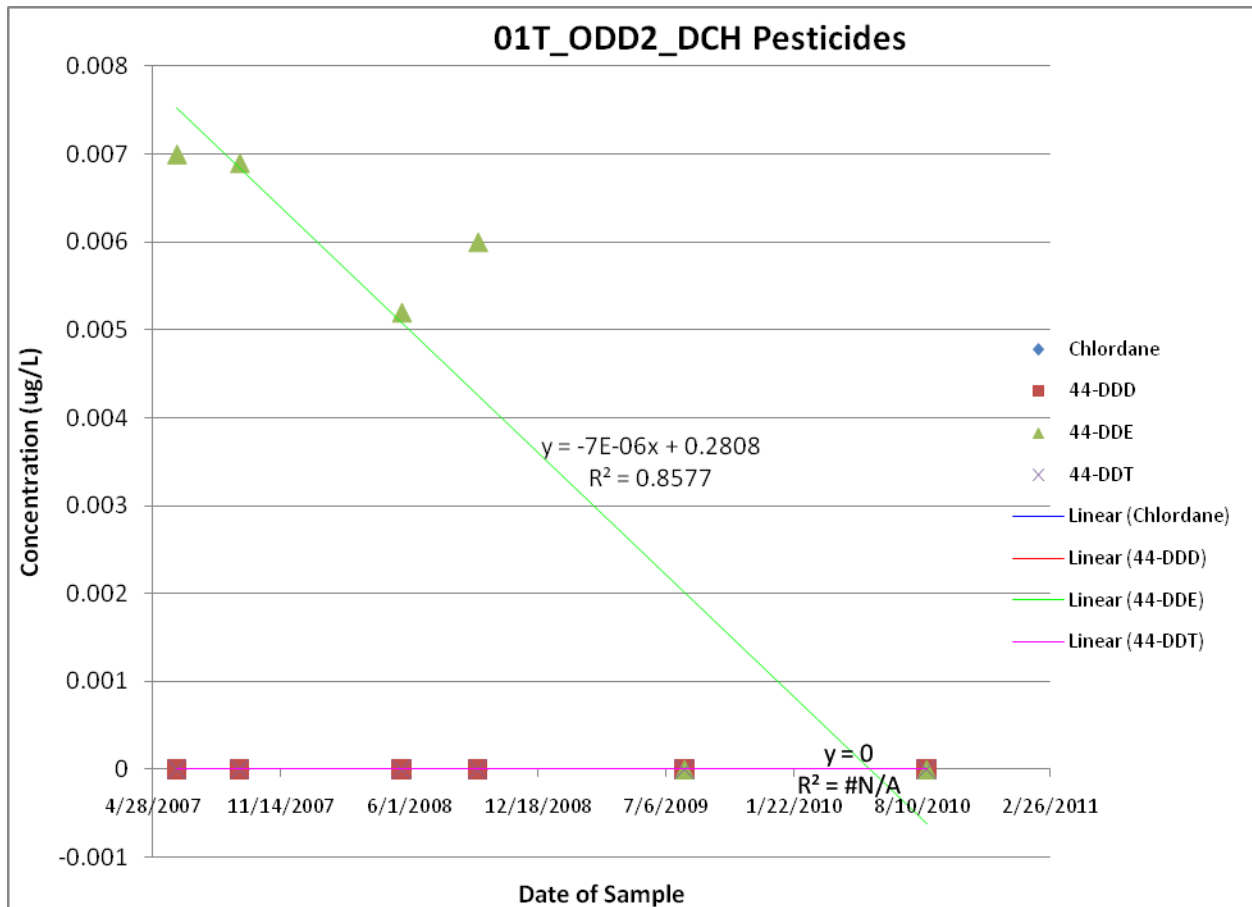


Figure 11. 01T_ODD2_DCH OC Pesticides Concentrations

04D_ETTG

Overall, legacy pesticides concentrations are decreasing at this site as shown in the figure below, particularly 4,4'-DDE and 4,4'-DDD. This site is also a second tier priority monitoring site as per the VCAILG WQMP. The number of wet weather exceedances at this site has remained the same for nitrogen and OP pesticides. The number of OC pesticides exceedances during storms has slightly increased from 3 to 5 over the Conditional Waiver period. However, the number of OC pesticides exceedances during dry weather has decreased, potentially from decreased irrigation runoff sediment transport.

