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

DRAFT

2012 - 2013 Water Quality Management Plan

submitted to:

**LOS ANGELES REGIONAL WATER QUALITY
CONTROL BOARD**

prepared by:

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On behalf of the

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



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Acronyms

AMR	Annual Monitoring Report
BMP	Best Management Practice
LA	Load Allocation
MIL	Mobile Irrigation Lab
MRP	Monitoring and Reporting Program Plan
NOA	Notice of Applicability
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
OC	Organochlorine
OP	Organophosphorus
PCB	Polychlorinated biphenyl
QAPP	Quality Assurance Project Plan
RCD	Resource Conservation District
TMDL	Total Maximum Daily Load
UCCE	University of California Cooperative Extension
VCAILG	Ventura County Agricultural Irrigated Lands Group
WQMP	Water Quality Management Plan

Executive Summary

The Conditional Waiver specifies that if the monitoring results demonstrate an exceedance of water quality benchmarks, then a Water Quality Management Plan (WQMP) must be developed. This WQMP is being submitted on behalf of the Ventura County Agricultural Irrigated Lands Group. The exceedances that are addressed occurred during the 2012 to 2013 monitoring year and include those of Conditional Waiver water quality benchmarks and applicable total maximum daily load allocations for agriculture.

Along with the identification of water quality benchmark exceedances and an identification of conditions and potential sources, a pesticide use evaluation was performed relating the applications of chlorpyrifos and diazinon with water quality results.

The previous WQMP identified a three-part approach to address water quality priorities. The following bullets summarize the activities that took place over the past year and are further detailed within this WQMP.

- Develop a comprehensive web-based survey system to better track and evaluate BMP implementation. Feedback VCAILG has received from outreach efforts and past surveys were used to develop the new focused, web-based survey.
- Continue to provide outreach and education information to engage VCAILG members regarding education opportunities, water quality monitoring results, and Conditional Waiver requirements.
- Provide targeted additional follow-up activities focused on documenting occurrences and implementing BMPs to address irrigation runoff.

Responses to the online management practice survey resulted in survey coverage of sixty-six percent of the irrigated acres enrolled in VCAILG. Survey respondents reported high implementation rates by BMP category and across monitoring drainage tiers, but there are specific BMPs that stood out as having lower adoption rates.

The next year of WQMP implementation will focus on outreach to convey the survey and monitoring results. To enable a more detailed analysis of the survey results and better relate that information to water quality, improving survey coverage are a high priority.

Introduction

On October 7, 2010 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. R4-2010-0186). 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 forms to comply with this Order. 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 April 7, 2011. 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 September 15, 2011, signifying the Regional Board’s approval of the VCAILG and its Monitoring Program.

The first Annual Monitoring Report was submitted by the VCAILG to the Regional Board February 26, 2013 with the most recent report being filed on the same date in 2014. Each Annual Monitoring Report provides a detailed summary of activities of the VCAILG during the past year, 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 data collected during the wet and dry monitoring events. Also included is a discussion of monitoring results that exceeded water quality benchmarks.

The Conditional Waiver specifies that if the monitoring results demonstrate an exceedance of water quality benchmarks, then a Water Quality Management Plan (WQMP) must be developed. Per the August 3, 2012 approval letter from the Regional Board Executive Officer, the first

WQMP developed under the 2010 Conditional Waiver was submitted on March 15, 2013. This and future WQMPs are to be submitted May 26th. As specified in Conditional Waiver, “the primary objective of the WQMP is to identify and construct or implement targeted management practices to reduce or eliminate waste discharges from irrigated agriculture lands to the water of the state in order to achieve water quality objectives.” To meet this objective, the WQMP is designed to:

1. Assess the impacts of waste discharges from irrigated lands to surface waters;
2. Quantify and identify waste sources;
3. Identify and implement new and/or revised management practices to reduce or eliminate discharges of waste that cause or contribute to exceedances of water quality benchmarks;
4. Document the implementation and maintenance of management practices; and
5. Document attainment of water quality benchmarks.

This document serves as the WQMP for exceedances of water quality benchmarks that occurred during the 2012-2013 monitoring year. All of the water quality benchmark exceedances are addressed by this WQMP. The WQMP also discusses the water quality problems that can be caused by the benchmark exceedance and the degree to which agricultural discharges are contributing to the problem (where feasible and appropriate). By addressing exceedances of all Conditional Waiver water quality benchmarks, applicable total maximum daily load (TMDL) allocations for agriculture, as specified in Appendix 3 of the Conditional Waiver, are included. Additionally, past WQMPs written under both the 2005 and 2010 Conditional Waivers serve to meet the WQMP development requirement for those TMDLs that compel one.

The WQMP contains four major sections. The first section provides a discussion of the VCAILGMP and TMDL monitoring site locations, crop types that drain to each site, standard water quality benchmarks, TMDL load allocation benchmarks, a summary of exceedances that occurred during the 2012-2013 monitoring year, and pesticide use evaluation. To further support this first section, constituent-specific information in Appendix A summarizes the currently available information on sources of the constituents and discusses the water quality problems associated with the benchmark exceedances. Site specific detail regarding benchmark exceedances can be found in Appendix B. The second section describes the WQMP implementation process and identifies priority areas. The next section details the progress made in implementing the 2012 WQMP. Three major goals were identified for completion: creation of a web-based management practice survey and surveying of VCAILG members, outreach and BMP implementation projects, and targeted BMP outreach. Finally, next steps are identified to continue the WQMP iterative process.

Identification of Benchmark Exceedances

This section provides background information regarding the monitoring that took place, such as monitoring objectives and sample locations, and crop types that drain to each monitoring site. Tables with the standard water quality benchmarks and TMDL load allocation benchmarks are provided to place the summarized benchmark exceedances in context. All of this information is also included in the VCAILG 2012-2013 Annual Monitoring Report. Site-specific exceedance information is further detailed in Appendix B.

MONITORING OBJECTIVES

The objectives of the VCAILGMP required under the Conditional Waiver include the following:

- Monitor the discharge of wastes in irrigation return flows, tile drains, stormwater, and waters of the state and identify waste sources;
- Where discharges of waste cause or contribute to exceedances of water quality benchmarks, or cause pollution or nuisance, submit a Water Quality Management Plan (WQMP) to implement targeted management practices to reduce or eliminate the discharge of waste;
- Report results and other required information on an annual basis; and
- 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 TMDL Monitoring Programs within Ventura County).

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. A background (“BKGD”) site was chosen for one of the Santa Clara River Watershed sites in the natural area upstream. Calleguas Creek Watershed sites supplement monitoring performed under the Calleguas Creek Watershed TMDL Monitoring Program (CCWTMP) and retain consistency with previous VCAILG sampling. Monitoring sites in the Santa Clara River and Ventura River Watersheds were selected to continue building on existing data previously collected by VCAILG and meet TMDL requirements, where applicable.

The specific criteria for selection of monitoring sites are as follows:

- Land use (primarily agricultural drainages);
- Subwatershed representation;
- Acres of agricultural irrigated lands represented;
- Proximity to agricultural operations;
- Previous or existing monitoring locations under the *2005 Conditional Waiver* or TMDL monitoring programs;
- Drainage into waterbodies included on or proposed for the federal Clean Water Act 303(d) list of impaired waterbodies;
- Size and complexity of watershed;
- Size and flow of waterbodies; and,
- Safe access during dry and wet weather.

Table 1 lists monitoring sites selected in each watershed and associated global positioning system (GPS) coordinates for sampling Conditional Waiver Appendix 1, Table 1 constituents. Table 2 lists monitoring sites and GPS coordinates for effective TMDL monitoring locations. Figure 1 through Figure 7 show site locations for all monitoring sites within each watershed. To

further distinguish sites, Table 3 and Table 4 provide acreages of different crop types within each monitoring drainage area.

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:

S03D_BARDS signifies that the monitoring site is an agricultural drain located in the Santa Clara River Watershed. The site is located along Bardsdale Avenue.

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 1. VCAILGMRP Monitoring Locations for Conditional Waiver Constituents

Watershed/ Subwatershed	Site ID	Reach	Waterbody Type ¹	Site Location	GPS Coordinates ²	
					Latitude	Longitude
Calleguas Creek / Mugu Lagoon	01T_ODD3_ARN	1	T	Rio de Santa Clara/Oxnard Drain #3 at Arnold Rd.	34.123564	-119.156514
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_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_LONG2	6	T	Long Canyon at Balcom Canyon Rd. crossing	34.281721	-118.958565
Oxnard Coastal	OXD_CENTR	--	D	Central Ditch at Harbor Blvd.	34.220555	-119.254983
Santa Clara River	S02T_ELLS	2	T	Ellsworth Barranca at Telegraph Rd.	34.306805	-119.141275
	S02T_TODD	2	T	Todd Barranca at Hwy. 126	34.313584	-119.117095
	S03T_TIMB	3	T	Timber Canyon at Hwy. 126	34.370172	-119.020939
	S03T_BOULD	3	T	Boulder Creek at Hwy. 126	34.389578	-118.958738
	S03D_BARDS	3	D	Discharge along Bardsdale Ave. upstream of confluence with Santa Clara River	34.371535	-118.964470
	S04T_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
VRT_SANTO		--	T	San Antonio Creek at Grand Avenue	34.454455	-119.221723

1. T = Tributary to receiving water; D = agricultural Drain; B = Background site.

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

Table 2. Monitoring Locations for Effective TMDLs

Watershed/ Subwatershed	Site ID	Reach	Waterbody Type ¹	Site Location	GPS Coordinates ²	
					Latitude	Longitude
Calleguas Creek/ Mugu Lagoon	01T_ODD2_DCH	1	T	Duck Pond/Oxnard Drain #2/Mugu Drain S. of Hueneme Rd.	34.1395	-119.1183
Calleguas Creek/ Calleguas Creek	02D_BROOM	2	D	Discharge to Calleguas Creek at Broome Ranch Rd.	34.1434	-119.0711
Calleguas Creek/ Revolon Slough	04D_WOOD	4	D	Agricultural drain on E. side of Wood Rd. N of Revolon	34.1707	-119.0960
	05D_SANT_VCWPD	5	D	Santa Clara Drain at VCWPD Gage #781	34.2425	-119.1114
Calleguas Creek/ Arroyo Las Posas	06T_FC_BR	6	T	Fox Canyon at Bradley Rd.	34.2646	-119.0115
Calleguas Creek/ Arroyo Simi	07D_HITCH_LEVEE_2	7	D	2 nd corrugated pipe discharging on N. site of Arroyo Simi flood control levee off of Hitch Blvd.	34.2714	-118.9205
Calleguas Creek/ Conejo Creek	9BD_GERRY	9B	D	Drain crossing Santa Rosa Rd. at Gerry Rd.	34.2369	-118.9473
Santa Clara River Estuary	S01D_MONAR	1	D	Drain entering SCR Estuary at Monarch Lane between Harbor Blvd. and Victoria Ave.	34.2333	-119.2413
Santa Clara River	S02T_ELLS	2	T	Ellsworth Barranca at Telegraph Rd.	34.3068	-119.1413
Oxnard Coastal	OXD_CENTR	--	D	Central Ditch at Harbor Blvd.	34.2206	-119.2550
Oxnard Coastal/ Channel Islands Harbor	CIHD_VICT	--	D	Discharge to Doris Drain at S. Victoria Ave.	34.2099	-119.2207

1. T = Tributary to receiving water; D = agricultural Drain

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

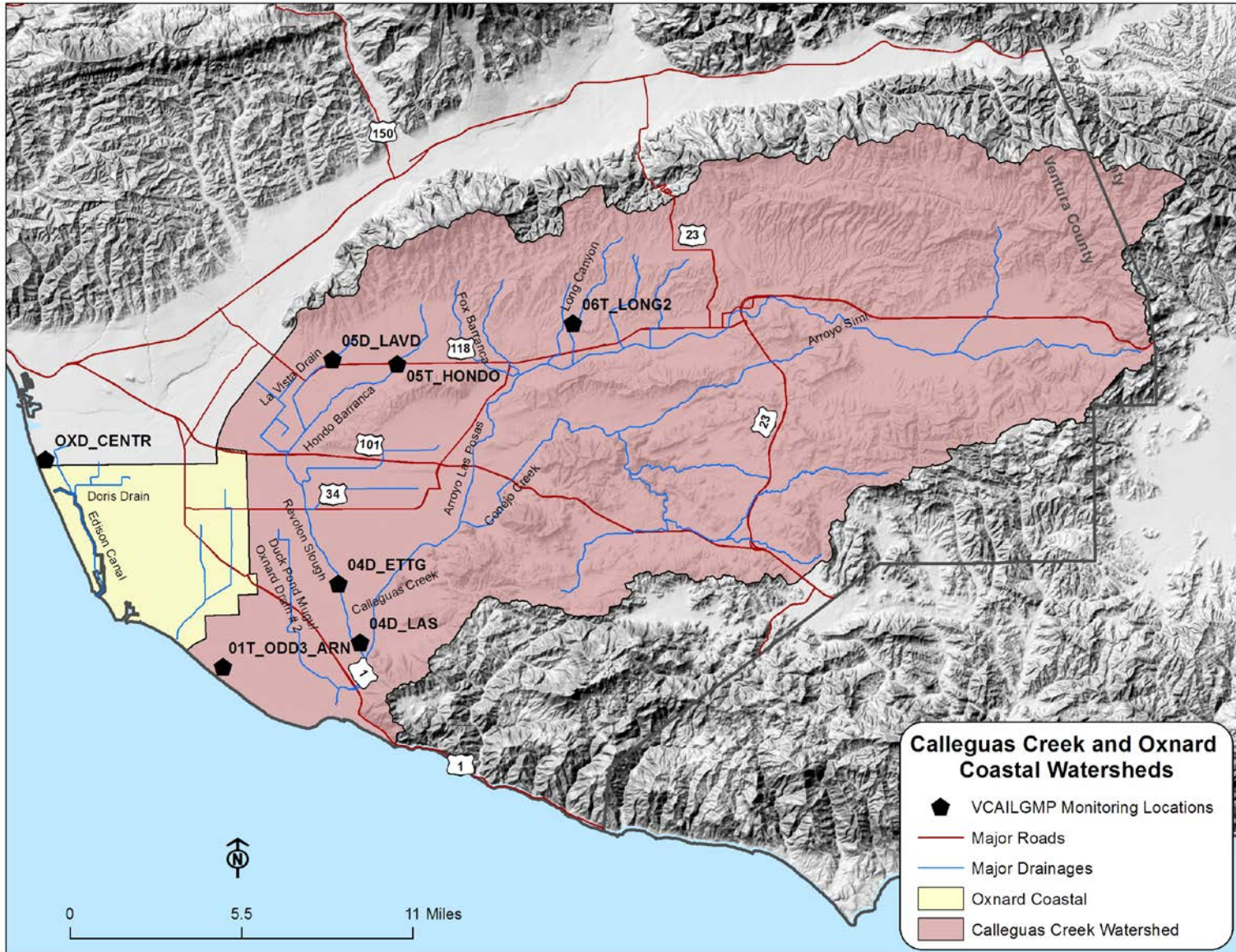


Figure 1. VCAILG Monitoring Sites in the Calleguas Creek/Oxnard Coastal Watersheds

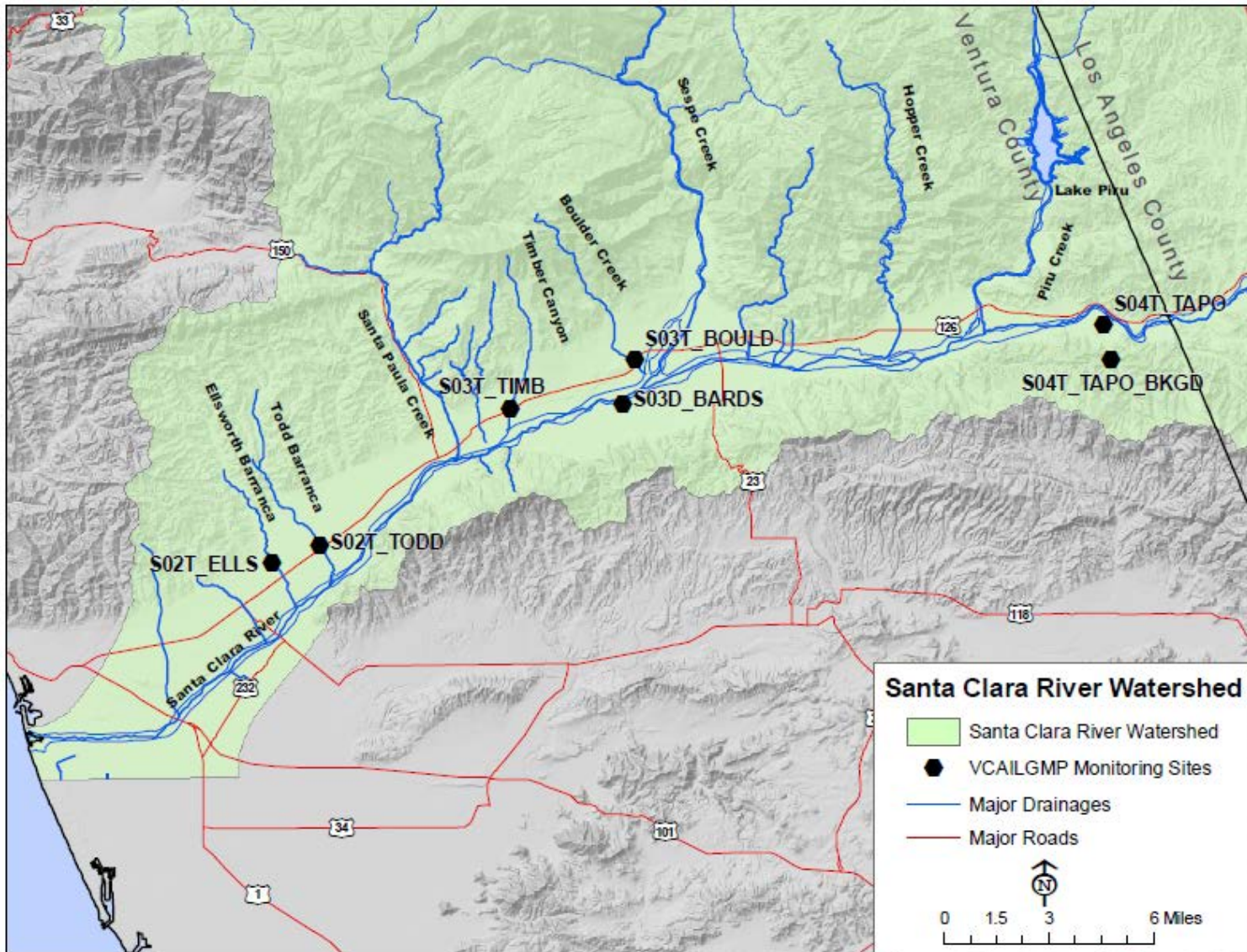


Figure 2. VCAILG Monitoring Sites Located in the Santa Clara River Watershed

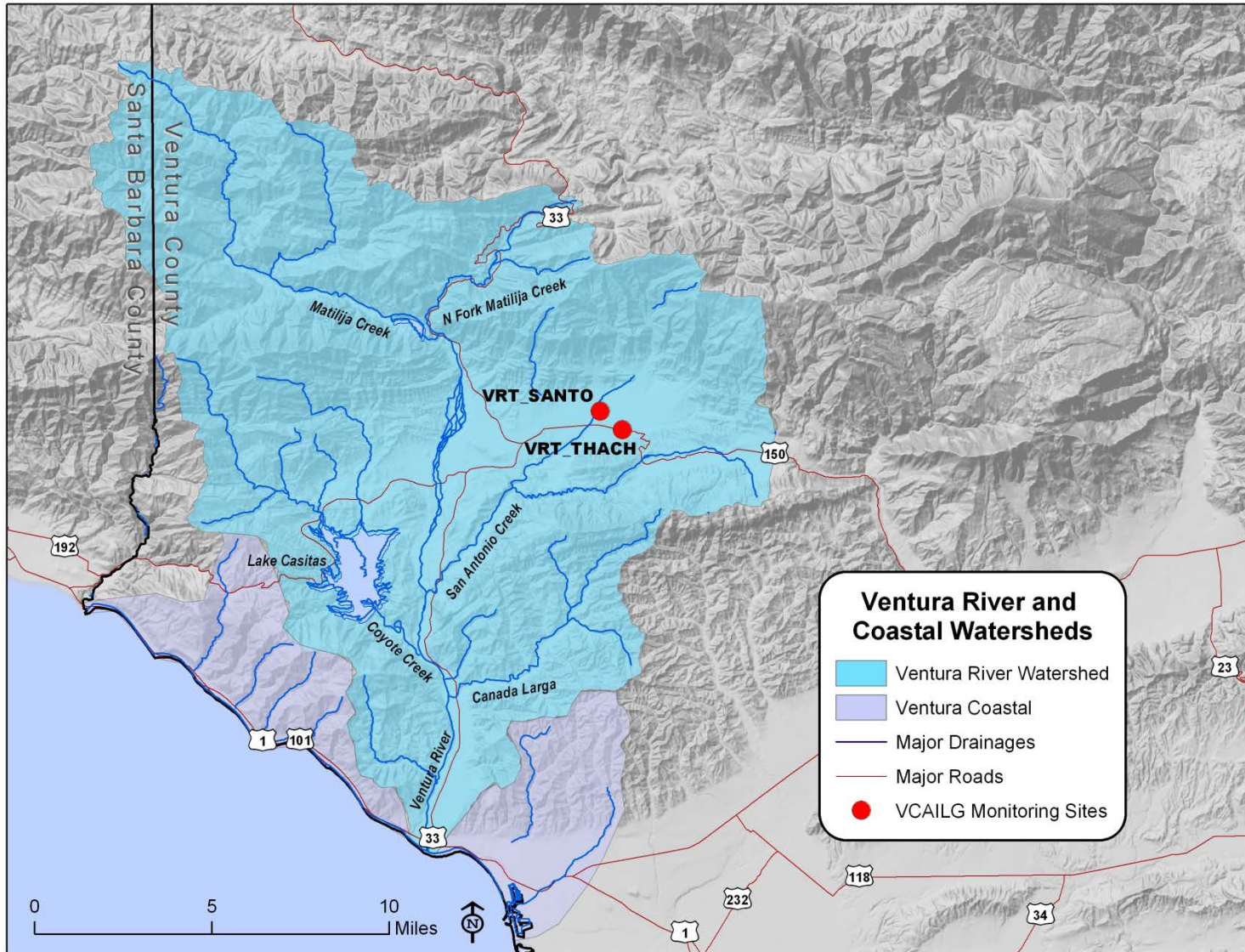


Figure 3. VCAILG Monitoring Sites Located in the Ventura River Watershed

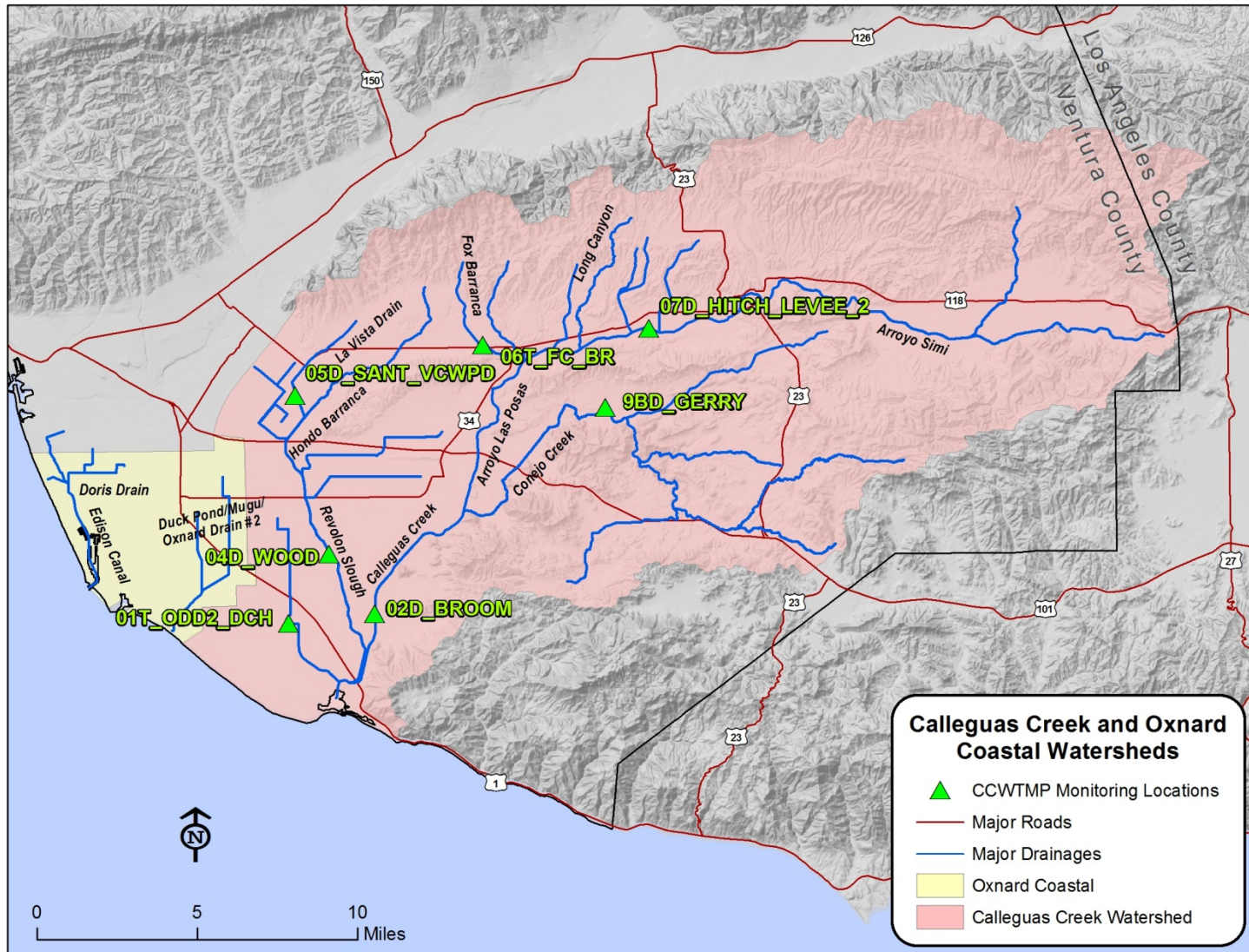


Figure 4. CCWTMP Monitoring Sites

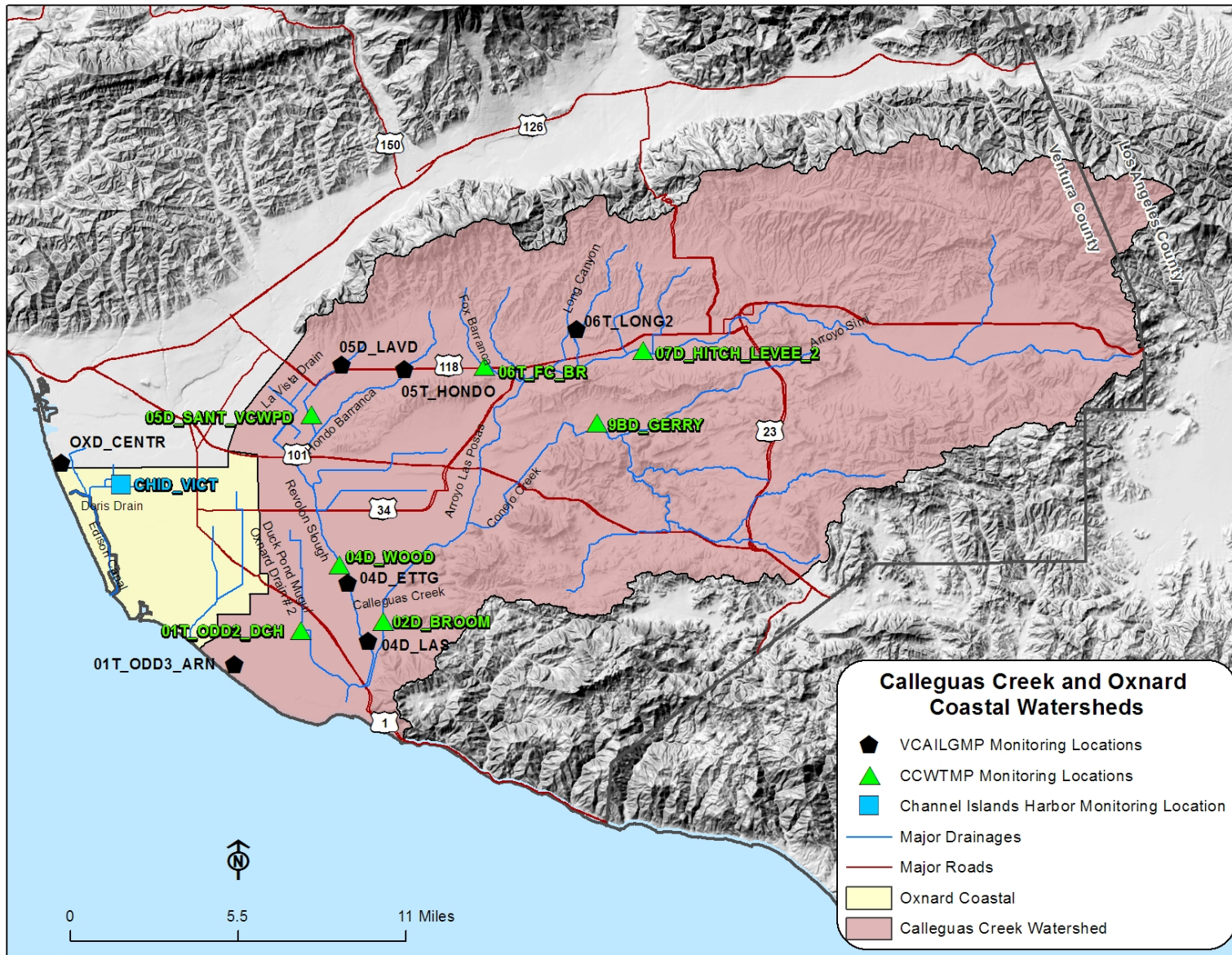


Figure 5. Calleguas Creek and Oxnard Coastal Watershed Monitoring Sites for All Programs

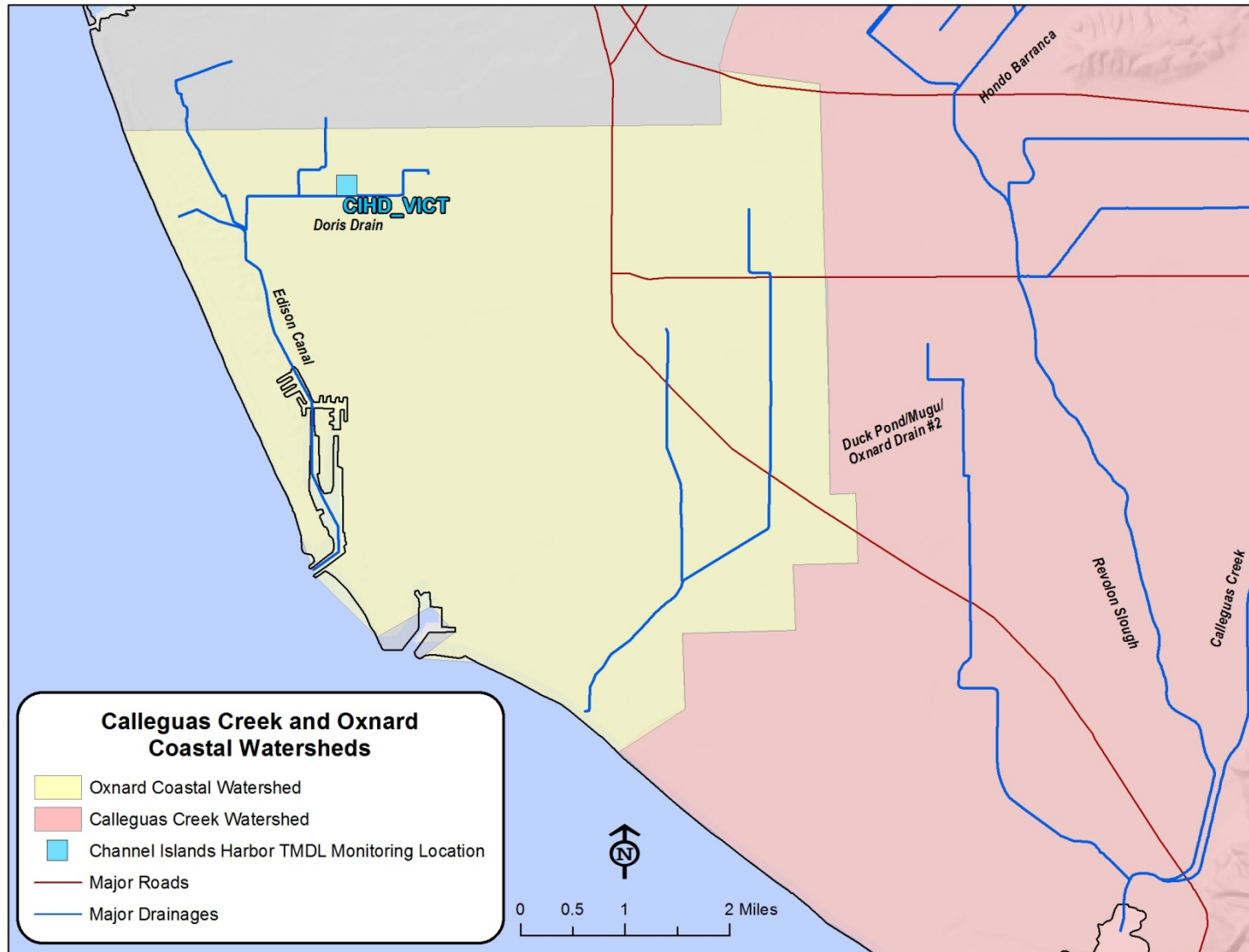


Figure 6. Channel Islands Harbor Bacteria TMDL Monitoring Site

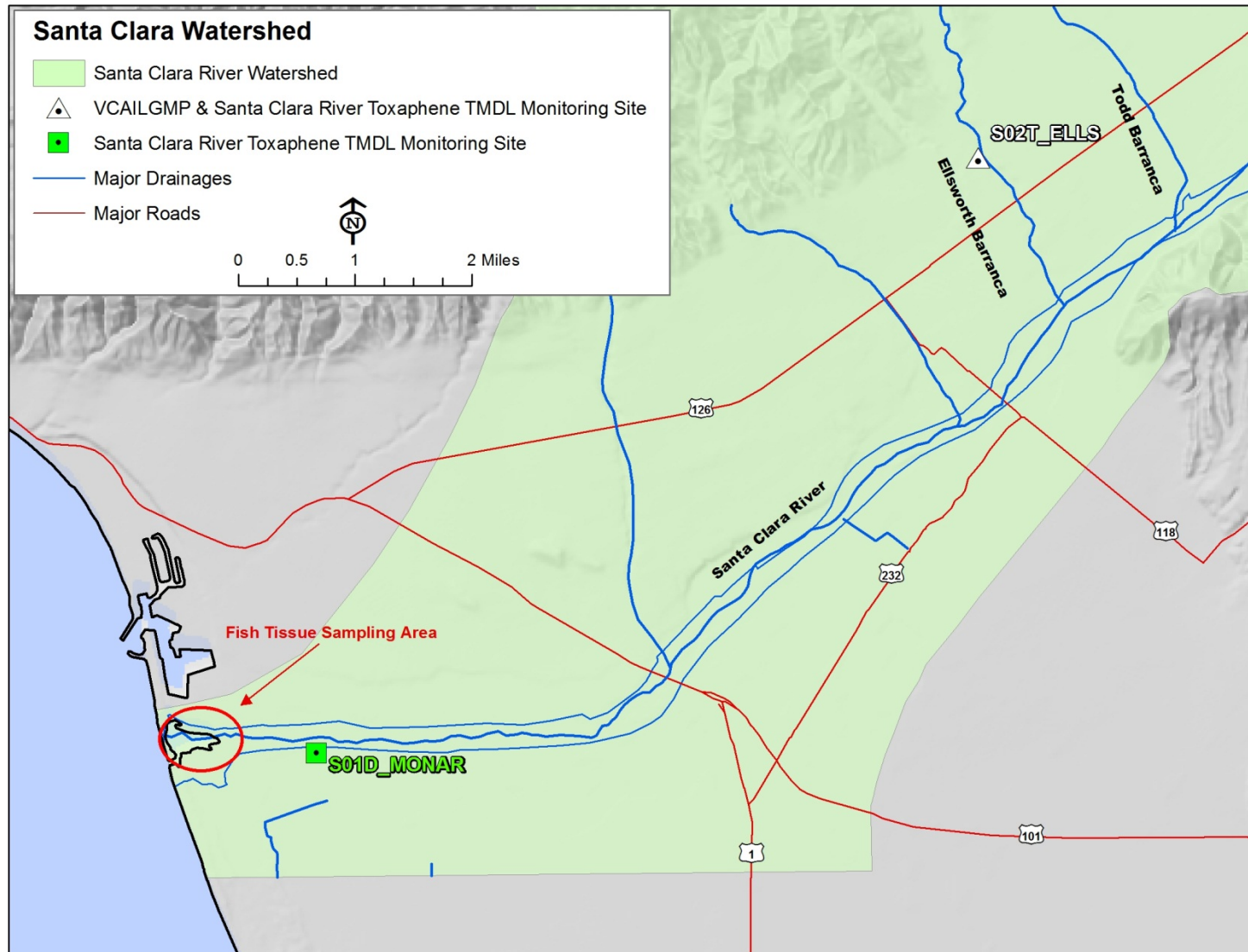


Figure 7. Santa Clara River Estuary Toxaphene TMDL Monitoring Sites

Table 3. Estimated Irrigated Acreage Represented at VCAILG Monitoring Sites

Station ID	Irrigated Agricultural Acreage ^{1,2}									Total Drainage Area Acres
	Row Crops	Cut Flowers	Citrus	Avocados	Other Tree Crops	Strawberries	Other Berries	Sod	Nursery	
01T_ODD3_ARN	867							540		800
04D_ETTG	2534		116			322	180			3,779
04D_LAS	779	17				137			8	1,339
05D_LAVD	7		202	159		51	181			877
05T_HONDO	8		1087	566	1		92		5	3,928
06T_LONG2	2	10	203	157		10	17		46	2,813
OXD_CENTR	337	85	13			273				1,243
S02T_ELLS	99		276	529	1	24	21			9,015
S02T_TODD	122	46	222	152						5,748
S03D_BARDS	39		705	92					17	2,214
S03T_BOULD	0		175	672					157	3,764
S03T_TIMB	18		104	421	2					2,183
S04T_TAPO	29		33						50	3,686
VRT_SANTO			285	242	13					7,220
VRT_THACH	6		630	158	9				3	6,003

1. Data Source Ventura County Agricultural Commissioner's Office
2. Some acreage is double or triple counted due to multi-cropping practices.

Table 4. Estimated Irrigated Acreage Represented at TMDL Monitoring Sites

Station ID ¹	Irrigated Agricultural Acreage ^{2,3}									Total Drainage Area Acres
	Row Crops	Cut Flowers	Citrus	Avocados	Strawberries	Other Berries	Sod	Nursery	Other	
01T_ODD2_DCH	844	3	9		470		126	1	239	1,564
02D_BROOM	1,154	0	335	328		385		23	204	8,236
04D_WOOD	316				43	27			79	470
05D_SANT_VCWPD	285		404	174	2	71				1,154
06T_FC_BR	80	13	791	62	2	55		59	1	2,602
07D_HITCH_LEVEE_2	85							57		142
9BD_GERRY			32	86		120				447
S01D_MONAR	115				49				11	209
CIHD_VICT	168				73					99

1. Sites OXD_CENTR and S02T_ELLS are also monitored for specific TMDL constituents; their drainage area and crop type information is listed in the previous table.
2. Data Source Ventura County Agricultural Commissioner's Office
3. Some acreage is double or triple counted due to multi-cropping practices.

STANDARD WATER QUALITY BENCHMARKS

This section presents the water quality benchmarks as specified in the Conditional Waiver (R4-2010-0186) used to evaluate monitoring data collected at VCAILG monitoring sites in 2012 through 2013. Benchmarks used for determining exceedances of the standard water quality benchmarks include numeric and narrative water quality objectives contained in Appendix 2 of the Conditional Waiver, which consist of narrative and numeric Basin Plan objectives and water quality standards from the California Toxics Rule (CTR). In instances where the Conditional Waiver references the Basin Plan or CTR, without specifying a benchmark number, the lowest applicable number was selected for each watershed. The Conditional Waiver also includes effective TMDL load allocations (LAs) as water quality benchmarks. A subset of those TMDLs includes the provision to develop WQMPs regardless of whether monitoring data exceed water quality benchmarks. This WQMP has been written to meet any mandatory TMDL requirements compelling WQMP development.

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. The following tables specify applicable water quality benchmarks by watershed or stream reach, where appropriate.

Table 5. Standard Water Quality 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 Table 16.
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 18, 19, and 20.
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 16 through 20.

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. R4-2010-0186, Los Angeles Regional Water Quality Control Board, adopted October 7, 2010.

Table 6. Standard Water Quality 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 (mg/L)	Ammonia ¹ (mg/L)	Phosphate (mg/L)
CC below Potrero Rd.	-----	-----	-----	-----	10 ²	pH, temperature dependent	-----
CC above Potrero Rd.	-----	150	250	850	10 ³	pH, temperature dependent	-----
OXD	-----	-----	-----	-----	10 ²	pH, temperature dependent	-----
SCR Reach 1	Tidally-influenced mouth of Santa Clara River upstream to 101 Bridge	-----	-----	-----	10 ²	pH, temperature dependent	-----
SCR Reach 2	Upstream of Hwy 101 Bridge to Freeman Diversion	150	600	1200	10 ²	pH, temperature dependent	-----
SCR Reach 3	Upstream of Freeman Diversion to A Street Bridge in Fillmore	100 ⁴	650	1300	5 ³	pH, temperature dependent	-----
SCR Reach 4	Upstream of A Street Bridge in Fillmore to Blue Cut Gaging Station	100	600	1300	5 ³	pH, temperature dependent	-----
VR Reach 4	Between Camino Cielo Rd. and Casitas Vista Rd.	60	300	800	5 ³	pH, temperature dependent	-----

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

1. 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.
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 was used for comparison with VCAILG data collected at monitoring sites in this reach.
3. The Nitrogen benchmark listed is as Nitrate-N plus Nitrite-N.
4. The 100 mg/L benchmark for chloride is the revised water quality objective adopted by the Regional Board in Resolution 2003-015.

Table 7. Standard Water Quality Benchmarks for Copper

Constituent	Freshwater ¹		Brackish or Saltwater ¹	
	Benchmark (µg/L)	Benchmark Source	Benchmark (µg/L)	Benchmark Source
Copper ²	$= 0.96e^{[0.8545(\ln hardness)+(-1.702)]}$	CTR CCC ³	3.1	CTR CCC ³

1. Freshwater benchmark applies to discharges to waters with salinities <1 ppt at least 95% of the time. Saltwater benchmark applies when salinities are ≥10 ppt at least 95% of the time. For discharges between these categories, or tidally influenced freshwater that supports EST beneficial uses, the lower criteria of the two shall be used; which is the saltwater benchmark.
2. As per footnote “m” to the Table in Paragraph (b)(1) of the CTR; “The freshwater and saltwater criteria for metals are expressed in terms of the dissolved fraction of the metal in the water column.” In instances where the measured hardness is >400 mg/L as CaCO₃, a hardness of 400 is used to calculate the benchmark. This was done in accordance with CTR §31692, f. Hardness.
3. CTR = California Toxics Rule (USEPA, May 18, 2000).
CCC = Criteria Continuous Concentration

Table 8. Standard Water Quality 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	0.00059	CTR HHO
2,4'-DDD	-----	-----	-----	-----	-----	-----
2,4'-DDE	-----	-----	-----	-----	-----	-----
2,4'-DDT	-----	-----	-----	-----	-----	-----
4,4'-DDD	0.00084	CTR HHO	0.00084	CTR HHO	0.00084	CTR HHO
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	0.00075	CTR HHO	0.00075	CTR HHO	0.00075	CTR HHO

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 9. Standard Water Quality Benchmarks for Organophosphorus Pesticides

Constituent	CC, OXD, SCR, VR Watersheds
	Benchmark (ug/L) ¹
Bolstar	-----
Chlorpyrifos	0.025
Demeton	-----
Diazinon	0.10
Dichlorvos	-----
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 2 of the Conditional Waiver

Table 10. Standard Water Quality Benchmarks for Pyrethroid Pesticides

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

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

SUMMARY OF STANDARD WATER QUALITY BENCHMARK EXCEEDANCES

The following summarizes the exceedances of standard water quality benchmarks as specified in Conditional Waiver Appendix 2 or included by reference to narrative and numeric Basin Plan objectives and water quality standards from the California Toxics Rule. A discussion of the sources of these constituents is provided after the discussion of TMDL benchmarks and exceedances. Site specific information regarding benchmark exceedances and conditions can be found in Appendix B.

Monitoring data from samples collected at 7 of the 15 VCAILG Monitoring Program (VCAILGMP) sites exceeded benchmarks and triggered the requirement to develop WQMPs to address the exceedances. Background sites are not included in the total number of monitoring sites because they are located upstream of irrigated agricultural operations and do not trigger the development of a WQMP. Exceedances of standard water quality benchmarks occurred in all watersheds, except Ventura River Watershed where no samples were collected during the 2012-2013 monitoring year due to lack of flow.

Table 11 lists the exceedances that occurred at each site for each monitoring event. This table also identifies sites that were sampled, but no exceedances occurred, as well as sites that were not sampled due to the absence of flowing water. OC pesticides, primarily DDT compounds, caused the highest number of exceedances overall, followed by nitrogen compounds. Benchmark exceedances of the OP pesticide chlorpyrifos occurred almost exclusively during wet weather and at sites located in the Calleguas Creek and Oxnard Coastal Watersheds. During the first dry event (Event 16, August 2012), all sites sampled had exceedances except for one (S02_ELLS). During the storm event (Event 17, January 2013) and the second dry event (Event 18, May 2013) all sites sampled had exceedances.

Toxicity sampling took place during wet Event 17. No dry weather toxicity sampling was performed due to a scheduling error. The dry weather toxicity sampling will be made up during the 2013-2014 monitoring year. For Event 17, single-species, short-term chronic toxicity testing was conducted for freshwater sites on *C. dubia* (6- to 8-day 3-brood survival and reproduction) and for high conductivity sites on *Hyalella* (10-day survival). None of the sites exhibited organism survival toxicity.