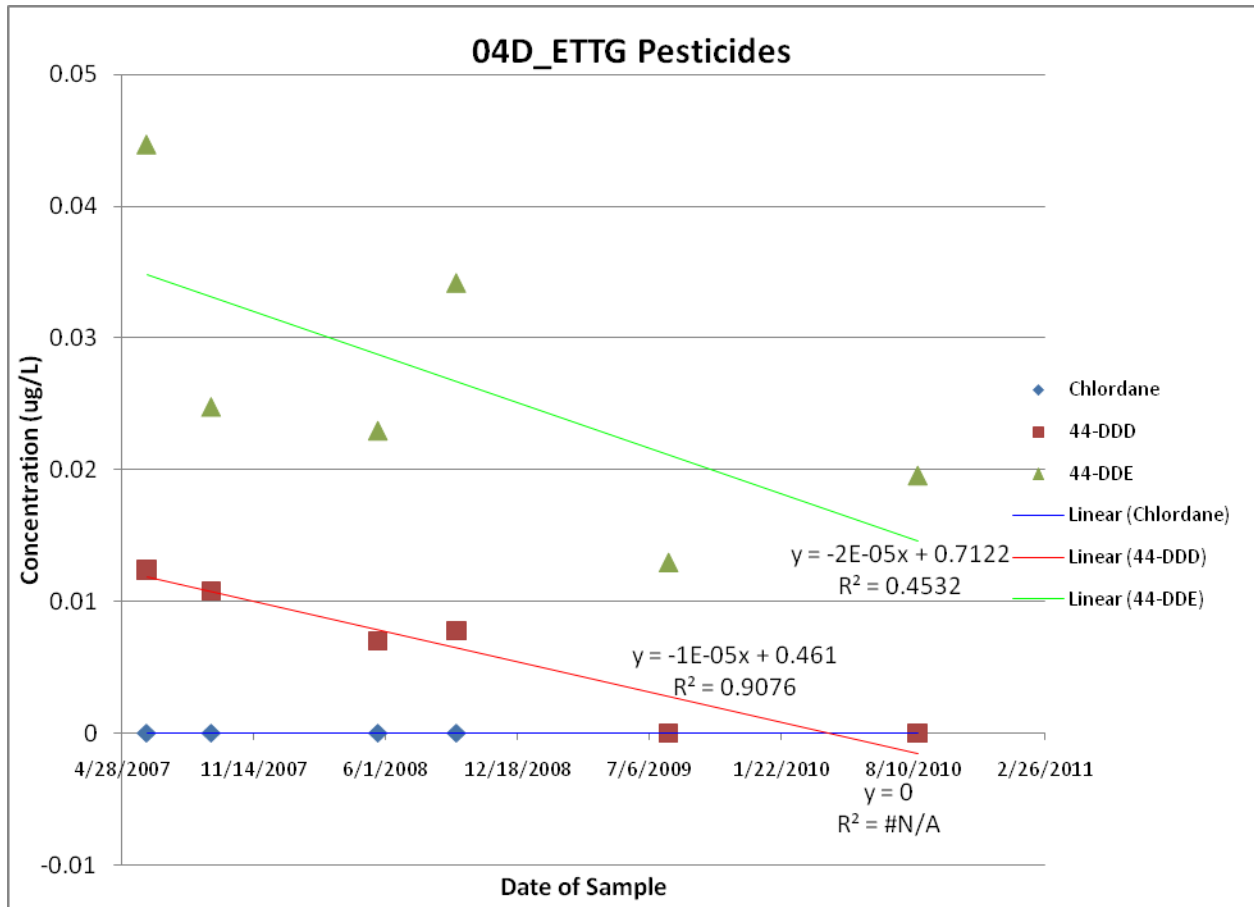


Figure 12. 04D_ETTG OC Pesticides Concentrations

04D_LAS

This is a second tier priority monitoring site under the VCAILG WQMP. The number of dry weather nitrogen and OC pesticides exceedances at this site have decreased over the monitoring period. The average concentrations of constituents during dry events has also gone down over time. Figure 13 shows decreasing concentrations of all OC pesticides with exceedances, except for chlordane.