Table 11. Exceedances of Standard Water Quality Benchmarks in 2012 – by Site and Event ¹

Site	Event 16 – Dry August 28, 2012	Event 17 – Wet January 25, 2013	Event 18 – Dry May 21, 2013
01T_ODD3_ARN	Nitrate-N DDD, DDE	Ammonia-N, Nitrate-N, Copper DDD, DDE, DDT	Nitrate-N Copper DDD, DDE
04D_ETTG	Nitrate-N Copper DDD, DDE,	Nitrate-N Copper DDD, DDE, DDT	Nitrate-N Copper DDE
04D_LAS	Nitrate-N DDE	Nitrate-N DDE Chlorpyrifos	Nitrate-N DDD, DDE
05D_LAVD	TDS, Sulfate	DDD, DDE, DDT, Toxaphene, Chlorpyrifos	NS
05T_HONDO	NS	NS	NS
06T_LONG2	NS	NS	NS
OXD_CENTR	DO Nitrate-N Chlorpyrifos	Nitrate-N DDE, DDT Chlorpyrifos	Nitrate-N
S02T_ELLS	None	NS	NS
S02T_TODD	TDS, Sulfate Nitrate-N,	TDS, Sulfate Nitrate-N DDE, DDT,	TDS, Sulfate DDE, DDT
S03T_TIMB	NS	NS	NS
S03T_BOULD	NS	NS	NS
S03D_BARDS	NS	NS	NS
S04T_TAPO	TDS, Chloride, Sulfate Nitrate-N,	TDS, Chloride, Sulfate Nitrate-N DDE	TDS, Chloride, Sulfate Nitrate-N
VRT_SANTO	NS	NS	NS
VRT_THACH	NS	NS	NS
Total Number of Sites Sampled	8	7	6
Total Number of Sites with Exceedances	7	7	6

NS = Not Sampled; site dry or ponded

1. Listed exceedances for DDD, DDE, and DDT are all in the form of 4,4' isomers.

TMDL WQMP REQUIREMENTS

Appendix 3 of the Conditional Waiver lists water quality benchmarks that come from TMDL load allocations (LAs). Including these LAs as benchmarks means an exceedance triggers the development of a WQMP. Additionally, certain TMDLs require a WQMP regardless of whether monitoring data exceed the LAs; they include the Calleguas Creek Watershed and Mugu Lagoon OC Pesticides and PCBs TMDL, Calleguas Creek Watershed and Mugu Lagoon Toxicity, Chlorpyrifos, and Diazinon TMDL, Calleguas Creek Metals and Selenium TMDL and Calleguas

Creek Watershed Boron, Chloride, Sulfate, and TDS (Salts) TMDL. Therefore, this WQMP covers all the previously listed TMDLs regardless of benchmark exceedances. TMDLs that only require a WQMP in the event of a load allocation benchmark exceedance are explained below. The process and BMPs outlined in the WQMP are designed to result in compliance with both the standard water quality and TMDL LA benchmarks. Standard water quality and TMDL LA benchmark exceedances are further detailed in Appendix B.

Calleguas Creek Watershed Nitrogen Compounds TMDL

The LA for the Calleguas Creek Watershed Nitrogen Compounds TMDL is expressed as the sum of nitrate-nitrogen and nitrite-nitrogen (Table 12).

Table 12. Load Allocations for Nitrogen Compounds

Constituent	Load Allocation (mg/L)
Nitrate-N + Nitrite-N	9

Revolon Slough and Beardsley Wash Trash TMDL

LAs for this TMDL are zero trash. Dischargers may achieve compliance with the LAs by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. By March 6, 2010, agricultural dischargers were required to demonstrate full compliance and attainment of the zero trash target's requirement that trash is not accumulating in deleterious amounts between the required trash assessment and collection events.

Non-point source dischargers are complying with the Trash TMDL requirements through a program that includes a combination of a Minimum Frequency Assessment Collection (MFAC) Program and other BMPs. The MFAC program includes regular collection and counting of trash. Various components of the WQMP address the BMP portion of Trash TMDL compliance, including VCAILG education, outreach, and the Management Practice Survey that have all provided information and BMPs related to trash collection and proper disposal.

Santa Clara River Nitrogen Compounds TMDL

The LA for the Santa Clara River Nitrogen Compounds TMDL applicable to VCAILG monitoring sites is listed in Table 13.

Table 13. Load Allocations for Nitrogen Compounds

Constituent	Load Allocation (mg/L)¹
Ammonia-N + Nitrate-N + Nitrite-N	10

1. The specified load allocation applies to all Santa Clara River reaches within Ventura County.

Ventura River Estuary Trash TMDL

LAs are zero trash. Dischargers may achieve compliance with the LAs by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. By March 6, 2010 agricultural dischargers must demonstrate full compliance and

attainment of the zero trash target's requirement that trash is not accumulating in deleterious amounts between the required trash assessment and collection events.

Non-point source dischargers are complying with the Trash TMDL requirements through a program that includes a combination of a MFAC program and other BMPs. Various components of the WQMP address the BMP portion of Trash TMDL compliance, including VCAILG education, outreach, and the Management Practice Survey that have all provided information and BMPs related to trash collection and proper disposal.

Santa Clara River Estuary Toxaphene TMDL

The Conditional Waiver incorporated toxaphene LAs for suspended sediment and fish tissue as Water Quality Benchmarks (Appendix 3) shown in the table below.

Table 14. Load Allocations for Toxaphene

Reach	Toxaphene in Fish Tissue (µg/kg)	Toxaphene in Suspended Sediment (µg/kg)
Santa Clara River Estuary	6.1	0.1

SUMMARY OF TMDL LOAD ALLOCATION BENCHMARK EXCEEDANCES

Details regarding the monitoring sites and conditions during which TMDL LA benchmark exceedances occurred can be found in Appendix B. The Calleguas Creek Watershed Boron, Chloride, Sulfate, and TDS (Salts) TMDL interim LAs are currently being met at all sites, with the exception of boron at the 04_WOOD site, which represents the Revolon Slough subwatershed. The Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL interim LA was exceeded for selenium in Revolon Slough, however, this TMDL already requires a WQMP. Final TMDL LA exceedances occurred for both nitrogen TMDLs (Calleguas Creek Watershed and Santa Clara River Nitrogen Compounds TMDLs).

PESTICIDE USE EVALUATION

In 1990, California became the first state to require full reporting of agricultural pesticide use in response to demands for more realistic and comprehensive pesticide use data. Under the program, all agricultural pesticide use must be reported monthly to county agricultural commissioners, who in turn, report the data to DPR.

California has a broad legal definition of "agricultural use" so the reporting requirements include pesticide applications to parks, golf courses, cemeteries, rangeland, pastures, and along roadside and railroad rights-of-way. In addition, all postharvest pesticide treatments of agricultural commodities must be reported along with all pesticide treatments in poultry and fish production as well as some livestock applications. Only agricultural applications, as noted by specific commodity treated, are summarized in this document.

For the purpose of this evaluation, pesticide use records for 2005-2010 from the DPR were reviewed to identify long-term use trends for chlorpyrifos and diazinon. In addition, pesticide use records for 2012-2013 were compared with VCAILG monitoring data for the same year. The evaluation focused on diazinon and chlorpyrifos since those are the only two presently permitted pesticides with water quality benchmarks under the Ag Waiver.

The review of pesticide use data for 2005-2010 focused on Ventura County-wide application of chlorpyrifos and diazinon. For the comparison of the 2012-2013 pesticide use records to VCAILG monitoring data, pesticide application locations had to be linked to the appropriate monitoring site drainage area as not all pesticide applications within Ventura County occurred within a monitoring site drainage area. Additional manipulation of the pesticide use data included converting the percent concentration of active ingredient based on the product name to an amount of active ingredient applied during each application. Depending on the product formulation, the conversion was either into gallons or pounds of active chlorpyrifos or diazinon. The dates and amounts of pesticides applied were then compared to the benchmark exceedances. Table 15 lists chlorpyrifos use by crop type for 2005-2010 and Table 16 lists the diazinon use by crop type for 2005-2010. Table 17 includes 2012-2013 chlorpyrifos application information by crop type as well as a comparison to water quality data from associated VCAILG monitoring sites. Table 18 includes 2012-2013 diazinon application information by crop type as well as a comparison of water quality data from associated VCAILG monitoring sites.

LONG-TERM PESTICIDE USE DATA

Chlorpyrifos

For agricultural application, chlorpyrifos is used on a variety of products including row crops, nursery crops, citrus crops, and others. For the years 2005-2010, the highest amount of chlorpyrifos was applied to lemons and second highest applied was to strawberries. Other crops with high amounts of chlorpyrifos application included radishes, broccoli, oranges, cabbage, and tangerines. Total annual chlorpyrifos usage ranged from 27,291.16 pounds in 2007 to 39,227.90 pounds in 2008 with an average annual usage of 33,012.44 pounds (Table 15).

Table 15. Amount of chlorpyrifos applied (lbs) by crop per year between 2005 and 2010.

Crop Type	Chlorpyrifos Application (lbs)					
	2005	2006	2007	2008	2009	2010
Alfalfa	N/A	N/A	N/A	N/A	2	0.75
Avocado	0.5	13	13	N/A	N/A	3
Bean, Unspecified	N/A	N/A	N/A	N/A	9	N/A
Bok Choy	39	N/A	45	N/A	0.75	9
Broccoli	841	490	120	496	142	6
Cabbage	381	688	792	2,673	1,608	1,621
Cauliflower	31	N/A	N/A	N/A	N/A	N/A
Chinese Cabbage	N/A	N/A	N/A	N/A	0.75	2
Citrus	N/A	N/A	N/A	N/A	7	8
Collard	81	111	14	7	24	104
Corn, Human Consumption	331	351	15	40	63	5
Cucumber	148	2	64	190	N/A	82
Daikon	N/A	N/A	N/A	0.5	N/A	N/A
Fumigation ¹	N/A	29	30	N/A	N/A	N/A
Grape	N/A	N/A	N/A	8	N/A	N/A
Grapefruit	4	5	N/A	N/A	N/A	96
Kale	5	7	4	N/A	6	23
Landscape Maintenance	42	25	48	27	3.3	17
Lemon	24,040	25,670	18,610	27,826	23,102	24,288
Lime	N/A	N/A	N/A	27	N/A	N/A
Mint	0.7	N/A	N/A	N/A	N/A	N/A
Mustard	N/A	N/A	N/A	N/A	N/A	92
N-Grnhs ² Flower	32	12	19	19	25	44

Crop Type	Chlorpyrifos Application (lbs)					
	2005	2006	2007	2008	2009	2010
N-Grnhs Plants in Containers	7	8	36	31	5	40
N-Out ³ Flower	182	131	141	109	113	110
N-Out Plants in Containers	111	120	65	45	17	80
N-Out Transplants	6	1	9	6	9	2
Onion, Dry	107	N/A	6	156	N/A	N/A
Orange	590	1,000	511	401	188	294
Orchard Floor	N/A	N/A	N/A	N/A	53	10
Peas	N/A	N/A	N/A	N/A	N/A	70
Pest Control ⁴	173	19	0.005	N/A		
Pumpkin	N/A	N/A	N/A	N/A	N/A	0.19
Radish	1,132	12	9	43	70	852
Rights of Way	0.15	0.4	2	1	0.45	N/A
Strawberry	1,838	5,150	6,489	6,576	7,219	6,341
Tangelo	N/A	N/A	N/A	35	40	N/A
Tangerine	10	57	248	511	511	66
Turf/ Sod	4	15	N/A	N/A	N/A	8
Uncultivated Ag	N/A	N/A	N/A	N/A	13	N/A
Annual Total	30,104	33,947	27,291	39,228	33,232	34,273

1. Fumigation includes commodity, soil preparation, and other types of fumigation

2. N-Grnhs = Nursery Greenhouse

3. N-Out = Nursery Outdoor

4. Pest Control includes regulatory and structural pest control

Diazinon

For agricultural application, diazinon is used on a variety of products including row crops, nursery crops, berries, and others. For the years 2005-2010, the crops with the highest amount of diazinon applied included raspberries, onions, greens, tomatoes, and cabbage. Total annual diazinon usage ranged from 932.76 pounds in 2009 to 3,183.43 pounds in 2007 with an average annual usage of 2,179.24 pounds (Table 16).

Table 16. Amount of diazinon applied (lbs) by crop per year between 2005 and 2010.

Crop Type	Diazinon Application (lbs)					
	2005	2006	2007	2008	2009	2010
Bean	125	9	104	141	149	199
Beet	25	26	20	56	51	233
Blackberry	N/A	N/A	N/A	N/A	N/A	1
Bok Choy	N/A	N/A	81	5	0.5	N/A
Cabbage	10	56	130	155	140	300
Cauliflower	N/A	9	N/A	N/A	N/A	N/A
Chinese Cabbage	N/A	7	15	3	N/A	N/A
Collard	82	196	92	95	24	18
Corn, Human Consumption	530	169	319	99	41	5
Daikon	N/A	6	N/A	3	11	0.8
Fumigation, Soil	N/A	N/A	154	N/A	N/A	N/A
Kale	0.88	12	11	19	9	85
Landscape Maintenance	N/A	0.5	N/A	2	0.2	0.04
Lemon	N/A	N/A	N/A	N/A	N/A	0.03
Lettuce ¹	74	214	229	323	159	128
Melon	0.75	14	1	N/A	N/A	N/A
Mushroom	334	173	5	N/A	N/A	N/A
Mustard	80	75	57	12	1	N/A
N-Grnhs Flower	6	2	N/A	N/A	1	N/A
N-Grnhs Plants in Containers	8	8	N/A	2	3	9
N-Grnhs Transplants	N/A	4	N/A	N/A	N/A	N/A
N-Outdr Flower	36	110	3	0.5	13	11
N-Outdr Plants in Containers	53	114	74	31	39	16
Onion ²	533	440	2	95	201	345
Parsley	N/A	N/A	0.37	40	N/A	N/A

Crop Type	Diazinon Application (lbs)					
	2005	2006	2007	2008	2009	2010
Peas	N/A	N/A	N/A	N/A	N/A	4
Pest Control ³	42	2	0.29	0.38	N/A	0.11
Radish	4	74	99	2	11	31
Raspberry	954	323	1,780	370	43	204
Spinach	216	15	N/A	27	11	94
Strawberry	N/A	33	N/A	10	23	0.28
Sugar Beet	N/A	N/A	N/A	N/A	0.03	N/A
Squash	N/A	N/A	5	N/A	N/A	N/A
Swiss Chard	N/A	1	N/A	3	N/A	N/A
Tomato	N/A	N/A	2	331	N/A	234
Turnip	N/A	8	N/A	N/A	N/A	N/A
Annual Total	3,112	2,100	3,183	1,826	933	1,920

1. Includes head and leaf crop types
2. Includes dry and green crop types
3. Includes regulatory and structural pest control

PESTICIDE USE AND VCAILG MONITORING DATA

Chlorpyrifos

For agricultural application, chlorpyrifos is the active ingredient in several products including Lorsban, Dursban, Nufos, and Warhawk. Use of chlorpyrifos is common on lemons, strawberries, and cabbage in Ventura County. Chlorpyrifos was applied within the drainage areas of 12 of 15 VCAILG monitoring sites. Of the 12 monitoring sites, two sites had a total of three exceedances of the chlorpyrifos water quality benchmark during the monitoring year. Two of the exceedances occurred during the January 25, 2013 storm event. The other occurred during the August 8, 2012 dry weather event. The following factors may contribute to the likelihood that chlorpyrifos is transported off-site: pesticide formulation and application method, date of application in relation to subsequent rain events, and proximity to a drainage channel, stream, or tributary. Table 17 provides chlorpyrifos application details within the VCAILG monitoring site drainage areas and exceedances of the 0.025 µg/L benchmark.

Table 17. Chlorpyrifos Applications and Benchmark Exceedances by Monitoring Site for 2012-2013

Site	Date	Commodity	Active Ingredient Applied (gal)	Active Ingredient Applied (lbs)	Total Applied per Site (gal)	Total Applied per Site (lbs)	Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Concentration (ug/L)	Total Drainage Area (acres)
04D_ETTG	7/5/2012	Cabbage		7.50			N/A	N/A	N/A	3779
	7/18/2012	Cabbage		11.25						
	7/25/2012	Cabbage		7.50						
	7/27/2012	Collard		4.65						
	7/29/2012	Kale		3.10						
	8/2/2012	Cabbage		11.25						
	8/8/2012	Cabbage		7.50						
	8/11/2012	Cabbage		7.50						
	8/15/2012	Mustard	1.10							
	8/20/2012	Kale		3.74						
	8/22/2012	Mustard	0.61							
	8/28/2012	Cabbage	7.50							
	9/4/2012	Cabbage	0.76		7.93	116.78				
	9/12/2012	Cabbage	0.72							
	9/18/2012	Cabbage	0.72							
	9/24/2012	Cabbage	1.46							
	9/24/2012	Cabbage		5.25						
	10/4/2012	Cabbage		4.73						
	10/5/2012	Cabbage		4.50						
	10/8/2012	Cabbage	0.54							
10/9/2012	Cabbage		9.00							
2/25/2013	Cabbage		5.57							
2/25/2013	Cabbage		8.75							
3/13/2013	Cabbage	2.02								
6/26/2013	Cabbage		7.50							
04D_LAS	7/5/2012	Cabbage		8.25			1/25/2013	Wet	0.0327	1339
	7/11/2012	Cabbage		7.50		24.75				
	7/19/2012	Cabbage		9.00						
05D_LAVD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	877	

Site	Date	Commodity	Active Ingredient Applied (gal)	Active Ingredient Applied (lbs)	Total Applied per Site (gal)	Total Applied per Site (lbs)	Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Concentration (ug/L)	Total Drainage Area (acres)
05T_HONDO	8/2/2012	Lemon	23.57				N/A	N/A	N/A	3928
	8/7/2012	Lemon	2.54		33.75	68.25				
	8/20/2012	Lemon	7.65							
	10/9/2012	Lemon		68.25						
06T_LONG2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2813	
OXD_CENTR	8/15/2012	Strawberry	20.90				8/8/2012	Dry	0.045	1243
	8/22/2012	Strawberry	16.68				1/25/13	Wet	0.118	1243
	8/23/2012	Strawberry	16.88							
	8/23/2012	Strawberry	2.93							
	8/24/2012	Strawberry	2.61							
	1/3/2013	Cabbage		27.00						
	1/17/2013	Flowers - Indoor		0.23	60.01	77.63				
	1/17/2013	Cabbage		30.60						
	1/23/2013	Cabbage		14.40						
	2/22/2013	Flowers - Indoor		0.60						
	5/31/2013	Flowers - Indoor		0.60						
	6/1/2013	Flowers - Indoor		0.45						
	6/1/2013	Flowers - Outdoor		0.45						
6/8/2013	Flowers - Indoor		3.30							
S02T_ELLS	9/13/2012	Lemon	20.50		21.73		N/A	N/A	N/A	9015
	5/28/2013	Lemon	1.23							
S02T_TODD	9/19/2012	Lemon	4.57				N/A	N/A	N/A	5748
	4/6/2013	Plants - Outdoor		1.00						
	4/30/2013	Cabbage		19.80	4.57	74.80				
	4/30/2013	Cabbage		25.20						
	6/17/2013	Cabbage		28.80						
S03D_BARDS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2214	
S03T_BOULD	8/17/2012	Lemon		17.69		17.69	N/A	N/A	N/A	3764
VRT_SANTO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7220	

Site	Date	Commodity	Active Ingredient Applied (gal)	Active Ingredient Applied (lbs)	Total Applied per Site (gal)	Total Applied per Site (lbs)	Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Concentration (ug/L)	Total Drainage Area (acres)
VRT_THACH	8/23/2012	Orange	0.16		0.49		N/A	N/A	N/A	6003
	8/30/2012	Tangerine	0.11							
	9/18/2012	Orange	0.06							
	9/18/2012	Tangerine	0.16							

Diazinon

Diazinon usage was much less widespread than chlorpyrifos in 2012-2013. The commodities receiving the most diazinon were dry and green onions. Applications of diazinon occurred within three VCAILG monitoring site drainage areas. There were no exceedances of the 0.10 µg/L benchmark. Table 18 includes diazinon application information for the VCAILG monitoring site drainage areas.

Table 18. Diazinon Applications and Benchmark Exceedances by Monitoring Site for 2012-2013

Site	Date	Commodity	Active Ingredient Applied (gal)	Active Ingredient Applied (lbs)	Total Applied per Site (gal)	Total Applied per Site (lbs)	Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Concentration (ug/L)	Total Drainage Area (ac.)
05T_HONDO	8/24/2012	Raspberry		4.32		4.32	N/A	N/A	N/A	3928
OXD_CENTR	2/20/2013	Flowers - Indoors		1.9200		2.88	N/A	N/A	N/A	1243
	5/13/2013	Flowers - Indoors		0.9600						
S04T_TAPO	12/3/2012	Onion - Dry ETC		7.5000		180.00	N/A	N/A	N/A	3686
	12/13/2012	Onion - Dry ETC		5.0000						
	12/21/2012	Onion - Green		5.0000						
	12/27/2012	Onion - Dry ETC		5.0000						
	1/5/2013	Onion - Dry ETC		40.0000						
	1/12/2013	Onion - Dry ETC		5.0000						
	1/22/2013	Onion - Dry ETC		5.0000						
	1/29/2013	Onion - Dry ETC		5.0000						
	2/2/2013	Onion - Dry ETC		5.0000						
	2/2/2013	Onion - Dry ETC		5.0000						
	2/14/2013	Onion - Dry ETC		5.0000						
	2/21/2013	Onion - Dry ETC		5.0000						
	2/27/2013	Onion - Dry ETC		5.0000						
	3/6/2013	Onion - Dry ETC		5.0000						
	3/15/2013	Onion - Green		5.0000						
	3/21/2013	Onion - Green		5.0000						
	3/28/2013	Onion - Green		5.0000						
	4/5/2013	Onion - Dry ETC		5.0000						
	4/11/2013	Onion - Dry ETC		5.0000						
	4/20/2013	Onion - Green		5.0000						
4/26/2013	Onion - Dry ETC		5.0000							
5/3/2013	Onion - Green		5.0000							
5/13/2013	Onion - Green		5.0000							
5/20/2013	Onion - Green		5.0000							
5/25/2013	Onion - Green		5.0000							

Site	Date	Commodity	Active Ingredient Applied (gal)	Active Ingredient Applied (lbs)	Total Applied per Site (gal)	Total Applied per Site (lbs)	Date Benchmark Exceeded	Dry or Wet Event?	Exceedance Concentration (ug/L)	Total Drainage Area (ac.)
	5/31/2013	Onion - Green		5.0000						
	6/22/2013	Onion - Green		5.0000						
	6/29/2013	Onion - Green		7.5000						

PESTICIDE USE SUMMARY

For the 2012-2013 monitoring year, chlorpyrifos and diazinon were applied throughout the year. Out of fifteen sites visited during three monitoring events, there were three total exceedances of the chlorpyrifos water quality benchmark at two of the VCAILG monitoring sites. Two occurred during the January 25, 2013 storm event (04D_LAS and OXD_CENTR) and one occurred during the August 8, 2012 dry weather event (OXD_CENTR). There does not appear to be any correlation between application amount and benchmark exceedances. There were no exceedances of the diazinon water quality benchmark during the three monitoring events. As such, there does not appear to be a link between applications and water quality benchmark exceedances.

Pesticide use is variable and performed in response to a variety of factors such as pest pressures, sudden outbreaks of latent diseases and/or pathogens, cropping patterns, variation in neighboring crops that may have incompatible maximum residue limits, etc. Also, the use of a specific pesticide on a particular crop varies from year to year (Table 15 and Table 16). All pesticide use decisions are based on farmer and pest control advisor (PCA) expertise, and applied under the authority of the local Agricultural Commissioner's office and the Department of Pesticide Regulation (DPR). Outside of compiling the provided pesticide use information and observing any trends, VCAILG does not have the authority to require pest control application modifications. Six questions in the new management practice survey relate to pesticide management (page 49), they include scouting, maintenance, storage, and application timing considerations. The results of these questions will be used in evaluating future pesticide usage records.

WQMP Implementation Process

The purpose of this section is to outline the process utilized by VCAILG to identify the need for management practices, implement specific management practices and track the implementation and effectiveness of those management practices to mitigate water quality benchmark exceedances and achieve TMDL load allocations. In addition to VCAILG, other agencies and organizations are working with Ventura County farmers to provide technical expertise, assistance with BMP implementation, and in some cases, cost sharing opportunities. The most significant effort since the submittal of the previous WQMP has been the development of an online management practice survey, which was used to gather BMP information from the VCAILG membership. It has been just over a month since the survey period ended. The initial analysis of the data is provided in this WQMP and the information from the survey will continue to be mined for aiding in the promotion of an iterative BMP implementation process to improve water quality. Figure 8 demonstrates the iterative WQMP implementation process.

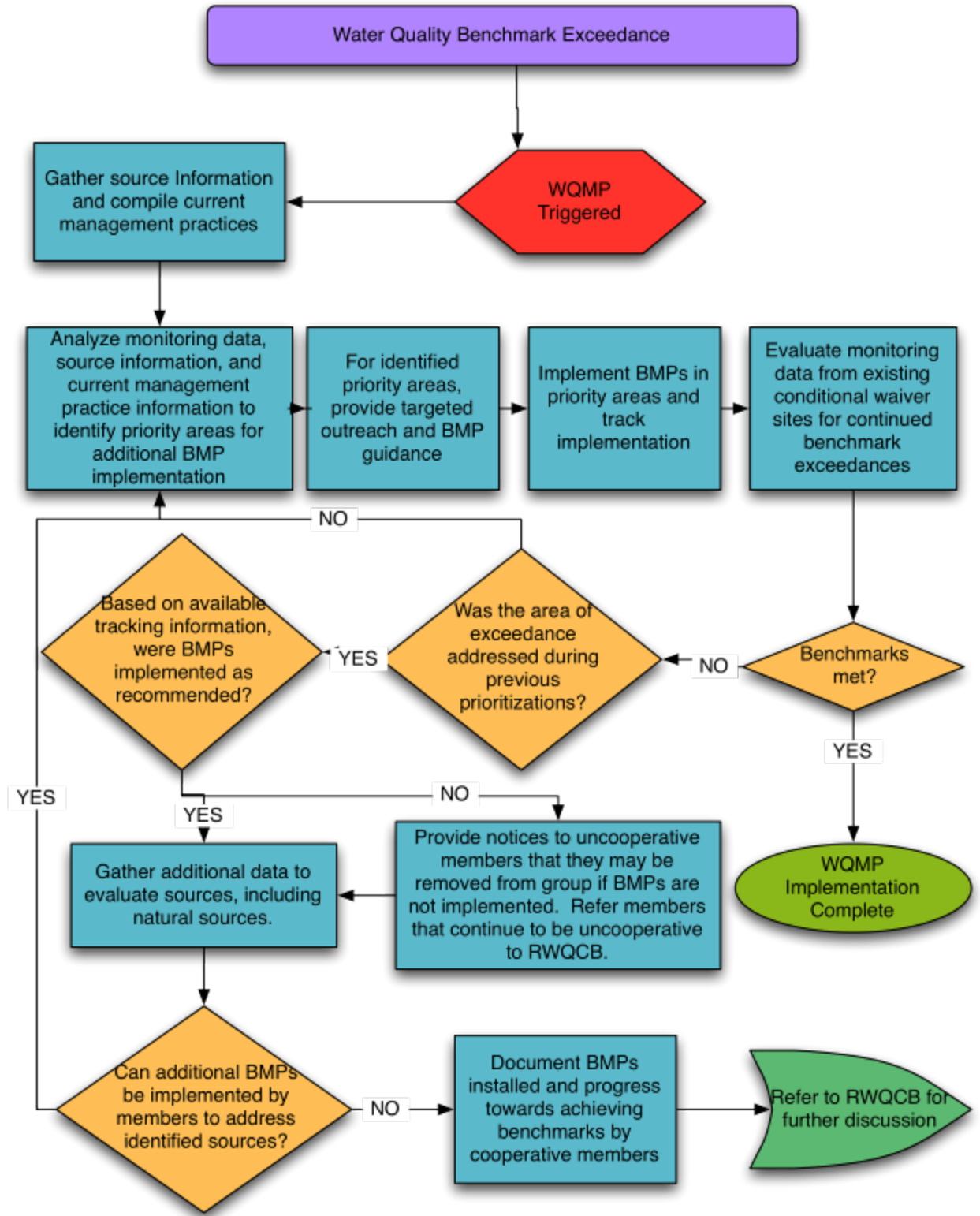


Figure 8. WQMP Implementation Process

IDENTIFICATION OF PRIORITY AREAS

One critical component of implementing the WQMP is prioritizing the monitoring sites. Identifying priority areas is important for focusing outreach efforts and promoting the implementation of BMPs in the areas with water quality benchmark exceedances. The Conditional Waiver specifies that information such as the severity of water quality problems, existence of TMDL load allocations, and availability of other data sources be considered when identifying priority areas. For continuity purposes, the priority tiers are proposed to remain the same. TMDL only monitoring sites have been prioritized based on geography, water quality data, and the number of effective TMDLs in that area. Category 1 and 2 columns in the table below list the number of effective TMDLs and priority ranking during the 2005 Conditional Waiver, if applicable. The color each site is shaded represents the priority tier under this WQMP for compliance with the 2010 Conditional Waiver. Figure 9 shows the location of all monitoring sites and identifies them according to priority tier.

Table 19. Prioritization for VCAILGMP and TMDL Monitoring Sites

Site ID	Category 1 # of Effective TMDLs	Category 2 Prioritization During 2005 Conditional Waiver
VCAILGMP Monitoring Sites		
01T_ODD3_ARN	4	2nd
04D_ETTG	5	2nd
04D_LAS	5	2nd
05D_LAVD	5	1st
05T_HONDO	5	3rd
06T_LONG2	4	None
OXD_CENTR	1	1st
S02T_ELLS	2	3rd
S02T_TODD	1	1st
S03T_TIMB	1	3rd
S03T_BOULD	1	3rd
S03D_BARDS	1	3rd
S04T_TAPO	1	1st
VRT_THACH	0	None
VRT_SANTO	0	None
TMDL Only Monitoring Sites		
01T_ODD2_DCH	4	2nd
02D_BROOM	4	2nd
04D_WOOD ¹	5	N/A
05D_SANT_VCWPD	5	1st
06T_FC_BR	4	3rd
07D_HITCH_LEVEE_2	4	N/A
9BD_GERRY	5	None
S01D_MONAR	1	N/A
CIHD_VICT	1	N/A

1. The drainage area for 04D_WOOD is nested within the 04D_ETTG drainage area.

	Category 1	Category 2
High Priority	≥ 4	1st Priority
Medium Priority	2 – 3	2nd Priority
Low Priority	≤ 1	3rd Priority or None

	1st Tier Priority Drainage
	2nd Tier Priority Drainage
	3rd Tier Priority Drainage

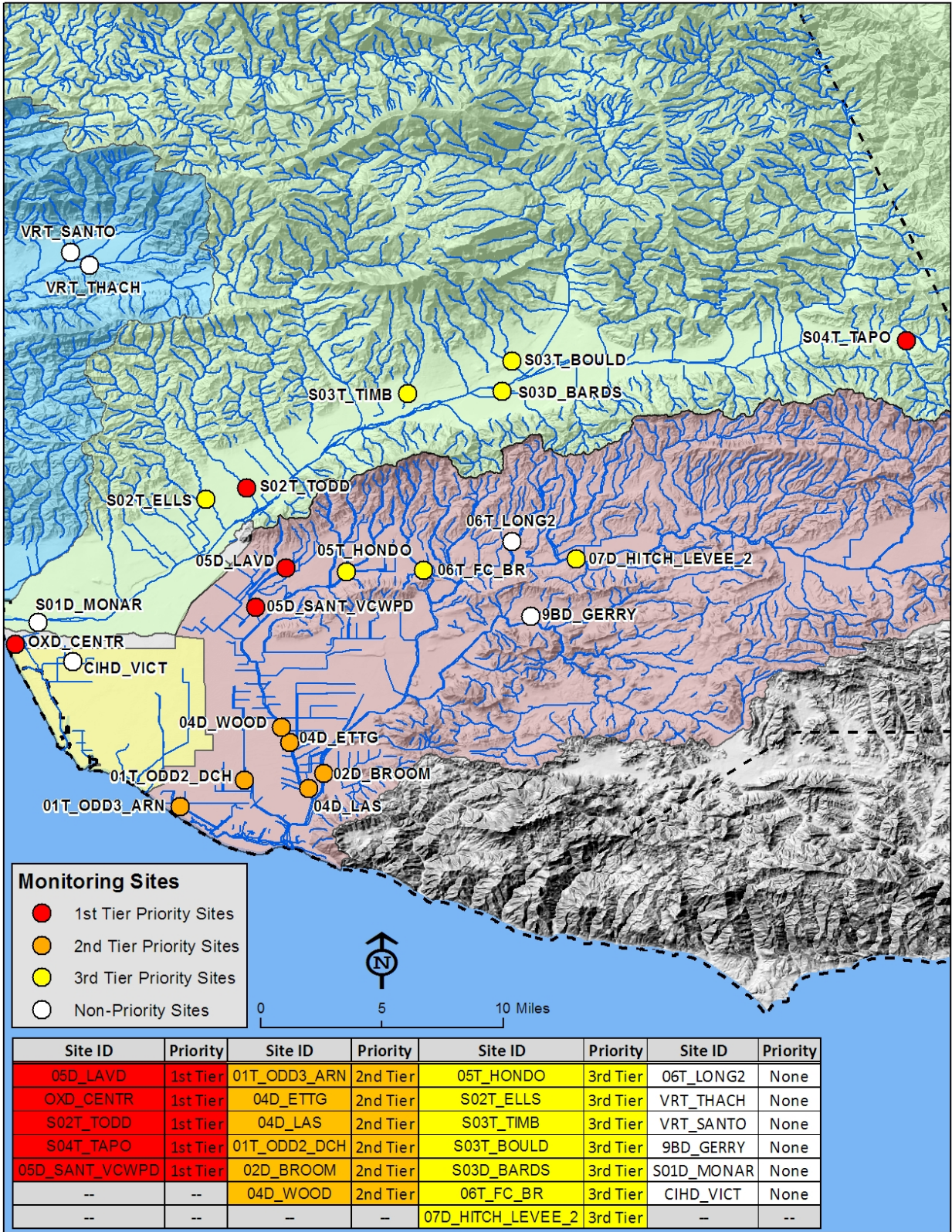


Figure 9. Monitoring Sites Presented by Priority Tier

WQMP Implementation Progress

In the previous WQMP, a three part approach was identified to address water quality priorities during the first WQMP period. The following bullets summarize the approach and the subsequent sections provide relevant details related to implementing the WQMP.

- ✓ Develop a comprehensive web-based survey system to better track and evaluate BMP implementation. Feedback VCAILG has received from outreach efforts and past surveys were used to develop the new focused, web-based survey.
- ✓ Continue to provide outreach and education information to engage VCAILG members regarding education opportunities, water quality monitoring results, and Conditional Waiver requirements.
- ✓ Provide targeted additional follow-up activities focused on documenting occurrences and implementing BMPs to address irrigation runoff.

WEB-BASED MANAGEMENT PRACTICE SURVEY

The web-based Management Practice Survey was created as a refinement of the previous BMP survey used in past WQMPs. Using the web-based survey provides benefits to both VCAILG and its members. Farmers are able to enter information easily for all parcels that they grow on and answer crop specific questions. VCAILG members have the ability to print their completed surveys for their own records and progress tracking. Additionally, development of the online survey took into consideration errors and inaccurate responses received on the paper forms. Error messages and prompts were incorporated to prevent issues such as the number of reported irrigated acres exceeding the assessed parcel acreage or incorrect parcel number entry. While these prompts and backstops have improved the accuracy of the survey data, additional modifications are being considered to further refine the process and minimize manual clean-up of the data set.

The online management practice survey compiles the following information related to the ownership and farm operations:

- Identification of person filling out the survey and confirmation of landowner contact information;
- Parcels and irrigated acreage under the management of the person filling out the survey;
- Crops farmed on each parcel within the following categories:
 - Strawberries
 - Raspberries
 - Row Crops
 - Orchard
 - Nursery
 - Cut Flowers
 - Sod
 - Other (must be specified)

Management questions related to overhead cover, surface treatments, and irrigation methods are asked separately for each crop type that is farmed. Some of the options listed below are only

applicable to certain crops and within the survey, only the most applicable answers are given as options for a particular crop. To avoid repeating the questions for every crop type, all possible answers are provided below:

1. What type of overhead cover is used in the production area?
 - No Overhead Cover _____ acres
 - Hoop House _____ acres
 - Greenhouse _____ acres
 - Other (specified) _____ acres

2. What type of surface treatments are used in the production area?
 - Raised Beds _____ acres
 - Plastic _____ acres
 - Cover Crop _____ acres
 - Mulch _____ acres
 - Weed Cloth _____ acres
 - Bare Soil _____ acres
 - Other (specified) _____ acres

3. What type of irrigation systems are used?
 - Overhead Sprinkler, Then Drip _____ acres
 - Overhead Sprinkler Only _____ acres
 - Drip Only _____ acres
 - Micro-Sprinkler, Then Drip _____ acres
 - Micro-Sprinkler Only _____ acres
 - Furrow/Flood _____ acres
 - Hand Watering _____ acres
 - Other (specified) _____ acres

The BMP portion of the survey includes thirty-six questions presented in five categories: irrigation and salinity management, nutrient management, sediment management, pesticide management, and trash management. Only one answer can be given for each BMP. Each management practice category also includes a free form field for farmers to describe additional practices they are doing, not captured by the survey questions. This information may be useful to refine the survey questions or learn about new innovative BMPs that could be the topic of future education and outreach. The web-based BMP survey questions and possible answers are provided in the following table. BMPs related to equipment and systems maintenance are noted with a “M”. The method in which the data is being collected allows for reporting of the number of BMPs implemented, number of parcels addressed by each BMP, and the area the BMPs cover.

Irrigation and Salinity Management						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not applicable
1	Sprinkler irrigation runoff is captured or kept on the property.					
2 M	At least every 5 years, the irrigation system is tested for distribution uniformity by monitoring water delivery or pressure differences within a block.					
3 M	Regular maintenance is performed on the irrigation system to maintain distribution uniformity and prevent runoff caused by leaks or clogged lines.					
4	Pressure regulators or pressure compensating emitters are used.					
5 M	Sprinkler heads and drip emitters of the same flow rate are used within each block and replaced with the same heads or emitters, when necessary.					
6	Soil moisture is measured using any of the following: <ul style="list-style-type: none"> • Sensors • Tensiometers • Probes • Irrigation monitoring service 					
7	Flow meters are used to measure actual water use and are coupled with known crop use values or other measurements to match irrigation to plant needs.					
8	Irrigation water quality is tested for parameters of interest including: <ul style="list-style-type: none"> • Nitrate • pH • Electrical Conductivity (EC) • Sodium • Chloride • Bicarbonate • Boron 					
9	Water use for plant establishment has been reduced by adopting more efficient irrigation methods such as: <ul style="list-style-type: none"> • Early drip use • Intermittent sprinklers • Microsprinklers 					

Irrigation and Salinity Management (continued)						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not applicable
10	Irrigation decisions are made by trained personnel who understand appropriate irrigation management.					
11	Salt leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).					
Please describe any additional irrigation and/or salinity management practices employed on your farm, or ways you have reduced water use:						

Nutrient Management						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not Applicable
12	Soil or leaf/petiole tests are conducted to determine fertilization needs and the minimum amount necessary is applied based on the results.					
13	Fertilizer applications are split into multiple smaller applications to maximize plant uptake.					
14 M	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.					
15	Fertilizer applications are timed to consider irrigation and potential rain events.					
16	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.					

Nutrient Management (continued)						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not Applicable
17	Fertilizer decisions are made by trained personnel who understand the 4R's of nutrient management: <ul style="list-style-type: none"> • Right fertilizer source • Right rate • Right time • Right place 					
18	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.					
19 M	Backflow prevention devices are installed and maintained.					
Please describe any additional practices employed on your farm to prevent fertilizers from leaving the property through surface runoff or leaching below the root zone:						

Sediment Management						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not Applicable
20	Long runs of production area are broken up by access roads or buffer strips to reduce sediment movement.					
21	In sloped production areas, one or more of the following management practices is used to minimize erosion: <ul style="list-style-type: none"> • Contour farming • Contoured buffer strips • Terracing 					

Sediment Management (continued)						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not Applicable
22 M	Bare soil is minimized through use of cover crops, mulch, leaving plant debris, or planting subsequent crops, and the soil cover is replenished periodically to maintain effectiveness.					
23	Soil amendments, such as polyacrylamide (PAM), are used to reduce sediment movement and retain water.					
24 M	Berms, culverts, or flow channels are in place to divert water away from roads. These devices or structures are maintained to preserve their functionality.					
25	Road erosion is minimized by use of any of the following: <ul style="list-style-type: none"> • Grading • Gravel • Grass • Mulch • Water bars • Drains 					
26	Non-cropped areas with bare soil are protected from erosion with any of the following: <ul style="list-style-type: none"> • Vegetation • Mulch • Gravel • Water diversion 					
27	Ditch banks are protected from erosion with vegetation, rock placement or geotextiles.					
28	One or more of the following is in place to treat runoff before it leaves the property. <ul style="list-style-type: none"> • Grassed waterways • Vegetated filter strips • Sediment traps • Tailwater recycling systems 					
Please describe any additional practices employed on your farm to control sediment transport and minimize erosion:						

Pesticide Management						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not Applicable
29	Before application of pesticides, pest scouting is conducted using one or more of the following methods: <ul style="list-style-type: none"> • Yellow sticky traps • Pheromone traps • Plant inspection • Beating • Net sweeping 					
30	Natural enemy populations are considered when choosing pesticides, application rates, and timing.					
31 M	Sprayers are routinely calibrated to ensure accurate application rates.					
32 M	Worn nozzles and screens are replaced to ensure the best coverage of pesticide applications.					
33	Pesticides are stored and mixed on an impermeable pad and at least 100 feet down slope from water sources (such as wells).					
34	Pesticides are not applied when rain or scheduled irrigation events are anticipated.					
Please describe any additional practices employed on your farm to prevent pesticides from leaving the property:						

Trash Management						
#	BMP	Yes, New since Oct. 2010	Yes, Prior to Oct. 2010	Planned for Future	No, not currently used	Not Applicable
35 M	The property is kept clean and free of trash.					
36 M	The property has an adequate number of trash containers that are covered and emptied regularly.					

MANAGEMENT PRACTICE SURVEY EVALUATION

Background

Utilizing the information and lessons learned surveying the farmers whose properties drain to Tier 1, 2, and 3 priority sites, a web-based management practice survey (Survey) was developed. This new survey approach was detailed in the 2012 WQMP, which received conditional approval from the LARWQCB on December 11, 2013. The framework of the Survey was described previously in this WQMP. Distribution of the Survey to VCAILG enrollees has occurred in three phases. Survey login and completion instructions were initially distributed to landowners and growers in first and second-tier priority drainages on February 21, 2014. The remaining landowners and growers received their survey login and instructions in two groups, both in April of 2014. Letters notifying VCAILG members of the survey requirement and deadlines for completion are included in Appendix C. Following the final survey deadline, the survey data was downloaded into an Access database for evaluation and analysis.

The Survey was designed, in part, to gather information about the extent of use of 36 BMPs, each of which was assigned to one of the following management categories:

- Irrigation and Salinity Management
- Nutrient Management
- Sediment Management
- Pesticide Management
- Trash Management

As part of the Survey, respondents were asked to assign one of the following five descriptors (“scores”) to each of the BMPs:

- 1 - Yes, new since October 2010
- 2 - Yes, prior to October 2010
- 3 - Planned for future
- 4 - No, not currently used
- 5 - Not applicable

The design of the survey resulted in associations between Ventura County Assessor’s Parcel Numbers (APNs) and the scores (1 – 5) for each of the 36 BMPs.

In order to expand options for stratifying and exploring survey data for this report, BMPs were assigned to one of four “Characterization Categories”, which were designed to reflect differences in the underlying nature of the activity involved. The Characterization Categories are listed in Table 20 with brief descriptors.

Table 20. Characterization Categories Used to Stratify Survey Data.

Characterization Category	Example Activities
Real Time Data	Use of weather data, soil moisture sensors, tensiometers, sources of real time evapotranspiration data
Testing	Use of pest scouting devices Chemical testing of irrigation water Measurements for timing and amount of irrigation needed Soil tests Leaf and petiole analysis Irrigation system pressure tests
Specialized Knowledge	Acquisition (including web sites) and use of up-to-date, specialized knowledge about soil types, crop rooting depths, pests and disease, nutrient requirements of crops, pesticide effectiveness and recommendations for application, etc.
Cropped Area Actions	Actions taken in areas under production, such as field preparation, planting, mulching, irrigation, fertilization
Uncropped Area Actions	Actions taken in areas where crops are not growing, such as maintenance of equipment, storage and disposal of chemicals and waste, maintenance and layout of ditches and roads, employee training, treatment of riparian zones and natural vegetation, ground cover in non-cropped areas

Level of Response

Letters and instructions requesting that VCAILG members complete the web-based management practice survey were sent to all landowners (1,203 letters) and growers (218 letters) during the spring of 2014. This request resulted in the completion and submittal of 672 unique surveys. A summary of the survey response rate is provided in the table below. Table 22 provides a crop type breakdown for the surveys completed to date.

Table 21. Management Practice Survey Coverage

Area Type	Assessed Acres	Irrigated Acres
Total farm acreage	149,566	86,392
Total VCAILG member acres	129,206	78,047
Total VCAILG member acres surveyed	83,908	51,819
Percent survey coverage of VCAILG member acres	65%	66%

Table 22. Surveyed Acres by Crop Type

Crop Type	Crop Acres Surveyed	Crop Type Percentage of Surveyed Acreage
Strawberry	6,417	12.4%
Raspberry	2,054	4%
Row Crop	14,815	28.6%
Orchard	26,585	51.3%
Sod	252	0.5%
Nursery	798	1.5%
Cut Flowers	395	0.8%
Other	502	1%
Total	51,818	100%

Comparison of Survey Results

Survey results were downloaded from the website into an Access database. The database was queried on the basis of VCAILG site drainage area, if applicable, and Assessor Parcel Number (APN). In many cases, a single set of management practices (single set of scores for the 36 BMPs) applied to an entire parcel. In other cases, where more than one survey was returned that applied to a particular parcel (e.g., when an owner and a tenant reported management practices for subsets of the same parcel) and it was evident that the same irrigated area was being addressed by both respondents, the survey responses from one of the respondents were deleted for that parcel using professional judgment after inspecting the titles of the survey respondents (e.g., owner, manager, etc.). Many surveyed parcels straddled boundaries between two VCAILG site drainages or between a VCAILG site drainage and unmonitored areas. In order to assign survey responses to the correct amounts and locations of irrigated land, GIS was used to partition the area of parcels that overlapped two drainages. A map of all surveyed parcels was overlain by a map of VCAILG monitored drainages. Based on visual inspection, the irrigated acreage for parcels that straddled drainage boundaries was partitioned, and the pertinent survey responses were assigned to the fractions of the parcel belonging to each of the drainage areas.