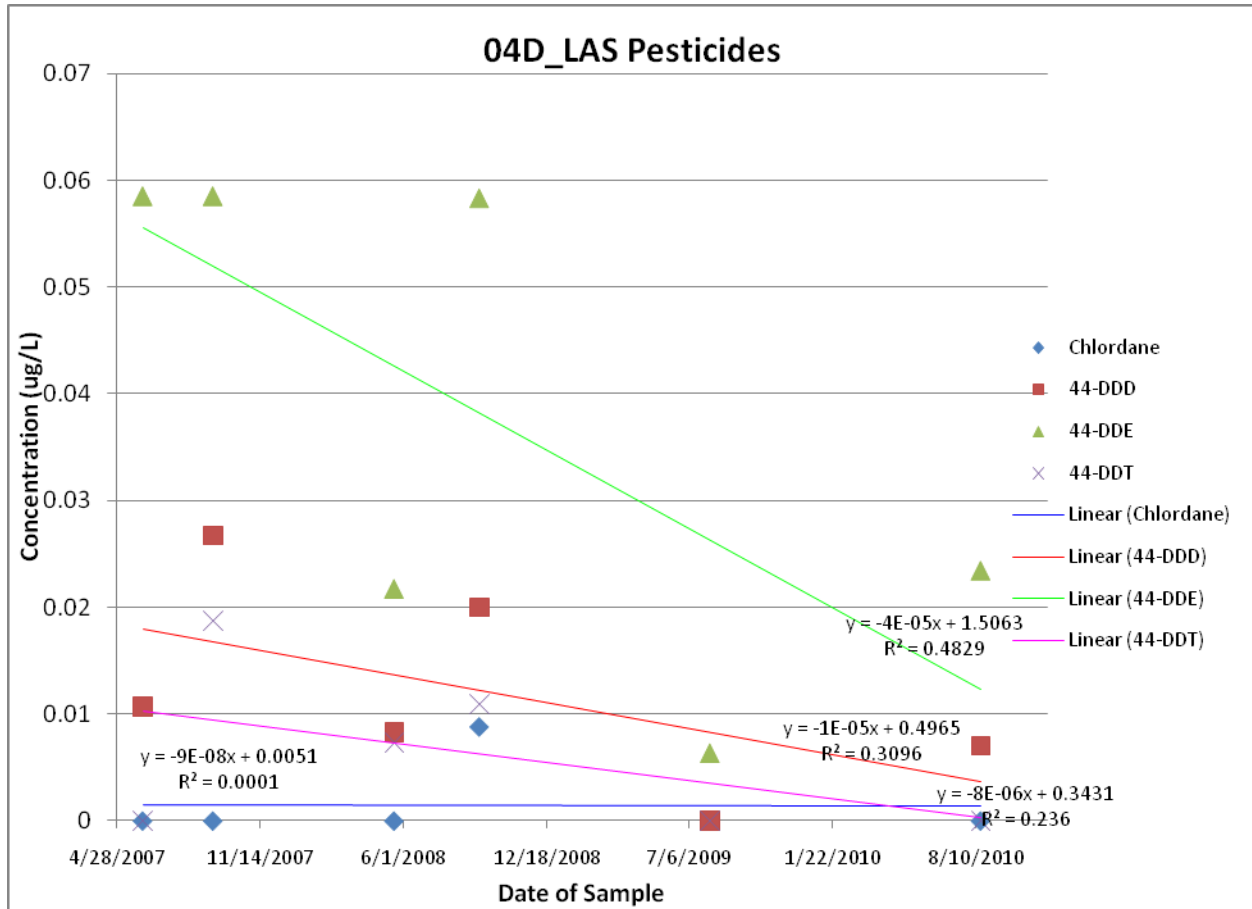


Figure 13. 04D_LAS OC Pesticides Concentrations

05D_SANT_VCWPD

This is a first tier priority monitoring site under the VCAILG WQMP. Average constituent concentrations during dry weather have decreased significantly since the first event. Pesticide concentrations have also dropped since the beginning of the monitoring program.