Because Survey results are now available for drainage tiers as well as the VCAILG membership overall, it is now possible to evaluate whether there is a correspondence between rates of BMP use and general water quality. In other words, it is now possible to evaluate whether or not particular BMPs are used to a greater extent in drainages where there are fewer benchmark exceedances and where fewer TMDLs apply (and vice versa). Such an evaluation is useful for determining whether there is justification (based on survey results) for prioritizing BMPs for future survey efforts or for outreach and training.

In order to simplify such comparisons, BMP's were considered "adopted" whether they were implemented recently, since October 2010 (corresponding to a score of "1" in the survey) or came into use prior to October 2010 (corresponding to a score of "2" in the Survey). "Adoption rates" for individual monitored drainages and for the aggregate unmonitored area were calculated for each BMP as the percent of total *applicable* acres for the BMP which were assigned a "1" or a "2", as follows:

Adoption Rate (%) =

$$\frac{(\text{Acres with Score "1"})+(\text{Acres with Score "2"})}{[(\text{Irrigated Acres associated with Surveyed Parcels})-(\text{Acres with Score "5"})]}$$

The adoption rates for individual BMPs for each monitoring site drainage area as well as all surveys for parcels located outside of monitoring areas (unmonitored drainages) are provided in Appendix D.

Average BMP adoption rates for Tiers 1-3, non-priority drainages, and surveys from parcels that do not drain to a monitoring site (unmonitored drainage area) are presented on the basis of BMP Characterization and Management Categories in Table 23. Farms for which surveys have been submitted report high adoption rates when considering BMPs grouped into both characterization and management categories. Differences in adoption rates become apparent when considering the individual BMP questions (Table 24 and Appendix D).

Table 23. Average Adoption Rates for BMP Categories

	Number of Applicable BMPs	Average Adoption Rates for Categories of BMPs				
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages	Unmonitored Drainage Area
BMP Characterization						
Cropped Area Action	16	85%	87%	93%	86%	88%
Specialized Knowledge	2	89%	100%	100%	95%	98%
Testing	8	79%	81%	81%	71%	79%
Uncropped Area Action	10	90%	88%	92%	90%	87%
BMP Management Category						
Irrigation & Salinity Management	11	100%	91%	100%	97%	95%
Nutrient Management	8	80%	91%	94%	90%	92%
Sediment Management	9	81%	80%	83%	75%	78%
Pesticide Management	6	99%	99%	99%	93%	97%
Trash Management	2	98%	97%	99%	99%	98%

Table 24. Area-weighted^[1] Mean Adoption Rates (Percent of Applicable Acres) for BMPs by Drainage Group

Management Category	BMP	Drainage Group					Characterization Category	BMP Description
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages	Unmonitored Drainage Area		
Irrigation & Salinity Management	1	43%	41%	87%	94%	58%	Cropped Area Action	Sprinkler irrigation runoff is captured or kept on the property.
Irrigation & Salinity Management	2	84%	69%	87%	55%	73%	Testing	At least every 5 years, the irrigation system is tested for distribution uniformity by monitoring water delivery or pressure differences within a block.
Irrigation & Salinity Management	3	100%	98%	100%	100%	99%	Cropped Area Action	Regular maintenance is performed on the irrigation system to maintain distribution uniformity and prevent runoff caused by leaks or clogged lines.
Irrigation & Salinity Management	4	81%	75%	99%	72%	83%	Cropped Area Action	Pressure regulators or pressure compensating emitters are used.
Irrigation & Salinity Management	5	100%	91%	100%	97%	95%	Cropped Area Action	Sprinkler heads and drip emitters of the same flow rate are used within each block and replaced with the same heads or emitters, when necessary.
Irrigation & Salinity Management	6	43%	66%	82%	73%	77%	Testing	Soil moisture is measured using any of the following: <ul style="list-style-type: none"> • Sensors • Tensiometers • Probes • Irrigation monitoring service

Management Category	BMP	Drainage Group					Unmonitored Drainage Area	Characterization Category	BMP Description
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages				
Irrigation & Salinity Management	7	81%	62%	80%	70%	78%	Testing	Flow meters are used to measure actual water use and are coupled with known crop use values or other measurements to match irrigation to plant needs.	
Irrigation & Salinity Management	8	92%	99%	88%	80%	89%	Testing	Irrigation water quality is tested for parameters of interest including: <ul style="list-style-type: none"> • Nitrate • pH • Electrical Conductivity (EC) • Sodium • Chloride • Bicarbonate • Boron 	
Irrigation & Salinity Management	9	100%	100%	92%	94%	94%	Cropped Area Action	Water use for plant establishment has been reduced by adopting more efficient irrigation methods such as: <ul style="list-style-type: none"> • Early drip use • Intermittent sprinklers • Micro-sprinklers 	
Irrigation & Salinity Management	10	100%	100%	99%	97%	99%	Cropped Area Action	Irrigation decisions are made by trained personnel who understand appropriate irrigation management.	

Management Category	BMP	Drainage Group					Characterization Category	BMP Description
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages	Unmonitored Drainage Area		
Irrigation & Salinity Management	11	95%	76%	35%	49%	54%	Testing	Salt leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).
Nutrient Management	12	73%	100%	99%	89%	94%	Testing	Soil or leaf/petiole tests are conducted to determine fertilization needs and the minimum amount necessary is applied based on the results.
Nutrient Management	13	78%	96%	100%	97%	99%	Cropped Area Action	Fertilizer applications are split into multiple smaller applications to maximize plant uptake.
Nutrient Management	14	62%	73%	76%	62%	68%	Testing	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.
Nutrient Management	15	78%	100%	100%	99%	99%	Cropped Area Action	Fertilizer applications are timed to consider irrigation and potential rain events.
Nutrient Management	16	78%	90%	98%	78%	92%	Cropped Area Action	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.

Management Category	BMP	Drainage Group					Unmonitored Drainage Area	Characterization Category	BMP Description
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages				
Nutrient Management	17	78%	100%	100%	96%	98%	Specialized Knowledge	Fertilizer decisions are made by trained personnel who understand the 4R's of nutrient management: <ul style="list-style-type: none"> • Right fertilizer source • Right rate • Right time • Right place 	
Nutrient Management	18	97%	78%	99%	97%	90%	Uncropped Area Action	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.	
Nutrient Management	19	96%	89%	81%	100%	95%	Uncropped Area Action	Backflow prevention devices are installed and maintained.	
Sediment Management	20	97%	95%	98%	95%	94%	Cropped Area Action	Long runs of production area are broken up by access roads or buffer strips to reduce sediment movement.	
Sediment Management	21	99%	79%	86%	73%	93%	Cropped Area Action	In sloped production areas, one or more of the following management practices is used to minimize erosion: <ul style="list-style-type: none"> • Contour farming • Contoured buffer strips • Terracing 	

Management Category	BMP	Drainage Group					Unmonitored Drainage Area	Characterization Category	BMP Description
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages				
Sediment Management	22	87%	94%	92%	91%	88%	Cropped Area Action	Bare soil is minimized through use of cover crops, mulch, leaving plant debris, or planting subsequent crops, and the soil cover is replenished periodically to maintain effectiveness.	
Sediment Management	23	23%	33%	31%	9%	24%	Cropped Area Action	Soil amendments, such as polyacrylamide (PAM), are used to reduce sediment movement and retain water.	
Sediment Management	24	99%	95%	98%	82%	96%	Uncropped Area Action	Berms, culverts, or flow channels are in place to divert water away from roads. These devices or structures are maintained to preserve their functionality.	
Sediment Management	25	97%	100%	89%	98%	97%	Uncropped Area Action	Road erosion is minimized by use of any of the following: <ul style="list-style-type: none"> • Grading • Gravel • Grass • Mulch • Water bars • Drains 	

Management Category	BMP	Drainage Group					Characterization Category	BMP Description
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages	Unmonitored Drainage Area		
Sediment Management	26	97%	90%	90%	89%	91%	Uncropped Area Action	Non-cropped areas with bare soil are protected from erosion with any of the following: <ul style="list-style-type: none"> • Vegetation • Mulch • Gravel • Water diversion
Sediment Management	27	77%	64%	86%	94%	69%	Uncropped Area Action	Ditch banks are protected from erosion with vegetation, rock placement or geotextiles.
Sediment Management	28	52%	71%	79%	47%	52%	Uncropped Area Action	One or more of the following is in place to treat runoff before it leaves the property. <ul style="list-style-type: none"> • Grassed waterways • Vegetated filter strips • Sediment traps • Tailwater recycling systems
Pesticide Management	29	100%	100%	100%	93%	98%	Testing	Before application of pesticides, pest scouting is conducted using one or more of the following methods: <ul style="list-style-type: none"> • Yellow sticky traps • Pheromone traps • Plant inspection • Beating • Net sweeping
Pesticide Management	30	100%	100%	100%	93%	97%	Specialized Knowledge	Natural enemy populations are considered when choosing pesticides, application rates, and timing.

Management Category	BMP	Drainage Group					Characterization Category	BMP Description
		Tier 1	Tier 2	Tier 3	Non-Priority Drainages	Unmonitored Drainage Area		
Pesticide Management	31	100%	100%	100%	92%	98%	Cropped Area Action	Sprayers are routinely calibrated to ensure accurate application rates.
Pesticide Management	32	100%	100%	100%	95%	99%	Cropped Area Action	Worn nozzles and screens are replaced to ensure the best coverage of pesticide applications.
Pesticide Management	33	92%	95%	94%	91%	88%	Uncropped Area Action	Pesticides are stored and mixed on an impermeable pad and at least 100 feet down slope from water sources (such as wells).
Pesticide Management	34	100%	100%	100%	95%	99%	Cropped Area Action	Pesticides are not applied when rain or scheduled irrigation events are anticipated.
Trash Management	35	98%	100%	100%	100%	100%	Uncropped Area Action	The property is kept clean and free of trash.
Trash Management	36	98%	94%	99%	99%	96%	Uncropped Area Action	The property has an adequate number of trash containers that are covered and emptied regularly.

1. Adoption rates for individual drainages within a "drainage group" were weighted by the surveyed acreage identified as "applicable" for each BMP in each drainage.

Observations from Survey Data

In marked contrast to the results reported in the 2012 WQMP (when priority tiers were surveyed in different years and survey results combined for comparison) there was no consistently higher rate of BMP use in Tier 3 drainages as compared to Tier 1 this time when the VCAILG membership was surveyed all at once (Table 21). BMP use was reported on similar percentages of applicable acres across tiers for most BMPs. Only five BMPs had notably lower mean adoption rates in Tier 1 drainages than in Tier 3 drainages (cases in which discrepancies between adoption rates were 20% or higher) (Table 24):

- BMP #1. Sprinkler irrigation runoff is captured or kept on the property.
- BMP #6. Soil moisture is measured using any of the following: sensors, tensiometers, probes, irrigation monitoring service.
- BMP #12. Soil or leaf/petiole tests are conducted to determine fertilization needs and the minimum amount necessary is applied based on the results.
- BMP #13. Fertilizer applications are split into multiple smaller applications to maximize plant uptake.
- BMP #28. One or more of the following is in place to treat runoff before it leaves the property: grassed waterways, vegetated filter strips, sediment traps, tailwater recycling systems.

No strong patterns in BMP use emerged when adoption rates were averaged across Tiers and BMP categories (Table 23). Generally, “Testing” BMPs as a group had a lower adoption rate than the other characterization categories, but there were no notable differences in use of “Testing” BMPs between tiers. “Sediment Management” BMPs as a group were reported to be practices on lower percentages of applicable acres in all Tiers compared to other BMP Management Categories. Adoption rates for BMPs in the aggregated unmonitored drainage area were similar to those in monitored drainages.

As noted in the Next Steps section, further analysis of the survey data will be conducted and utilized, in combination with the water quality monitoring data, to evaluate relationships between BMP implementation and water quality as part of the next WQMP.

GROWER OUTREACH AND BMP IMPLEMENTATION PROJECTS

Ventura County Agricultural Irrigated Lands Group

Outreach and education programs have been an important requirement of the Conditional Waiver and a focus of VCAILG efforts. The main method of communication with VCAILG members has been the annual direct mailing to the entire VCAILG membership in the annual newsletter. The 2013 newsletter is included in Appendix C and the 2014 newsletter will be sent this summer. This newsletter will contain the survey results and how they related to the monitoring data.

The VCAILG has also worked with a number of organizations and agencies to provide relevant and crop specific information regarding Conditional Waiver requirements, water quality status as demonstrated by VCAILG monitoring, and applicable management practice information to improve water quality. Since the adoption of the 2010 Conditional Waiver, over 50 education opportunities have been offered to VCAILG members adding up to 154.5 hours of Regional

Board approved credits. These courses have included: Conditional Waiver update meetings in each of the major watersheds, crop specific meetings, field tours (typically crop specific), and field BMP research demonstrations. To further promote the practice of preventing irrigation runoff, Farm Bureau staff gave three talks at education meetings highlighting the benefits of efficient irrigation systems and proper use. Two of these courses focused on strawberry and row crop production. The third class was not crop specific, but local farmers spoke about their experiences with different irrigation hardware and moisture sensor systems. Vendors of irrigation system and sensing equipment were also in attendance to answer questions about available products. A list of all education courses that took place since the adoption of the 2010 Conditional Waiver to date is provided below.

Table 25. Courses Offered for Education Credit

Date	Course Title	Education Hours
11/01/2010	ABC's of Fertilizer and Irrigation Management	6
11/02/2010	ABC sobre Manejo de Fertilizantes y Riego	6
02/18/2011	Strawberry Irrigation Field Day	2
06/20/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
06/21/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
06/22/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
06/23/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/25/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/26/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/27/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
07/28/2011	Conditional Waiver & TMDL Regulatory Overview & BMP Info.	4
09/13/2011	Erosion and Pesticide Runoff Management in Nurseries	4
09/14/2011	Erosion and Pesticide Runoff Management in Orchards	4
11/02/2011	Managing Nitrogen in Row Crops	2
11/15/2011	Irrigation and Nutrient Management	2
11/16/2011	General Conditional Waiver Education (Spanish)	4
02/23/2012	Reducing runoff through tailwater capture and reuse	2
03/21/2012	Nutrient Management, Grassed Waterways, & IPM for Improved Water Quality	4
04/05/2012	Irrigation and Nutrient Management	2
04/19/2012	Manejo de Irrigacion en Fresas	2
04/24/2012	Site Planning to Improve Water Quality of Farm Runoff	2
06/05/2012	Effective Use Pesticides to Produce Healthy Ornamental Plants	4
06/06/2012	Irrigation Management	2
07/17/2012	Nursery Farm and Orchard Seminar	8
08/31/2012	Strawberry Production Meeting	2
09/11/2012	The New FCGMA Irrigation Allocation Index	2
10/10/2012	Managing Nitrogen in Row Crops	2
10/11/2012	Irrigation and Nutrient Management - Vendor Fair	2

Date	Course Title	Education Hours
10/17/2012	UC Hansen Ag Center Field Day	2
11/13/2012	Nutrient Management, Grassed Waterways, and IPM for Improved Water Quality	2
11/26/2012	Private Applicator Seminar	1
11/29/2012	Conditional Waiver - General overview	4
1/22/2013	NGA Water School	4
02/19/2013	4Rs of Nutrient Stewardship and Moisture Sensors	2
3/6/2013	Nutrient Trials and Moisture Sensors in Row Crops	2
3/20/2013	BMPs for California Nurseries	4
4/23/2013	Detention Basins and Nutrient Management for Improved Water Quality	2
5/8/2013	Algae TMDL Update and Nutrient Needs of Tree Crops	2
7/24/2013	Avocado Irrigation (Spanish)	3
8/7/2013	Farming Without Fumigants, Grower Demonstration Field Day	2
9/5/2013	Strawberry Production Meeting	3
9/17/2013	BMPs for California Nurseries	3
9/19/2013	LAILG Summer Water School	5
6/26/2013	Strawberry Field Day, Water Saving Practices	2
1/27/2014	Strawberry Irrigation and Nutrient Management	4
1/28/2014	Strawberry Irrigation and Nutrient Management (Spanish)	4
3/4/2014	Conditional Waiver Educational Class	2
3/26/2014	Water Management in Strawberry: Field Day	2
4/8/2014	Vegetable Production Meeting	1.5
Ongoing	Online FCGMA Irrigation Allowance Index Training	2

Ventura County Resource Conservation District Mobile Irrigation Lab

Program Description

The Ventura County Resource Conservation District (VCRC) Mobile Irrigation Lab (MIL) program was developed under the Proposition 84 Agricultural Water Quality Grant Program to work with landowners and farmers to improve water quality by limiting irrigation runoff and decreasing nutrient leaching, energy use, and water use. MIL staff evaluates irrigation systems, pumps, and energy usage at the field level and provide a report of results, including recommendations on how to improve distribution uniformity, energy savings, seasonal irrigation efficiency, and irrigation scheduling. The MIL is equipped to evaluate several types of irrigation systems, including sprinklers, microsprinklers, and drip. Optimizing irrigation systems and their performance can have several benefits. In relation to water quality, potential benefits include: decreased amount of water applied, decreased nutrient leaching, decreased tailwater runoff, decreased fertilizer and/or pesticide applications. A certain amount of cost share funding (\$129,000) was available to assist farmers in implementing recommended improvements based on MIL evaluations. The MIL program also includes outreach and educational workshops, both independently and in conjunction with VCAILG meetings.

MIL Program Accomplishments

In 2012, 58 irrigation evaluations were performed and in 2013, 75 irrigation evaluations were performed. Both of these exceed the grant minimum requirement of 48 evaluations per year. The final average Low Quarter Distribution Uniformity (lqDU) for the 14 farms that are part of the cost share program was 0.89. The lqDU measures how uniformly the water is applied to an area being watered. The higher the lqDU value, the better the performance of the system. The MIL program has a target performance level of 0.85 lqDU. The growers that are part of the cost share program, the watershed their farms are located in, the BMPs implemented, the crop types addressed, and the estimated water use reductions are presented in Table 26. Not every farmer participating in the program wishes to seek cost-share funding, though they may improve their system or install moisture meters to assist with irrigation scheduling as a response to the evaluation results. To capture and document these BMPs, MIL staff will continue following-up with program participants and tracking the improvements they make.

The VCRCDC participated in continual outreach by hosting two educational events in coordination with VCAILG where over 200 growers attended. VCRCDC attended various grower meetings and events where over 500 growers were informed of the MIL program. Involvement in monthly meetings ensured over 2,000 watershed stakeholders were informed about the MIL program and services provided. To advertise MIL services, posters were created and displayed at several locations which include the Farm Bureau, the Agricultural Commissioners' office, United Water District, Casitas Water District, Camrosa Water District, and the Calleguas Municipal Water District as well as businesses which sell irrigation hardware and fertilizer throughout the county. The number of posters displayed throughout Ventura County exceeded the grant requirement of 10 locations.

Table 26. Cost Share Program Summary Information

Grower	Watershed	Irrigation BMPs Implemented	Crop Type	Estimated Water Use Reduction (AF/year)
Borchard Babtiste Ranch	Calleguas Creek	Irrigation system upgrades	Lemon	3.45
Borchard DJB Ranch	Calleguas Creek	Irrigation system upgrades	Lemon	0.7
Bowler	Calleguas Creek	Micro-irrigation and irrigation water management	Avocado	4.6
Broome	Calleguas Creek	Micro-irrigation	Avocado	19.8
Hobson	Santa Clara River	Irrigation system upgrades	Lemon, Avocado	9.3
Ikeda	Calleguas Creek	Micro-irrigation, irrigation upgrades, water management	Avocado	3.75
Nichols	Santa Clara River	Micro-irrigation and upgrades	Avocado	24
Penman	Calleguas Creek	Micro-irrigation, irrigation upgrades, water management	Avocado	6.5
Pereira	Calleguas Creek	Irrigation water management	Cabbage	14.5
Romero	Santa Clara River	Micro-irrigation and upgrades	Avocado	8.2
Servin	Calleguas Creek	Micro-irrigation, irrigation upgrades, water management	Lemon	5.3
Thille	Calleguas Creek	Micro-irrigation and upgrades	Lemon	155
Waters	Calleguas Creek	Irrigation water management	Lemon	18
White	Ventura River	Micro-irrigation and upgrades	Orange, Tangerine	4.8

Natural Resources Conservation Service Planning and Assistance

The Natural Resources Conservation Service (NRCS) is a federal agency with local field offices and staff that work with private landowners providing conservation planning and assistance designed to benefit the soil, water, air, plants, and animals. Planning services are available to anyone and cost share funds are distributed through a competitive approval process to aid in the implementation of conservation practices.

NRCS currently has approximately 80 active contracts addressing resource concerns related to water quality, water quantity, organic transition, wildlife habitat, and streambank protection. Of the funded contracts, 21 are part of the National Water Quality Initiative (NWQI) totaling 16,230 acres and include 2.9 million dollars in payments for BMPs. In addition, 11 of the 21 contracts were completed in the last three years. The remaining contracts are at 25 percent complete, which means there is 75 percent of the money in contract at this time.

To address the various resource concerns on a property, conservation practices (BMPs) are identified and planned. Some of the practices currently under contract for installation between 2012 and 2014 include the following:

- ~790 acres of Nutrient Management (water quality)
- ~4,000 feet of underground outlet (soil and water quality)
- ~23,000 feet of underground drainage (soil erosion and water quality)
- 1,100 feet of windbreak (wind plant health and soil erosion protection)
- 637 feet of structure for water control (water quality/quantity, soil erosion)
- 12,000 plus feet of pipeline for water conveyance (water quality/quantity/soil erosion)
- 95 acres mulching (organic depletion and soil erosion protection)
- 1,900 feet of lined waterway (soil erosion/water quality)
- 4 irrigation reservoirs and 8 irrigation systems (water quality/quantity/soil erosion)
- ~80 acres of conservation/cover crops (soil health/erosion and water quality)
- 13 acres critical area planting (soil health/erosion and water quality)
- 1 ag chemical handling facility (water quality)
- ~1000 acres of Irrigation Water Management (water quality/quantity)

Adaptive Management Practice Implementation

The available management practices for on-farm implementation are continuing to evolve as new technologies and information becomes available. The necessity of new BMPs can be driven by any, or a combination of the following: cost considerations, need to improve efficiency, market changes, regulatory pressure, problems with current systems, drive to increase yields, desire to improve crop quality, etc. Local agencies and organizations, commodity groups, universities, farmers, and private companies all play a role in expanding on the current knowledge base and providing new BMP research and technologies. Many of these emerging BMPs are developed on farms, creating case-study opportunities that can serve as demonstration sites for other farmers. As the effectiveness of these new BMPs is demonstrated, growers can be expected to adapt their own management strategies to incorporate the latest and most cost-effective options suitable for their crops, locations and cultural practices. The following two tables list some of the current or future BMP implementation and outreach opportunities in Ventura County related to these research and development efforts.

Table 27. Adaptive BMP Implementation

Agency or Organization	Research and BMP Implementation Activities
UCCE - Ventura	<p>Farm Advisor, Oleg Daugovish is doing field trials throughout the County for establishing strawberries using drip tape with minimal or no overhead irrigation (Funding from NSSI/Wal-Mart foundation).</p> <p>UCCE received grants from UC Hansen Trust and UC ANR (Farm Advisors Biscaro and Daugovish are cooperating on this state-wide project in Ventura County) to optimize nitrogen and water use by crops of key importance (celery, strawberry, and caneberries).</p> <p>Local research is also being done regarding the use of cover crops to minimize sediment and associated pollutant movement in tunnel/hoop house fields.</p> <p>Additionally, funding was recently approved for two nutrient related grants. One project will evaluate nitrogen and phosphorus leaching from organic fertilizers. The focus of the second grant is to assess the effectiveness of riparian ornamentals as vegetative filters for nitrogen and phosphorus uptake.</p>
California Strawberry Commission	<p>Employs staff devoted to water education. They are implementing an irrigation training program based on irrigation evaluations from 18 strawberry operations in Ventura and other major growing areas (<i>i.e.</i> Watsonville and Santa Maria). The farm evaluations include irrigation distribution uniformity, soil analysis and properties, water analysis, etc.</p>
California Celery Research Advisory Board	<p>Currently funding nutrient management trials being performed on farms in Ventura County.</p>
Fox Canyon Groundwater Management Agency	<p>FCGMA developed and has implemented an irrigation allowance index, which restricts pumping to all GMA pumpers to the calculated value for efficient water use based on crop type, weather, location, leaching, and frost protection. An emergency pumping ordinance was passed, which should increase water efficiency by the farmers.</p>
UCCE	<p>Michael Cahn and other UC specialists have been conducting trials relating quick nitrogen testing and weather-based irrigation scheduling to optimize fertilization and water management. The CropManage tool that was developed allows farmers to input various farm specific information (<i>i.e.</i> crop type and age, irrigation method, and water delivery per hour, quick nitrogen test results) and the program will make recommendations for how long and when to irrigate and how much nitrogen, if any, should be applied. A limited number of crops are currently in the system, but research is underway to expand.</p>
Ventura County Resource Conservation District	<p>The RCD received a grant from the Department of Water Resources to continue the Mobile Irrigation Lab under an Agricultural Water Use and Efficiency program. The grant will fund the program for the next three years.</p>
Ventura County Agricultural Commissioner's Office	<p>Hosts a pesticide container recycling program.</p>
Community Recycling and Local Farmers	<p>Community Recycling and local farmers are collaborating to recycle the agricultural plastic covering strawberry beds and also used in some vegetable fields. Community Recycling estimates they collect approximately 70% of the agricultural plastic in the county. The used plastic is cleaned, processed, and turned into pellets to be used in new products. Research is being done testing the use of recycled plastic in the fields and determining the percent recycled material that will still stretch and maintain the necessary strength.</p>

Table 28. BMP Outreach and Education

Agency or Organization	Outreach and Education
UCCE – Ventura	<p>A Strawberry BMP Manual has been written in Spanish and English. A bilingual Row Crop BMP Manual has been published and printed copies distributed at meetings. Both the strawberry and row crop (vegetable) BMP guidelines are available on the UCCE website: http://ceventura.ucanr.edu/Com_Ag/Veg/Water_96/ for row crops, and http://ceventura.ucanr.edu/files/154573.pdf (English) http://ceventura.ucanr.edu/files/154574.pdf (Spanish) for strawberry. UCCE also hosts various commodity specific education meetings.</p> <p>Research and field trials related to strawberry establishment with drip tape and minimal to no overhead irrigation was discussed at the irrigation field days in Oxnard (74 attendees) and the UCCE centennial symposium (80 attendees), also in Oxnard.</p>
California Strawberry Commission	<p>An education program targeting owners/growers and irrigators is in the works. Owner/growers learn about proper system design, and education for irrigators focuses on irrigation system maintenance and scheduling. The CSC provides information/education in both English and Spanish. CSC provides education classes and field demonstrations every year. The meetings are a way to inform growers about the latest research and technology related to strawberry production. Meetings are typically presented in English and Spanish.</p>
California Avocado Society	<p>CAS holds bimonthly meetings in Ventura. These meetings are relevant to farm management and water quality; pest management and fertilization are two major focuses.</p>
Fox Canyon Groundwater Management Agency	<p>A series of videos have been developed and are accessible to farmers online that detail using the irrigation allowance index as well as crop specific information on irrigation and proper water management.</p>
Ventura County Resource Conservation District	<p>The RCD has applied for additional education funding to continue offering outreach programs related to water quality and BMPs.</p>
VCAILG	<p>Since adoption of the 2010 Conditional Waiver, VCAILG and partnering agencies have offered 154 hours of education for its members. Meetings range in content, but focus on regulation (Conditional Waiver and TMDLs), water quality monitoring data, and BMPs and resources for improving water quality. The Management Practice Survey is another important tool in providing BMP information to VCAILG members.</p>

TARGETED BMP OUTREACH

The previous WQMP identified targeted outreach related to preventing irrigation runoff and optimizing irrigation efficiency as a priority. Efforts related to this WQMP priority are summarized in the following:

- All VCAILG members with farms located within or near a Tier 1 or 2 drainage site, where dry weather irrigation runoff was observed during Bacteria Study Surveys were contacted directly. These farmers were notified of the observance of runoff and provided photo documentation and maps to pinpoint the location on their property. This outreach occurred prior to the management practice survey notifications being mailed. The farmers were alerted to the importance of documenting their BMPs with the online survey and encouraged to investigate and implement practices that would minimize runoff during irrigations. Since these were all farms within or near high priority areas, the farmers were told of the water quality exceedances in their area and that they are required to make improvements.
- VCAILG members within Tier 1 and 2 drainage sites were sent letters notifying them of the RCD Mobile Irrigation Lab and its services. The letter and accompanying RCD flier elaborate on the program and how irrigation efficiency is an important management strategy for protecting water quality. Contact information for VCAILG members within these priority drainages was provided to the RCD, allowing them to directly engage with the farmers and schedule irrigation evaluations. A copy of the letter and RCD flier are included in Appendix C.

Next Steps in the WQMP Process

The WQMP implementation process (Figure 8) guides the iterative approach to identify and address water quality benchmark exceedances. It is in this section that the details to achieve the WQMP goals are provided. Table 29 correlates steps identified in the WQMP implementation process flow chart to specific actions to be taken by VCAILG. Following the table is a more detailed discussion outlining the next steps in the WQMP process.

Table 29. WQMP Implementation Tasks and Timeline

(***Bold italic*** text corresponds to tasks that are VCAILG actions that will be completed over the next year.)

Flow Chart Step	Task	Implementation Actions and Timeline
Gather source information and compile current management practices	<i>Evaluate web-survey data</i>	<i>Included in this WQMP and analysis will be expanded to further refine outreach activities.</i>
	Compile BMP information from VCRCO MIL and NRCS	Included in this WQMP; update annually as available
	Complete a pesticide use evaluation	Included in this WQMP; update annually

Flow Chart Step	Task	Implementation Actions and Timeline
Analyze monitoring data, source information, and current management practice information to identify priority areas for additional BMP implementation	Identify priority areas	Included in this WQMP; to be updated each subsequent WQMP, if appropriate.
Provide targeted outreach and BMP guidance	Contact VCAILG members of BMP assistance opportunities	Emails and/or mailings will be sent to VCAILG members regarding services and programs provided by the RCD, NRCS, FCGMA, UCCE, and other entities providing assistance.
	Dry weather Bacteria Study survey outreach and irrigation runoff prevention assistance	VCAILG will contact members on whose property irrigation runoff is observed during dry weather Bacteria Study surveys.
	Contact VCAILG members through a yearly direct mailing with BMP and WQ data results.	A VCAILG water quality newsletter will be sent to members annually to inform members of needed action. Refer to Appendix C for the 2013 newsletter.
Implement BMPs in priority areas and track implementation	BMP implementation by VCAILG members	Ongoing
	Tracking of BMPs by collaborating agencies	NRCS and the MIL both provide BMP implementation assistance and funding. NRCS has set application and funding cycles, whereas the MIL accepts cost share requests anytime during the grant period.
	Tracking of BMPs through the new web-based management practice survey	VCAILG members will be re-surveyed for properties they own or manage prior to the submittal of the next WQMP.
Evaluate monitoring data for water quality benchmark exceedances	Compare monitoring results to standard water quality and TMDL LA benchmarks	Submitted in all Annual Monitoring Reports
Evaluate BMP implementation to determine next steps	Evaluate the level of new BMPs implemented since October 2010	Analysis will be done using data from the first web-survey period and compared to the second; reporting will take place in the next WQMP.
	Update and revise WQMP as appropriate based on an assessment of progress made	Each year monitoring results demonstrate exceedances of water quality benchmarks, a WQMP will be submitted.

The priorities for continuing to implement the WQMP can be divided into three categories. The categories are listed below along with supporting actions to support accomplishment of the identified priorities.

1. Continue focused outreach and education.
 - VCAILG newsletter sent every summer to all members highlighting water quality problems, BMP implementation requirement, and opportunities for assistance.
 - Improve survey coverage by contacting VCAILG members that did not complete an online survey during the first survey period.
 - Members will be informed of grant programs and cost share assistance available through collaborating agencies, such as NRCS, RCD, UCCE, etc. To focus this effort, particular attention may be given to those who answered “planned for future” on their survey for BMPs that qualify for funding.
 - Promote the prevention of irrigation runoff as follows:
 - Contact members on whose property irrigation runoff is observed during dry weather Bacteria Study surveys.
 - Evaluate web survey responses related to irrigation type and provide outreach accordingly.
 - Promote the RCD’s mobile irrigation lab.
2. Complete a more detailed analysis of the online management practice survey results and conduct analysis to link to water quality results.
 - Evaluate survey data to compare previously implemented to newly implemented (since October 2010) BMPs. Use this information to compare water quality data collected during the 2005 Conditional Waiver period to that obtained for compliance with the 2010 Conditional Waiver.
 - Compare planned to actual BMP implementation after the next survey and determine if any conclusions can be drawn related to water quality improvements.
3. This final priority category is dependent upon the additional survey analysis described in step 2. Based on more detailed BMP analysis, identify approach to address any discrepancies or data gaps identified in accordance with the WQMP implementation flow chart (Figure 8). This could include, but is not limited to:
 - Follow-up steps if relationships between BMP implementation and water quality cannot be identified in areas where water quality improvements are not being observed (e.g. drainages where BMP implementation is reported as high, but benchmark exceedances are still occurring).
 - Follow-up procedures for areas where BMPs are not being implemented as recommended and water quality does not meet benchmarks or is not shown to be improving.

Constituent-Specific Water Quality Problems
and Sources

Appendix 1 of the Conditional Waiver details the required elements of a WQMP. One of the elements is the “Identification of likely waste sources, review of possible correlations between sampling conditions (e.g., time and weather), seasonal growing activities, and water quality results.” To identify likely waste sources, pollutants or measured parameters were divided into constituent groups. For each group the characteristics of the pollutants and a summary of potential sources are discussed. Water quality benchmark exceedance information by site and for each applicable TMDL is provided in Appendix B.

POLYCHLORINATED BIPHENYLS AND ORGANOCHLORINE PESTICIDES

This constituent group includes polychlorinated biphenyls (PCBs) and organochlorine (OC) pesticides such as chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, and toxaphene. PCBs are organochlorides that were widely used as dielectric and coolant fluids in transformers, capacitors, and electric motors as well as flame retardants, inks, adhesives, paints, pesticide extenders, plasticizers, polyolefin catalyst carriers, surface coatings, wire insulators, metal coatings. Commercial production of PCBs in the United States began in 1929. By 1974, most domestic uses of PCBs were restricted to nominally closed applications and by 1977, manufacture of PCBs was stopped in the United States because of evidence of negative environmental and human health effects. Chlordane is a pesticide that was first used in 1948 and was banned in 1988. DDT is an insecticide that was first used in 1939 and was banned in the United States in 1972. Dieldrin is an insecticide that came into use in the 1950s and was banned in 1970. Toxaphene is an insecticide containing over 670 chemicals that was first used in the 1940s. The EPA canceled the registrations of toxaphene for most uses as a pesticide or pesticide ingredient in 1982.

PCBs are considered persistent organic pollutants due to their resistance to environmental degradation. Although banned for most uses, PCBs still persist in the environment. PCBs are referred to as legacy pesticides due to the fact that although most uses have been banned for many years, they continue to persist in the environment. OC pesticides are also referred to as legacy pollutants because they have been banned for agricultural use for many years yet continue to persist in the environment. As a result, these pesticides have long-term environmental impacts as they remain present in sediments and bioaccumulate in the food chain.

PCBs and OC pesticides are similar in their tendency to strongly sorb to sediment, silt, and organic matter. Therefore, the primary sources of these constituents are sediment discharges from areas of historic pesticide applications or PCB release sites. PCBs were not used for agricultural applications and are not expected to be discharged significantly from agricultural fields.

ORGANOPHOSPHORUS PESTICIDES

Organophosphorus (OP) pesticides are the class of pesticides that replaced the use of organochlorine pesticides in many cases. Although they do not persist as long in the environment, current applications of the pesticides may cause aquatic toxicity when present in waterbodies above threshold levels. The OP pesticides covered by this WQMP are chlorpyrifos and diazinon.

Chlorpyrifos was introduced in 1965 and was primarily used as a home and garden insecticide until the phase-out of residential uses began in 2000. Chlorpyrifos is still widely applied for agricultural uses. Diazinon is an insecticide that was heavily used in the 1970s and 1980s for

indoor insect control in residential, non-food buildings. Residential use of diazinon was outlawed in 2004, but diazinon is still approved for agricultural uses.

Between 2012 and 2013, chlorpyrifos application occurred in 12 of the 15 VCAILGMP monitoring site drainage areas while diazinon application occurred in 3 of the 15. There were 380 pounds of chlorpyrifos and 128 gallons of chlorpyrifos applied within the 12 monitoring site drainage areas. There were 187 pounds of diazinon applied within the 3 monitoring site drainage areas. Chlorpyrifos was most heavily applied to lemons, strawberries, and cabbage. Diazinon was applied to onions and greenhouse flowers.

SALTS

Salts are dissolved ions that are transported in water. The salts covered by this WQMP include chloride, sulfate, total dissolved solids (TDS), and boron, though only the first three constituents are being monitored by VCAILG. The primary source of all salts in agricultural discharges is the water supply. The water supply for irrigation is comprised mostly of local ground and surface water, as well as some imported water in certain parts of the county. Some supplies are relatively high in salts and their use for irrigation water concentrates the salts in the soils as plants take up the water and leave the salts on the fields. Other sources of salts, particularly sulfate, include pesticides and fertilizers. Sulfate may be applied directly to crops as the pesticide copper sulfate, and/or as a fertilizer as calcium sulfate.

During dry weather, salts are discharged from agricultural fields as irrigation runoff. Salts are also discharged during wet weather as stormwater runoff; however salt loadings in stormwater runoff tend to be diluted. Other non-agricultural salts sources include: imported water, water softeners that discharge to publicly owned treatment works, wastewater treatment chemicals, atmospheric deposition, urban pesticides and fertilizers, and indoor water use.

CHRONIC TOXICITY

Chronic toxicity is a measure of how suitable sample water would be in supporting aquatic life. This is determined by exposing aquatic organisms to sample water and comparing the effects on the organisms to the effects on similar organisms exposed to a control sample comprised of laboratory control water (modified according EPA to the appropriate test method). A decline in growth, reproduction, or biomass of the organisms in the sample water relative to the organisms in the control sample indicates a toxic effect. Toxicity is a water quality problem that can be caused by numerous pollutants including pesticides, metals, salts, nutrients, pH-related effects, and other pollutants.

NITROGEN

This WQMP covers nitrate-nitrogen, nitrite-nitrogen, ammonia-nitrogen, and the sums of all of these constituents. Nitrogen is an important macronutrient necessary for plant growth and is widely applied to agricultural lands as both organic and inorganic fertilizers. When excessive nitrogen is applied to crops and discharges off the field with irrigation runoff and/or stormwater runoff, or leaches to groundwater it poses a threat to water quality.

METALS AND SELENIUM

Copper, nickel, mercury, and selenium are all naturally occurring trace elements. Depending on their form and concentration, they can cause toxic effects in aquatic life. These constituents are naturally present in agricultural soils and may also be present in these sources: (1) groundwater used for irrigation, (2) imported irrigation water, and (3) local surface water irrigation sources. An additional input pathway for these elements is atmospheric deposition. Currently, copper is the only metal identified as being applied as a pesticide, though mercury was used historically. Trace levels of these constituents may also be present in other pesticides and fertilizers. Losses of these constituents from agricultural areas can occur through plant uptake and crop removal, leaching, and volatilization. However, of concern in regards to water quality is trace element transport to surface waters from erosion and runoff, which can carry sediment-bound and soluble forms of these constituents.

DISSOLVED OXYGEN, TEMPERATURE, AND PH

Dissolved oxygen, temperature, and pH are not pollutants, but rather water quality indicators. Each of these measurements can be influenced by pollutants or physical characteristics of the water body being measured. Factors influencing dissolved oxygen concentrations include volume and velocity of flowing water, water temperature, weather (sunny versus cloudy), time of day (daytime of nighttime), type and number of organisms in a water body, dissolved or suspended solids, nutrients, organic wastes, riparian vegetation, and groundwater inflow. Temperature may vary due to human-induced thermal pollution, the amount of shade on the water body, turbidity, and the confluence of water bodies with differing temperatures. Additionally, water temperature is influenced by the ambient air temperature at the time of sample collection independent of any discharge contributions. To meet the water quality benchmark for pH, the measurement must remain between 6.5 and 8.5. Normal acidity or alkalinity of waterbodies will vary based on natural influences, such as type of soil or bedrock, groundwater influence, etc. However, discharges from anthropogenic sources can alter pH and harm aquatic life, depending on the duration and magnitude of the change.

TRASH

Trash in agricultural areas generally consists of materials used during agricultural production including plastic sheeting, fertilizer/ pesticide containers, tubing, binding materials, metal scraps, and other materials. Trash in agricultural areas also consists of materials related to the activities of farm workers including plastic bottles, plastic bags, cigarette butts, food containers, clothing, and other materials. There are three main pathways for trash entering water bodies: (1) wind or runoff transporting the materials from the fields directly to the water bodies; (2) dumping of materials directly to the water bodies; and (3) trash entering conveyances such as pipes or channels through wind, runoff, or direct dumping and then discharged to the water bodies. Two effective TMDLs address trash and have load allocations included in Appendix 3 of the Conditional Waiver: (1) Ventura River Estuary Trash TMDL and (2) Revolon Slough/ Beardsley Wash Trash TMDL.

Standard Water Quality and TMDL LA
Benchmark Exceedances Data by Site

This appendix provides specific data complementary to the information presented in the Constituent-Specific Water Quality Problems and Sources Section and elaborates upon the summaries of benchmark exceedances that followed the listing of applicable benchmarks. Specifically, this appendix provides information regarding the possible correlation between sampling conditions, seasonal growing activities, and water quality results by presenting the standard water quality and TMDL load allocation benchmark exceedances at each site by watershed. A summary regarding the possible correlation between sampling conditions, seasonal growing activities, and water quality results is provided at the end of the Benchmark Exceedances Section.

BENCHMARK EXCEEDANCES

Calleguas Creek Watershed

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. Row crops and sod are the primary crop types in the vicinity of this site.

Table 30. 01T_ODD3_ARN Benchmark Exceedances for 2012-2013

Constituent	Units	Benchmark	Event 16 Dry 8/28/2012	Event 17 Wet 1/25/2013	Event 18 Dry 5/21/2013
Nutrients					
Ammonia-N	mg/L	2.36/ 1.11/ 1.66/ 0.85/ 0.4/ 4.0/ 0.6 ^[1]	NE	8.6	NE
Nitrate-N	mg/L	10 ^[2]	43.83	45.59	36.31
Metals					
Dissolved Copper	µg/L	3.1 ^[3]	NE	4.48	3.68
Organochlorine Pesticides					
4,4'-DDD	µg/L	0.00084	0.0055	0.0125	0.0173
4,4'-DDE	µg/L	0.00059	0.0124	0.0612	0.0487
4,4'-DDT	µg/L	0.00059	NE	0.0154	NE

Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.

NE = No Exceedance

- 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 was used for comparison with VCAILG data for this site.
- Copper benchmark for saltwater applies at this site.

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). Row crops are the most common crops grown within this site drainage area. Additional crop types include strawberries, other berries (such as raspberries or blueberries), and citrus.

Table 31. 04D_ETTG Benchmark Exceedances for 2012-2013

Constituent	Units	Benchmark	Event 16 Dry 8/28/2012	Event 17 Wet 1/25/2013	Event 18 Dry 5/21/2013
Nutrients					
Nitrate-N	mg/L	10 ^[1]	53.00	75.64	51.71
Metals					
Dissolved Copper	µg/L	3.1 ^[2]	3.82	4.05	5.16
Organochlorine Pesticides					
4,4'-DDD	µg/L	0.00084	0.0055	0.0069	NE
4,4'-DDE	µg/L	0.00059	0.0254	0.0449	0.0079
4,4'-DDT	µg/L	0.00059	NE	0.0099	NE

Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.

NE = No Exceedance

1. 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 for this site.
2. The copper benchmark for saltwater applies at this site.

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). Row crops are the primary crop type along with significant acreage of strawberries being grown in the vicinity of this site.

Table 32. 04D_LAS Benchmark Exceedances for 2012-2013

Constituent	Units	Benchmark	Event 16 Dry 8/28/2012	Event 17 Wet 1/25/2013	Event 18 Dry 5/21/2013
Nutrients					
Nitrate-N	mg/L	10 ^[1]	33.78	44.28	42.52
Organochlorine Pesticides					
4,4'-DDD	µg/L	0.00084	NE	NE	0.0064
4,4'-DDE	µg/L	0.00059	0.0116	0.0302	0.017
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	NE	0.0327	NE

Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.

NE = No Exceedances

1. 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 for this site.
2. The copper benchmark for saltwater applies at this site.

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. Citrus, avocados, and berries (other than strawberries) are the major crop types that drain to this monitoring location.

Table 33. 05D_LAVD Benchmark Exceedances for 2012-2013

Constituent	Units	Benchmark	Event 16 Dry 8/28/2012	Event 17 Wet 1/25/2013	Event 18 Dry 5/21/2013
Field Measurements/ General Water Quality					
TDS	mg/L	850	1690	NE	NS
Sulfate	mg/L	250	850	NE	NS
Organochlorine Pesticides					
4,4'-DDD	µg/L	0.00084	NE	0.0348	NS
4,4'-DDE	µg/L	0.00059	NE	0.4065	NS
4,4'-DDT	µg/L	0.00059	NE	0.1347	NS
Toxaphene	µg/L	0.00075	NE	0.08264	NS
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	NE	0.157	NS

Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.

NE = No Exceedance

NS = No Sample; site was dry

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). Hondo Barranca drains land planted primarily with citrus and avocado orchards. This site was dry during all three monitoring events for 2012-2013. Therefore, no water quality benchmark exceedances occurred.

06T_LONG2

This monitoring site is located on Long Canyon where it crosses Balcom Canyon Road north of Highway 118. Long Canyon is a tributary to Calleguas Creek Reach 6 (Arroyo Las Posas). The drainage area for this monitoring site consists mostly of citrus and avocado orchards, with small portions used for growing nursery stock, berries, and cut flowers. This site was dry during all three monitoring events for 2012-2013. Therefore, no water quality benchmark exceedances occurred.