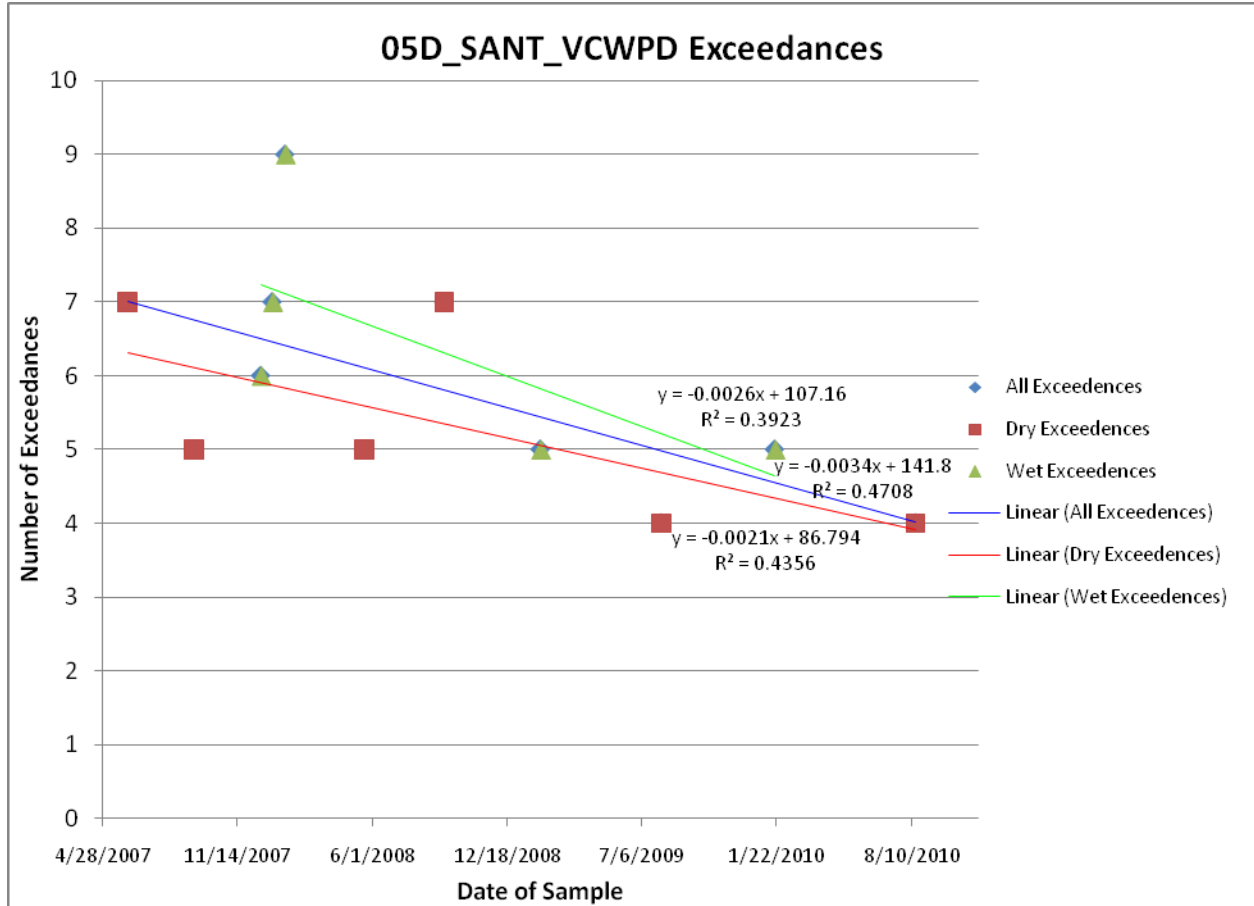


Figure 14. 05D_SANT_VCWPD Number of Exceedances per Monitoring Event

Education Requirement

The Conditional Waiver requires Group participants to earn 8 hours of education credit. VCAILG members were given a couple course options in 2010 to fulfill the education requirement prior to the expiration of the 2005 Conditional Waiver (Order No. R4-2005-0080). The two meeting options were both out in the field demonstrations of BMPs currently being utilized on local farms. Table 70 lists the courses offered during 2010 that were attended by VCAILG members for education credit. Over the course of the 2005 Conditional Waiver, VCAILG members have taken advantage of 66 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 during the 2005 Conditional Waiver. During the five year Waiver period, VCAILG members have completed over 13,000 hours of water quality education, with an average of greater than 9 hours for each member.

For the first two years of the new 2010 Conditional Waiver, VCAILG will be coordinating with various agencies and groups to provide its members with educational opportunities to fulfill the new 8 hour education requirement.

Table 70. Courses Offered in 2010 for Education Credit

Date	Education Hours	Course Title	Course Coordinator and/or Sponsor
2/28/2010	2.5	Strawberry Irrigation Field Day	UCCE
4/29/2010	3.5	Orchard Irrigation Tour	UCCE

Conclusions and Recommendations

MONITORING PROGRAM CHANGES

As this is the final Annual Monitoring Report for the 2005 Conditional Waiver, no monitoring program changes are recommended at this time. A new MRP and QAPP will be submitted six months from the adoption of the 2010 Conditional Waiver; these documents will include necessary monitoring program changes taking into account the incorporation of TMDL load allocations.

PESTICIDE USE DATA SUBMITTAL

In the VCAILG 2009 Water Quality Management Plan (WQMP), pesticide usage was evaluated for 2009. 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. Additionally, information from the Management Practice Survey results for the second tier priority drainages was compared to the pesticide usage and water quality benchmark exceedance data. Data for 2010 will be available later in 2011 and a similar analysis will be performed and included in future reports as required under the 2010 Conditional Waiver.