Oxnard Coastal Watershed

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. Strawberries and row crops are the predominant crop types that drain to this site.

Table 34. OXD_CENTR Benchmark Exceedances for 2012-2013

Constituent	Units	Benchmark	Event 16 Dry 8/28/2012	Event 17 Wet 1/25/2013	Event 18 Dry 5/21/2013
Field Measurements					
Dissolved Oxygen	mg/L	≥ 5	4.63	NE	NE
Nutrients					
Nitrate-N	mg/L	10 ^[1]	18.1	27.84	14.1
Organochlorine Pesticides					
4,4'-DDE	µg/L	0.00059	NE	0.0094	NE
4,4'-DDT	µg/L	0.00059	NE	0.0061	NE
Organophosphorus Pesticides					
Chlorpyrifos	µg/L	0.025	0.045	0.118	NE

Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.

NE = No Exceedance

- 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 for this site.

Santa Clara River Watershed

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. Citrus and avocados are the primary crop types associated with this site. Flow was only present at this site during dry Event 16. No exceedances of any water quality benchmarks occurred during dry Event 16.

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. Citrus and avocados are the primary crop types associated with this site.

Table 35. S02T_TODD Benchmark Exceedances for 2012-2013

Constituent	Units	Benchmark	Event 16 Dry 8/28/2012	Event 17 Wet 1/25/2013	Event 18 Dry 5/21/2013
General Water Quality					
TDS	mg/L	1200	2040	2280	1730
Sulfate	mg/L	600	928	1180	829
Nutrients					
Nitrate-N	mg/L	10	12.96	10.58	NE
Organochlorine Pesticides					
4,4'-DDE	µg/L	0.00059	NE	0.0144	0.0078
4,4'-DDT	µg/L	0.00059	NE	0.0122	0.0232

Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.

NE = No Exceedance

NS = No Sample

S03T_TIMB

This monitoring site is located on Timber Canyon Creek just upstream of Hwy 126, east of Santa Paula. Timber Canyon Creek is a tributary to Santa Clara River Reach 3. Drainage from this site is mostly from avocado and citrus orchards. This site was dry during all three monitoring events for 2012-2013. Therefore, no water quality benchmark exceedances occurred.

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. Citrus, avocados, and nurseries are the primary crop types associated with this site. This site was dry during all three monitoring events for 2012-2013. Therefore, no water quality benchmark exceedances occurred.

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. Drainage to this site is mostly from citrus orchards with small proportions of the area used for avocados and row crops. This site was dry during all three monitoring events for 2012-2013. Therefore, no water quality benchmark exceedances occurred.

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. Citrus, row crops, and nursery stock are grown in the vicinity of this monitoring site.

Table 36. S04T_TAPO Benchmark Exceedances for 2012-2013

Constituent	Units	Benchmark	Event 16 Dry 8/28/2012	Event 17 Wet 1/25/2013	Event 18 Dry 5/21/2013
General Water Quality					
TDS	mg/L	1300	2850	2650	2470
Chloride	mg/L	100	199	215	189
Sulfate	mg/L	600	1320	1320	1150
Nutrients					
Nitrate-N	mg/L	5	16.48	14.76	12.06
Organochlorine Pesticides					
4,4'-DDE	µg/L	0.00059	NE	0.0081	NE

Concentrations in **bold italics** indicate an exceedance of a water quality benchmark applicable to this site for the specified constituent.

NE = No Exceedance

Ventura River Watershed

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. Avocados and citrus are the predominant crop types associated with this site.

This site was dry during all three monitoring events for 2012-2013. Therefore, no water quality benchmark exceedances occurred.

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. Citrus and avocados are the predominant crop types associated with this site.

This site was dry during all three monitoring events for 2012-2013. Therefore, no water quality benchmark exceedances occurred.

POSSIBLE CORRELATIONS BETWEEN SAMPLING CONDITIONS, SEASONAL GROWING ACTIVITIES, AND WATER QUALITY RESULTS

For the Calleguas Creek Watershed, there appears to be a correlation between wet weather and the detection of DDT. Other organochlorine pesticides were detected during both wet and dry events, but DDT was only present in all but one CCW site storm sample. Nitrate exceedances occurred during all three events at the three monitoring sites located lower in the watershed. Upper watershed sites were dry during the monitoring events or did not have exceedances. There does not appear to be a correlation between season and growing activities, as a variety of crops are grown in the various drainage areas with differing growing activities and practices.

For the Oxnard Coastal Watershed, it is difficult to identify any correlations as there is only one monitoring site in the watershed. However, there appears to be a correlation between wet weather and organochlorine pesticide concentrations greater than the applicable water quality benchmark, specifically 4,4'-DDT and 4,4'-DDE. The other pesticide with benchmark exceedances was chlorpyrifos, with greater than benchmark levels detected during the first dry and storm events. The nitrate benchmark was exceeded during all three events. There does not appear to be a correlation between seasonal growing activities as the types of crops in the drainage area do not vary highly between seasons.

For the Santa Clara River Watershed, only two sites had benchmark exceedances during the 2012-2013 monitoring year. The Ellsworth Barranca site was sampled during the first dry event and no exceedances occurred. This site was dry during the remaining monitoring events. Three additional Santa Clara River Watershed sites remained during dry during all three events. The Todd Road and Tapo Canyon sites were both sampled during all three events and had similar exceedances of salts and nitrate benchmarks. A few OC pesticides exceedances also occurred at these two sites.

For the Ventura River Watershed, water was not present for sampling at the two sites during any of the 2012-2013 monitoring events so a correlation cannot be made.

TMDL BENCHMARK EXCEEDANCES

Calleguas Creek Watershed and Mugu Lagoon Metals and Selenium TMDL

The interim load allocations are being met in the receiving waters for all metals constituents except for selenium in Revolon Slough (04_WOOD site). It has been noted in the current and previous CCW TMDL annual reports that rising groundwater is a large background source of selenium in the Revolon Slough subwatershed. There are two agricultural land use sites located in this subwatershed: (1) 04D_WOOD and (2) 05D_SANT_VCWPD. The selenium monitoring results from the receiving water site and the two agricultural land use sites are provided below (Table 37). Of the two agricultural land use sites, 05D_SANT_VCWPD is located the furthest upstream in the subwatershed and has significantly higher selenium concentrations than 04D_WOOD.

Table 37. Revolon Slough Receiving Water and Agricultural Land Use Monitoring Sites Selenium Data

Site ID ¹	Dry Weather Events & Dates				
	Interim LA ¹	34 Aug-12	35 Nov-12	37 Feb-13	38 May-13
04_WOOD	6	20.3	17.8	20.4	12.5
04D_WOOD	6	NS	NE	NE	NS
05D_SANT_VCWPD	6	48.3	68.8	64.5	57.8

Concentrations in **bold italics** indicate the concentration was greater than the load allocation applicable to this TMDL.

NE = No Exceedance

NS = No Sample

1. 04_WOOD is the receiving water site; 04D_WOOD and 05D_SANT_VCWPD are agricultural land use sites upstream of the receiving water monitoring location.

Calleguas Creek Watershed Nitrogen Compounds TMDL

Table 38 shows the monitoring data from CCWTMP agricultural land use monitoring sites that exceeded the applicable load allocation. Monitoring sites located in the lower part of the watershed consistently exceed the nitrogen LAs, whereas sites in the upper reaches are typically below the allocation. Table 39 shows a comparison of Calleguas Creek Watershed VCAILGMP sites exceedance data. The single CCWTMP site and three VCAILGMP monitoring sites without load allocation exceedances are not included in the tables below.

Table 38. CCWTMP Agricultural Land Use Monitoring Sites Nitrate-N + Nitrite-N Data

Site	Constituent	Allocation ¹ (mg/L)	Event 34 Dry Aug-2012	Event 35 Dry Nov-2012	Event 36 Wet Jan-2013	Event 37 Dry Feb-2013	Event 38 Dry May-2013
01T_ODD2_DCH	Nitrate-N + Nitrite-N	9	50.17	45.83	47.67	51.44	64.60
02D_BROOM	Nitrate-N + Nitrite-N	9	NS	53.85	66.91	72.57	36.13
04D_WOOD	Nitrate-N + Nitrite-N	9	NS	38.75	56.91	36.28	NS
05D_SANT_VCWPD	Nitrate-N + Nitrite-N	9	35.04	37.92	44.30	44.77	33.49
07D_HITCH_LEVEE_2	Nitrate-N + Nitrite-N	9	NS	NS	60.80	NS	NS
9BD_GERRY	Nitrate-N + Nitrite-N	9	19.54	NS	NS	NS	20.02

Concentrations in **bold italics** indicate the concentration was greater than the load allocation applicable to this TMDL.

NS = Not Sampled; site dry.

1. The load allocation is the sum of nitrate-nitrogen + nitrite-nitrogen.

Table 39. Nitrogen Load Allocation Compared to CCW VCAILGMP Site Data

Site	Constituent	Allocation ¹ (mg/L)	Event 16 Dry Aug-2012	Event 17 Wet Jan-2013	Event 18 Dry May-2013
01T_ODD3_ARN	Nitrate-N	9	43.83	45.59	36.31
04D_ETTG	Nitrate-N	9	53	75.64	51.71
04D_LAS	Nitrate-N	9	33.78	44.28	42.52

Concentrations in **bold italics** indicate the concentration was greater than the load allocation applicable to this TMDL.

NS = Not Sampled; site dry.

2. The load allocation is the sum of nitrate-nitrogen + nitrite-nitrogen.

Calleguas Creek Watershed Boron, Chloride, Sulfate, and TDS (Salts) TMDL

Interim load allocations for salts constituents are currently being met at all sites, with the exception of boron at 04_WOOD representing the Revolon Slough subwatershed. There is one agricultural land use site where salts are measured upstream of the compliance site. The results for boron from the 04D_WOOD agricultural land use site alongside the receiving water data are presented in Table 40. When comparing the receiving water and land use data for boron, it is important to keep in mind that quarterly dry weather grab samples are collected at 04D_WOOD as compared to monthly dry weather means reported for 04_WOOD, generated from daily averages of five-minute sensor data. During the August and May quarterly events, the agricultural land use site 04D_WOOD was dry. Grab samples collected for boron in November and February were below the interim LA.

Table 40. Boron Monitoring Data (mg/L) in Revolon Slough

Site ID	Site Type	Interim	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13
		LA												
04_WOOD	Receiving Water	1.8	1.89	1.89	1.83	1.43	1.78	1.91	1.83	1.90	1.74	1.79	1.79	1.97
04D_WOOD	Ag	1.8		NS			1.63			1.51			NS	

Concentrations in ***bold italics*** indicate the concentration was greater than the load allocation applicable to this TMDL.
 NS = Not Sampled; site dry.

Santa Clara River Nitrogen Compounds TMDL

Table 41 lists the VCAILGMP monitoring sites located within the Santa Clara River Watershed that exceeded the nitrogen load allocation. In addition to the two sites with nitrogen exceedances, four additional sites did not exceed the nitrogen load allocation.

Table 41. Nitrogen Load Allocations Compared to SCR VCAILGMP Site Data

Site	Constituent	LA ¹ (mg/L)	Event 16 Dry Aug-2012	Event 17 Wet Jan-2013	Event 18 Dry May-2013
S02T_TODD	Ammonia-N + Nitrate-N	10	13.01 EST	10.64	NE
S04T_TAPO	Ammonia-N + Nitrate-N	10	16.48	14.87	12.09 EST

Concentrations in **bold italics** indicate the concentration was greater than the load allocation applicable to this TMDL.

NE = No Exceedance

NS = Not Sampled; site dry.

EST = Estimated concentration; ammonia-N below reporting limit

1. Nitrite-N concentrations are not monitored as part of the VCAILGMP, however, levels of nitrite are typically insignificant compared to the other nitrogen compounds that are measured.

Outreach Materials



Executive Committee

October 1, 2012

STEVE BACHMAN
United Water Conservation District

Dear VCAILG member,

JERRY CONROW
Ojai Basin GMA

Three months ago, we contacted you concerning your property, which drains to a waterway where our monitoring program detected levels of nutrients or pesticides that exceed state water-quality standards. When this happens, state regulations for runoff from irrigated agricultural lands require that landowners implement changes in their management practices to address the issue.

JOHN KRIST
Farm Bureau of Ventura County

Improving irrigation efficiency is one such management strategy. To help landowners take this important step toward addressing water-quality problems in Ventura County, the Resource Conservation District (RCD) is offering free, confidential evaluations of agricultural irrigation systems. The evaluations are being performed under a state grant program, which is described in the enclosed flier.

JOHN MATHEWS
Arnold, Bleuel, LaRoche, et al

DAVE SOUZA
Pleasant Valley County Water District

KELLE PISTONE
Assoc. of Water Agencies of Ventura Co.

ROB ROY
Ventura County Agricultural Assoc.

Steering Committee

Although participation is voluntary, VCAILG encourages you to take advantage of this **free** analysis. Not only will your participation in this grant program help improve water quality in our region, it will demonstrate to state and federal agencies that Ventura County farmers and ranchers take their regulatory obligations seriously. This will help immeasurably when VCAILG's program comes up for renewal in three years.

EDGAR TERRY
Terry Farms, Inc.

JONATHAN CHASE
Hailwood Inc.

JIM COULTAS
Coultas Ranch Company

ROBERT CRUDUP
Valley Crest Tree

Unless we hear otherwise from you, VCAILG plans to forward your information to the RCD staff so they can contact you to schedule an evaluation. If you do not wish to be contacted by the RCD staff, please call or email Dale Zurawski, the Farm Bureau's water quality program manager, at (805) 289-0155 or dale@farmbureauvc.com before Oct. 19, 2012.

PAUL DEBUSSCHERE
DeBusschere Ranch

MIKE FRIEL
Laguna Grove Service

JURGEN GRAMCKOW
Southland Sod Farms

Thank you for your willingness to make our program a success.

GUS GUNDERSON
Limoneira Company

Sincerely,

JIM LLOYD-BUTLER
Lloyd-Butler Ranch

DOUG O'HARE
Somis Pacific Ag Management Co.

Edgar Terry, chairman
VCAILG Steering Committee

JESSE GOMEZ
Newhall Land & Farming Co.

CRAIG UNDERWOOD
Underwood Ranches

MOBILE IRRIGATION LABORATORY (MIL) COST SHARE PROGRAM

ASSISTING AGRICULTURAL OPERATIONS WITH IRRIGATION SYSTEM IMPROVEMENTS

This Program is intended to promote Best Management Practice (BMP) implementation for irrigation and nutrient management. Eligible participants include owners and operators of nursery, row crops, and orchard operations.

As funding allows, upon review of applicants' expenditures, applicants will be reimbursed for:

- 50% of eligible equipment costs, up to \$1,500, for agricultural operations < 100 acres
- 50% of eligible equipment costs, up to \$5,000, for agricultural operations ≥ 100 acres
- Additional 25% coverage of eligible equipment costs, up to \$1,000, with increase in irrigation efficiency
- Additional 25% coverage of eligible equipment costs, up to \$1,000, with reduction in water usage



Types of Qualifying Equipment:

- Tensiometers
- Atmometers
- Pressure compensating emitters and filters
- Soil moisture sensors
- Salinity sensors
- Drip and micro irrigation systems
- Valves
- Emitters/nozzles
- Irrigation Controllers
- Other equipment as approved by the RCD (not to include consultant fees or leased equipment)



Contact Vic Akundzadeh at the RCD for a FREE irrigation evaluation and for more details on how to apply for cost share funding:

Resource Conservation District
3380 Somis Rd
Somis, CA 93066
office: 805-386-4489 ex. 113
mobile: 805-216-3641





Executive Committee

STEVE BACHMAN
United Water Conservation District

JERRY CONROW
Ojai Basin GMA

JOHN KRIST
Farm Bureau of Ventura County

JOHN MATHEWS
Arnold, Bleuel, LaRochelle, et al

KELLE PISTONE
Assoc. of Water Agencies of Ventura Co.

ROB ROY
Ventura County Agriculture Assoc.

DAVE SOUZA
Pleasant Valley County Water District

Steering Committee

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Hailwood, Inc.

ROBERT CRUDUP
Valley Crest Tree

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DeBusschere Ranch

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GUS GUNDERSON
Limoneira Company

JIM LLOYD-BUTLER
Lloyd-Butler Ranch

DOUG O'HARA
Somis Pacific Ag Management Co.

CRAIG UNDERWOOD
Underwood Ranches

February 1, 2013

Dear VCAILG Member,

The *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Los Angeles Region* (Conditional Waiver, Order No. R4-2010-0186) requires all VCAILG members to complete **8 hours** of educational training on water quality impairments, regulatory requirements, and management practices that control waste discharges. The full 8 hours of training must be completed by **September 15, 2013**.

To date, VCAILG and other support agencies (Resource Conservation District, University of California Cooperative Extension, etc.) have offered more than 25 education classes for Conditional Waiver credit. As time available for the completion of this requirement grows short, VCAILG is providing you the following:

- *Education Classes and Credit Report* – Lists the class name, location, date, time, number of hours, and name of the person in attendance at meetings for which you have received credit.
- *Water-quality Workshops 2013* – A schedule of upcoming education classes is on the back of this letter.

If the enclosed Education Classes and Credit Report shows that you have fulfilled your 8 hours of training, please keep this report as your proof of completion.

If you have not yet obtained 8 hours of credit, you must attend the appropriate number of upcoming workshops in order to fulfill this requirement. Please note that the list of upcoming classes is not an exhaustive list and other support agencies will also be offering education opportunities in the coming months. Announcements and emails will be sent throughout the year notifying you of additional education classes.

Very truly yours,

Edgar Terry
Steering Committee Chairman
Ventura County Agricultural Irrigated Lands Group



Executive Committee

May 17, 2013

STEVE BACHMAN
United Water Conservation District

Dear VCAILG member

JERRY CONROW
Ojai Basin GMA

You are receiving this letter because property you own or manage is located in an area where VCAILG's water-quality monitoring program has detected exceedences of state and federal water-quality standards in agricultural runoff.

JOHN KRIST
Farm Bureau of Ventura County

Improved management of irrigation and nutrient application can help solve this problem. It's not easy, however, to find the extra cash required to purchase and install new equipment or structures. This is why we want to make you aware of a valuable opportunity to secure financial assistance for improvements to your operation that will also improve water quality.

JOHN MATHEWS
Arnold, Bleuel, LaRochelle, et al

KELLE PISTONE
Assoc. of Water Agencies of Ventura Co.

ROB ROY
Ventura County Agriculture Assoc.

DAVE SOUZA
Pleasant Valley County Water District

You are among the farmers and ranchers eligible to apply for a share of \$1 million made available this year for the Calleguas Creek watershed through a federal incentive program to improve water quality. The funding is provided through the Environmental Quality Incentives Program (EQIP), administered by the Natural Resources Conservation Service (NRCS). EQIP is a voluntary program to promote agricultural production and environmental quality.

Steering Committee

EDGAR TERRY
Terry Farms, Inc.

The funding will enable NRCS to provide financial and technical assistance to farmers to install best management practices to protect water quality and assist in complying with regulations. Eligible practices include improving irrigation and fertilizer management, controlling runoff, and installing vegetation-lined ditches to absorb pesticides and capture nutrients.

JONATHAN CHASE
Hailwood, Inc.

ROBERT CRUDUP
Valley Crest Tree

Applications will be screened and ranked in two batches on June 21 and July 12, 2013. Applications received by June 21 will receive first priority; if additional funds remain, applications received by July 12 may also be funded.

PAUL DEBUSSCHERE
DeBusschere Ranch

MIKE FRIEL
Laguna Grove Service

JESSE GOMEZ
Newhall Land & Farming Co.

JURGEN GRAMCKOW
Southland Sod Farms

If you wish to apply, or would like additional information, please contact NRCS District Conservationist Dawn Afman at (805) 984-2358, Ext 101, or Dawn.Afman@ca.usda.gov.

GUS GUNDERSON
Limoneira Company

JIM LLOYD-BUTLER
Lloyd-Butler Ranch

Sincerely,

DOUG O'HARA
Somis Pacific Ag Management Co.

CRAIG UNDERWOOD
Underwood Ranches

Edgar Terry
Steering Committee Chairman
Ventura County Agricultural Irrigated Lands Group

Understanding your 2013-2014 billing invoice

Welcome to this edition of the Ventura County Agricultural Irrigated Lands Group newsletter. We hope the information in these pages will help you better understand how the program works, and keep you up to date on program activities.

This newsletter accompanies your member invoice for the 2013-2014 fiscal year. If you were enrolled in the program last year, the formatting of this year's invoice will look familiar.

As was the case last year, all Total Maximum Daily Load compliance costs are included in the VCAILG billing. In previous years, the Calleguas Creek TMDL charges were billed separately

IN THIS ISSUE

- Progress and problems
- Understanding your invoice

and payment was considered voluntary, as they were not a component of the Conditional Waiver program. The Regional Board, however, has made the waiver the legal compliance mechanism for all TMDLs addressing agricultural runoff in Ventura County. Payment of those TMDL assessments now is mandated by the VCAILG participation agreement.

The total VCAILG program budget for 2013-2014 is \$1,313,657. Last year's total was \$1,616,404. The decrease is 19 percent. The invoiced amount will be \$1,162,988, reflecting application of \$150,669 in carryover funds as a credit against projected 2013-2014 expenditures. Effective this year, the FBVC administrative fee is set at a flat \$250,000 instead of a percentage of total program costs.

As before, the VCAILG assessments will be based exclusively on the costs of monitoring, reporting, mitigation, state board fees and Farm Bureau's administrative fee. Farm Bureau will absorb all direct and indirect costs associated with program administration and management, including employee salaries and benefits, printing and postage, meetings, accounting fees, travel and bank charges, and office overhead.

The number of billing sub-watersheds remains unchanged

from last year. Although program costs are down overall, some assessment rates will increase while others will decrease.

Per-acre assessment history

Watershed	2010	2011	2012	2013
Calleguas	\$29.28	\$17.53	\$23.59	\$19.68
Santa Clara	\$12.06	\$7.07	\$7.40	\$10.35
Ventura	\$23.73	\$10.03	\$8.84	\$10.93
Revolon	\$30.39	\$18.25	\$24.64	\$20.54
McGrath	\$21.70	\$4.92	\$8.02	\$11.81
Cl Harbor	\$13.42	\$4.92	\$6.99	\$9.75
Coastal	\$8.93	\$4.92	\$6.99	\$9.75

Here is a brief description of the charges on your invoice:

VCAILG management and reporting: This represents the cost of services provided by our primary consulting firm, Larry Walker Associates, to manage the data collection and analysis, and to file all required reports and other documents with the state. This cost is shared equally across all seven watersheds.

Ag Waiver monitoring: This is the cost of collecting and analyzing water-quality samples as required by the Conditional Waiver. It varies by watershed, depending on what kinds of pollutants have been found there and the number of monitoring sites.

State fee: The Water Resources Control Board imposes this fee to help recover the cost of administering regulatory programs. The amount does not vary by watershed.

Farm Bureau Administrative Fee: Farm Bureau of Ventura County manages the VCAILG program, and the Board of Directors sets this fee each year at a level intended to recover the full direct and indirect costs of program management and to generate funds for other programs benefitting the agricultural community.

TMDL Monitoring and Implementation: TMDLs are additional water-quality regulations that require additional monitoring. These costs vary by watershed, depending on what kinds of pollutants have been found there and the number of monitoring sites.

Water-quality progress and problems: Looking toward 2015

VCAILG was established in 2006 to enable growers to comply with new regulations aimed at improving water quality. We are halfway through the second five-year term of the Conditional Waiver, which will come up for renewal in 2015.

As a reminder, what is being "waived" is a discharge permit that would require edge-of-field monitoring. The "conditions" of the waiver are fairly straightforward: achieve improvements in water quality, adopt new Best Management Practices to address problems, and attend eight hours of educational classes. We also are required to document BMPs that have been recently implemented

and conduct a study to determine whether farms are a source of bacteria in local waterways.

We have been collecting water-quality monitoring data since 2007. It reveals a wide range of conditions, from very good to problematic.

On the positive side, at most monitoring sites in areas planted mainly in avocados and citrus, we are not seeing any irrigation runoff, which means we meet dry-weather standards there. We also are meeting the water quality target of 10 parts per million for nitrate in storm runoff.

(Continued from preceding page)

VCAILG has categorized the various watersheds and subwatersheds in the county based on the frequency and severity of contamination detected through our monitoring program, and prioritized those with the worst record. Our top five priority sites are those having the most problems with nitrogen and pesticide exceedances. The five sites in the second tier also have high nitrogen levels and some pesticides problems.

As for improvement, we have seen reduced nitrate levels in irrigation runoff at two out of these 10 monitoring sites. At the sites where we have seen reduced nitrogen levels, we have also seen BMPs implemented that addressed nutrient loading.

The remaining 11 monitoring locations throughout the county fall into the third priority tier, or are not regarded as a priority at all. We are seeing few nitrogen exceedances in these areas. These sites are all characterized by orchard crops and a high level of implemented BMPs.

We continue to see low levels of pesticides at all of our monitoring sites. Although the majority of the legacy pesticides are rarely or never detected, others like DDT and toxaphene are still showing up. Likewise, we still see some detections of currently used pesticides.

Implementing new BMPs

BMP implementation should focus on irrigation and nutrient management. Why? Because we see the most consistent problems with nitrate and this is a contaminant that farmers have the most control over. It also makes economic sense to be more efficient in irrigation and nutrient management. Since legacy pesticides persisting in the soil are still showing up in runoff, we must address them through sediment control.

Educational program

VCAILG members have shown their commitment to the educational process with 70 percent of our members completing the eight-hour requirement and 39 percent taking more than the eight required hours of classes. To date, VCAILG has provided 35 educational opportunities, offering over 100 hours of workshops. There will be more opportunities in the coming months for our members to gain educational hours through courses approved for VCAILG credit and offered by our partner organizations, such as the California Strawberry Commission and UC Cooperative Extension. Announcements of future meetings will be distributed through email. VCAILG members may also call the Farm Bureau office for a list of upcoming classes.

Documenting BMP implementation

The Conditional Waiver requires that we document BMPs that are being implemented. To meet this requirement, VCAILG is developing a web-based survey of recently implemented BMPs. We expect to have the survey ready in early 2014. We plan to start surveying those farms that drain to our monitoring sites with the most water quality problems and then eventually survey our entire membership.

Bacteria Study

The Conditional Waiver also requires that we conduct a bacteria study to determine whether farmland is contributing to bacteria exceedances at local beaches. This study began last year and will continue this year with sampling at a few VCAILG monitoring sites and tile drains. We will also continue our driving surveys to collect edge-of-field samples during wet and dry weather. In areas where irrigation runoff is observed, we will be contacting farmers to help locate potential problems and provide assistance.

The bottom line

So how are we doing? We have a successful program so far. However, since our monitoring data do not reflect strong reductions in the pollutants, our challenge is to show that we are continuing to implement BMPs. By developing a web-based survey system, we hope to drive the process and create meaningful, less onerous methods to comply with the laws created to protect human health and the environment. For more information, go to the Farm Bureau website under Water Issues and download VCAILG documents.

Executive Committee

STEVE BACHMAN
 United Water Conservation District
 JERRY CONROW
 Ojai Basin GMA
 JOHN KRIST
 Farm Bureau of Ventura County
 JOHN MATHEWS
 Arnold, Bieuel, LaRoche, et al
 DAVE SOUZA
 Pleasant Valley County Water District
 KELLE PISTONE
 Assoc. of Water Agencies of Ventura Co.
 ROB ROY
 Ventura County Agricultural Association

Steering Committee

EDGAR TERRY (chairman)
 Terry Farms, Inc.
 JONATHAN CHASE
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 DeBusschere Ranch
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 Lloyd-Butler Ranch
 DOUG O'HARA
 Somis Pacific Ag Management Co.
 CRAIG UNDERWOOD
 Underwood Ranches

VCAILG is administered by the
 Farm Bureau of Ventura County.

◆
 5156 McGrath St.
 Ventura, CA 93003

◆
 805-289-0155

◆
 vcailg@farmbureauvc.com

◆
 Newsletter compiled by John Krist
 and Dale Zurawski.



Executive Committee

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*Pleasant Valley County Water
District*

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Limoneira Company

JIM LLOYD-BUTLER
Lloyd-Butler Ranch

DOUG O'HARA
Somis Pacific Ag Management Co.

CRAIG UNDERWOOD
Underwood Ranches

February 21, 2014

Dear VCAILG Member:

You are receiving this letter because you are farming property within one of our high-priority monitoring drainages. High-priority areas are those where multiple pollutants have been consistently detected in exceedance of the water quality limits.

After seven years of successful effort to monitor water quality and to educate growers about their role in protecting it, the Ventura County Agricultural Irrigated Lands Group (VCAILG) has developed a web-based survey to document best management practices (BMPs). These BMPs are steps growers can take to modify their management activities and strategies to improve water quality in the most cost-effective manner possible. We are required to provide this documentation to state regulators, and we believe the online survey is the quickest and easiest way to gather the necessary information. Although all VCAILG members will eventually be asked to complete the survey, we are initially focusing on growers in areas with the most significant water-quality issues. Your participation is essential if we are to satisfy this legal obligation on your behalf.

Please complete the survey by **Tuesday, March 11, 2014**. We are sending this request to landowners as well as growers. If you own a parcel but do not actively farm it, please communicate with your grower or growers and make sure they complete the survey for your property. Although we strongly encourage you to complete the survey online, we can provide you a hard copy upon request. You would then be responsible for filling it out and returning it to the Farm Bureau.

The website address and your unique log in information are provided on the following page. The survey website includes a page of answers to Frequently Asked Questions, which provides additional information about the survey and explains how to complete it. Thank you for your continued cooperation in VCAILG.

Sincerely,

Edgar Terry
Steering Committee Chairman
Ventura County Agricultural Irrigated Lands Group



Executive Committee

STEVE BACHMAN
United Water Conservation District

JERRY CONROW
Ojai Basin GMA

JOHN KRIST
Farm Bureau of Ventura County

JOHN MATHEWS
Arnold, Bleuel, LaRoche, et al

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Pleasant Valley County Water District

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JIM LLOYD-BUTLER
Lloyd-Butler Ranch

DOUG O'HARA
Somis Pacific Ag Management Co.

CRAIG UNDERWOOD
Underwood Ranches

March 14, 2014

Dear VCAILG Member:

You are receiving this letter because we want to help you comply with state water-quality regulations. After seven years of successful effort to monitor water quality and to educate growers about their role in protecting it, the Ventura County Agricultural Irrigated Lands Group (VCAILG) has developed a web-based survey to document best management practices (BMPs). These BMPs are steps growers can take to modify their management activities and strategies to improve water quality in the most cost-effective manner possible.

We are required to provide this documentation to state regulators, and we believe the online survey is the quickest and easiest way to gather the necessary information. All VCAILG members are being asked to complete the survey. The survey will be used to determine the current level of BMP implementation; through future updates, we will document additional improvements. Your participation is essential if we are to satisfy this legal obligation on your behalf.

Please complete the survey by **Tuesday, April 1, 2014**. We are sending this request to landowners as well as growers. If you own a parcel but do not actively farm it, please communicate with your grower or growers and make sure they complete the survey for your property. Although we strongly encourage you to complete the survey online, we can provide you a hard copy upon request. You would then be responsible for filling it out and returning it to the Farm Bureau.

The website address and your unique login information are provided on the following page. The survey website includes a page of answers to Frequently Asked Questions, which provides additional information about the survey and explains how to complete it. Thank you for your continued cooperation and participation in VCAILG.

Sincerely,

Edgar Terry
Steering Committee Chairman
Ventura County Agricultural Irrigated Lands Group



Executive Committee

March 27, 2014

STEVE BACHMAN

United Water Conservation District

JERRY CONROW

Ojai Basin GMA

JOHN KRIST

Farm Bureau of Ventura County

JOHN MATHEWS

Arnold, Bleuel, LaRoche, et al

KELLE PISTONE

*Assoc. of Water Agencies of
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Ventura County Agriculture Assoc.

DAVE SOUZA

*Pleasant Valley County Water
District*

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CRAIG UNDERWOOD

Underwood Ranches

Dear VCAILG Member:

You are receiving this letter because we want to help you comply with state water-quality regulations. After seven years of successful effort to monitor water quality and to educate growers about their role in protecting it, the Ventura County Agricultural Irrigated Lands Group (VCAILG) has developed a web-based survey to document best management practices (BMPs). These BMPs are steps growers can take to modify their management activities and strategies to improve water quality in the most cost-effective manner possible.

We are required to provide this documentation to state regulators, and we believe the online survey is the quickest and easiest way to gather the necessary information. All VCAILG members are being asked to complete the survey. The survey will be used to determine the current level of BMP implementation; through future updates, we will document additional improvements. Your participation is essential if we are to satisfy this legal obligation on your behalf.

Please complete the survey by **Tuesday, April 14, 2014**. We are sending this request to landowners as well as growers. If you own a parcel but do not actively farm it, please communicate with your grower or growers and make sure they complete the survey for your property. Although we strongly encourage you to complete the survey online, we can provide you a hard copy upon request. You would then be responsible for filling it out and returning it to the Farm Bureau.

The website address and your unique login information are provided on the following page. The survey website includes a page of answers to Frequently Asked Questions, which provides additional information about the survey and explains how to complete it. Thank you for your continued cooperation and participation in VCAILG.

Sincerely,

Edgar Terry
Steering Committee Chairman
Ventura County Agricultural Irrigated Lands Group

Appendix D

Adoption Rates for Individual BMPs Calculated on the Basis of Applicable Surveyed Acreage

BMP	Characterization Category	BMP Description	Tier 1 Drainages					Tier 2 Drainages					Tier 3 Drainages					Non-Priority Drainages				Unmonitored Drainage		
			05D_LAVD	05D_SANT_VCWPD	OXD_CENTR	S02T_TODD	S04T_TAPO	01T_ODD2_DCH	01T_ODD3_ARN	02D_BROOM	04D_ETTG	04D_LAS	05T_HONDO	06T_FC_BR	S02T_ELLS	S03D_BARDS	S03T_BOULD	S03T_TIMB	06T_LONG2	VRT_SANTO	9BD_GERRY		VRT_THACH	
Irrigation & Salinity Management																								
1	Cropped Area Action	Sprinkler irrigation runoff is captured or kept on the property.	66%	0%	46%	82%	0%	52%	[1]	59%	37%	17%	98%	95%	100%	42%	100%	27%	100%	85%	100%	91%	58%	
2	Testing	At least every 5 years, the irrigation system is tested for distribution uniformity by monitoring water delivery or pressure differences within a block.	100%	25%	93%	82%	100%	80%	[1]	40%	73%	92%	100%	100%	94%	90%	60%	72%	91%	36%	81%	18%	73%	
3	Cropped Area Action	Regular maintenance is performed on the irrigation system to maintain distribution uniformity and prevent runoff caused by leaks or clogged lines.	100%	100%	100%	100%	100%	100%	[1]	100%	94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%	
4	Cropped Area Action	Pressure regulators or pressure compensating emitters are used.	100%	82%	96%	100%	0%	100%	[1]	51%	91%	64%	99%	100%	100%	95%	100%	100%	88%	94%	81%	35%	83%	

BMP	Characterization Category	BMP Description	Tier 1 Drainages					Tier 2 Drainages					Tier 3 Drainages					Non-Priority Drainages				Unmonitored Drainage	
			05D_LAVD	05D_SANT_VCWPD	OXD_CENTR	S02T_TODD	S04T_TAPO	01T_ODD2_DCH	01T_ODD3_ARN	02D_BROOM	04D_ETTG	04D_LAS	05T_HONDO	06T_FC_BR	S02T_ELLS	S03D_BARDS	S03T_BOULD	S03T_TIMB	06T_LONG2	VRT_SANTO	9BD_GERRY		VRT_THACH
5	Cropped Area Action	Sprinkler heads and drip emitters of the same flow rate are used within each block and replaced with the same heads or emitters, when necessary.	100%	100%	100%	100%	100%	[1]	76%	100%	92%	100%	100%	100%	100%	100%	100%	92%	100%	100%	99%	95%	
6	Testing	Soil moisture is measured using any of the following: <ul style="list-style-type: none"> • Sensors • Tensiometers • Probes • Irrigation monitoring service 	23%	25%	41%	100%	5%	100%	[1]	14%	80%	82%	70%	94%	100%	39%	98%	20%	82%	61%	81%	70%	77%
7	Testing	Flow meters are used to measure actual water use and are coupled with known crop use values or other measurements to match irrigation to plant needs.	100%	100%	93%	94%	0%	59%	[1]	38%	79%	73%	93%	94%	97%	23%	87%	32%	73%	59%	73%	73%	78%

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			05D_LAVD	05D_SANT_VCWPD	OXD_CENTR	S02T_TODD	S04T_TAPO	01T_ODD2_DCH	01T_ODD3_ARN	02D_BROOM	04D_ETTG	04D_LAS	05T_HONDO	06T_FC_BR	S02T_ELLS	S03D_BARDS	S03T_BOULD	S03T_TIMB	06T_LONG2	VRT_SANTO	9BD_GERRY		VRT_THACH
8	Testing	Irrigation water quality is tested for parameters of interest including: <ul style="list-style-type: none"> • Nitrate • pH • Electrical Conductivity (EC) • Sodium • Chloride • Bicarbonate • Boron 	59%	82%	100%	94%	100%	100%	[1]	100%	97%	100%	100%	94%	94%	35%	100%	95%	83%	78%	81%	77%	89%
9	Cropped Area Action	Water use for plant establishment has been reduced by adopting more efficient irrigation methods such as: <ul style="list-style-type: none"> • Early drip use • Intermittent sprinklers • Micro-sprinklers 	100%	100%	100%	100%	100%	100%	[1]	100%	100%	100%	99%	100%	100%	43%	100%	100%	99%	86%	100%	92%	94%
10	Cropped Area Action	Irrigation decisions are made by trained personnel who understand appropriate irrigation management.	100%	100%	100%	100%	100%	100%	[1]	100%	100%	100%	100%	100%	100%	100%	89%	92%	100%	100%	99%	99%	

BMP	Characterization Category	BMP Description	Tier 1 Drainages					Tier 2 Drainages					Tier 3 Drainages					Non-Priority Drainages				Unmonitored Drainage	
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11	Testing	Salt leaching is performed only when necessary, as determined by measuring soil solution electrical conductivity (EC).	59%	93%	100%	100%	100%	79%	[1]	40%	97%	91%	33%	2%	66%	64%	27%	3%	62%	3%	91%	54%	54%
Nutrient Management																							
12	Testing	Soil or leaf/petiole tests are conducted to determine fertilization needs and the minimum amount necessary is applied based on the results.	69%	100%	42%	100%	100%	100%	[1]	100%	100%	100%	100%	95%	100%	100%	100%	100%	97%	95%	56%	89%	94%
13	Cropped Area Action	Fertilizer applications are split into multiple smaller applications to maximize plant uptake.	100%	100%	46%	100%	100%	100%	[1]	100%	87%	100%	100%	100%	100%	100%	100%	100%	99%	86%	100%	100%	99%
14	Testing	Fertilizer levels in fertigation water are tested to ensure that injectors are correctly calibrated.	100%	100%	42%	100%	5%	59%	[1]	50%	91%	88%	98%	98%	97%	22%	60%	32%	82%	21%	91%	59%	68%
15	Cropped Area Action	Fertilizer applications are timed to consider irrigation and potential rain events.	100%	100%	46%	100%	100%	100%	[1]	100%	100%	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%	100%	99%

BMP	Characterization Category	BMP Description	Tier 1 Drainages					Tier 2 Drainages					Tier 3 Drainages					Non-Priority Drainages				Unmonitored Drainage	
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16	Cropped Area Action	Fertilizer applications are adjusted to account for other nutrient sources, such as: irrigation water, cover crops, and residuals from previous fertilizations.	100 %	100 %	46%	100 %	100 %	100 %	[1]	76%	96%	92%	100 %	95%	100 %	100 %	100 %	89%	87%	100 %	100 %	44%	92%
17	Specialized Knowledge	Fertilizer decisions are made by trained personnel who understand the 4R's of nutrient management: <ul style="list-style-type: none"> • Right fertilizer source • Right rate • Right time • Right place 	100 %	100 %	46%	100 %	100 %	100 %	[1]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	97%	96%	100 %	94%	98%	
18	Uncropped Area Action	Fertilizers are stored where they are protected from rain and on an impermeable pad with a curb to contain spills.	66%	100 %	100 %	100 %	100 %	80%	[1]	58%	79%	100 %	99%	100 %	100 %	100 %	100 %	88%	99%	92%	100 %	97%	90%
19	Uncropped Area Action	Backflow prevention devices are installed and maintained.	77%	100 %	100 %	94%	100 %	100 %	[1]	63%	97%	100 %	100 %	95%	100 %	38%	56%	100 %	100 %	100 %	100 %	100 %	95%

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Sediment Management																								
20	Cropped Area Action	Long runs of production area are broken up by access roads or buffer strips to reduce sediment movement.	100 %	100 %	97%	89%	100 %	80%	[1]	100 %	94%	100 %	100 %	95%	100 %	100 %	100 %	88%	100 %	85%	100 %	93%	94%	
21	Cropped Area Action	In sloped production areas, one or more of the following management practices is used to minimize erosion: <ul style="list-style-type: none"> • Contour farming • Contoured buffer strips • Terracing 	100 %	100 %	NA	100 %	95%	0%	[1]	100 %	88%	100 %	95%	100 %	100 %	22%	95%	85%	94%	88%	100 %	29%	93%	
22	Cropped Area Action	Bare soil is minimized through use of cover crops, mulch, leaving plant debris, or planting subsequent crops, and the soil cover is replenished periodically to maintain effectiveness.	69%	100 %	93%	65%	100 %	100 %	[1]	100 %	82%	100 %	100 %	76%	94%	96%	100 %	83%	91%	90%	100 %	88%	88%	

BMP	Characterization Category	BMP Description	Tier 1 Drainages					Tier 2 Drainages					Tier 3 Drainages					Non-Priority Drainages				Unmonitored Drainage	
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23	Cropped Area Action	Soil amendments, such as polyacrylamide (PAM), are used to reduce sediment movement and retain water.	46%	75%	4%	33%	0%	0%	[1]	0%	43%	86%	28%	0%	72%	8%	48%	0%	23%	7%	0%	0%	24%
24	Uncropped Area Action	Berms, culverts, or flow channels are in place to divert water away from roads. These devices or structures are maintained to preserve their functionality.	100%	100%	100%	94%	100%	100%	[1]	100%	85%	100%	100%	95%	100%	96%	100%	100%	97%	98%	100%	48%	96%
25	Uncropped Area Action	Road erosion is minimized by use of any of the following: <ul style="list-style-type: none"> • Grading • Gravel • Grass • Mulch • Water bars • Drains 	100%	100%	96%	94%	100%	100%	[1]	100%	100%	100%	100%	95%	100%	30%	100%	100%	97%	98%	100%	99%	97%

BMP	Characterization Category	BMP Description	Tier 1 Drainages					Tier 2 Drainages					Tier 3 Drainages					Non-Priority Drainages				Unmonitored Drainage	
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26	Uncropped Area Action	Non-cropped areas with bare soil are protected from erosion with any of the following: <ul style="list-style-type: none"> • Vegetation • Mulch • Gravel • Water diversion 	100%	100%	93%	100%	100%	80%	[1]	100%	79%	100%	100%	100%	33%	100%	100%	95%	74%	100%	89%	91%	
27	Uncropped Area Action	Ditch banks are protected from erosion with vegetation, rock placement or geotextiles.	84%	82%	97%	88%	0%	79%	[1]	51%	75%	54%	90%	100%	91%	36%	94%	100%	88%	98%	96%	98%	69%
28	Uncropped Area Action	One or more of the following is in place to treat runoff before it leaves the property. <ul style="list-style-type: none"> • Grassed waterways • Vegetated filter strips • Sediment traps • Tailwater recycling systems 	48%	7%	39%	79%	95%	59%	[1]	100%	56%	64%	89%	100%	84%	20%	87%	69%	46%	76%	89%	11%	52%

BMP	Characterization Category	BMP Description	Tier 1 Drainages					Tier 2 Drainages					Tier 3 Drainages					Non-Priority Drainages				Unmonitored Drainage		
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Pesticide Management																								
29	Testing	Before application of pesticides, pest scouting is conducted using one or more of the following methods: <ul style="list-style-type: none"> • Yellow sticky traps • Pheromone traps • Plant inspection • Beating • Net sweeping 	100%	100%	100%	100%	100%	00%	[1]	00%	00%	00%	00%	99%	00%	00%	00%	00%	91%	00%	00%	88%	98%	
30	Specialized Knowledge	Natural enemy populations are considered when choosing pesticides, application rates, and timing.	00%	00%	00%	00%	00%	00%	[1]	00%	00%	00%	00%	00%	00%	00%	00%	00%	88%	00%	00%	90%	97%	
31	Cropped Area Action	Sprayers are routinely calibrated to ensure accurate application rates.	100%	100%	100%	100%	100%	100%	[1]	100%	100%	100%	100%	100%	100%	100%	100%	100%	88%	86%	100%	98%	98%	
32	Cropped Area Action	Worn nozzles and screens are replaced to ensure the best coverage of pesticide applications.	100%	100%	100%	100%	100%	100%	[1]	100%	100%	100%	100%	100%	100%	100%	100%	100%	95%	86%	100%	98%	99%	

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33	Uncropped Area Action	Pesticides are stored and mixed on an impermeable pad and at least 100 feet down slope from water sources (such as wells).	48%	100%	96%	100%	95%	80%	[1]	100%	94%	100%	98%	95%	94%	85%	100%	86%	87%	86%	93%	98%	88%
34	Cropped Area Action	Pesticides are not applied when rain or scheduled irrigation events are anticipated.	100%	100%	100%	100%	100%	100%	[1]	100%	100%	100%	100%	100%	100%	100%	100%	96%	86%	100%	98%	99%	
Trash Management																							
35	Uncropped Area Action	The property is kept clean and free of trash.	100%	100%	96%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
36	Uncropped Area Action	The property has an adequate number of trash containers that are covered and emptied regularly.	100%	100%	96%	100%	100%	80%	100%	100%	92%	100%	99%	95%	100%	100%	100%	100%	100%	94%	100%	100%	96%

[1] Only one survey addressed parcels that were wholly or partially in the 01T_ODD3_ARN drainage. The respondent provided nonsensical responses (“unapplicable”) for all of the BMPs except for BMPs 35 and 36. This would have resulted in a 0% adoption rate for BMPs 1-34 for this drainage area, and would have biased results where adoption rates were aggregated for Tier 2. Consequently, the surveyed acreage for 01T_ODD3_ARN was omitted from analysis for BMPs 1-34.